Outline of General Waste Management in the City of Kitakyushu

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1.Kitakyushu City's Policies of Waste Management and their Impacts



≪Changes of Concepts≫

Disposal Oriented (till 1993) Quick and safe disposal of discarded articles \rightarrow One-way structure that the municipality disposes waste generated by residents

Recycling Oriented (from 1993) Recycling perspective was introduced.

 \rightarrow Sorted collection of cans and bottles (1993), etc. started.

Material-cycle Oriented (from 2000)

Suppress waste generation, reuse, recycle, green purchasing



Information Disclosure and Accountability

Policy realization is not possible without citizens' understanding

Basic policy for organization of briefing session for citizens

(Date, time and venue for the briefing session will not be specified by the city) On-demand type of session shall be implemented that staff from Environment Bureau visit the requested place at requested time regardless of Saturday, Sunday or holiday even only for one participant.

- Request for holing briefing session was made to various groups and individuals such as individual people, community associations, women's society, elderly's association, and circle activities.
 - The greatest number of participants: 600 (at the university orientation)
 - The least number of participants: 1







Kitakyushu City's Master Plan for Promoting Formation of Sound Material-cycle Society (2011-2020)

To promote waste management administration that takes approaches for "low carbon" and "coexistence with nature" in addition to those for "material-cycle."

Basic principle: formation of a sustainable urban model
 Domestic waste generation per capita per day: 470g
 Recycling rate: 35%



Basic Ideas about Waste Segregation and Recycling

- 1 Easy to understand for citizens
 - \rightarrow Too many kinds of segregation is not good.
- 2 Establish recycling technologies and secure demands of recycled articles
 - → Materials are not reproduced without recycling mechanism.
- 3 Efficiency including cost

(Utilize collection routes of private sector and citizens)

 \rightarrow Increase in kinds of segregation boosts collection cost.



Criteria of Segregation; Adding target items when appropriate.

Collection Route	Target items	Collection Means	Inaugural Year	Disposal/Recycling Methods, others	
Administration	Domestic waste	Station1998The first paid system(paid designated bag)2006Fees were revised (not support to be addressed (not support to		The first paid system Fees were revised (raised).	
	Bulky waste	Door-to-door paid collection	1994	Iron/small electrical equipment collected by shredding facilities	
	Cans and glass bottles	Otation	1993	Cans: sorted into steel/aluminum; glass bottles: sorted into transparent / brown / others at a facility	
	PET bottles	Station (paid designated bag)	1997	Containers and Packaging Recycling Law	
	Plastic containers and packages		2006	Containers and Packaging Recycling Law	
	Paper cartons		2000	Recycled raw material for toilet rolls	
	Trays		2000	Containers and Packaging Recycling Law	
	Fluorescent lamps	Collection box	2002	Recycled raw material for Fluorescent lamps	
	Small metals articles		2006	Iron and aluminum materials	
	Small electrical equipment		2013	Act on Promotion of Recycling of Small Waste Electrical and Electronic Equipment	
Private sector	Waste cooking oil		2006	Biodiesel fuel	
	Ink cartridges	Collection box (free of charge)	2009	Ink cartridge parts	
	Button/rechargeable batteries	(-	Rare metal recycling	
	Reusable glass bottles	Dealers (free of charge)	-	Beer bottles, 1.8L bottles	
	Used clothes	Dry cleaners, etc.	2014	Vehicle interior finishing	
Citizens	Waste paper (newspaper/magazines/corrugated fiberboards, miscellaneous recyclable paper)	City's subsidy system	1994	Papermaking materials 6	

Waste Disposal Cost



2. Household Waste Disposal Flow



Waste Disposal Facilities in Kitakyushu City



3. Sorted Collection of Recyclable Waste

(1) Citizens buy a designated plastic bag,

put waste in it and bring it to a collection station;

- 1. Cans and bottles
- 2. PET bottles
- 3. Plastic containers and packages

(2) Collect them into exclusive collection boxes placed at supermarkets, etc. within the city.

- 1. Paper cartons, food trays
- 2. Fluorescent lamps
- 3. Small metal articles (pans, kettles)
- 4. Small waste electrical and electronic equipment
- 5. Used clothes





5. Transition of Waste Disposal Amount



Through <u>Annual survey; City Policy Evaluation by Citizen</u>, the item "appropriate disposal and recycling of waste" ranked as "<u>improving significantly</u>," at the followings;

<u>The 1st</u> for 22 years from 1993 to 2014 <u>The 2nd</u> for 2 years from 2015 to 2016

The City's measures have also been highly evaluated by citizens.















(2) Waste Collected/Disposed by the City of Kitakyushu

Household

- Domestic waste (twice a week: \50/45L-bag) →Organic waste, waste paper, waste plastics, etc.
- Bulky waste (once a month: \300 \1,000) →Furniture, beddings, etc.
- Plastic containers and packages (once a week: \12/25L-bag)
- Cans and bottles, PET bottles (once a week: \12/25L-bag)
- Paper cartons, food tray, small metals articles, fluorescent lamps, small electrical and electronic equipment (collected in a specific collection box at a supermarket, etc. as needed: free of charge)

Business operators

• Waste brought in by themselves (\100/10kg)

→Business operators or waste collectors/haulers bring waste to disposal facilities

①Domestic Waste Disposal Process

From Collection/Hauling to Incineration and Final Disposal



Many kinds of domestic waste



Cans and Bottles



PET Bottles



Plastic Containers



	Collection day	Plastic bag Color	Plastic bag Price
Kitchen garbage and others	Twice a week	Blue	20 liter : 22 ¢ 30 liter : 33 ¢ 45 liter : 50 ¢

Kitchen and others

- Kitchen garbage
- Plastic
- > Un-recycled paper
- Un-recycled wood
- Used cloth and shoes







etc.

Waste Collection Point

Blue net used for prevention of bird picking

Number of collection point (32,000 points) One point consists of around 10-15 households Twice a week collection



Waste Collection





collection point after collection



After collection

Waste is carried to 3 incineration plants.

Incineration Capacity		(ton/day)
	Shinmoji Incinerator	720
	Kogasaki Incinerator	810
	Hiagari Incinerator	600
	Total capacity	2,130
Actual total capacity		1,810
Average incinerated waste		1,300

Actual total capacity

- = Total capacity \times (310/365)
- = 2,130 × (310/365)
- = 1,810 (ton/day)

Excess capacity

- = 1,810 1,300 = 510 ton/day
- Periodical maintenance
- Waste volume depended on season
- Equipment breakdown



2

3



Shinmoji Incineration Plant



810 ton/day (270 ton × 3) 1998 completion

Kogasaki Incineration Plant



Hiagari Incineration Plant

600 ton/day (200 ton × 3) 1991 completion

720 ton/day (240 ton ★ 3) 2007 completion

Without fuel



24hours operation

Ash Pit and Ash Crane



Content of landfill materials are only in-organics. (Ash, Soil, Concrete, Rock, etc.)

Hibikinada Landfill



Kogasaki Volume of pit 950m3 (950 ton) Crane Capacity 4.8 ton

Hibikinada sea side landfill ma	anaged by Kitakyushu city in 2010

Area of landfill : 70 haCapacity: 12,100,000 m3Kind of waste: Domestic waste's incineration ash
Small & medium company 's concrete, sludge, plastics, glass and dustLife span: from 1986 to around 2022

Combustible Waste Incineration Structure

Municipal responsibility

Collection & Incineration & Landfill











Recycling method of Can, Glass Bottle and PET Bottle

	Collection day	Plastic bag Color	Plastic bag Price	
Can and Glass Bottle	Wednesday	Brown	25 liter : 12 ft	
PET Bottle	Weanesday	Orange		





Can & Glass Bottle (Recycling started 1993)











PET Bottle for recycling needs pure quality.

Collection Point

PET Bottle

Can & Glass Bottle

Number of collection point (11,000 points) One point consists of around 40 households Every Wednesday collection





Collection

Can and Bottle Recycling Center

Hiagari recycling Center

Honjyo Recycling Center

- Welfare for Mental handicapped workers
- 35 workers in each facility



PET bottles line

Fresh air supply duct

Can and bottles line

Classification

Steel and aluminum can is separated by machine Pet bottle and glass bottle separated by hand

After separation



Transparent bottle Brown

Brown bottle

Other bottle



PET bottle Steel & Aluminum can Plastic bac

Separation volume and recycling income of Can & Bottle in 2015

1\$ = ¥110

環境未来都市

	Volume (ton)	Income (US\$)
Aluminum	1,119	1,530,000
Steel can	758	145,000
Glass bottle	1,985	9,700
PET bottle	1,806	224,600
Total	5,668	1,909,300

Can, Glass Bottle & PET Bottle Recycling Structure

People responsibility : Separation



Municipal responsibility : Collection & Separation



Producing company's responsibility : Recycling

- ➤ Steel can → Steel

- \succ Aluminum can \rightarrow Aluminum \rightarrow PET bottle \rightarrow Carpet, cloth

Recycling method of Plastic Container

	Collection day	Plastic bag Color	Plastic bag Price
Plastic Container	Once a week	Green	25 liter : 12 ¢ 45 liter : 20 ¢



Plastic Container

- Egg package
- Noodle package
- Shampoo bottle
- Detergent bottle
- Food oil bottle
- Mayonnaise container
- > Cap of PET bottle etc.









Plastic Container Recycling Structure

People responsibility : Separation



Municipal responsibility : Collection & Separation



Producing company's responsibility : Recycling
 ➢ Plastic → Oil, Gas (Chemical Recycle)
 ➢ Plastic → New Plastics (Material Recycle)

凉虎木米都巾 北九州市

Food Trays Collection Box Placed at a Supermarket







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Fluorescent Lamps





Small Metal Articles



Small Waste Electrical and Electronic Equipment





(4) Support to Activities by Household and Community

- Waste paper, used clothes Financial incentive is provided according to collection result conducted by local civil society.
- Composing organic waste Support home composting of organic waste
- Pruned branches
 Support local collection activities
- Waste cooking oil Support local collection activities



Paper Recycling (2015)

- 1. Paper recycling is done by community activity.
- 2. Number of participated communities : 1,812.
- 3. Volume of recycled paper : 25,293 ton
- 4. Kitakyushu City subsidizes to community for their recycling activity : Total subsidy is 2.0 million US\$ in 2015

Community center collection : 7 ¢ /kg

Door to door collection : 5 ¢ /kg





Waste Paper Recycling — "Visualize" Regional Material-cycle Zone—

- The city's environment mascot "Teitan" is printed on recycled toilet paper, "Ecopper," made of milk carton and miscellaneous recyclable paper.
- Promote "ensuring regional material-cycle zone" and "actual impact of recycling" through cyclic activities that waste paper sorted by citizens are recycled by a local industry into toilet paper and come back to citizens.

