MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2008

Environmental Protection Department

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Waste Statistics for 2008

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Content

Abbreviations

C&I	Commercial and Industrial
C&SD	Census and Statistics Department
CEDD	Civil Engineering and Development Department
CWTC	Chemical Waste Treatment Centre
EPD	Environmental Protection Department
FEHD	Food and Environmental Hygiene Department
IETS	Island East Transfer Station
IWTS	Island West Transfer Station
KBTS	Kowloon Bay Transfer Station
MSW	Municipal Solid Waste
NENT	North East New Territories Landfill
NLTS	North Lantau Transfer Station
NT	New Territories
NWNTRTS	North West New Territories Refuse Transfer Station
OITF	Outlying Islands Transfer Facilities
PET	Polyethylene Terephthalate
RTS	Refuse Transfer Station(s)
SENT	South East New Territories Landfill
STTS	Sha Tin Transfer Station
tpd	tonnes per day
WENT	West New Territories Landfill
WKTS	West Kowloon Transfer Station

1. Introduction

This report presents the statistics on disposal and recovery / recycling of solid waste generated in Hong Kong in the year 2008. It aims to provide readers with the latest information available on solid waste.

The information contained in this report is compiled from the data collected from various sources throughout the year, including the ongoing solid waste monitoring work at waste facilities undertaken by the Environmental Protection Department.

The statistics on waste disposal and recovery / recycling are presented in Chapters 2 and 3 respectively, and the classification of solid waste and the methodology adopted in data collection are explained in Appendix 1.

Abbreviations used in the report are listed on page iv for ease of reference.

2. Waste Quantities and Characteristics

Plate 2.1 Disposal of solid waste at landfills in 2008

Waste type[1]	Average daily quantity (tpd)			Change from 2007	
	Public[2]	Private[3]	Total	Quantity (tpd)	Percentage
a. Domestic waste	5,118	963	6,081	-291	-4.6%
b. Commercial waste	-	2,280	2,280	90	4.1%
c. Industrial waste[4]	-	660	660	38	6.2%
d. Municipal solid waste[4] (a+b+c)	5,118	3,903	9,021	-163	-1.8%
e. Overall construction waste[5]	-	3,092	3,092	-66	-2.1%
f. Special waste[6]	948	443	1,391	-168	-10.8%
g. All waste received at landfills (d+e+f) Total	6,066	7,438	13,503	-398	-2.9%

Remark: Figures may not add up to total due to rounding off.

Notes:

(1) Refer to Appendix 1 for classification of solid waste.

(2) Waste collected by the FEHD, FEHD contractors and other government vehicles.

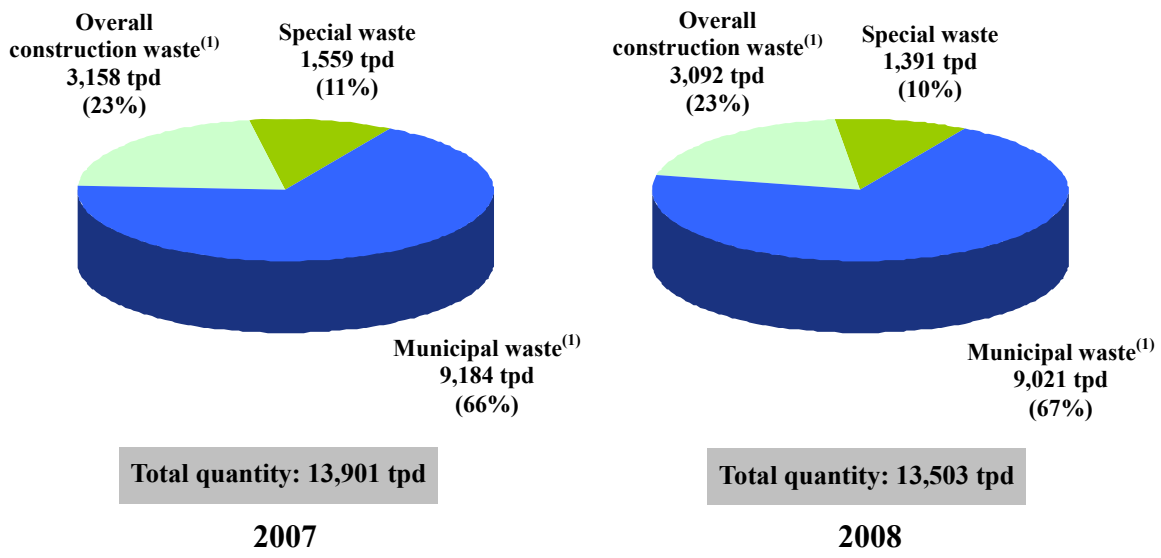
(3) Waste collected by private waste collectors.

(4) Waste concrete delivered to landfills as industrial waste since 2007 was re-grouped under overall construction waste. Its corresponding quantities have been deducted from municipal solid waste.

(5) The quantity does not include construction waste that is reused or disposed of at other outlets.

(6) The quantity does not include special waste that is treated or disposed of at other outlets.

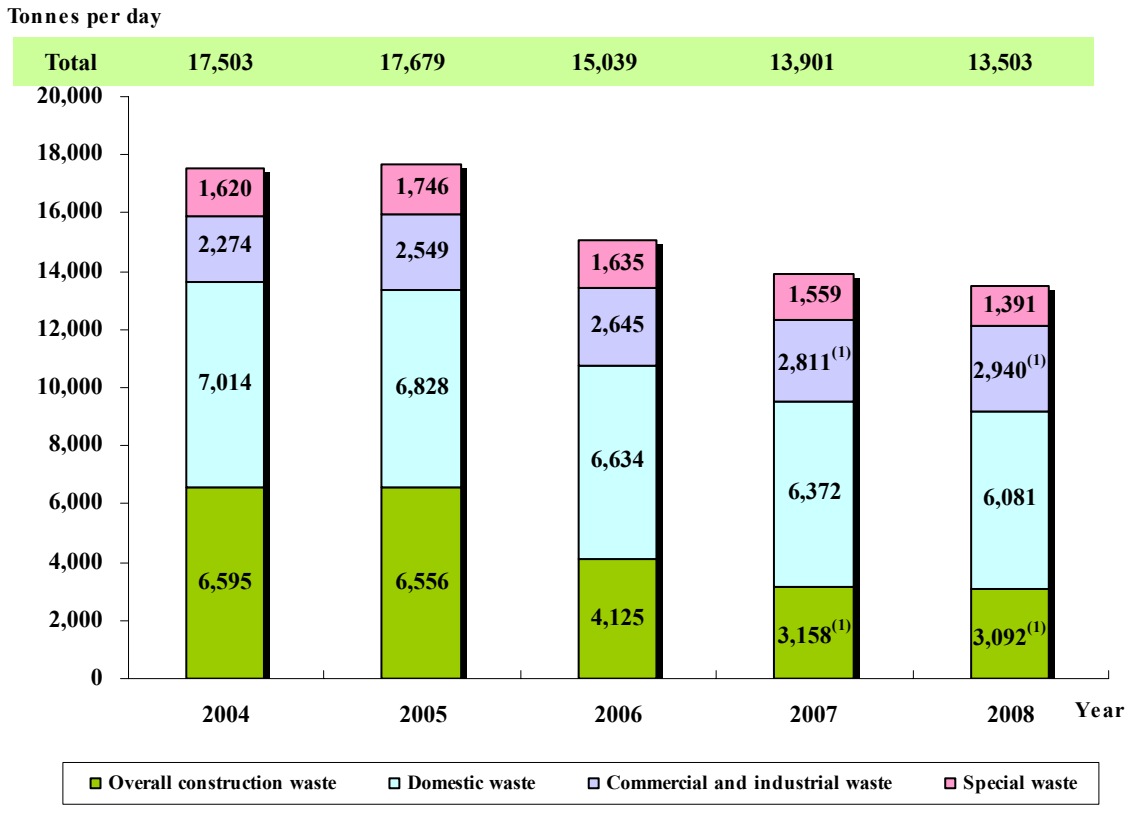
Plate 2.2 Disposal of solid waste at landfills in 2007 and 2008



Remark: Figures may not add up to total due to rounding off.

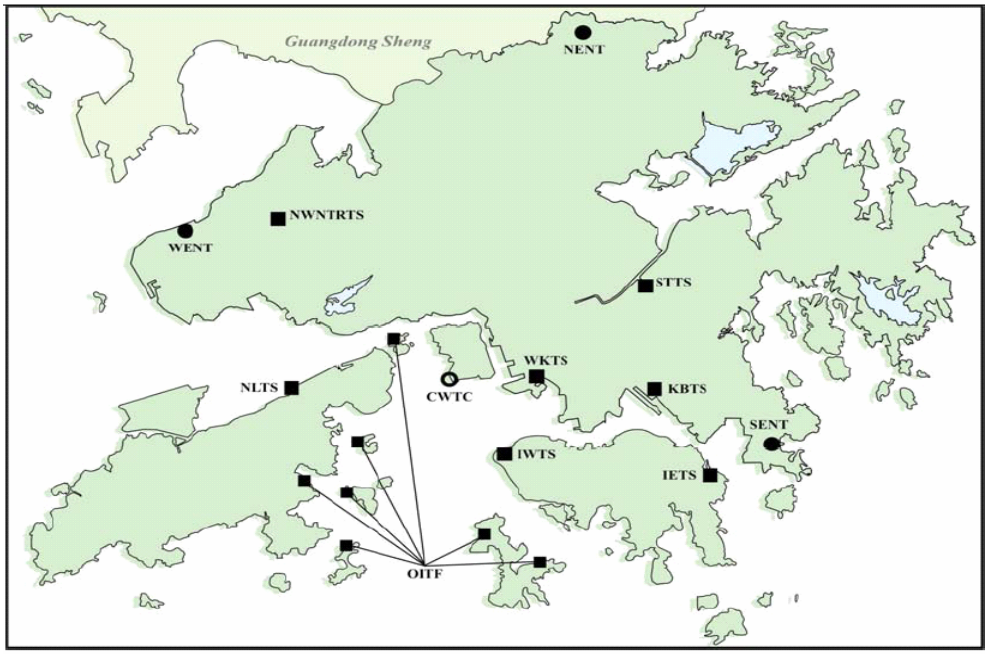
Note: (1) Waste concrete delivered to landfills as industrial waste since 2007 was re-grouped under overall construction waste. Its corresponding quantities have been deducted from municipal solid waste.

Plate 2.3 Disposal of solid waste at landfills in 2004 – 2008



Note: (1) Waste concrete delivered to landfills as industrial waste since 2007 was re-grouped under overall construction waste. Its corresponding quantities have been deducted from commercial and industrial waste.

Plate 2.4 Solid waste management facilities in Hong Kong



Landfill ●
- WENT - West New Territories Landfill
- SENT - South East New Territories Landfill
- NENT - North East New Territories Landfill

RTS ■
- IETS - Island East Transfer Station(1)
- IWTS - Island West Transfer Station(1)
- WKTS - West Kowloon Transfer Station(1)
- OITF - Outlying Islands Transfer Facilities(1)
- NLTS - North Lantau Transfer Station(1)
- STTS - Sha Tin Transfer Station(2)
- NWNTRTS - North West New Territories Refuse Transfer Station(3)
- KBTS - Kowloon Bay Transfer Station(4)

○ CWTC - Chemical Waste Treatment Centre

Notes:
(1) Waste from IETS, IWTS, WKTS, OITF and NLTS was transferred to WENT by sea.
(2) Waste from STTS was transferred to NENT by road.
(3) Waste from NWNTRTS was transferred to WENT by road.
(4) KBTS was temporarily closed in April 2005 and converted to a waste recycling centre.

Plate 2.5 Solid waste delivered to waste facilities in 2008

Disposal facility	Average daily quantity (tpd)				
	MSW		Overall construction waste	Special waste	Total
	Public[1]	Private[2]			
IETS - Island East Transfer Station	703	111	-	-	814
STTS - Sha Tin Transfer Station	923	-	-	-	923
IWTS - Island West Transfer Station	429	72	-	-	500
WKTS - West Kowloon Transfer Station	1,807	324	-	-	2,131
OITF - Outlying Islands Transfer Facilities	81	7	-	3	91[3]
NLTS - North Lantau Transfer Station	63	99	-	-	162
NWNTRTS - North West New Territories Refuse Transfer Station	800	63	-	-	864
WENT - West New Territories Landfill	3,872[4]	996[4]	454	765[4]	6,086[4]
SENT - South East New Territories Landfill	170	2,235	2,289	460	5,155
NENT - North East New Territories Landfill	1,075[4]	672	349	166	2,262[4]
Sub-total	5,118	3,903	3,092	1,391	13,503
Total	9,021		3,092	1,391	13,503

Remark: Figures may not add up to total due to rounding off. Please refer to Plate 2.12 for solid waste delivered to waste facilities other than landfills and RTS.

Notes:

(1) Waste collected by the FEHD, FEHD contractors and other government vehicles.

(2) Waste collected by private waste collectors.

(3) The quantity does not include construction waste received by OITF (58 tpd).

(4) The quantity includes the waste transferred from the RTS.

Plate 2.6 Arisings of solid waste by district in 2008

District	Average daily quantity[1] (tpd)					
	Domestic waste		C&I waste	Municipal solid waste	Overall construction waste	Total[4]
	Public[2] (a)	Private[3] (b)	(c)	(d) =(a)+(b)+(c)	(e)	(f) =(d)+(e)
Central & Western	296	23	97	415	46	462
Wanchai	260	33	161	454	34	488
Eastern	347	51	125	523	45	568
Southern	239	15	73	327	74	401
Hong Kong Island Sub-total	**1,142**	**122**	**455**	**1,719**	**199**	**1,918**
Yau Tsim Mong	461	34	220	715	85	800
Sham Shui Po	282	58	190	530	42	572
Kowloon City	243	58	146	448	101	548
Wong Tai Sin	257	28	121	406	35	440
Kwun Tong	348	104	265	717	300	1,017
Kowloon Sub-total	**1,591**	**283**	**941**	**2,815**	**563**	**3,378**
Kwai Tsing	298	19	150	466	90	556
Tsuen Wan	223	56	149	428	37	465
Tuen Mun	343	45	205	593	298	891
Yuen Long	488	34	177	699	106	804
North	152	215	161	528	61	590
Tai Po	205	51	64	321	52	373
Sha Tin	364	59	175	598	98	696
Sai Kung	176	74	336	585	1,532	2,117
NT- Mainland Sub-total	**2,249**	**552**	**1,417**	**4,218**	**2,274**	**6,492**
Cheung Chau	27	-	-	-	-	-
Mui Wo	25	-	-	-	-	-
Peng Chau	6	-	-	-	-	-
Ma Wan	5	-	-	-	-	-
Lamma Island	9	-	-	-	-	-
Hei Ling Chau	4	-	-	-	-	-
North Lantau	59	-	-	-	-	-
NT-Outlying Islands Sub-total	**135**	**6[5]**	**126[5]**	**268[5]**	**56[5]**	**323[5]**
Total	**5,118**	**963**	**2,940**	**9,021**	**3,091**	**12,112**

Remark: Figures may not add up to total due to rounding off.

Notes:

(1) The geographical distribution of solid waste arisings is estimated from weighbridge records at waste facilities and should be regarded as indicative reference only.

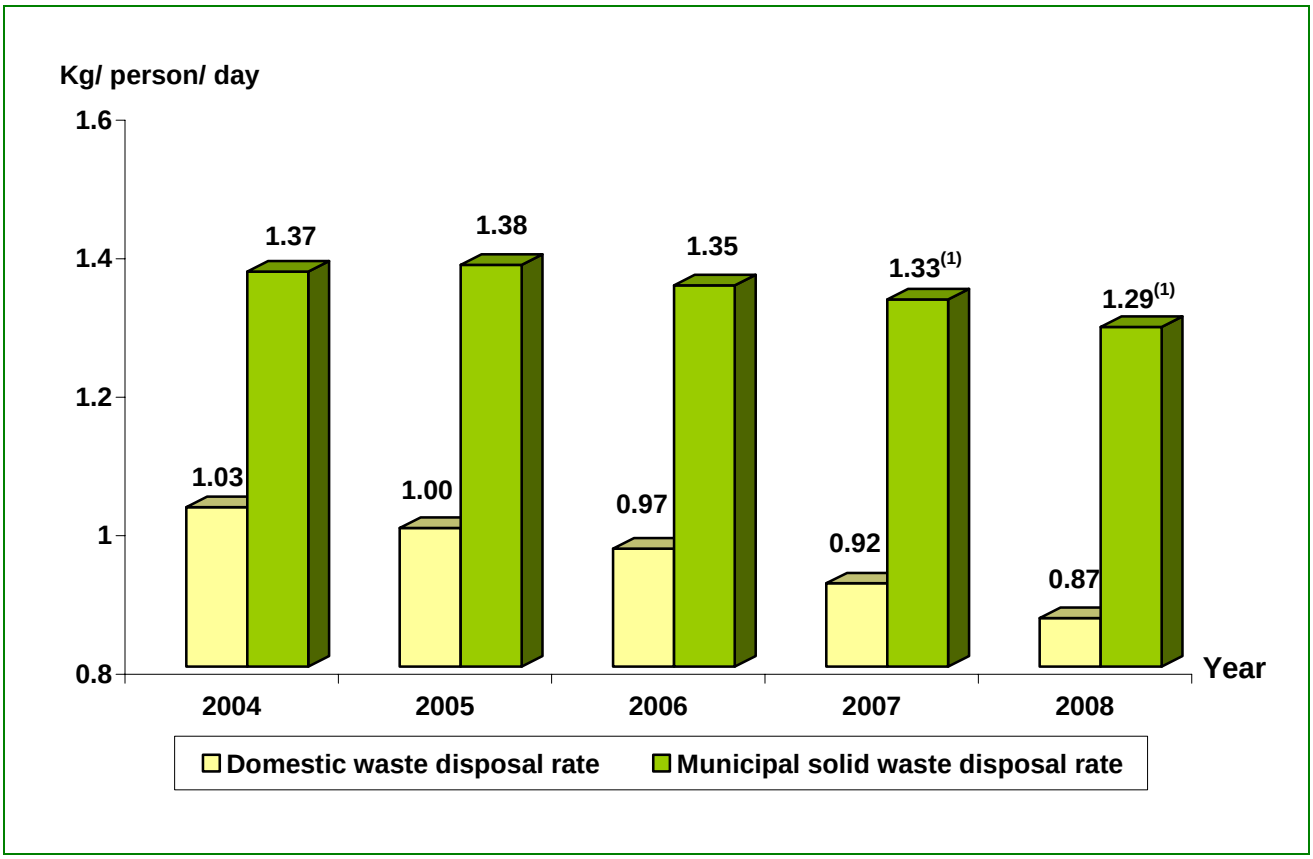
(2) Waste collected by the FEHD, FEHD contractors and other government vehicles, including public cleansing waste.

(3) Waste collected by private waste collectors.

(4) Special waste is not included.

(5) Breakdown into individual islands / areas is not available.

Plate 2.7 Per capita disposal rates of municipal solid waste and domestic waste in 2004 – 2008



Remark: Mid-year population figures are used in the calculation of per capita disposal rates. As the mid-year population figures from 2001 to 2005 have been revised in the 2006 Population By-Census, the per capita disposal rates reported in this table have been updated and differ slightly from the corresponding figures in previous reports.

Note:

(1) The waste concrete delivered to landfills as industrial waste since 2007 was re-grouped under overall construction waste. Its corresponding quantities have been deducted from municipal solid waste, and the associated per capita disposal rates in 2007 and 2008 have been updated accordingly.

Plate 2.8 Composition of municipal solid waste in 2008

Composition	Average daily quantity (tpd) and percentage by weight				
	Domestic waste	Commercial waste	Industrial waste	Commercial & industrial waste	Municipal solid waste
	(a)	(b)	(c)	(d)=(b)+(c)	(e)=(a)+(d)
Glass	258 (4.2%)	118 (5.2%)	7 (1.1%)	125 (4.3%)	383 (4.3%)
Metals	131 (2.2%)	61 (2.7%)	25 (3.8%)	86 (2.9%)	217 (2.4%)
Paper	1,533 (25.2%)	605 (26.5%)	56 (8.5%)	661 (22.5%)	2,193 (24.3%)
Plastics	1,161 (19.1%)	459 (20.1%)	82 (12.5%)	541 (18.4%)	1,702 (18.9%)
Putrescibles	2,534 (41.7%)	816 (35.8%)	102 (15.4%)	917 (31.2%)	3,452 (38.3%)
Textiles	174 (2.9%)	66 (2.9%)	57 (8.6%)	122 (4.2%)	296 (3.3%)
Wood/Rattan	78 (1.3%)	25 (1.1%)	304 (46.1%)	330 (11.2%)	407 (4.5%)
Household hazardous wastes (HHWs)[(1)]	78 (1.3%)	18 (0.8%)	2 (0.3%)	20 (0.7%)	98 (1.1%)
Others[(2)]	134 (2.2%)	113 (4.9%)	25 (3.8%)	138 (4.7%)	272 (3.0%)
Sub-total	6,081 (100%)	2,280 (100%)	660 (100%)	2,940 (100%)	9,021 (100%)

Remark: Figures denote quantities and percentages by wet weight, they may not add up to total due to rounding off.

Notes:

(1) Household hazardous wastes (HHWs) include paints, detergents, pesticides, fuels, cylinders, batteries, electrical appliances, computer products, mercury-containing fluorescent lamps and medicines, etc.

(2) Other waste includes bulky items and other miscellaneous materials.

Plate 2.9 Composition of municipal solid waste in 2008 – Breakdown of major components

Composition	Domestic waste		Commercial & industrial waste	
	Quantity (tpd)	% by weight	Quantity (tpd)	% by weight
Glass				
~ Glass bottles	193	(3.2%)	83	(2.8%)
~ Other glass	65	(1.1%)	42	(1.4%)
(Glass) Sub-total	258	(4.2%)	125	(4.3%)
Metals				
~ Ferrous metals	88	(1.5%)	70	(2.4%)
~ Aluminium cans	25	(0.4%)	7	(0.2%)
~ Other non-ferrous metals	19	(0.3%)	9	(0.3%)
(Metals) Sub-total	131	(2.2%)	86	(2.9%)
Paper				
~ Cardboard	323	(5.3%)	155	(5.3%)
~ Newsprint	523	(8.6%)	106	(3.6%)
~ Office paper	112	(1.8%)	104	(3.5%)
~ Others[(1)]	575	(9.4%)	296	(10.1%)
(Paper) Sub-total	1,533	(25.2%)	661	(22.5%)
Plastics				
~ Plastic bags	632	(10.4%)	235	(8.0%)
~ Polyfoam - dining wares	37	(0.6%)	23	(0.8%)
~ Polyfoam - others	29	(0.5%)	11	(0.4%)
~ PET plastic bottles	75	(1.2%)	34	(1.1%)
~ Non-PET plastic bottles	52	(0.9%)	13	(0.5%)
~ Others[(2)]	335	(5.5%)	224	(7.6%)
(Plastics) Sub-total	1,161	(19.1%)	541	(18.4%)
Putrescibles				
~ Food waste	2,148	(35.3%)	847	(28.8%)
~ Yard waste	62	(1.0%)	25	(0.8%)
~ Others[(3)]	325	(5.3%)	46	(1.6%)
(Putrescibles) Sub-total	2,534	(41.7%)	917	(31.2%)

Remark: Figures denote quantities and percentages by wet weight, they may not add up to total due to rounding off.

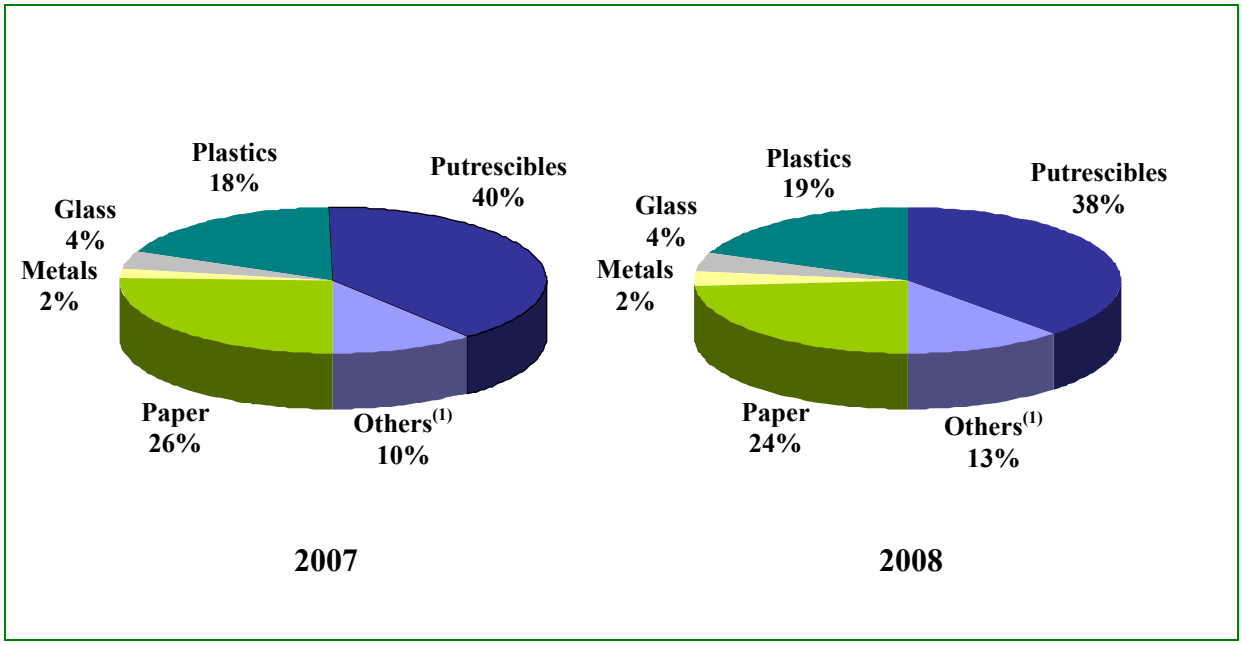
Notes:

(1) Other paper waste includes drink pack (tetrapak), tissue paper, etc.

(2) Other plastics waste includes household utensils, packaging materials, toys, scrap, etc.

(3) Other putrescibles waste includes cotton balls, other organic waste, etc.

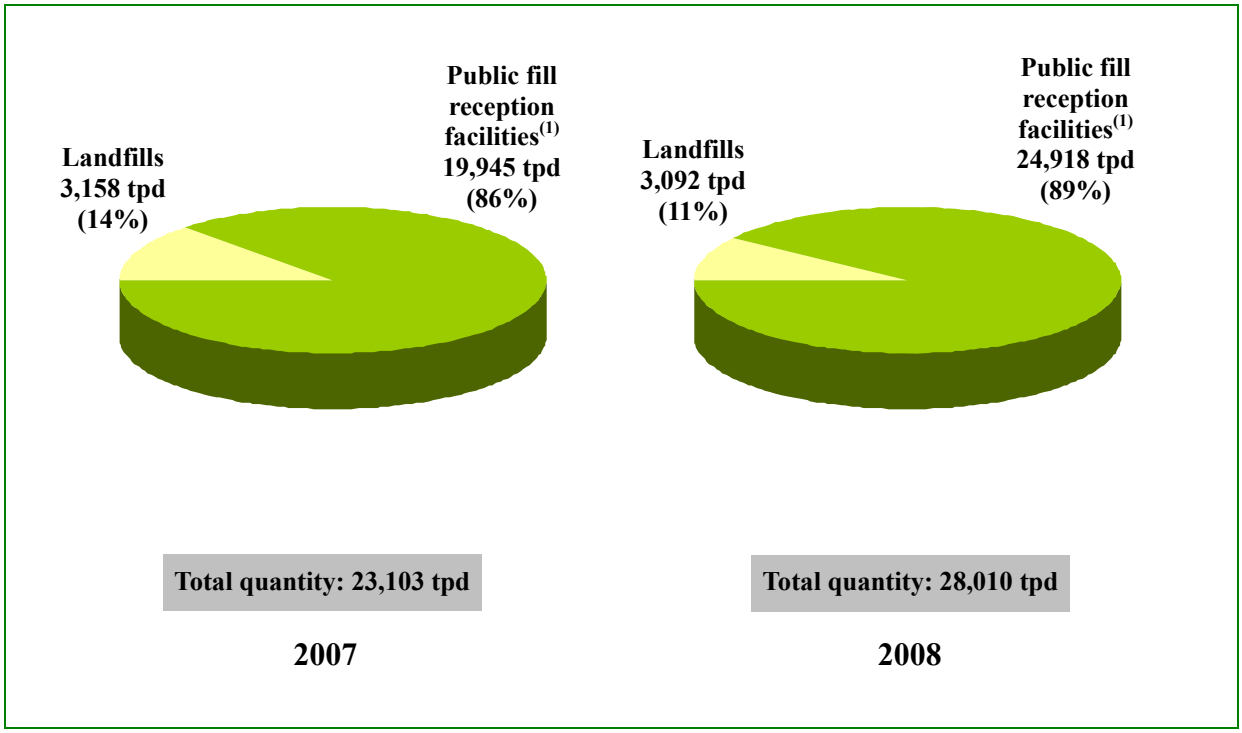
Plate 2.10 Composition of municipal solid waste in 2007 and 2008 – Major waste types



Notes:

(1) Others include bulky waste, textile, wood/rattan, household hazardous wastes and other unclassified waste.

Plate 2.11 Disposal of construction waste by destination in 2007 and 2008



Note:

(1) Public fill reception facilities are managed by CEDD for receiving inert fill materials for reuse.

Plate 2.12 Disposal of special waste in 2008

Waste type	Disposal method	Average daily quantity[1] (tpd)
Abattoir waste	Landfill	9
Animal carcasses and kennel waste	Landfill	8
Asbestos waste	Landfill[2]	5
Chemical waste other than asbestos waste	Landfill[2]	8
Clinical waste	Landfill[2]	5
Condemned goods	Landfill	18
CWTC stabilised residue	Landfill	18
Dewatered dredged materials	Landfill	0
Dewatered sewage sludge	Landfill	845
Dewatered waterworks sludge	Landfill	26
Grease trap waste	Landfill[3]	334[4]
Livestock waste	Landfill[5]	48
Sewage works screenings	Landfill	60
Waste tyres	Landfill[6]	8
	Landfill Sub-total	1,391
Chemical waste other than asbestos waste	CWTC	117
Dredged mud and excavated materials	Marine dumping	47,268[7]
Furnace bottom ash	Concrete manufacturing, stored in lagoon[8]	132
Livestock waste	Composting and other environmentally acceptable means[9]	192
Pulverised fuel ash	Concrete manufacturing, stored in lagoon[8]	1,311

Notes:

(1) Some types of special waste may not arise daily throughout the whole year. The average daily quantity is the total amount of waste generated in the year divided by the number of days in that year.

(2) Disposed of at SENT and WENT.

(3) Disposed of at WENT after treatment.

(4) The figure is the quantity of grease trap waste received at WENT before processing in the Interim Grease Trap Waste Treatment Facility. The quantity does not include grease trap waste diverted away for commissioning test of the Grease Trap Waste Treatment Facility at WKTS (101 tpd).

(5) Disposed of at WENT and NENT.

(6) Shredded or cut prior to disposal.

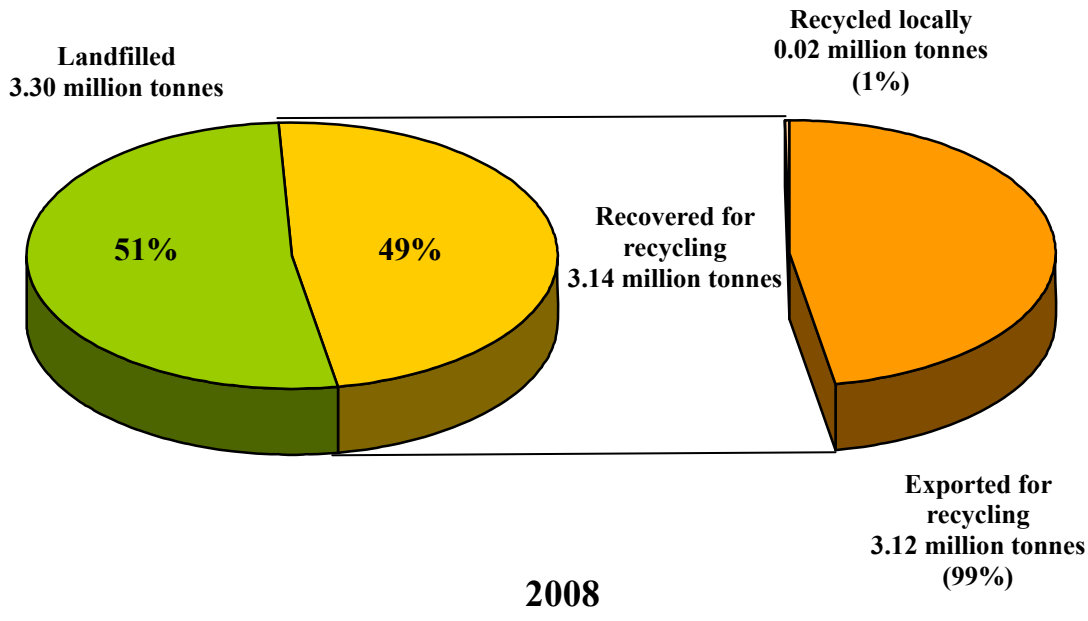
(7) Assuming the density of the dredged mud and excavated materials to be one tonne per cubic metre.

(8) The figures are calculated by making reference to the information provided by CLP Power Hong Kong Limited and The Hongkong Electric Company, Limited.

(9) Examples of environmentally acceptable means include on-site composting, aerobic treatment, dry muck-out, etc.

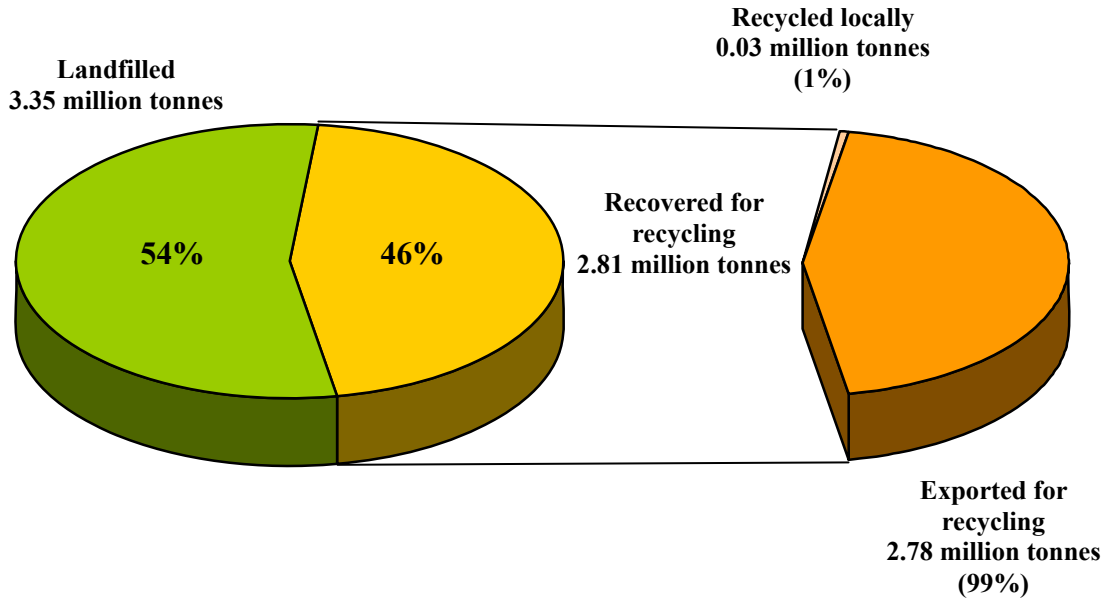
3. Waste Recovery and Recycling

Plate 3.1 Recovery of municipal solid waste in 2007 and 2008



2008

Remark: The waste concrete delivered to landfills as industrial waste since 2007 was re-grouped under overall construction waste. Its corresponding quantities have been deducted from municipal solid waste.



2007

Remark: The waste concrete delivered to landfills as industrial waste since 2007 was re-grouped under overall construction waste. Its corresponding quantities have been deducted from municipal solid waste.

Plate 3.2 Municipal solid waste recovery rates in 2004 – 2008

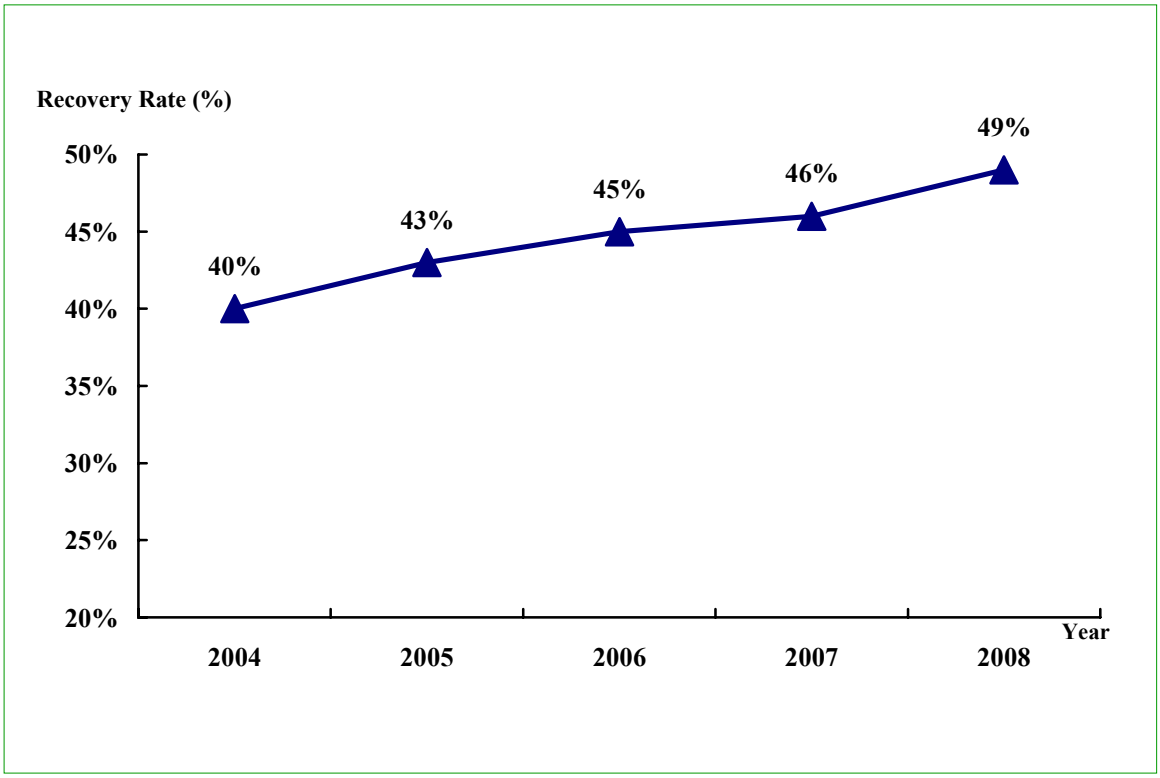


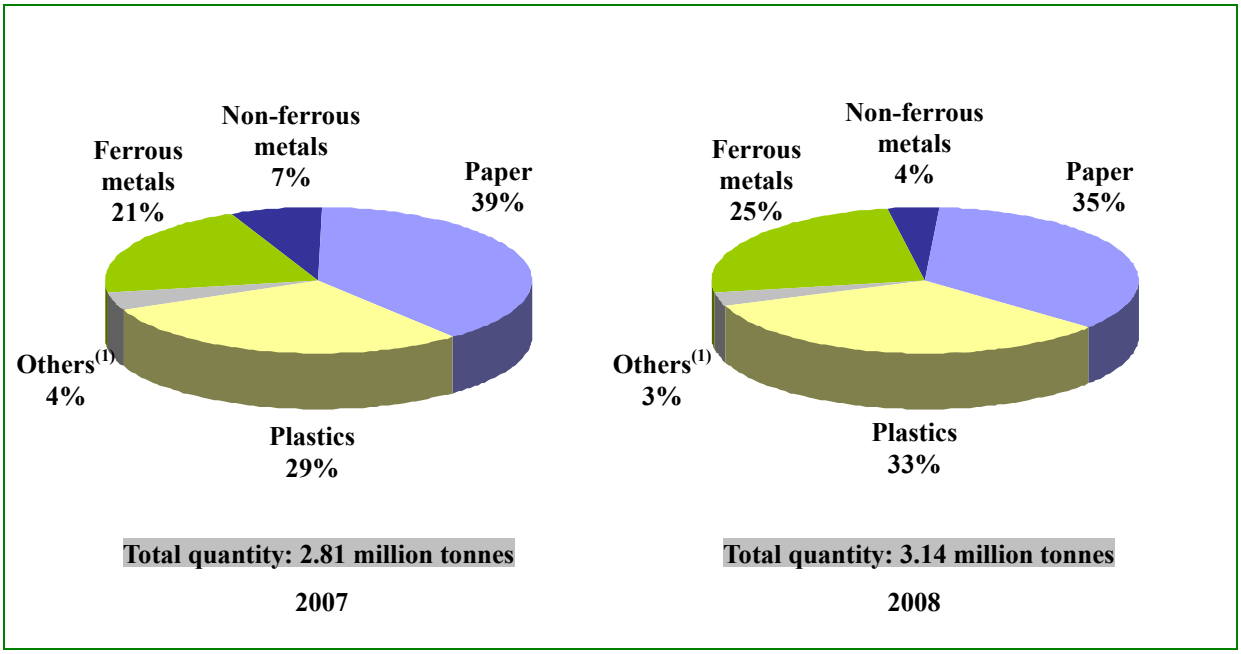
Plate 3.3 Recovered recyclable materials by type in 2008

Material type	Quantity of recovered recyclable materials (thousand tonnes)[1]		
	Exported for recycling (a)	Recycled locally (b)	Total recovered for recycling (c) = (a) + (b)
Paper	1,091	0	1,091
Plastics	1,021	2	1,023
Ferrous metals	793	0	793
Non-ferrous metals	140	0	140
Glass	0	1[2]	1
Rubber tyres	0	7[3]	7
Textiles	10	0	10
Wood	17	0	18
Electrical and electronic equipment	46	13	59
Total	3,118	24	3,143

Remark: Figures may not add up to the total due to rounding off.

Notes:
(1) Figures are rounded off to the nearest thousand tonne.
(2) Excluding glass beverage bottles recovered through deposit-and-refund system operated by local beverage manufacturers.
(3) Quantity includes reuse, retreading and recycling of vehicle tyres and retreading of aircraft tyres in Hong Kong.

Plate 3.4 Recovered recyclable materials by type in 2007 and 2008



Note:
(1) Others include glass, wood, rubber tyres, textiles, and electrical and electronic equipment.

Plate 3.5 Total quantities and export values of recovered recyclable materials in 2004 – 2008

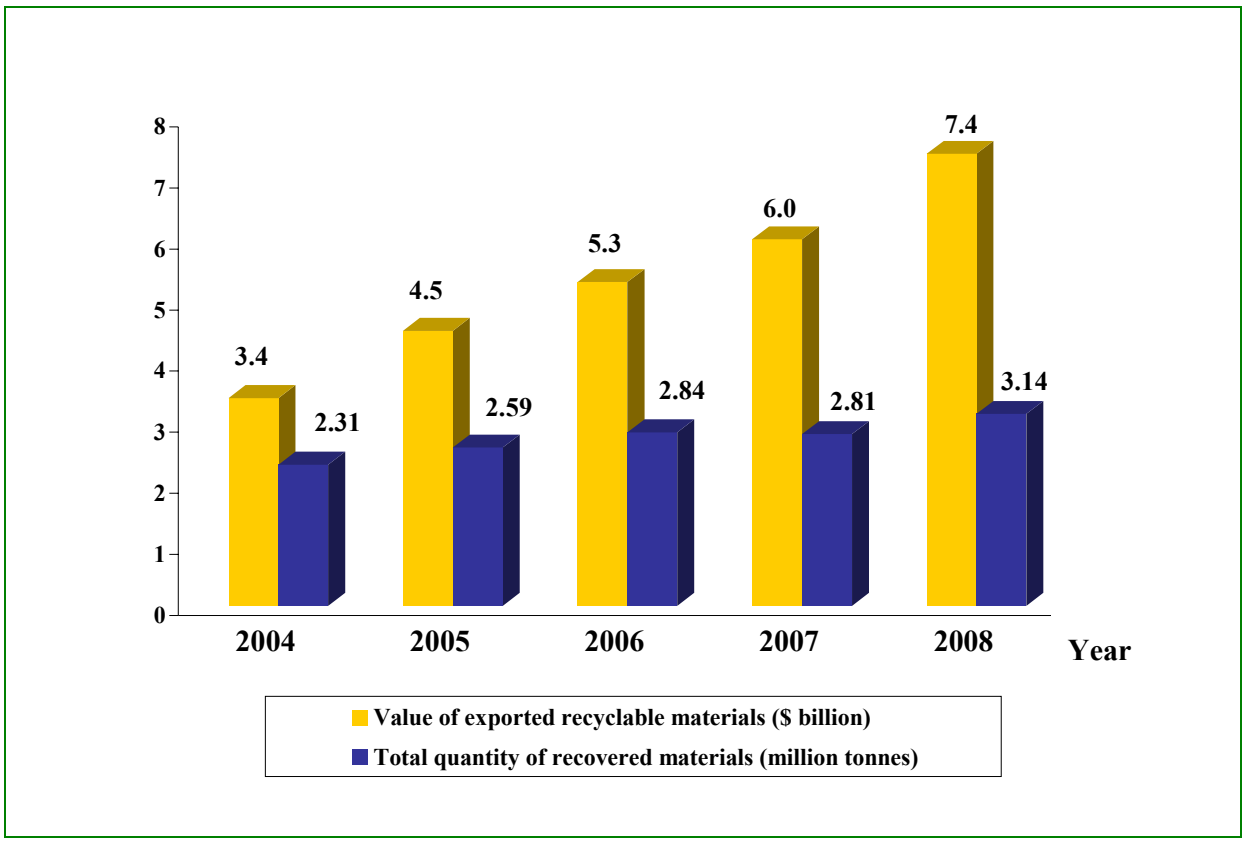
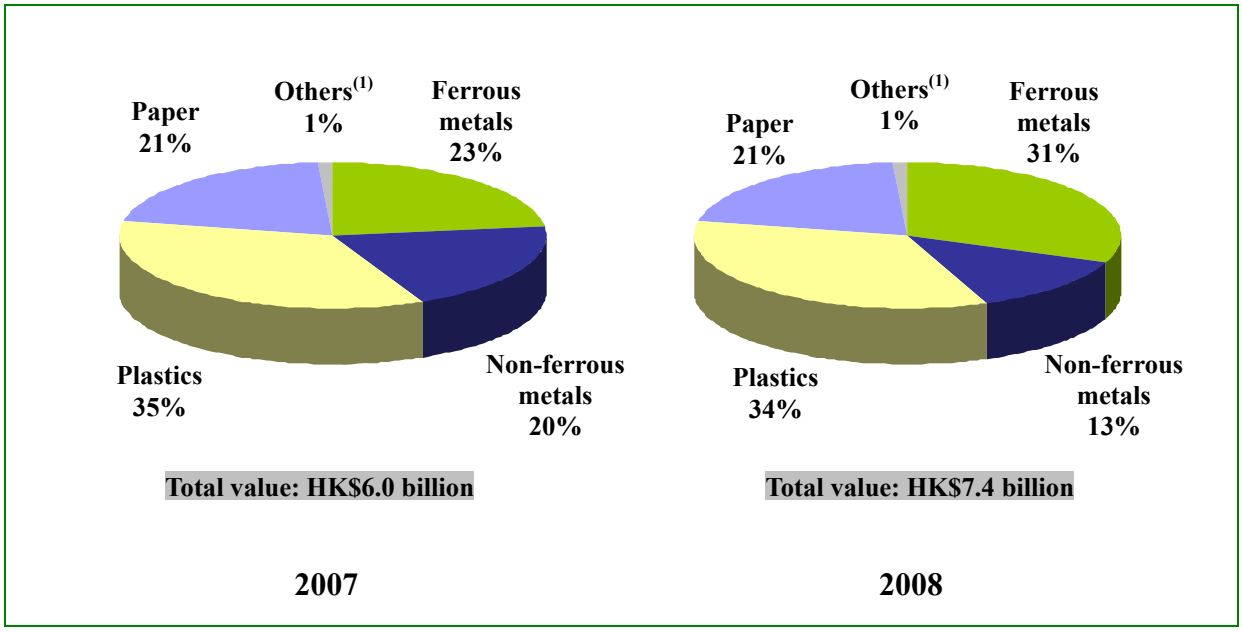


Plate 3.6 Values of exported recyclable materials in 2007 and 2008



Note:

(1) Others include glass, wood and textiles.

Plate 3.7 Quantities and values of exported recyclable materials by type

Category of recyclable materials	Quantity (tonnes)	Value ($ thousand)	Value per unit weight ($ / tonne)
a. Ferrous metals			
~ Alloy steel scrap	11,835	115,916	9,794
~ Pig or cast iron	0	0	0
~ Tinplate	0	0	0
~ Other scraps	781,031	2,225,440	2,849
(Ferrous metals) Sub-total	792,866	2,341,356	2,953
b. Non-ferrous metals			
~ Aluminium	61,963	262,928	4,243
~ Copper & alloys	78,341	609,255	7,777
~ Lead	0	0	0
~ Metal ash & residues	9	654	73,508
~ Nickel	1	198	226,545
~ Precious metal (without scrap gold)	66	116,388	1,772,775
~ Tin	20	104	5,127
~ Zinc	0	0	0
(Non-ferrous metals) Sub-total	140,399	989,528	7,048
c. Plastics			
~ Polyethylene	548,064	1,631,919	2,978
~ Polystyrene & copolymers	89,167	141,276	1,584
~ Polyvinyl chloride	2,606	5,541	2,126
~ Others	381,318	730,921	1,917
(Plastics) Sub-total	1,021,155	2,509,658	2,458
d. Textiles			
~ Cotton	3,085	9,983	3,236
~ Man-made fibres	0	0	0
~ Old clothing & other textile articles, rags, etc.	6,441	17,788	2,762
(Textiles) Sub-total	9,526	27,770	2,915
e. Wood & paper			
~ Paper	1,091,196	1,549,657	1,420
~ Wood (include sawdust)	17,433	17,433	1,000
(Wood & paper) Sub-total	1,108,628	1,567,090	1,414
f. Glass			
~ Glass	0	0	0
(Glass) Sub-total	0	0	0
g. Electrical and electronic equipment	45,870	N/A	N/A

Appendix 1: Classification of Solid Waste and Monitoring Methodology

Waste Classification and Terminology

Solid waste is classified into three main types by making reference to the sources of waste and the institutional arrangements for waste collection and disposal. These three types of solid waste are municipal solid waste, construction waste and special waste. The detailed interpretations of some commonly used terms are described below.

Municipal solid waste includes domestic waste, commercial waste and industrial waste.

- **Domestic waste** refers to household waste, waste generated from daily activities in institutional premises and refuse collected from public cleansing services. Public cleansing waste includes dirt and litter collected by the Food and Environmental Hygiene Department (FEHD), marine refuse collected by the Marine Department and waste from country parks collected by the Agriculture, Fisheries and Conservation Department.

- **Commercial waste** is waste arising from commercial activities taking place in shops, restaurants, hotels, offices, markets in private housing estates, etc. It is collected mainly by private waste collectors. However, some commercial waste is mixed with domestic waste and collected by the FEHD.

- **Industrial waste** is waste arising from industrial activities and does not include construction waste and chemical waste. It is usually collected by private waste collectors. However, some industries may deliver their industrial waste directly to landfills for disposal.

- It should be noted that there are bulky items like furniture and domestic appliances which cannot be handled by conventional compactor type refuse collection vehicles. These items are regarded as bulky waste and are usually collected separately. They may come from residential premises, commercial and industrial activities.

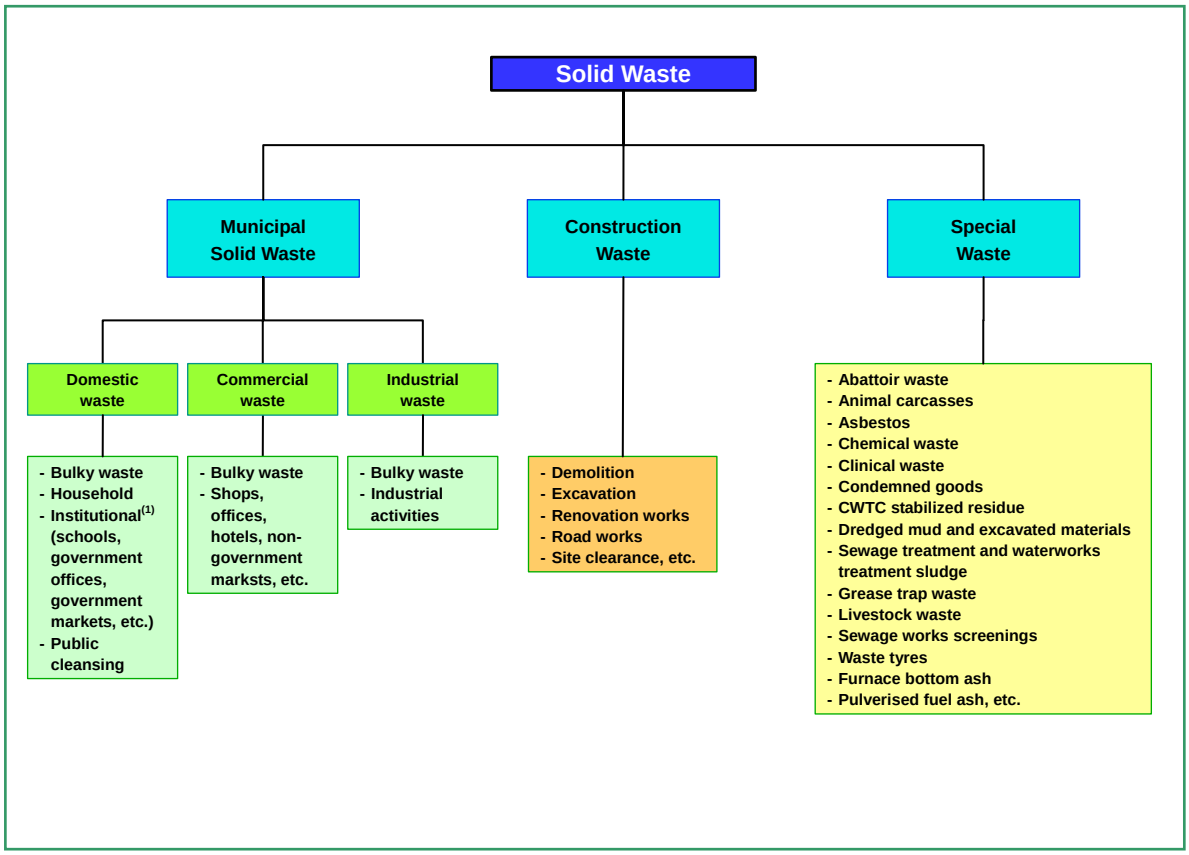
Construction waste (previously known as construction & demolition waste) is a mixture of surplus materials arising from site clearance, excavation, construction, refurbishment, renovation, demolition and road works. Over 80% of construction wastes are inert, which include debris, rubble, earth and concrete, are suitable for site formation and land reclamation. When properly sorted, materials such as concrete and asphalt can be recycled for use in construction. The remaining non-inert substances in construction waste, which include bamboo, timber, vegetation, packaging waste and other organic materials, are not suitable for site formation or land reclamation and are disposed of at landfills. Overall construction waste received at landfills includes construction waste from construction sites and waste concrete that is generated from concrete batching plants and cement plaster/mortar manufacturing plants not set up inside construction sites.

Special waste is waste that requires special disposal arrangement. It includes abattoir waste, animal carcasses, asbestos, chemical waste, clinical waste, condemned goods, CWTC stabilized residue, dredged mud and excavated materials, sewage treatment and waterworks

treatment sludge, grease trap waste, livestock waste, sewage works screenings, waste tyres, furnace bottom ash, pulverised fuel ash, etc.

Chemical waste is defined in the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordinance (Cap. 354). Chemical waste can be any substance arising from any process or trade activity which contains chemical in such form, quantity or concentration that can cause pollution to the environment or become a risk to health.

Current classification of solid waste



Note:

(1) Part of the waste generated from schools, government offices, government markets, etc. was mixed with household waste and/or public cleansing refuse during the process of collection carried out by the FEHD.

Methodology

Solid waste data are mainly collected by the following sources:

- Waste intake records taken at weighbridges of landfills and refuse transfer stations (RTS);
- Results of annual survey on waste composition conducted in October - December 2008 at landfills and RTS;
- Results of waste recovery survey conducted in December 2008 - February 2009 by The Nielsen Company (Hong Kong) Limited;
- Monthly statistics provided by other departments including FEHD, CEDD and C&SD and;
- Statistics on special and other wastes (Plate 2.12) provided by relevant specialist groups of EPD and concerned government departments.