3Rs & Waste Management in Tokyo

Resource Recycling Promotion Division
Bureau of the Environment
Tokyo Metropolitan Government

TOKYO METROPOLITAN GOVERNMENT 東京都

TODAY'S TOPIC

1. INTRODUCTION

- 1-1 WASTE/RECYCLING RELATED LAWS
- 1-2 CITY PROFILE
- 1-3 HISTORY OF WASTE IN TOKYO

2. 3RS AND WASTE MANAGEMENT IN TOKYO

- 2-1 MSW
- 2-2 INDUSTRIAL WASTE
- 2-3 TMG'S 5-YEAR PLAN

3. CONCLUSION

1. INTRODUCTION

1-1 WASTE/RECYCLING RELATED LAWS

WASTE/RECYCLING RELATED LAWS

Basic Law for Establishing the Recycling-Based Society

(Stipulating Basic Philosophy for Establishing the Recycling-Based Society)

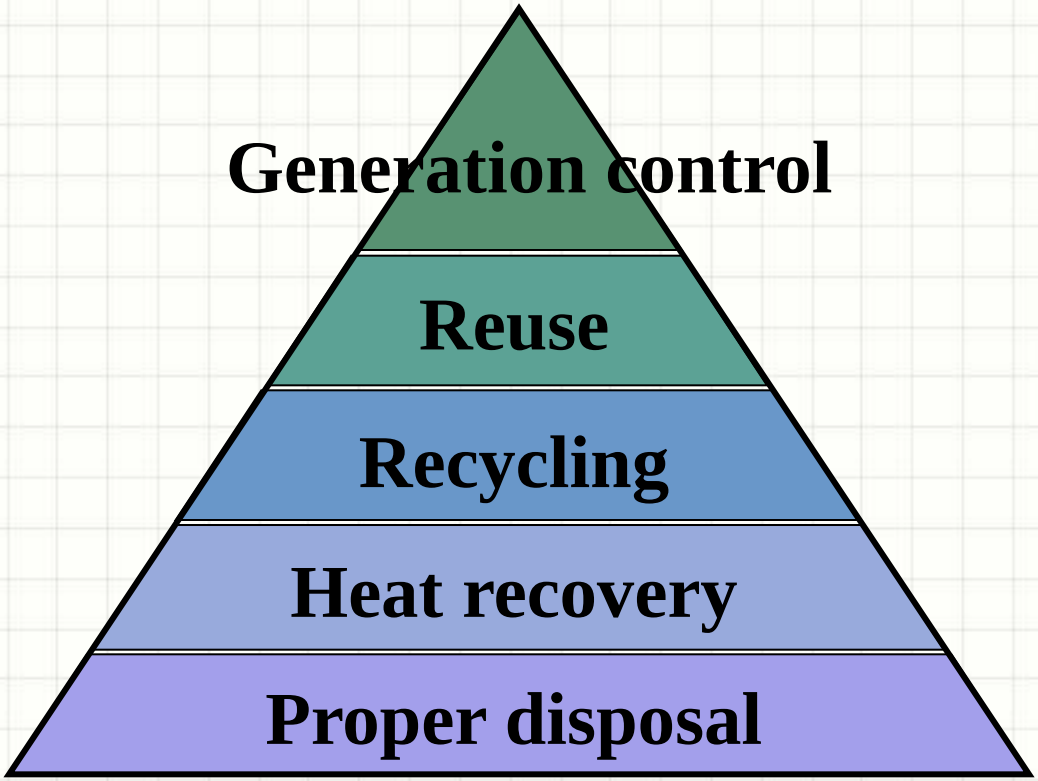
Law for the Promotion of Effective Utilization of Resources

Waste Disposal and Public Cleansing Law

- Containers and Packaging Recycling Law
- Home Appliances Recycling Law
- Food Recycling Law
- Construction Materials Recycling Law
- End-of-life Vehicle Recycling Law
- Promotion of Recycling of Small Waste Electrical and Electronic Equipment Law (2013.4-)

5 PRIORITY RANKS

Basic Law for Establishing the Recycling-Based Society



The hierarchy ranks waste management options according to their environmental benefits. These options should be taken, in this order, whenever environmentally beneficial and economically viable.

WASTE DISPOSAL AND PUBLIC CLEANSING LAW

Definition of waste in the law

Waste

- **Municipal Solid Waste**
  - Waste other than industrial waste (domestic waste, night soil, etc.)
  - **Household Waste**
  - **Municipal Waste from Business Offices**
- **Industrial Waste**
  - 20 items including sludge, waste plastic, waste oil, debris, etc.

Special Controlled Waste

Some waste items, such as PCB, asbestos, infectious waste, and explosives, are classified as general or industrial waste under special control. They are obliged to be kept under strict control.

WASTE DISPOSAL AND PUBLIC CLEANSING LAW

Roles of each body stated in the law

Nation level

- Establish basic policies,
- Formulate waste disposal standards,
- Provide support to prefectures/municipalities, etc.

Prefecture level

- Establish waste management plan,
- Provide control/guidance for appropriate disposal of industrial waste,
- Give licenses to industrial waste disposal contractors and approve construction of waste management facilities,
- Provide support to municipalities, etc.

Municipal level

- Establish general waste management plan,
- Treat general waste according to general waste management plan,
- Give licenses to general waste disposal contractors, etc.

OBLIGATION OF MAKING A MSW DISPOSAL PLAN

In the Waste Disposal and Public Cleansing Law

Prefectural Plan

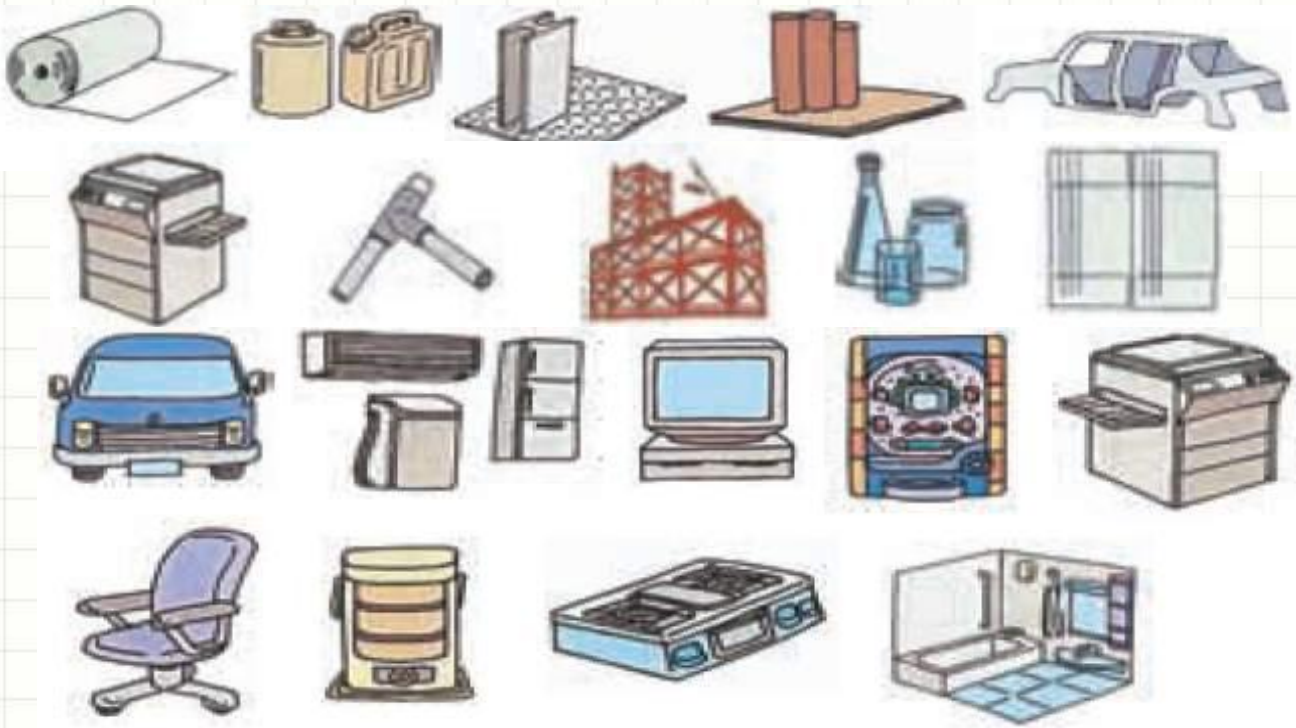
- Estimates amount of waste generation/treatment,
- Establishes basic policies related to reduction and treatment,
- Ensures proper management of general waste,
- Improves industrial waste management facilities, etc.

Municipal Plan

- Estimates amount of waste generation/treatment,
- Takes waste control measures,
- Classifies waste for sorting,
- Treats waste properly,
- Improves waste management facilities, etc.

LAW FOR THE PROMOTION OF EFFECTIVE UTILIZATION OF RESOURCES

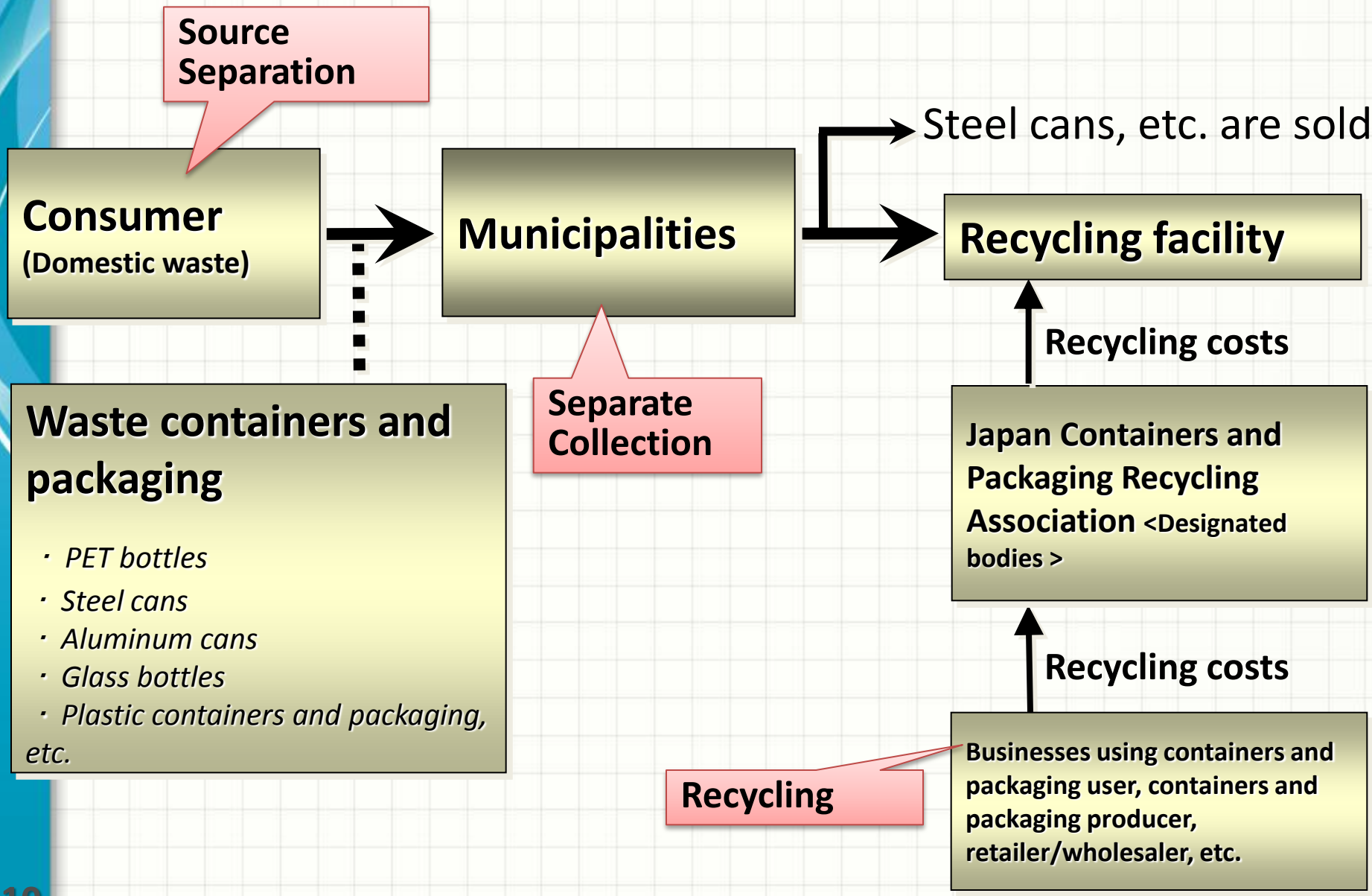
It states the standards of 3R efforts to be made by the producers



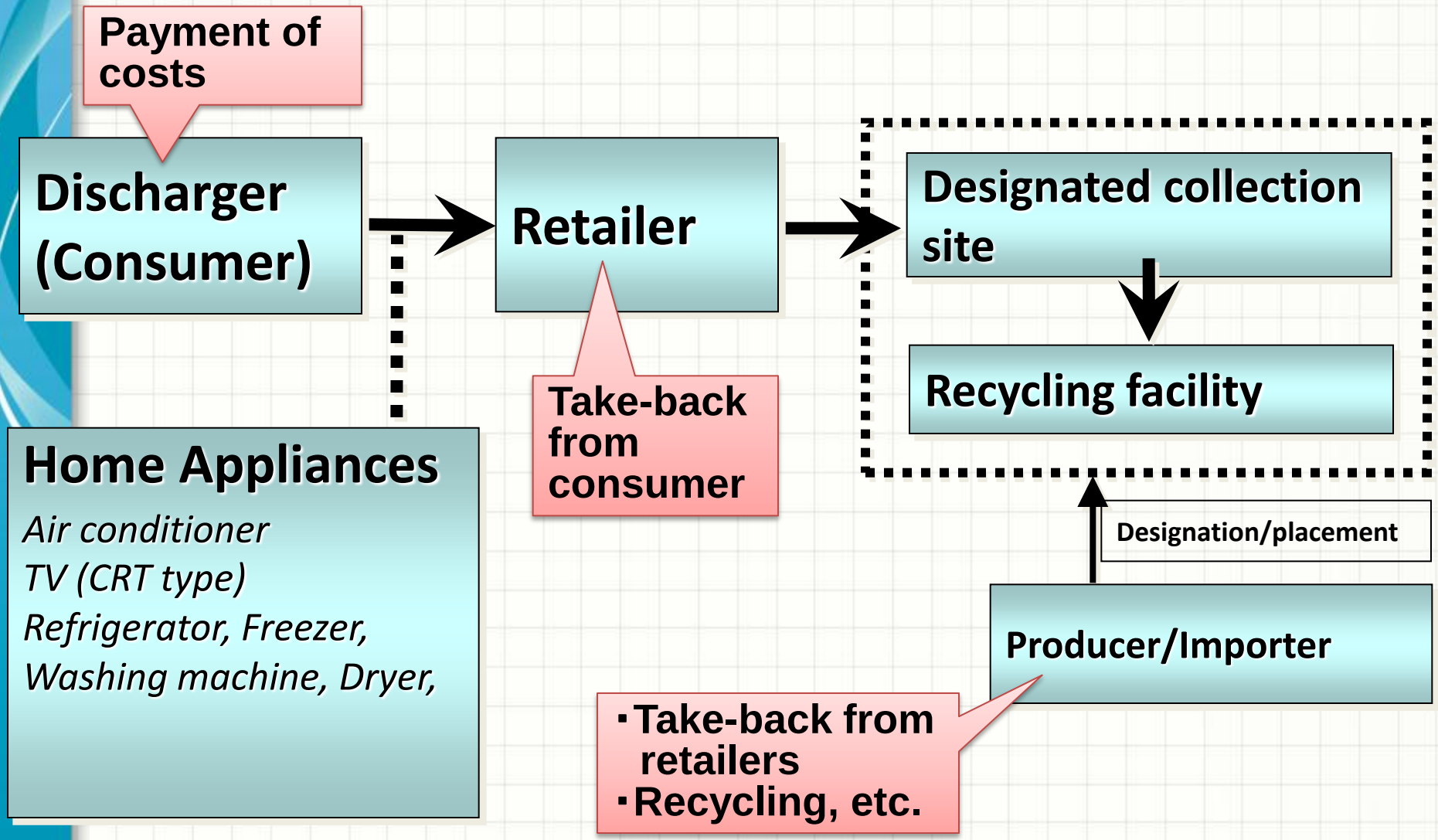
Regarding 69 products and 10 types of businesses.

The law covers approx. 50% of end-of-life products and waste in Japan

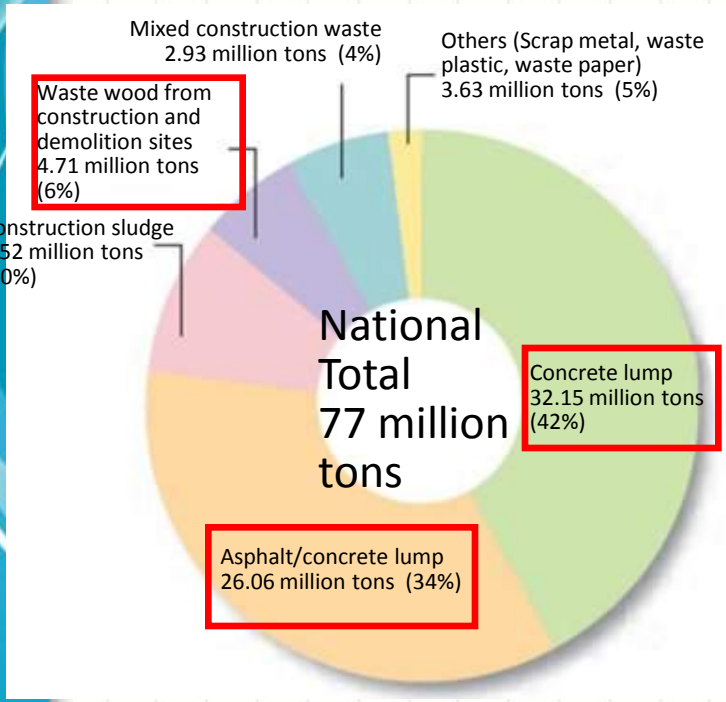
CONTAINERS AND PACKAGING RECYCLING LAW



HOME APPLIANCES RECYCLING LAW

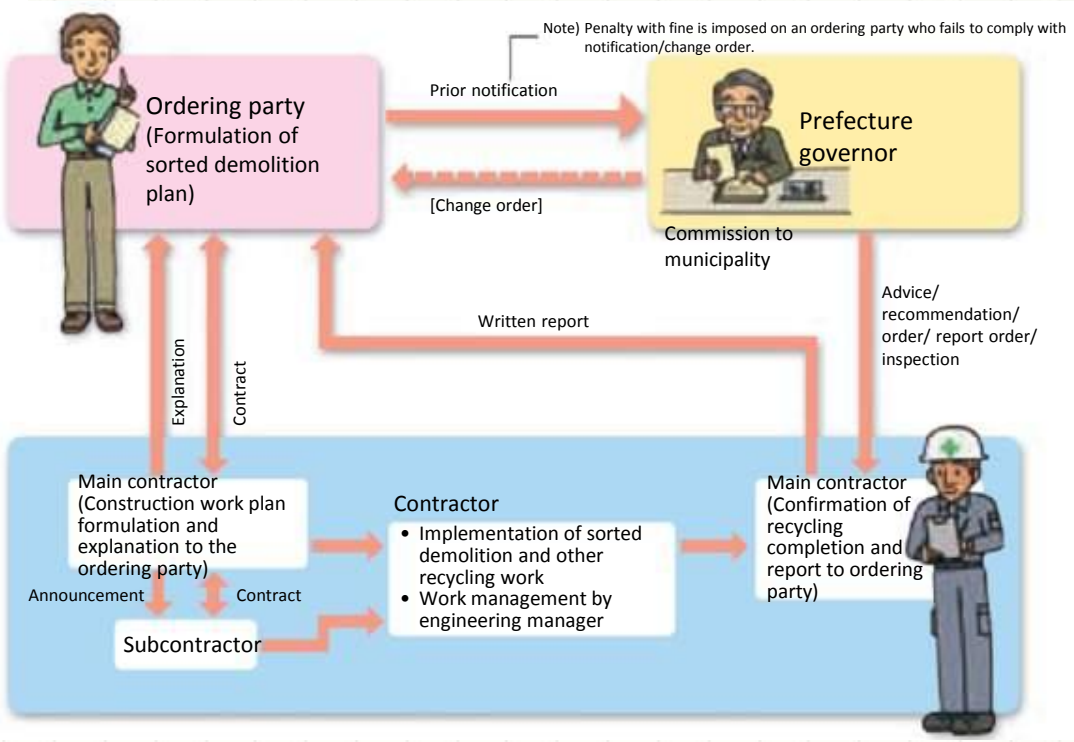


CONSTRUCTION MATERIALS RECYCLING LAW

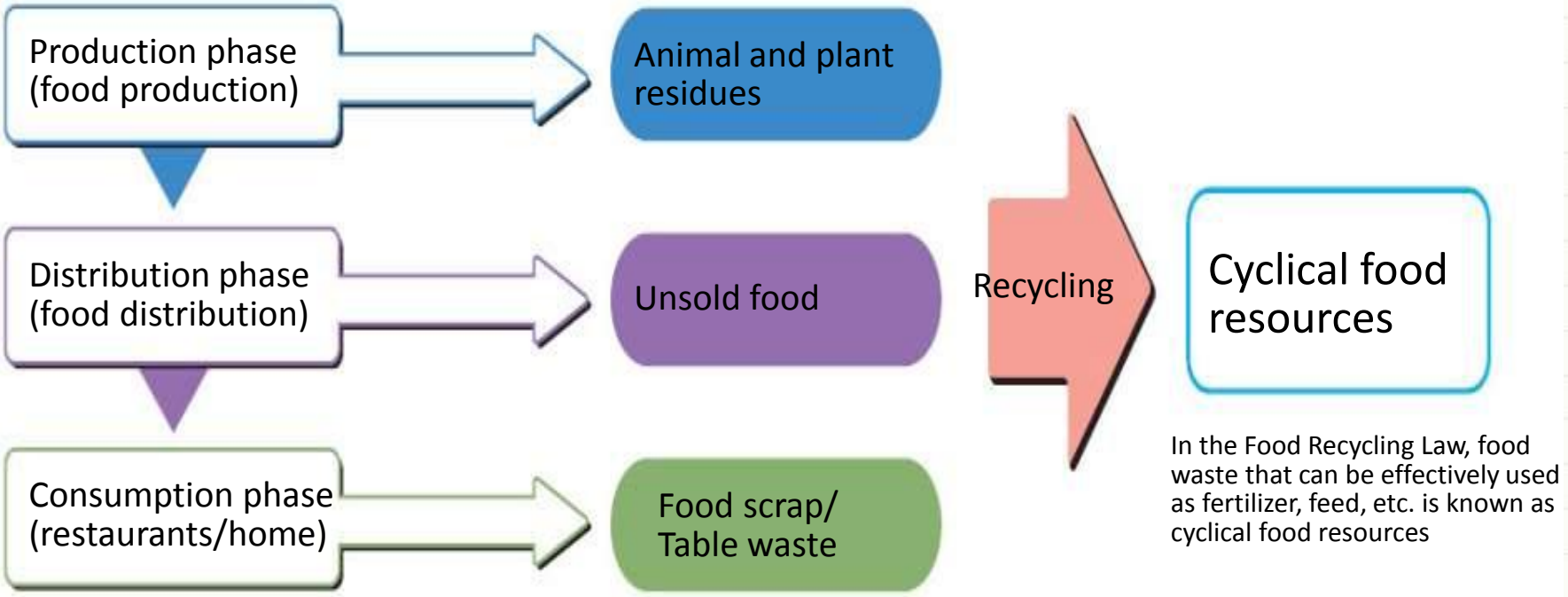


Items to be recycled

Order/implementation flow of sorted demolition/recycling



FOOD RECYCLING LAW



In the Food Recycling Law, food waste that can be effectively used as fertilizer, feed, etc. is known as cyclical food resources

	Annual generation (10,000 tons)	Recycling rate (%)
Food producer	493	81
Food wholesaler	74	62
Food retailer	263	35
Restaurants	305	22
Food industry total	1,134	54

END-OF-LIFE VEHICLE RECYCLING LAW

Vehicle owner

- Vehicle owner (Final owner)
  Pay recycling fee; Deliver an end-of-life vehicle to the receiver registered with the municipality

Related businesses

- Receiver
  Receives ELVs from the final owner, and delivers them to fluorocarbon recovery operators or dismantlers.
- Fluorocarbon recovery operator
  Recovers fluorocarbons and delivers it to automobile manufacturers or importers.
- Dismantler
  Dismantles ELVs, recovers airbags, and delivers them to automobile manufacturers or importers.
  Recovers fluorocarbons and delivers them to automobile manufacturers or importers.
- Shredder operator
  Shreds dismantled ELVs, and delivers shredder dust to automobile manufacturers or importers.

Automobile manufacturer / Importer

- Automobile manufacturer/importer
  When vehicles they produced or imported are scrapped, they take over shredder dust, airbags, and fluorocarbons generated from the ELVs, and recycle them.

It's NEW!

SMALL ELECTRONIC DEVICES RECYCLING PROMOTION LAW

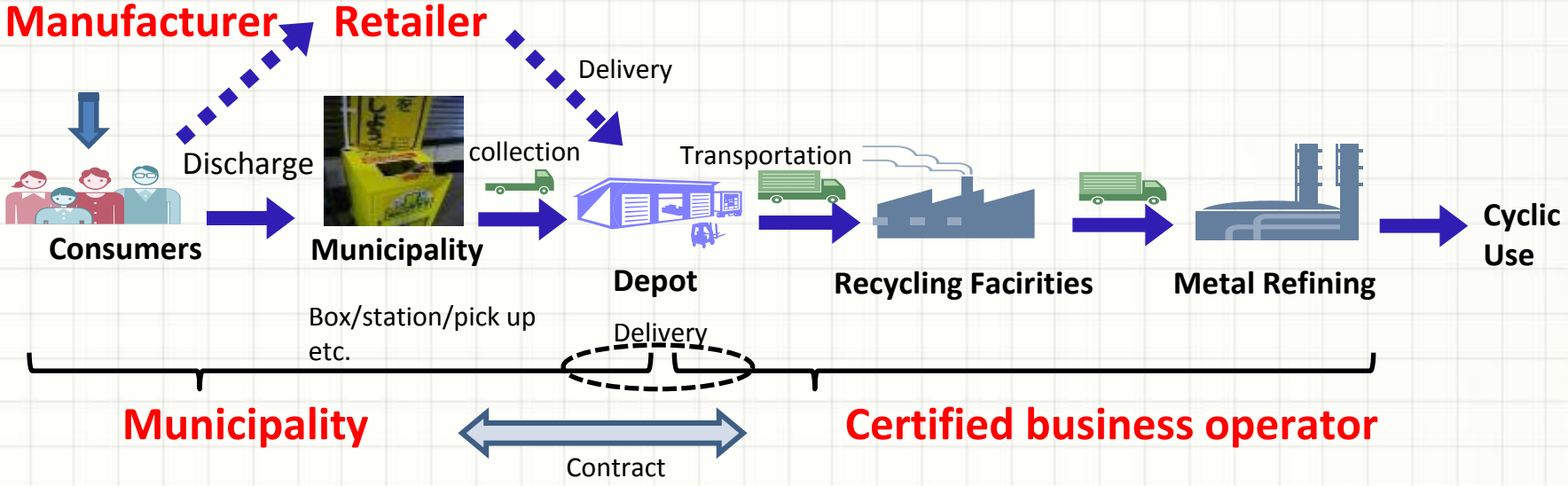
From April 2013

Background

Limitation of Natural Resources
-Escalating price of resources
Limitation of Environment
-Lack of land for final landfill site
-Proper management of the environment

Concept

Non mandatory scheme
Provide guideline, set up necessary procedure for each sector
In order to promote recycling of precious metals used in small electronic devices



1. INTRODUCTION

1-2 CITY PROFILE

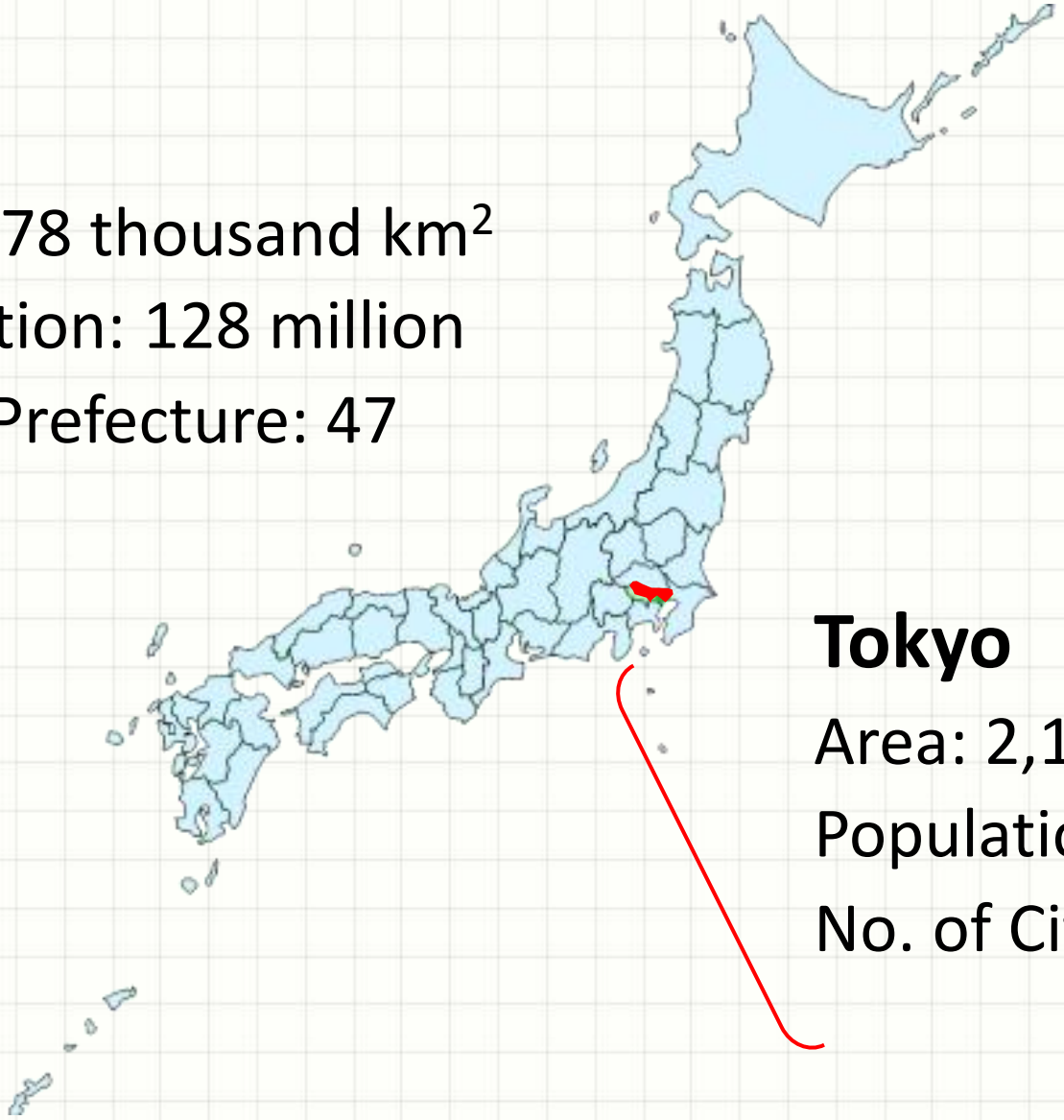
TOKYO

Japan

Area: 378 thousand km²

Population: 128 million

No. of Prefecture: 47



Tokyo

Area: 2,188 km²

Population: 13 million

No. of City: 62

TOKYO

Tama area

Area: 1160 km^2

Population: 4,192,937

No. of municipalities: 30

23-ward area

Area: 622 km^2

Population: 9,002,488

No. of municipalities: 23

Izu/Ogasawara islands

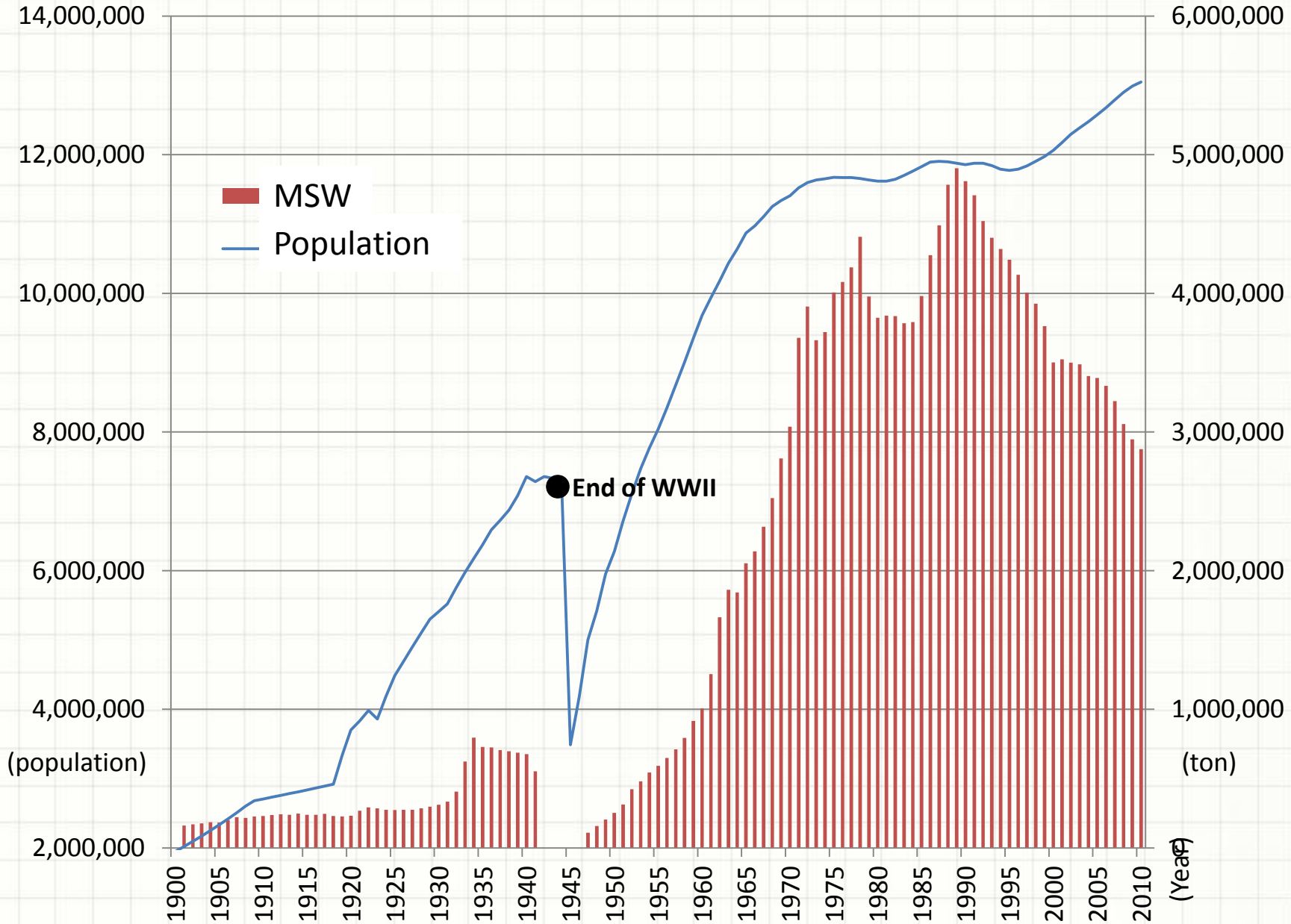
Area: 406 km^2

Population: 27,335

No. of municipalities: 9

As of 1st Jan 2013

Rapid increase of Population and MSW



【Biggest Challenge】 Lack of land for FDS

FDS in Tokyo Bay

①1927-1962
②1957-1966
③1965-1974
④1973-1986
⑤1977-
⑥1984-1991
⑦1998-

1. INTRODUCTION

1-3 HISTORY OF WASTE IN TOKYO

OPPOSITION AGAINST INCINERATOR 1950's

Outbreak of Flies (1965)

Burning down flies on FDS in cooperation with fire department and polices.

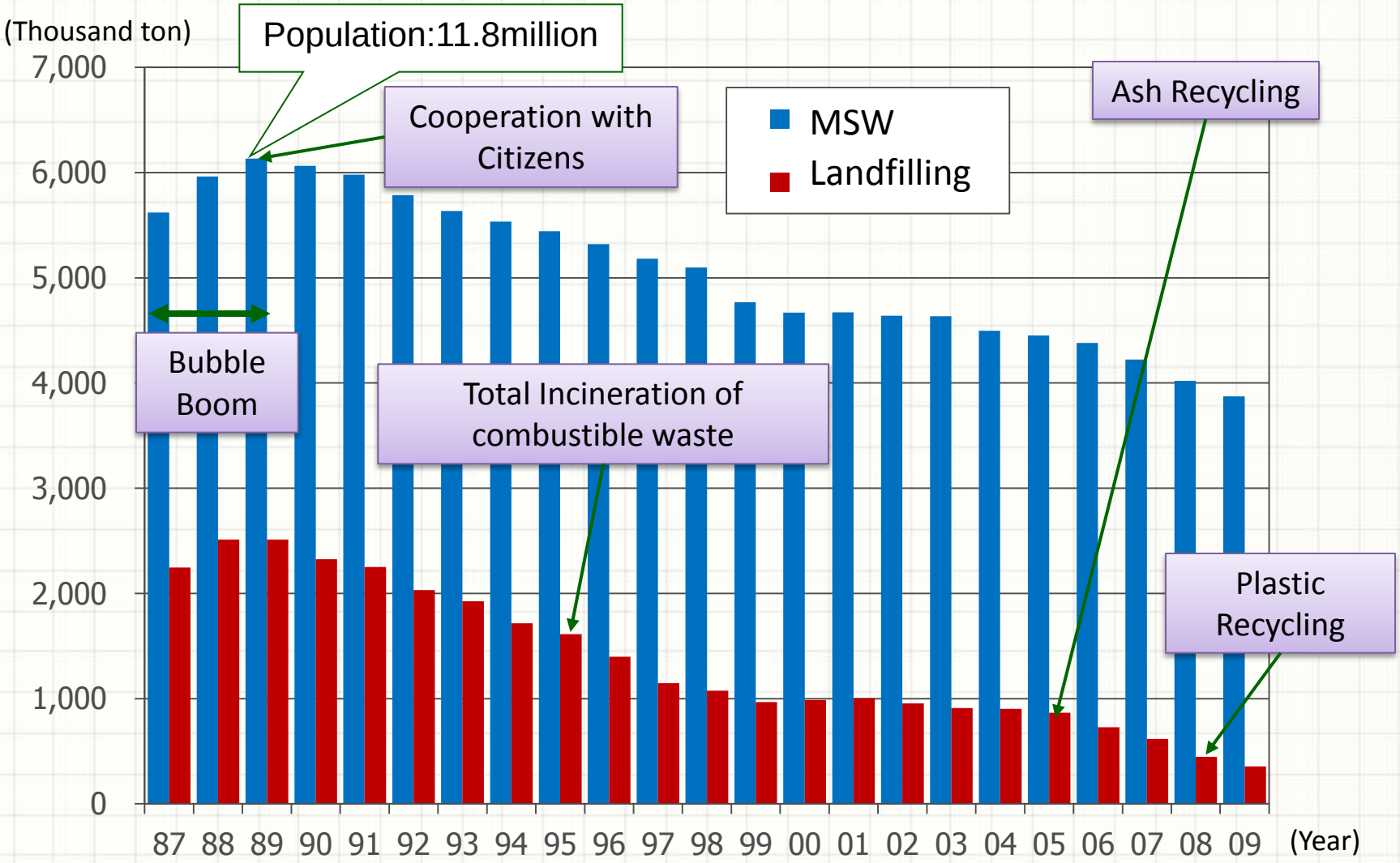
GARBAGE WAR 1970's

Don't bring garbage into my city

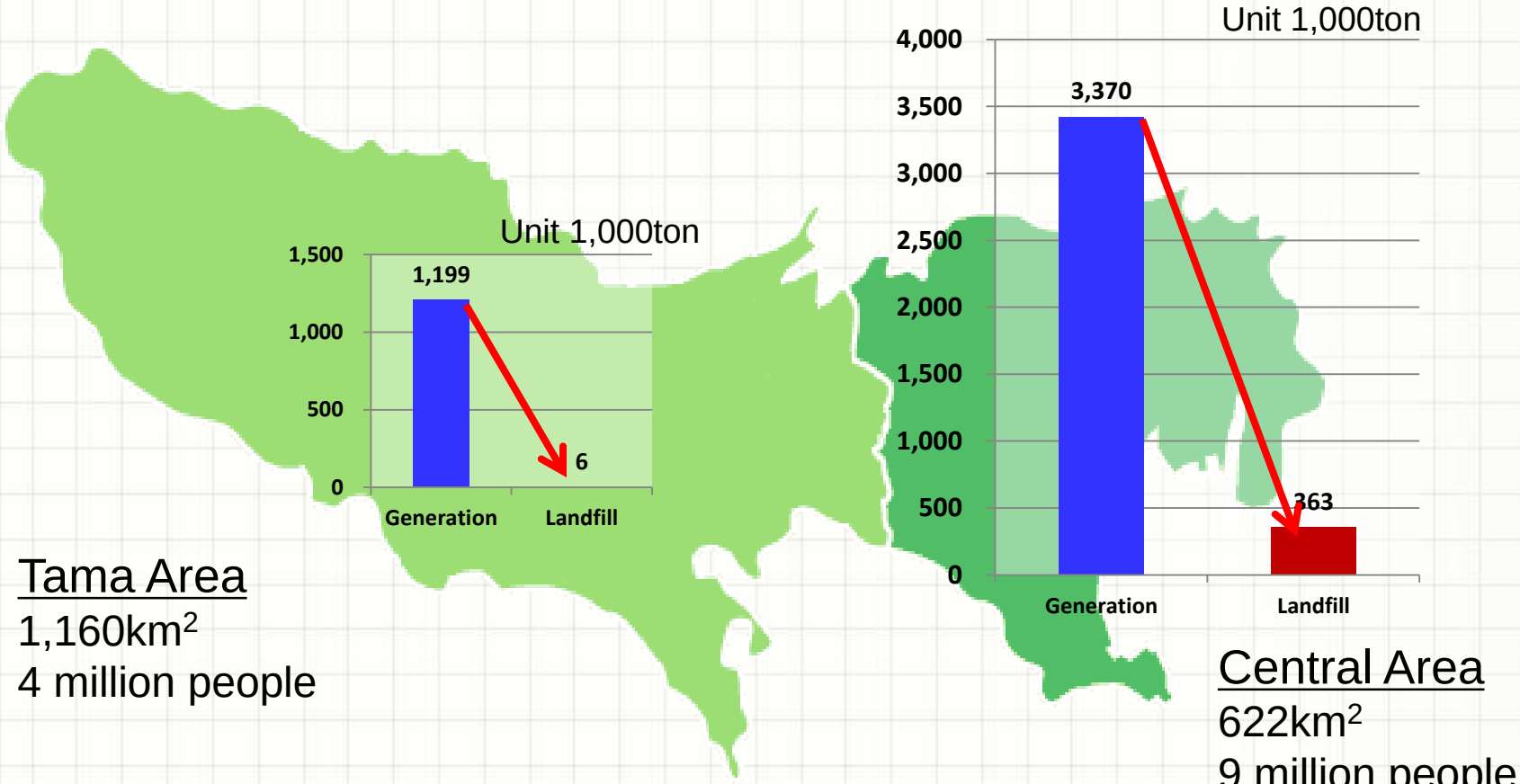
PEAK OF WASTE GENERATION (1989)

ILLEGAL DUMPING (C&D WASTE)

Reduction of Waste Generation and Final Disposal Amount



Reduction of Final Disposal Amount



Tama Area
1,160km^2
4 million people

Central Area
622km^2
9 million people

2. 3Rs and Waste Management in Tokyo

2-1 MSW

2-2 Industrial waste

2-3 TMG's 5-year Plan

2. 3Rs & Waste Management in Tokyo

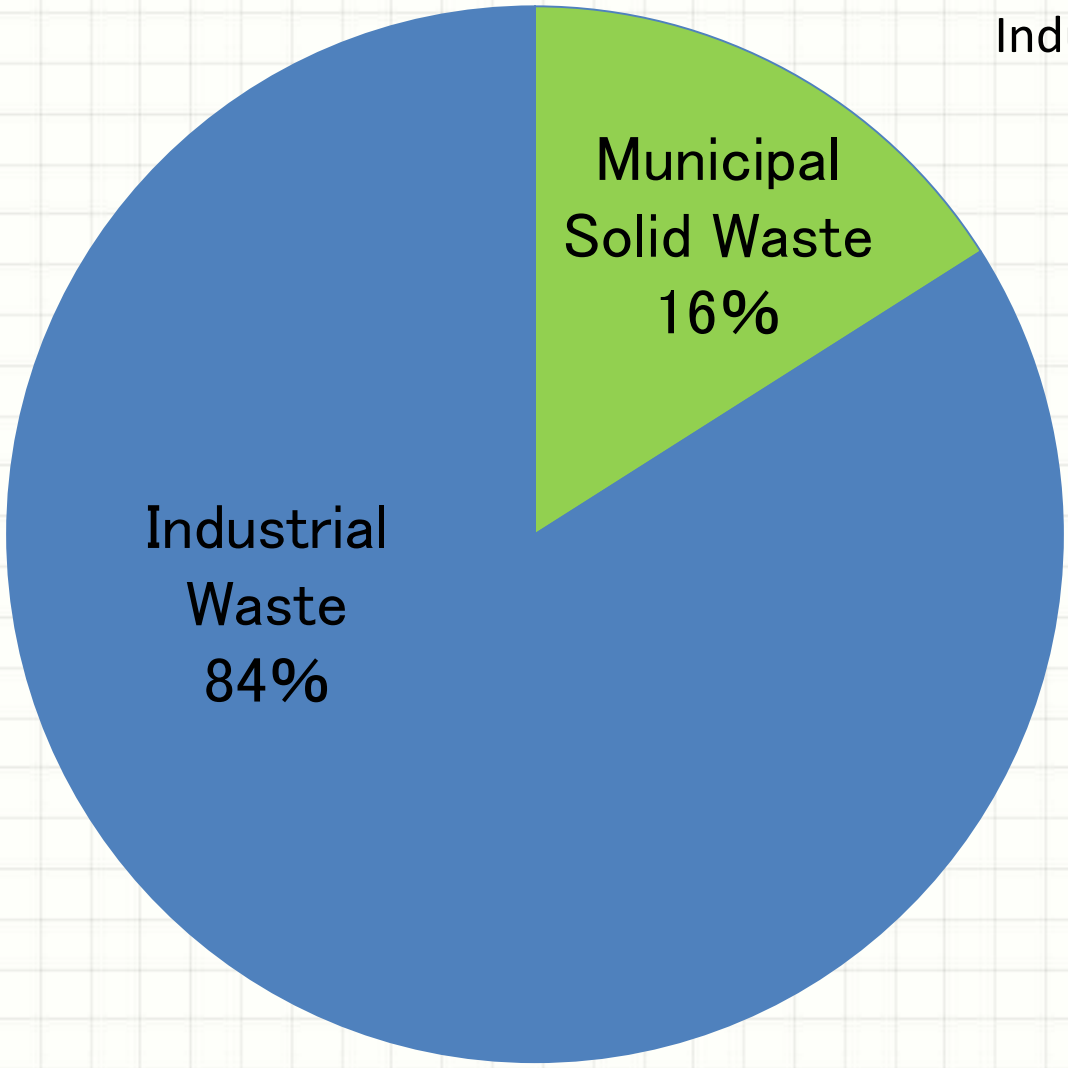
2-1 MSW

Waste Generation in Tokyo

77,700t/day

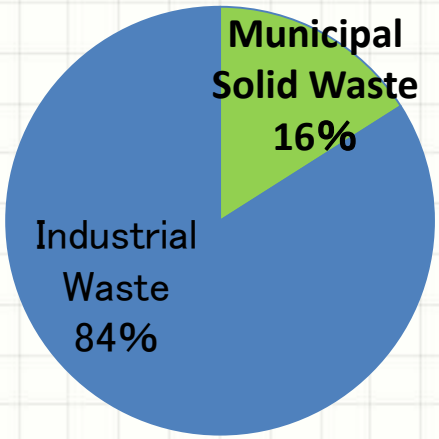
M S W : 12,600t/d

Industrial : 65,100t/d



In 2011

MSW IN TOKYO 12,600T/D



Waste generated by

- Households
- Small businesses

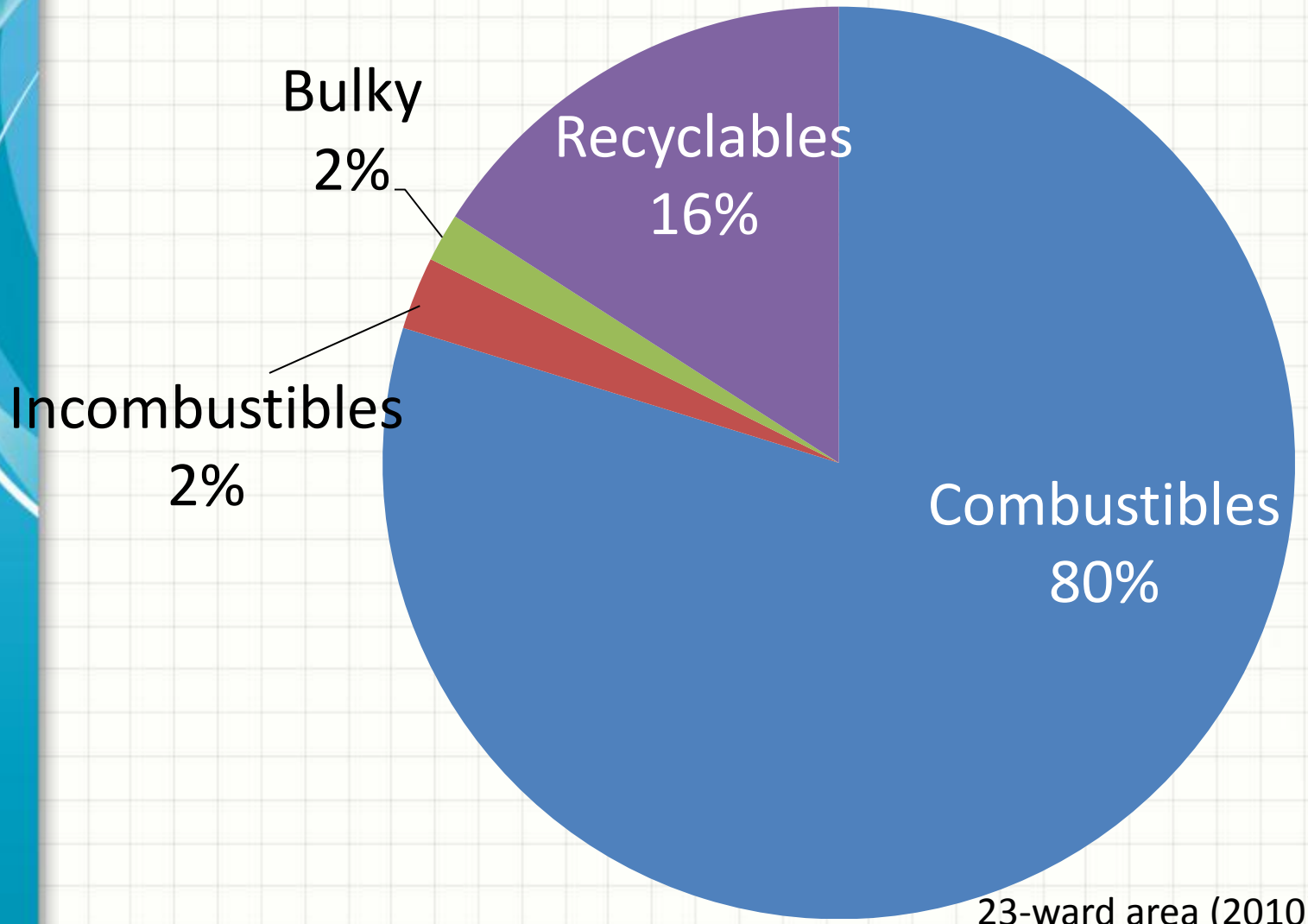
Managed and disposed by

Municipal Government

MSW MANAGEMENT

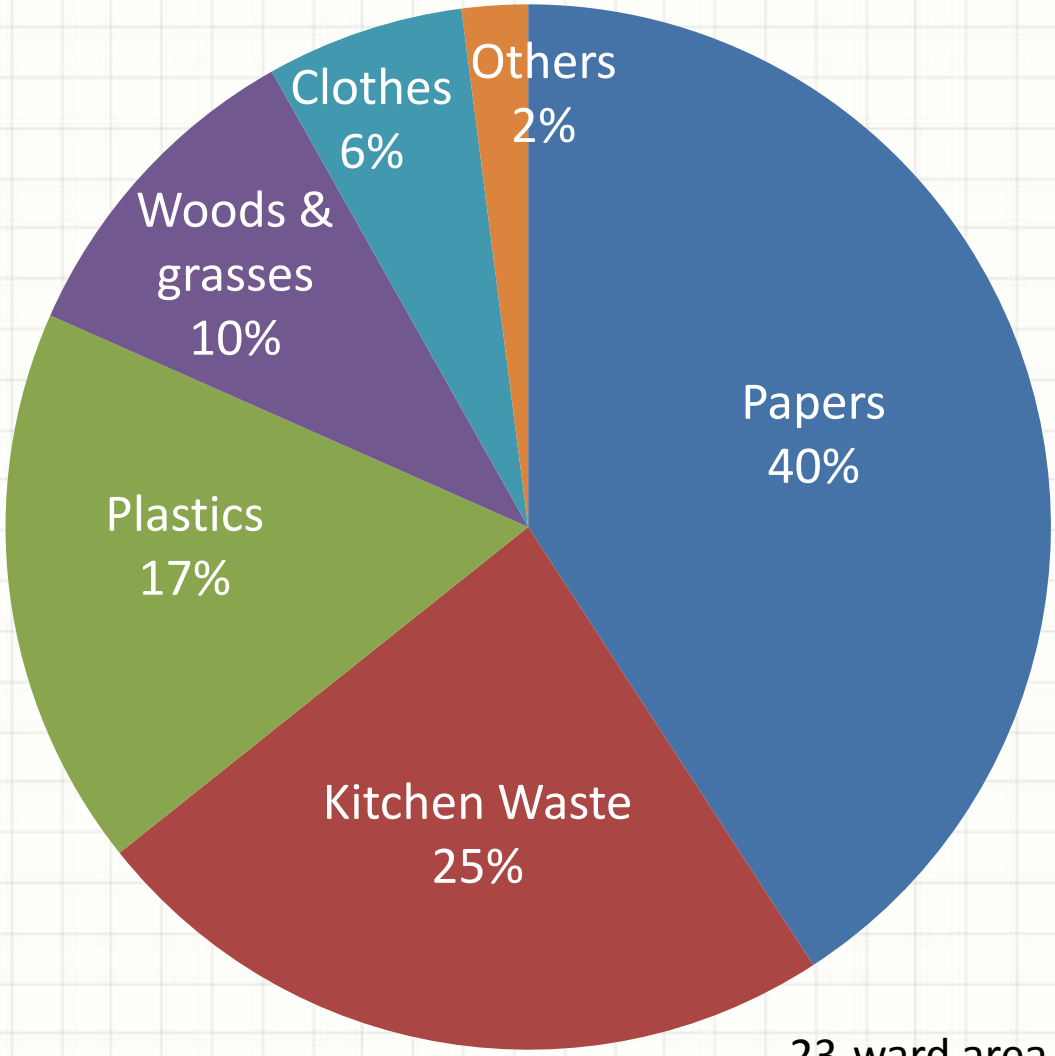
- Each municipal government has responsibility for MSW management
- Providing careful services to residents

RATIO OF MSW



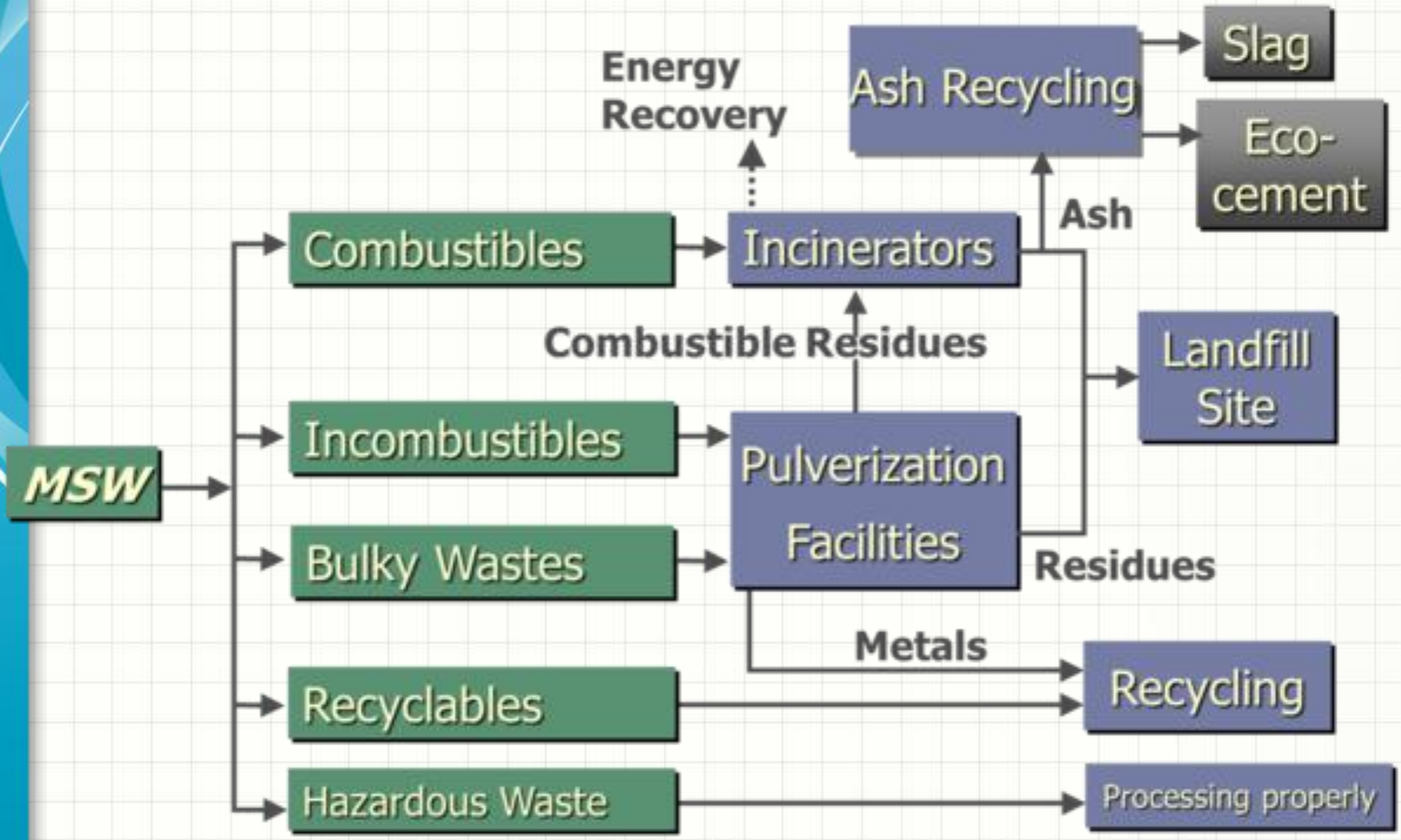
23-ward area (2010)
Source: Clean Association Tokyo23

COMPOSITION OF COMBUSTIBLE WASTE

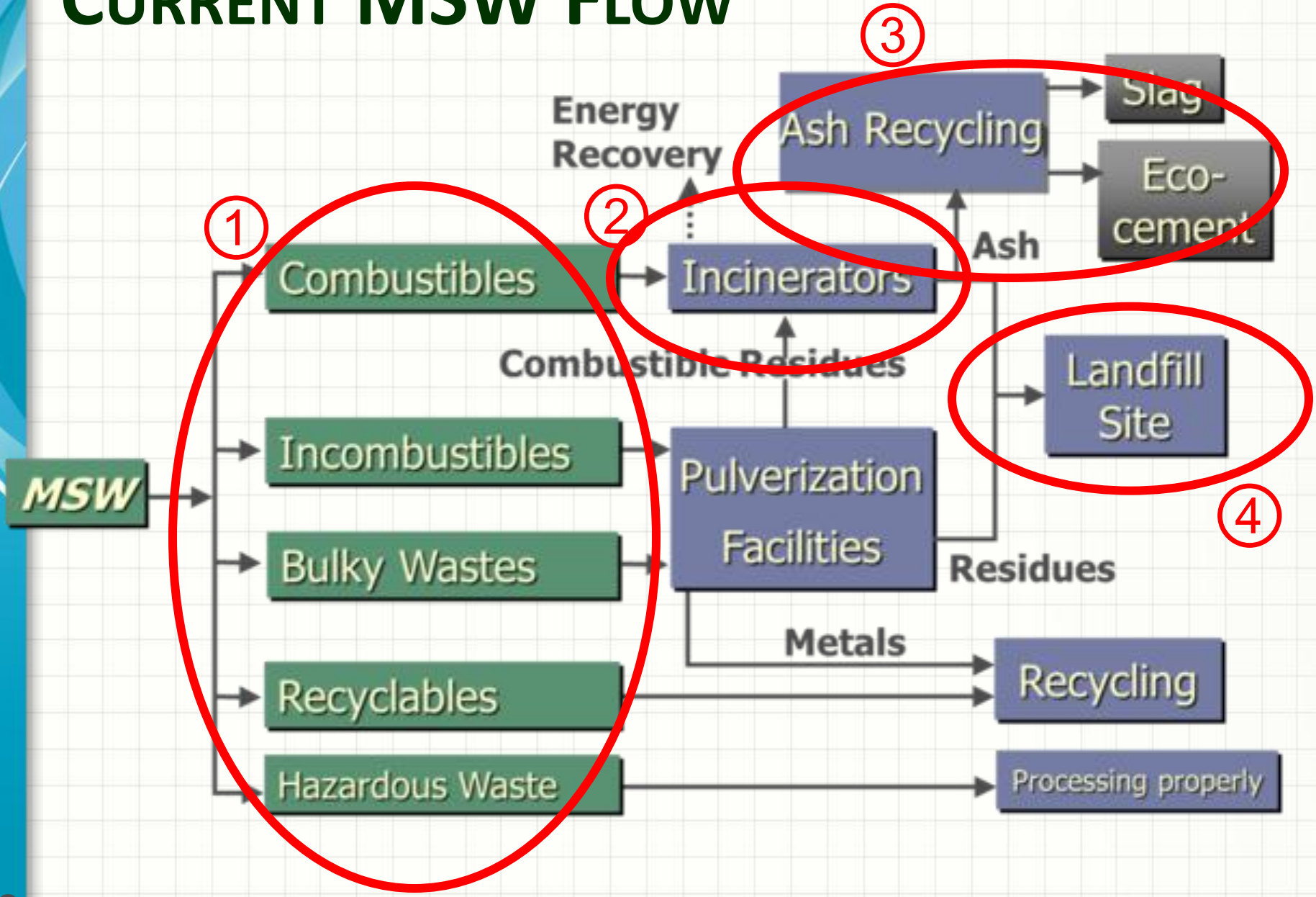


23-ward area (2012)
Data: Clean Association Tokyo23

CURRENT MSW FLOW



CURRENT MSW FLOW



Source Separation by Residents

Recyclables and garbage collection point in the community

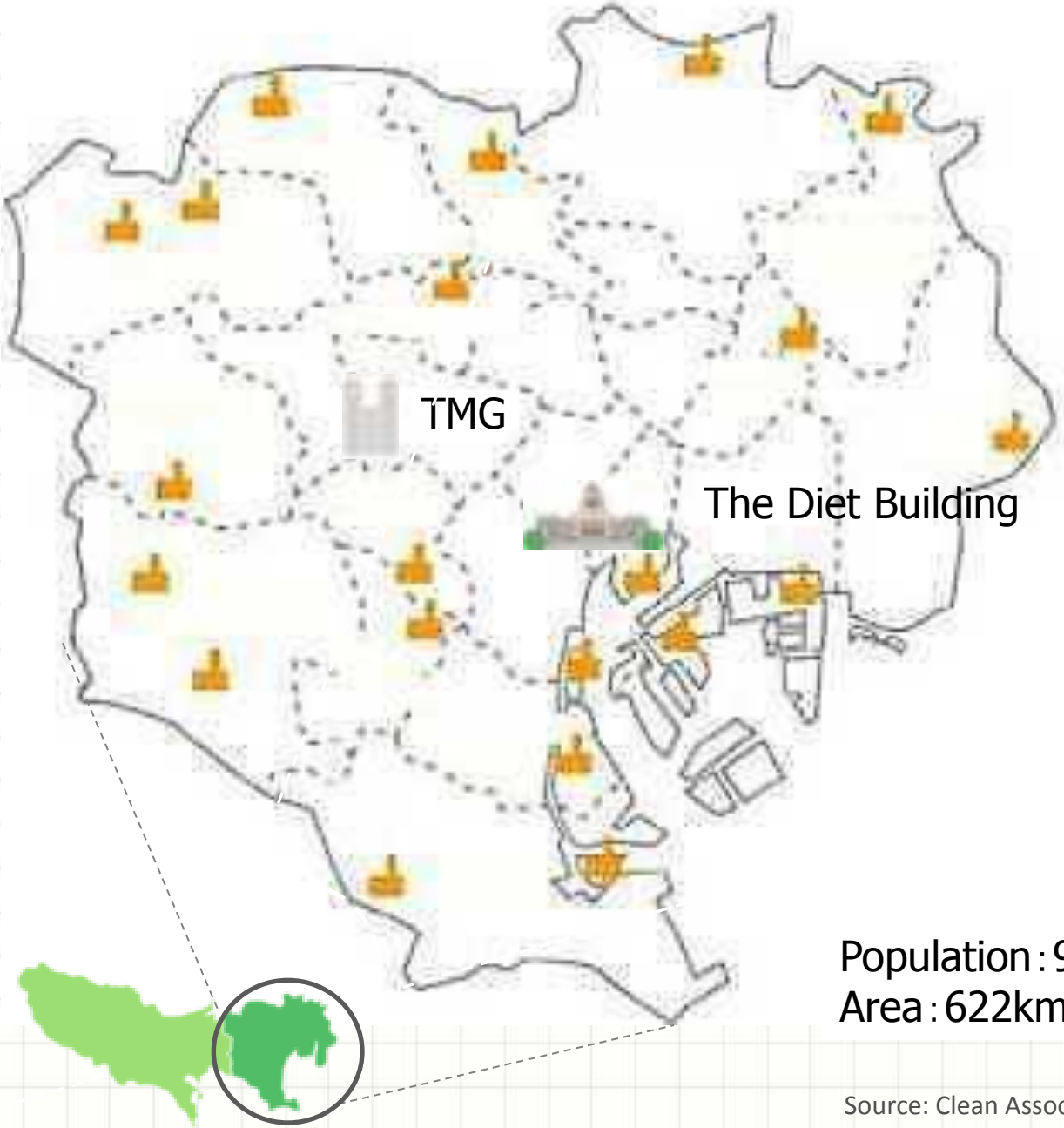
VOLUNTARY RECYCLING ACTIVITIES

Sign: Collection point for recyclables

CONTINUOUS COMMUNICATION

ENVIRONMENTAL EDUCATION

21 Incineration Plants in 23-Ward



Population : 9million
Area : 622km2

Source: Clean Association of TOKYO23

Feature of Incineration Plant in 23 ward

Toshima incineration plant
- next to Ikebukuro Station
(2.7 million passengers/day)

All incineration plants in 23-ward
- equipped with power generator

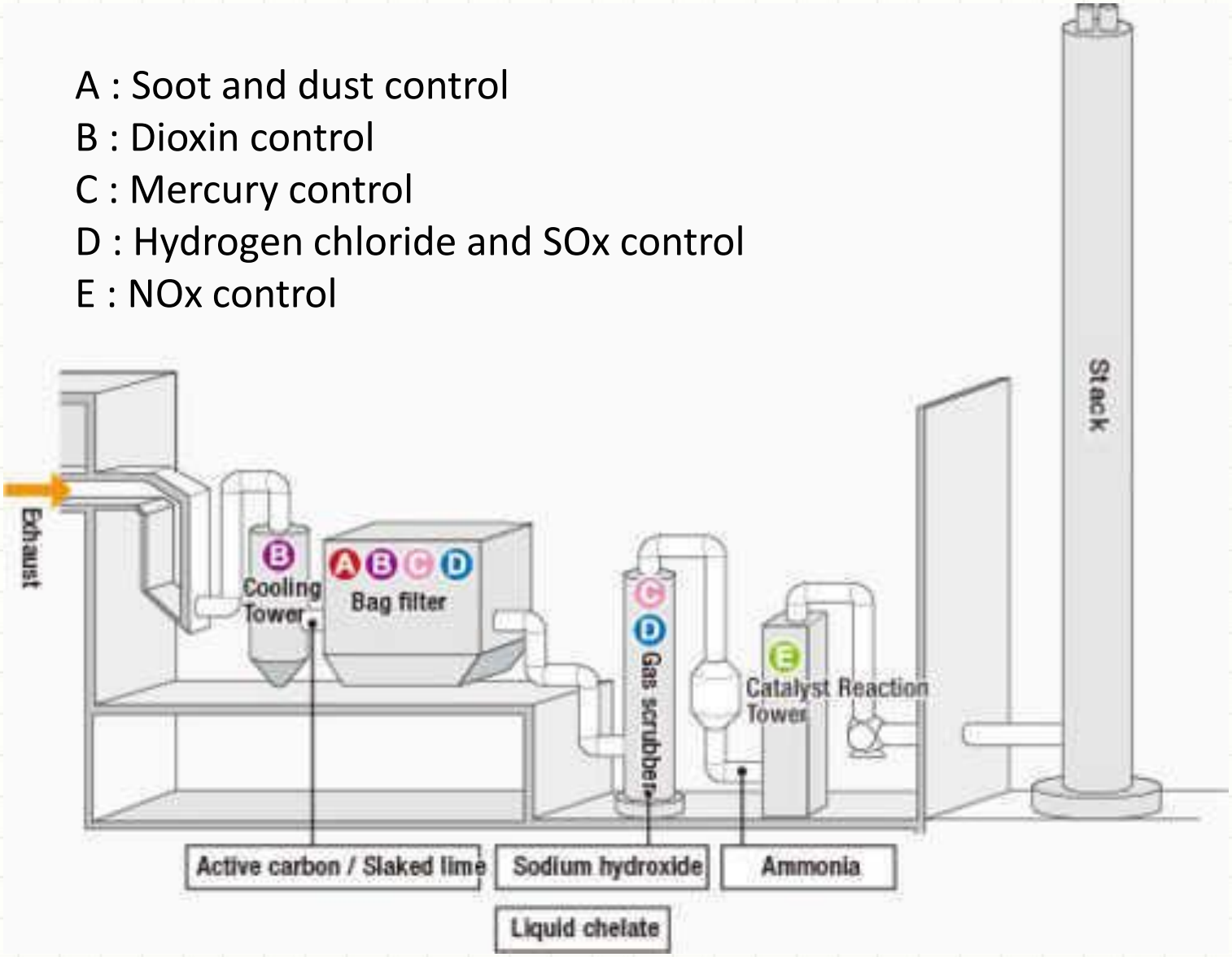
Total Generated Power	1,091million kWh
Electricity sold	510 million kWh
Income from electricity sold	5.4 billion yen
Supplied heat(Charged)	580,000 GJ
Income from heat sold	194 million yen

- have certificate of ISO14001

Source: Clean Association of TOKYO23

POLLUTION CONTROL OF SYNGAS

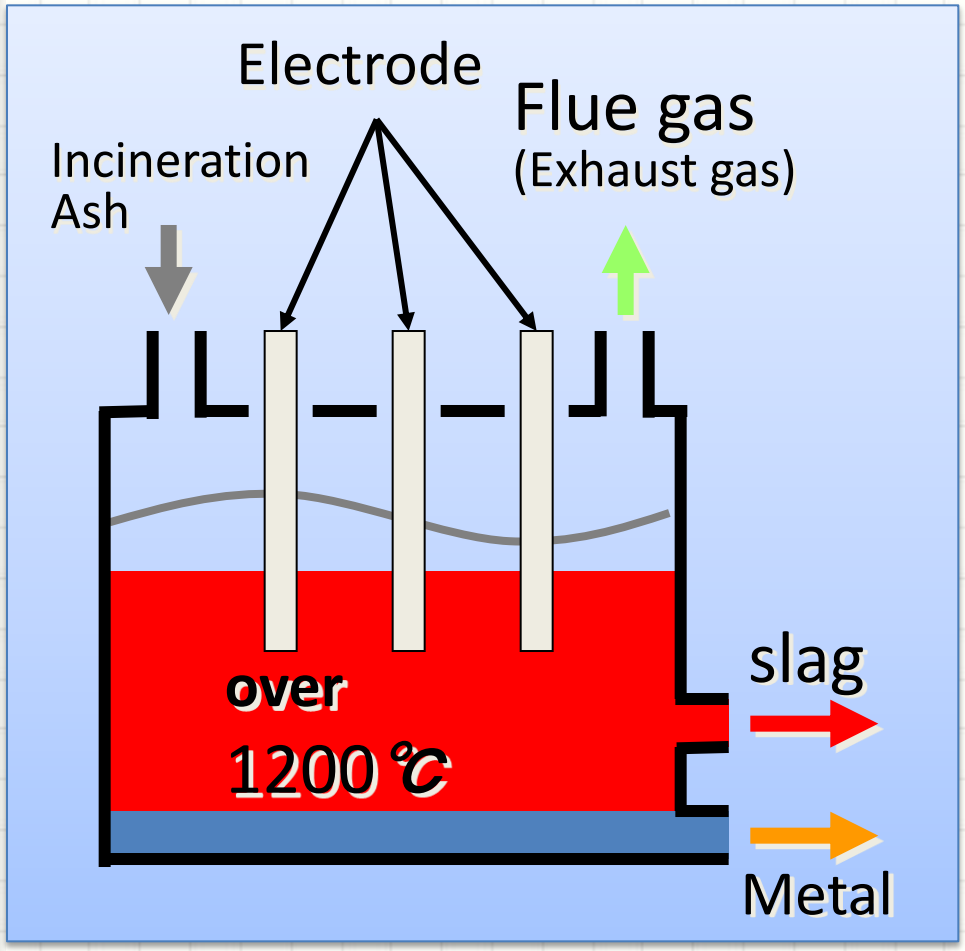
A : Soot and dust control
B : Dioxin control
C : Mercury control
D : Hydrogen chloride and SOx control
E : NOx control



Source: Clean Association of TOKYO23

ASH RECYCLING - ASH MELTING

(23 wards Area)



Ash Melting Furnace (Arc type)

Slag

Used for
construction material

Source: Clean Association of TOKYO23

ASH RECYCLING - ECO CEMENT (Tama Area)

Eco-cement

Used for construction material

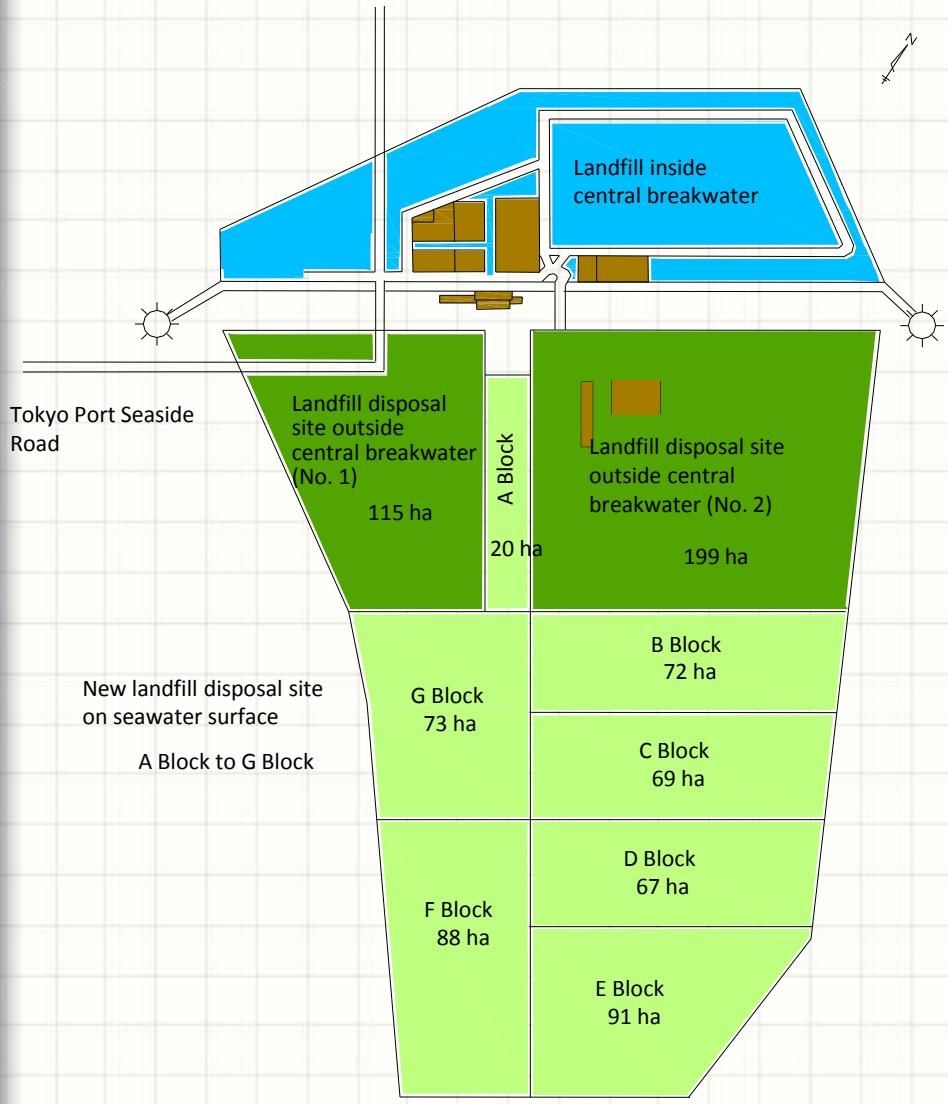
Source: Tokyo Tama Regional Association for Waste Management and Resource Recycling

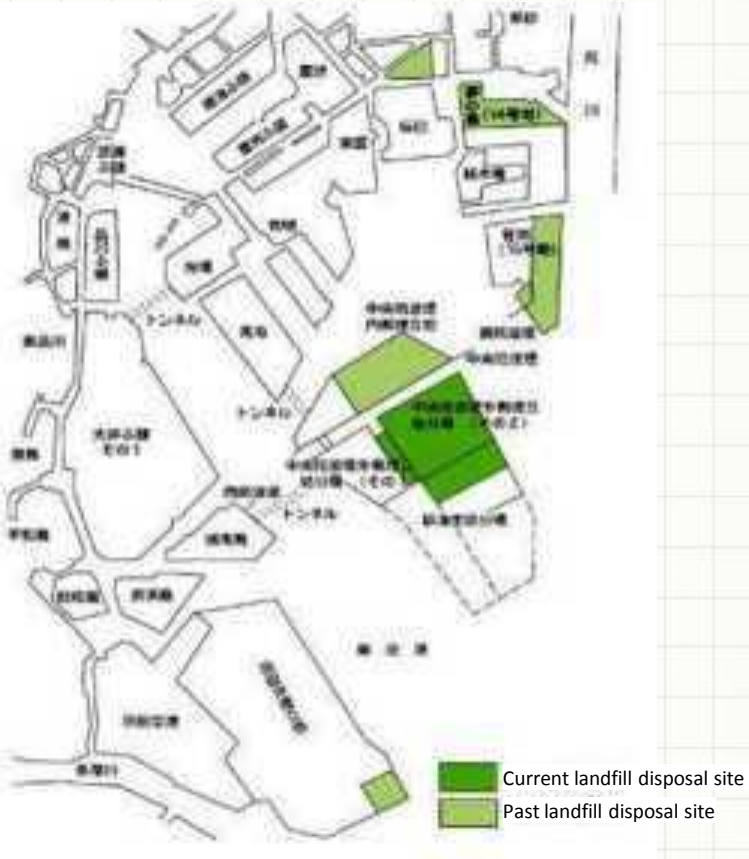
Final Disposal Site(FDS) in Tokyo Bay

Photo: Bureau of Environment, TMG

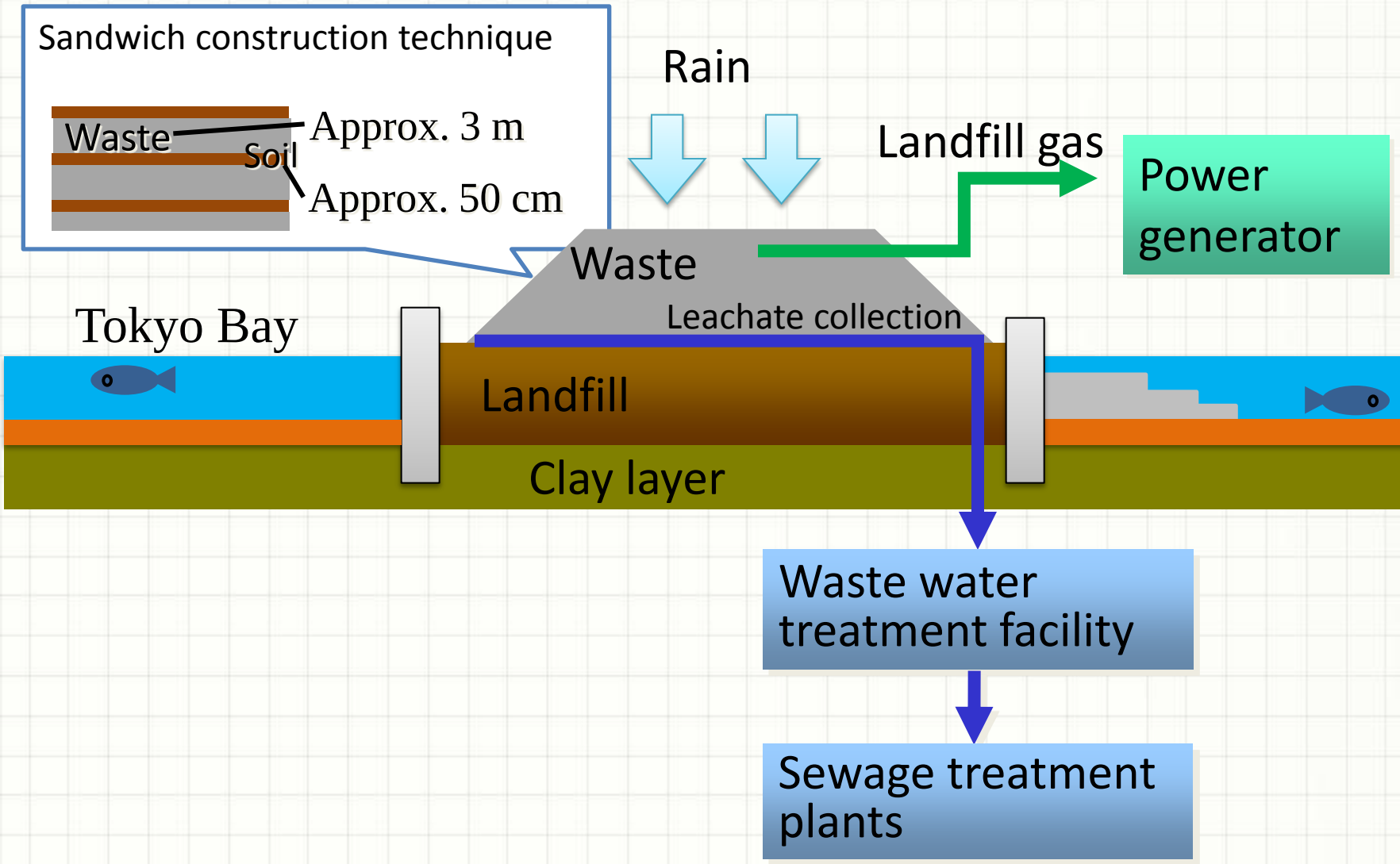
FDS

CENTRAL BREAKWATER OUTER LANDFILL SITE / NEW SEA SURFACE DISPOSAL SITE





STRUCTURE OF FDS



ENVIRONMENTAL EDUCATION AT FDS

No. of Visitor : 43,000 person/year
(including 37,000 elementary children)

2. 3Rs & Waste Management in Tokyo

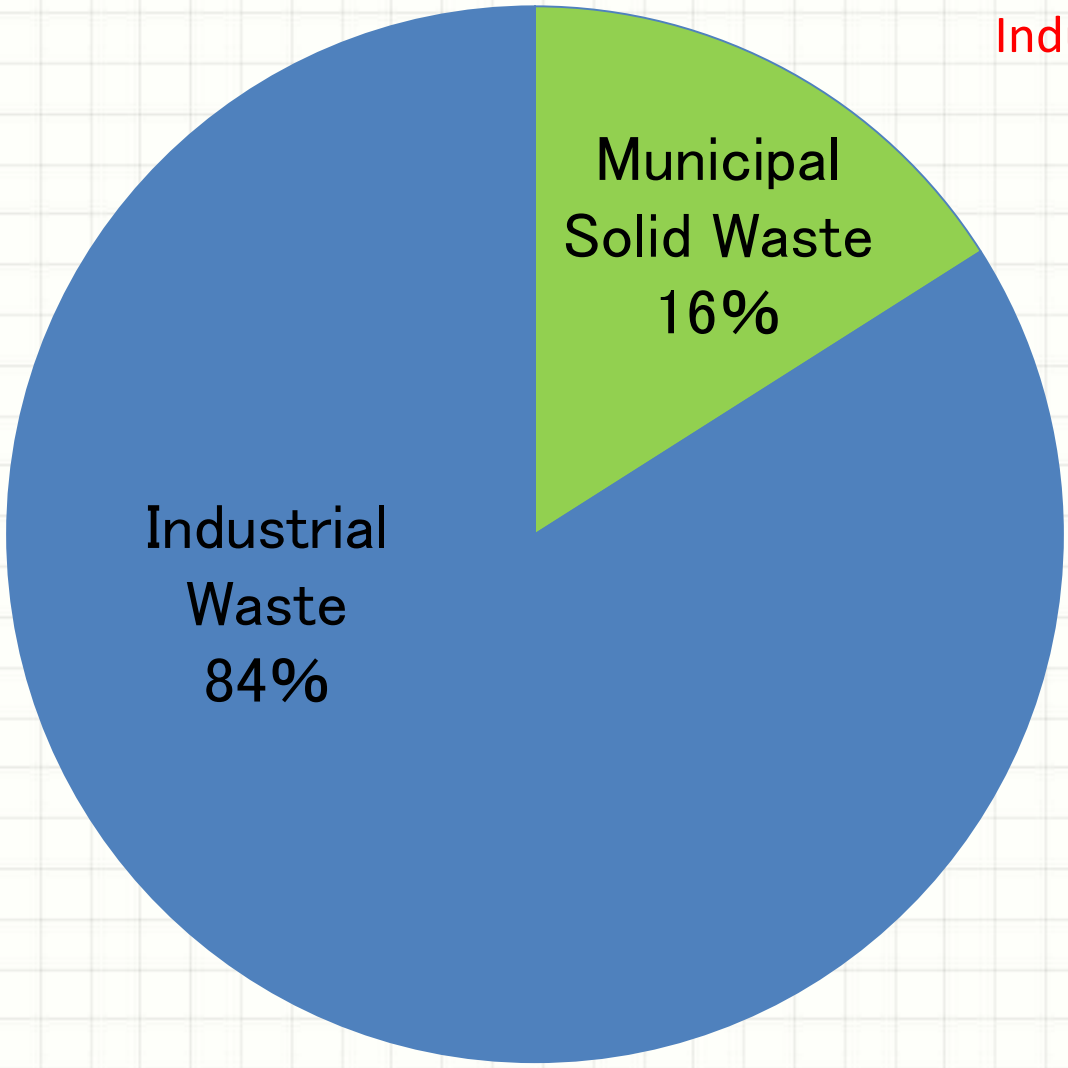
2-2 Industrial Waste

Waste Generation in Tokyo

77,700t/day

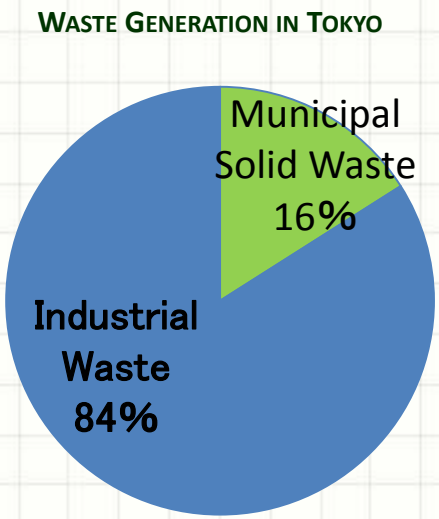
M S W : 12,600t/d

Industrial : 65,100t/d

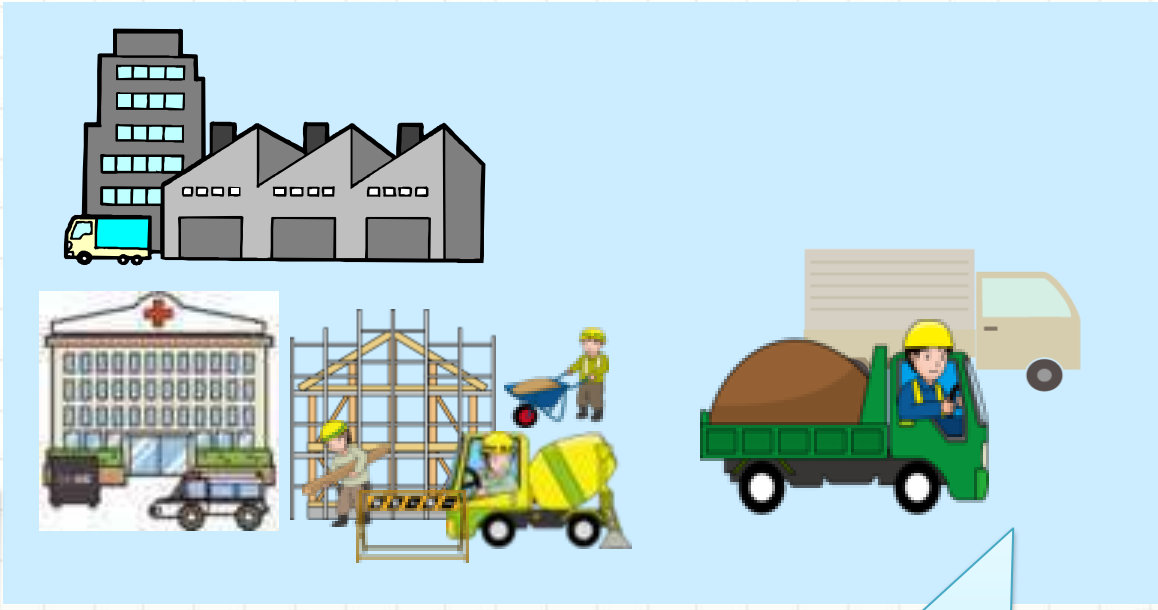


In 2011

Industrial Waste in Tokyo 65,100t/d



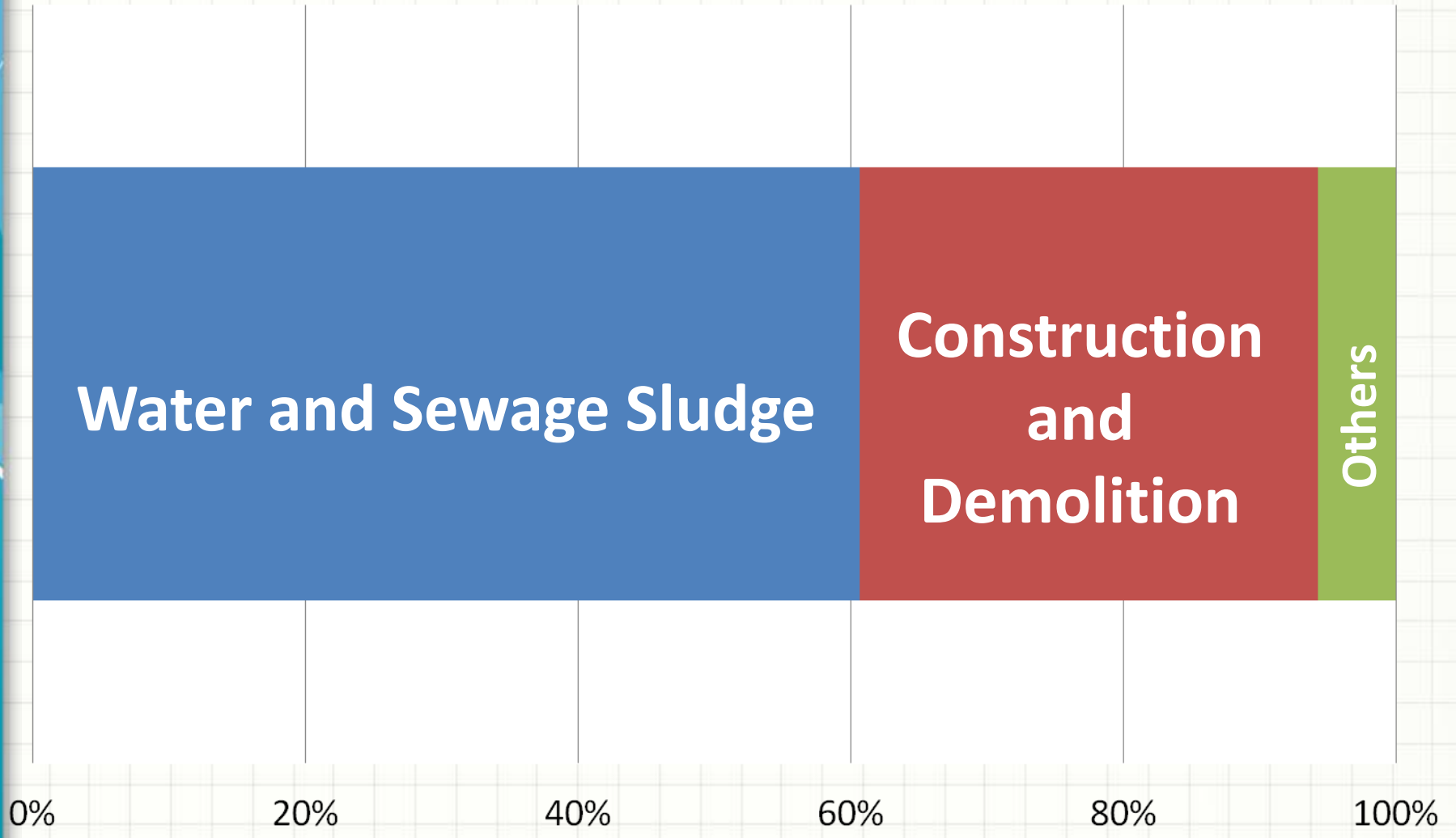
Waste Generation in Tokyo



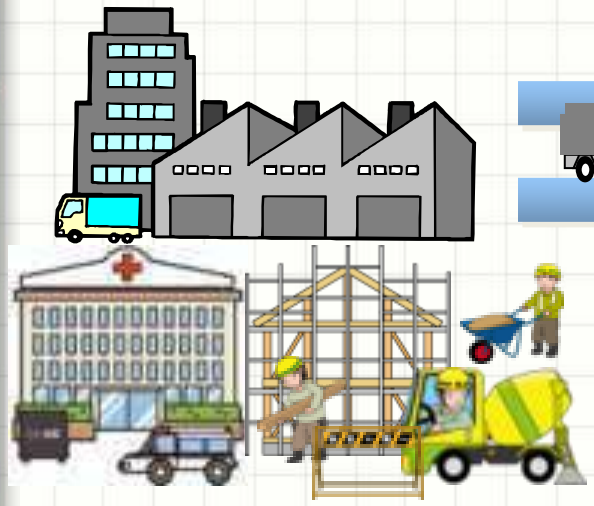
Generator has responsibility
for proper disposal

Disposed by private sector
licensed by Prefectural Government

Composition of Industrial Waste



Disposal Flow of Industrial Waste



Waste Generation
23 million tons / year

- Construction businesses,
- Manufacturing businesses,
- Hospitals, etc.

Intermediate Treatment
23 million t/y
(99%)

- Dehydration,
- Shredding,
- Incineration, etc.

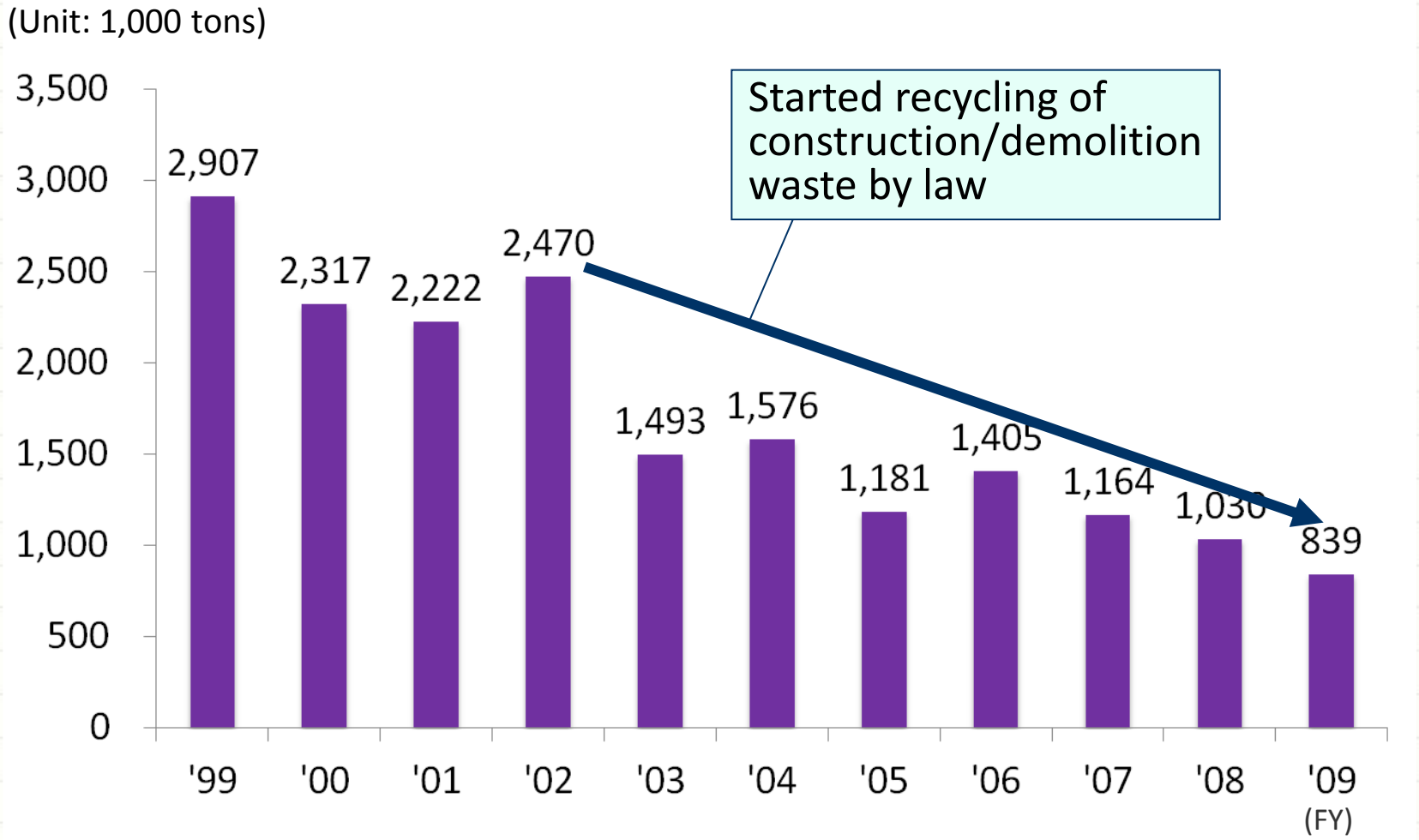
Final Disposal
839 t/y
(4%)

Recycling
6,274 t/y
(27%)

- Licensed Private Company

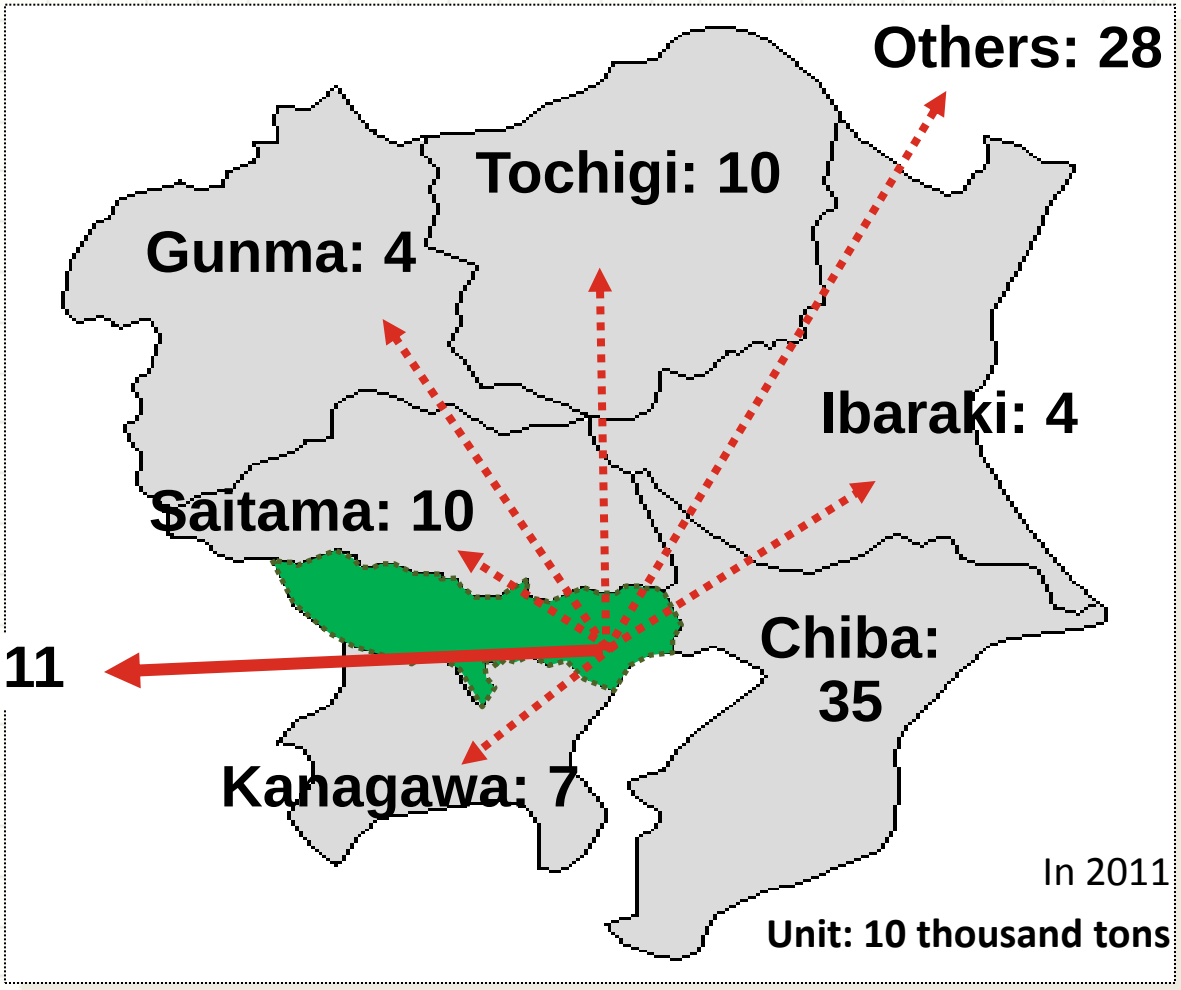
(Issued by Prefectural Government)

Reduction of Final Disposal of Industrial Waste



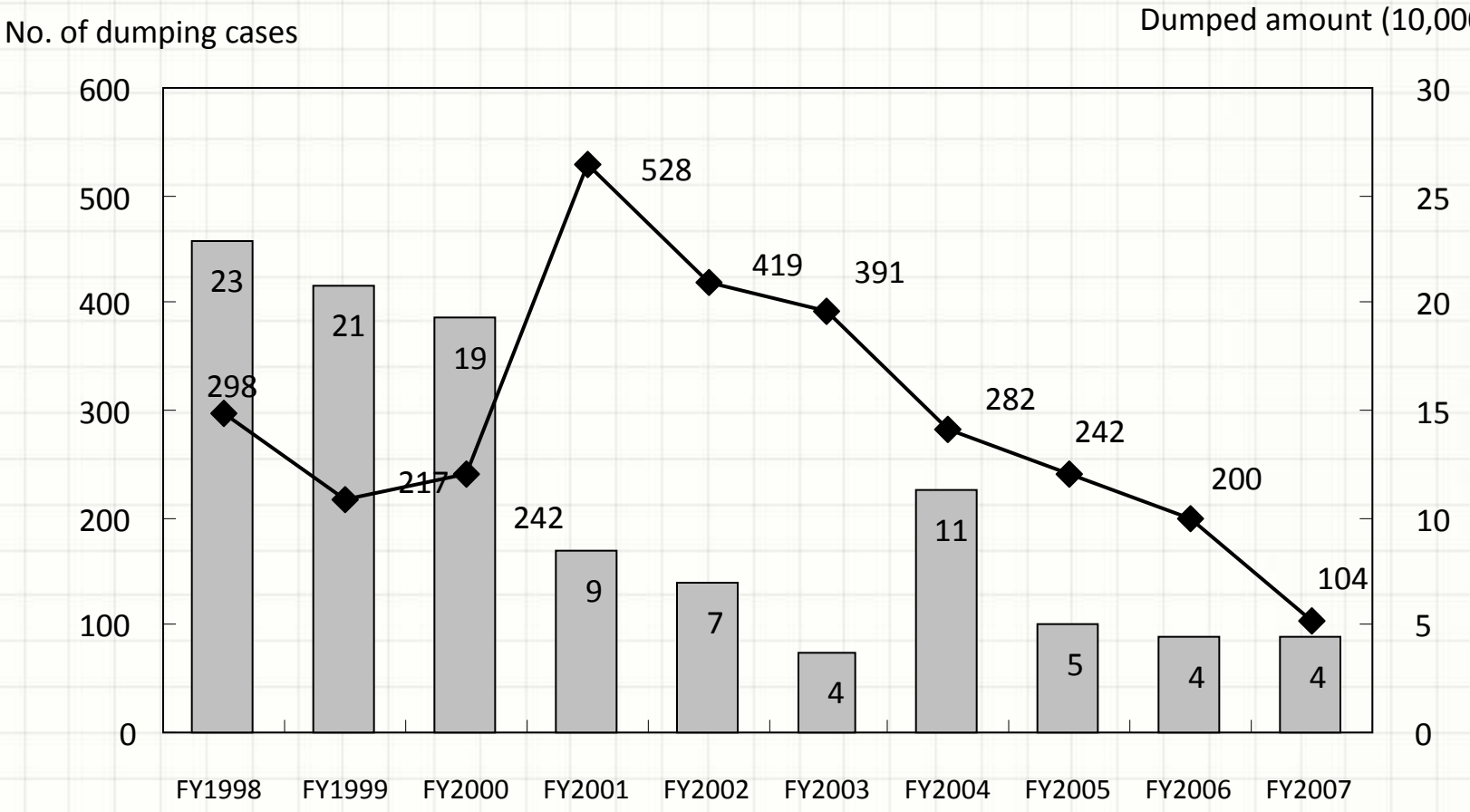
<CHALLENGE 1>

LACK OF DISPOSAL FACILITIES IN TOKYO



How wide the Industrial Waste produced in Tokyo is disposed.

<CHALLENGE 2>
ILLEGAL DUMPING IS STILL REMAINED



<CHALLENGE 2>

ILLEGAL DUMPING/DEPOSITION/EXPORTING

Aerial photo of illegal dumping site in Aomori/Iwate border

Illegal deposition of dismantled waste in Chiba

Huge illegal dumping on prefectural border of Aomori and Iwate (820 thousand m^3)

Treatment residue of end-of-life electronic appliances imported from developed countries (Guangdong, China)

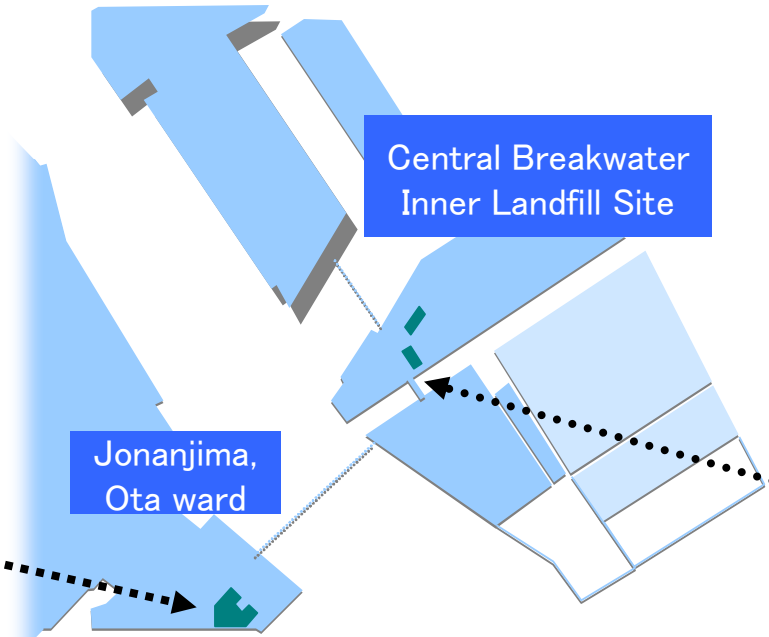
<SOLUTION 1> TOKYO SUPER ECO-TOWN

Construction and Demolition Waste

Construction and Demolition Waste Recycling Plant

Construction and Demolition Waste Recycling Plant

Construction and Demolition Waste Recycling Plant



PCB Waste Treatment

Waste Fuel Electric Power Generation Plant

Waste to Energy

E-Waste

E-Waste Recycling Plant

E-Waste Recycling Plant

Food Waste

Animal Feed from Food Waste

Biogas Power Generation from Food Waste

<SOLUTION 2> INSPECTION AT TOLLGATE

29 Local Government work together for eliminating illegal dumping.

<SOLUTION 3>
CERTIFICATION SYSTEM OF TOP-RUNNER INDUSTRIAL WASTE DISPOSAL COMPANY

Outline

Third party organization designated by TMG certify “Expert” and “Professional” companies which conduct proper disposal, recycling and reduction of environmental impact from their activities.

Purpose

1. Disseminate information about reliable disposal company to waste generator
2. Cultivate good company , promote proper disposal
3. Develop waste disposal & recycling industry

Evaluation item

1. Compliance
2. Stability
3. Advanced activities

Expert

Professional

The certificate and a special sticker are given to certified companies.

2. 3Rs & Waste Management in Tokyo

2-3 TMG's 5-year Plan

Integrated Strategy for the Sustainable Use of Resources

TMG 5-year Plan (2011-2015)

Policy

- Reducing extraction of natural resources
- Reducing greenhouse gas emissions
- Reducing final waste disposal

Target

- Reducing 30% of final waste disposal in FY2015 (compared with FY2007)

MAJOR POLICY (1)

[Promotion of 3R measures]

- Promotion of generation control and reuse

  Establishing a society that discharges no waste; Charging for domestic waste

- Promotion of recycling

  Development of urban mine; development of more efficient waste reverse logistics; development of highly efficient heat recovery; utilization of methane gas emitted from landfill disposal site

- Visualization of 3R effects

  Resource input amount; green gas reduction through cyclical use of resources; recycling costs

- Construction of support system for 3R efforts

  Promotion of popularization/enlightenment of green purchasing and environmental education

MAJOR POLICY (2)

[Promotion of proper treatment]

- Toxic waste

  Improvement of proper treatment system for waste with minute trace of PCB; continuation of TMG disposal site's acceptance of friable asbestos; reduction of mercury use and promotion of its proper treatment

- Industrial waste

  Use of non-friable asbestos; thorough screening/proper disposal of waste plasterboard; enhanced guidance for eradication of illegal dumping by using industrial waste G-men

- General waste

  Dangerous articles such as aerosol cans and cigarette lighters; medical waste from home medical care

- Proper management/operation of industrial waste management facility

  Reduction of environmental burden and maintenance cost of landfill disposal sites; providing guidance/advice to municipal recycling facilities

MAJOR POLICY (3)

[Promotion of development of waste disposal&recycling industry]

- Improve environment where superior disposal businesses have advantage

  Charging businesses discharging industrial waste for proper disposal costs; developing specialized disposal/recycling businesses by understanding industrial structure and current state

- Promotion of the Tokyo Super Eco-Town Project

  Actively present the outcomes of the Tokyo Super Eco-Town Project as advanced efforts and provide information to inside/outside Japan

- Collaborative technical research

  In order to advance waste management/recycling technology, collaborative technical research is implemented through cooperation of industry-university-public administration

CURRENT STUDY AND DELIBERATION(1)

Recycling of Small Size E-Waste

- Recovering metals such as minor metals after collecting and dismantling small size e-waste
- Result of collection

FY2009 (for 4 months): 13,000units

FY2010 (for 5months): 11,000units

CURRENT STUDY AND DELIBERATION(2)

Sharing Experience with Asian Major Cities

Participant Cities to ANMC21

Training program on 3R and Waste Management on site

3. Conclusion

3. Conclusion

- It took a long period
- Both "soft" and "hard" are essential
- Hoping to share experiences

1929

1999

Thank you for your attention !

TOKYO METROPOLITAN GOVERNMENT 東京都