MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2010

Environmental Protection Department

Monitoring of Solid Waste in Hong Kong
Waste Statistics for 2010

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Work done by: RTS Development Group,
Waste Reduction and EcoPark Group,
Environmental Infrastructure Division

Approved by: Dr. Ellen Y.L. CHAN

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Abbreviations

AWCP	Animal Waste Composting Plant
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
SLCP	Shaling Livestock Waste Composting Plant
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 2010. 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 2010

Waste type[1]		Average daily quantity (tpd)
a.	Domestic waste	6,135
b.	Commercial waste	2,352
c.	Industrial waste	627
d.	Municipal solid waste (a+b+c)	9,114
e.	Overall construction waste	3,584
f.	Special waste[2]	1,119
g.	All waste received at landfills (d+e+f) Total	13,817

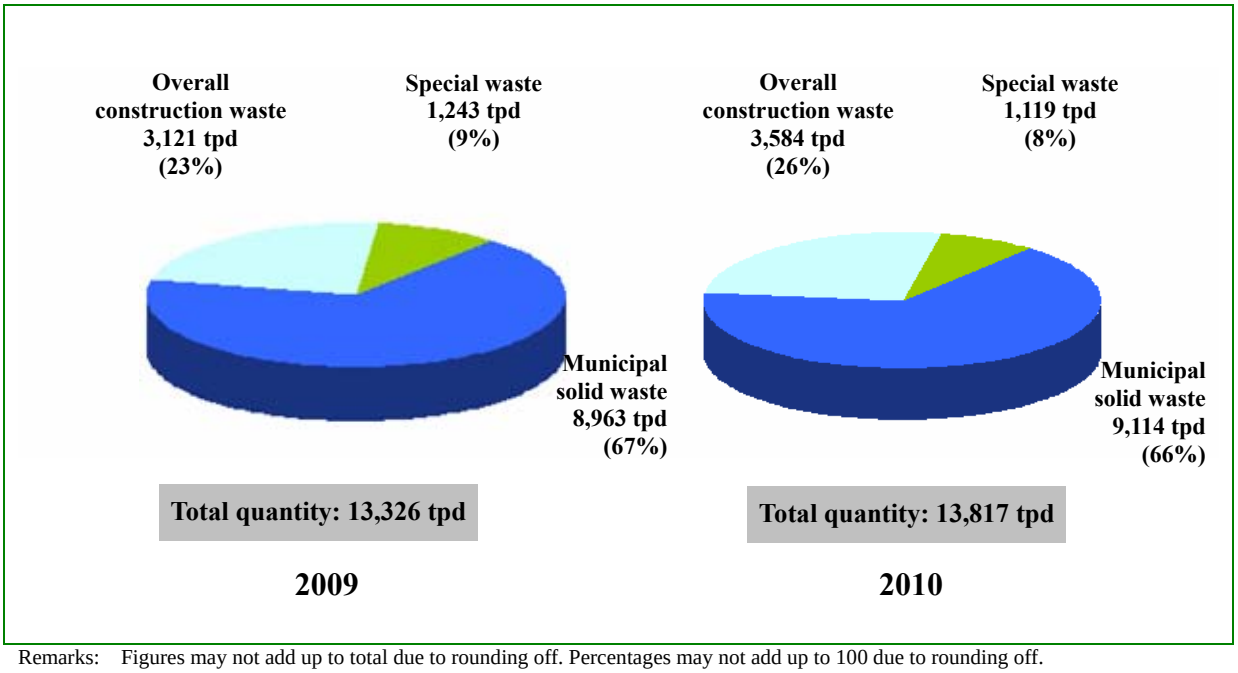
Remark: Figures may not add up to total due to rounding off.

Notes:

(1) Please refer to Appendix 1 for classification of solid waste.

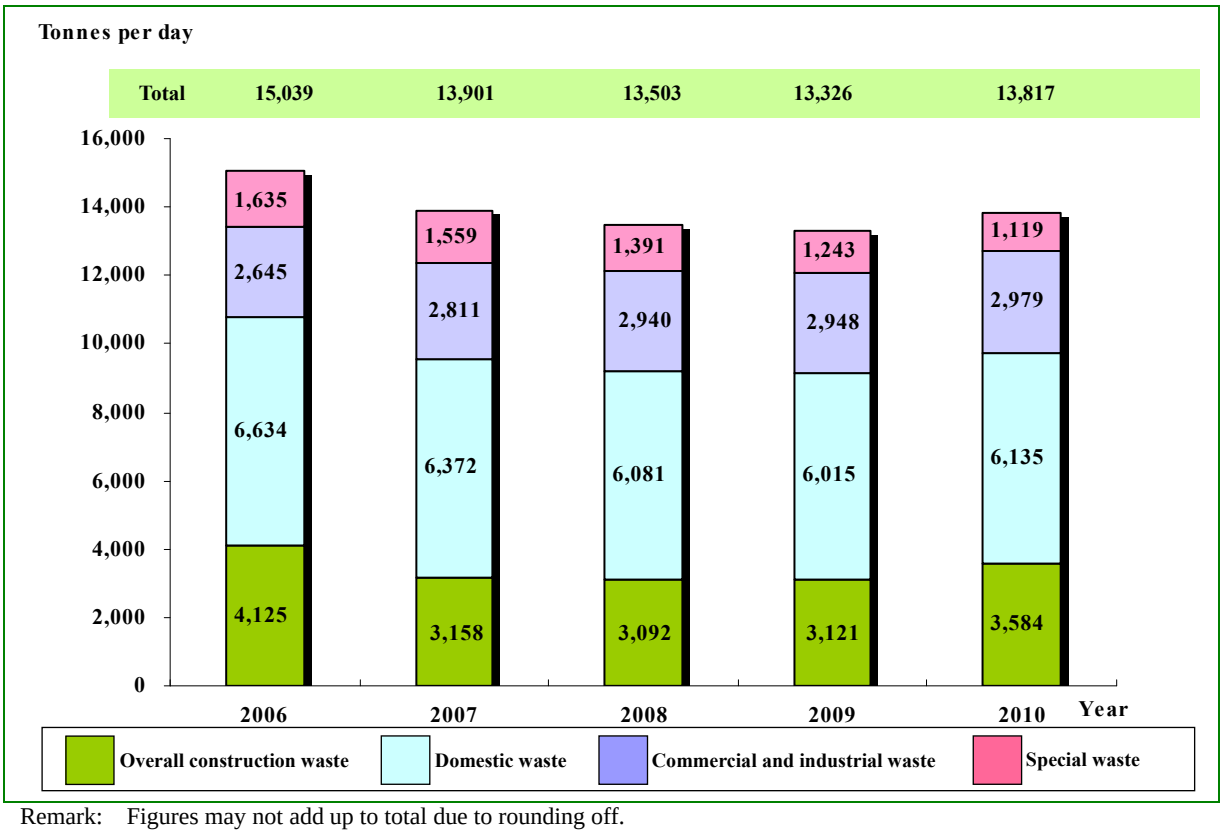
(2) The quantity does not include special waste that is treated or disposed of at other outlets.

Plate 2.2 Disposal of solid waste at landfills in 2009 and 2010



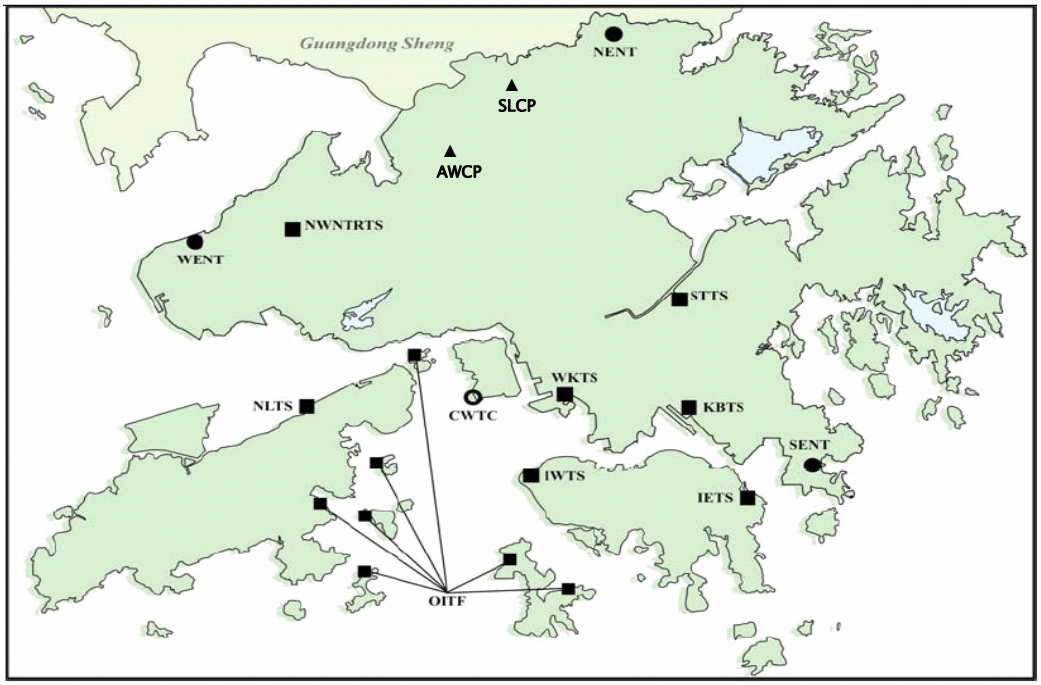
Remarks: Figures may not add up to total due to rounding off. Percentages may not add up to 100 due to rounding off.

Plate 2.3 Disposal of solid waste at landfills in 2006 – 2010



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

Plate 2.4 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

▲
- SLCP - Shaling Livestock Waste Composting Plant
- AWCP - Animal Waste Composting Plant

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 RTS and landfills in 2010

Disposal facility [1]	Average daily quantity (tpd)			
	MSW	Overall construction waste	Special waste	Total
IETS - Island East Transfer Station	811	-	-	811
STTS - Sha Tin Transfer Station	966	-	-	966
IWTS - Island West Transfer Station	517	-	-	517
WKTS - West Kowloon Transfer Station	2,237	-	465	2,702
OITF - Outlying Islands Transfer Facilities	84	41	3	128
NLTS - North Lantau Transfer Station	164	-	1	165
NWNTRTS - North West New Territories Refuse Transfer Station	918	-	-	918
WENT - West New Territories Landfill	5,093[2]	573[2]	496	6,161[2]
SENT - South East New Territories Landfill	2,166	2,581	415	5,162
NENT - North East New Territories Landfill	1,856[2]	430	208	2,494[2]
Total	9,114	3,584	1,119	13,817

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

Notes:

(1) Please refer to Plate 2.12 for solid waste delivered to other waste management facilities and outlets.

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

Plate 2.6 Arisings of solid waste by district in 2010

District	Average daily quantity[1] [2] (tpd)			
	Domestic waste	C&I waste	Municipal solid waste	Overall construction waste
	(a)	(b)	(c) =(a)+(b)	(d)
Central & Western	291	83	375	97
Wanchai	284	151	435	37
Eastern	447	117	564	57
Southern	235	74	310	66
Hong Kong Island Sub-total	**1,258**	**426**	**1,683**	**257**
Yau Tsim Mong	503	209	712	88
Sham Shui Po	325	153	477	55
Kowloon City	309	159	468	111
Wong Tai Sin	286	125	412	47
Kwun Tong	450	289	739	380
Kowloon Sub-total	**1,873**	**935**	**2,809**	**682**
Kwai Tsing	327	148	474	164
Tsuen Wan	286	151	437	27
Tuen Mun	407	250	657	372
Yuen Long	552	261	813	98
North	348	173	521	89
Tai Po	249	94	343	59
Sha Tin	424	185	609	96
Sai Kung	274	231	505	1,687
NT- Mainland Sub-total	**2,867**	**1,493**	**4,360**	**2,592**
Cheung Chau	27	-	-	-
Mui Wo	23	-	-	-
Peng Chau	6	-	-	-
Ma Wan	5	-	-	-
Lamma Island	9	-	-	-
Hei Ling Chau	3	-	-	-
North Lantau	63	-	-	-
NT-Outlying Islands Sub-total	**136**	**125[3]**	**262[3]**	**53[3]**
Total	**6,135**	**2,979**	**9,114**	**3,584**

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

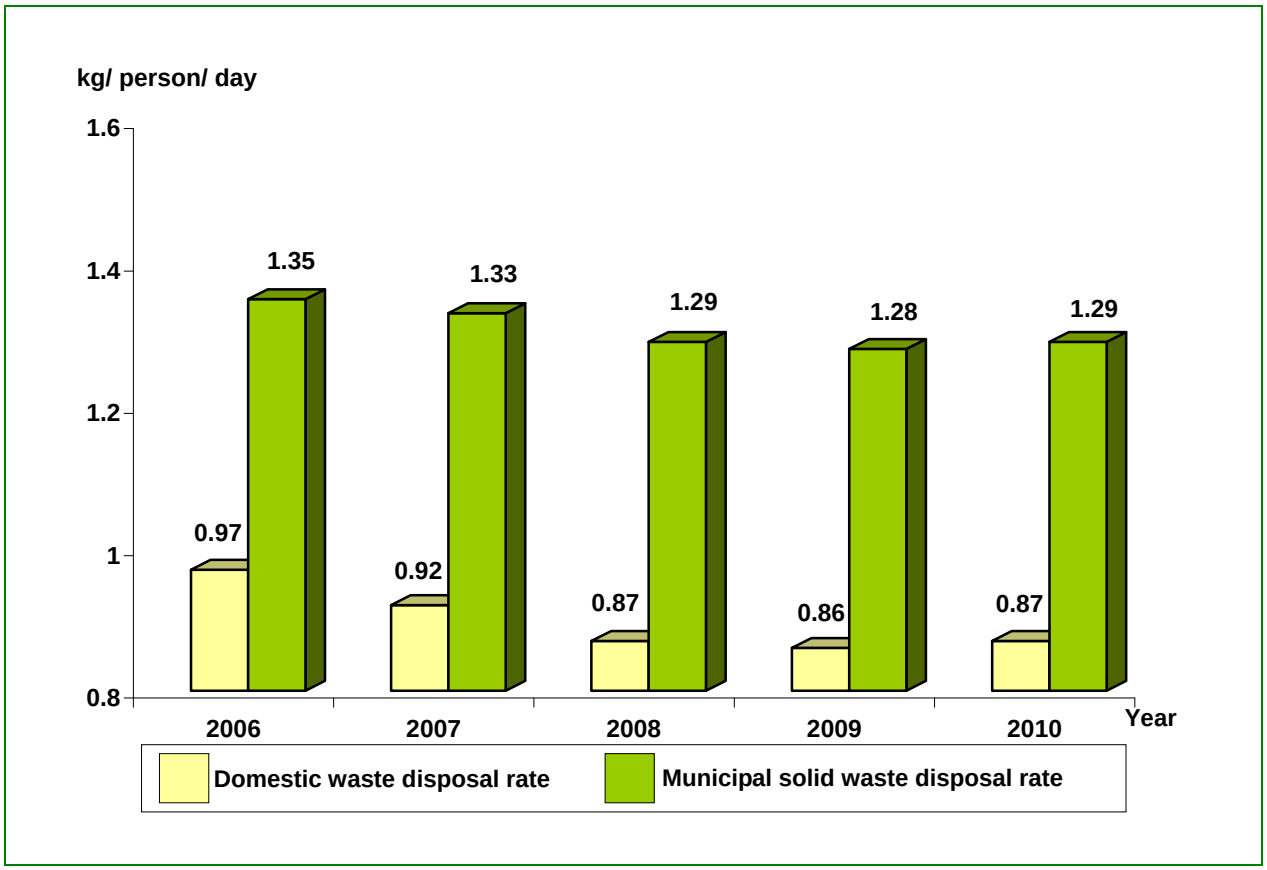
Notes:

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

(2) Special waste is not included.

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

Plate 2.7 Per capita disposal rates of municipal solid waste and domestic waste in 2006– 2010



Remark: Mid-year population figures are used in the calculation of per capita disposal rates.

Plate 2.8 Composition of municipal solid waste in 2010

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	310 (5.1%)	55 (2.4%)	8 (1.3%)	63 (2.1%)	374 (4.1%)
Metals	103 (1.7%)	40 (1.7%)	33 (5.3%)	73 (2.5%)	176 (1.9%)
Paper	1,259 (20.5%)	684 (29.1%)	61 (9.8%)	745 (25.0%)	2,004 (22.0%)
Plastics	1,266 (20.6%)	548 (23.3%)	127 (20.3%)	675 (22.7%)	1,941 (21.3%)
Putrescibles	2,747 (44.8%)	846 (36.0%)	75 (12.0%)	922 (30.9%)	3,668 (40.2%)
Textiles	168 (2.7%)	45 (1.9%)	21 (3.4%)	66 (2.2%)	234 (2.6%)
Wood/Rattan	74 (1.2%)	32 (1.4%)	189 (30.1%)	221 (7.4%)	295 (3.2%)
Household hazardous wastes (HHWs)(1)	75 (1.2%)	25 (1.1%)	8 (1.3%)	33 (1.1%)	108 (1.2%)
Miscellaneous(2)	133 (2.2%)	77 (3.3%)	105 (16.7%)	181 (6.1%)	314 (3.4%)
Sub-total	6,135 (100%)	2,352 (100%)	627 (100%)	2,979 (100%)	9,114 (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, pesticides, fuels, cylinders, batteries, electrical appliances, computer products, mercury-containing fluorescent lamps and medicines, etc.

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

Plate 2.9 Composition of municipal solid waste in 2010 – Breakdown of major components

Composition	Domestic waste		Commercial & industrial waste	
	Quantity (tpd)	% by weight	Quantity (tpd)	% by weight
Glass				
~ Glass bottles	246	(4.0%)	52	(1.7%)
~ Other glass	64	(1.0%)	12	(0.4%)
(Glass) Sub-total	310	(5.1%)	63	(2.1%)
Metals				
~ Ferrous metals	77	(1.3%)	57	(1.9%)
~ Aluminium cans	17	(0.3%)	5	(0.2%)
~ Other non-ferrous metals	9	(0.2%)	11	(0.4%)
(Metals) Sub-total	103	(1.7%)	73	(2.5%)
Paper				
~ Cardboard	195	(3.2%)	160	(5.4%)
~ Newsprint	445	(7.2%)	88	(2.9%)
~ Office paper	59	(1.0%)	55	(1.9%)
~ Others[(1)]	560	(9.1%)	442	(14.8%)
(Paper) Sub-total	1,259	(20.5%)	745	(25.0%)
Plastics				
~ Plastic bags	580	(9.4%)	237	(8.0%)
~ Polyfoam - dining wares	32	(0.5%)	20	(0.7%)
~ Polyfoam – others	27	(0.4%)	29	(1.0%)
~ PET plastic bottles	77	(1.3%)	37	(1.2%)
~ Non-PET plastic bottles	46	(0.8%)	10	(0.3%)
~ Others[(2)]	504	(8.2%)	342	(11.5%)
(Plastics) Sub-total	1,266	(20.6%)	675	(22.7%)
Putrescibles				
~ Food waste	2,397	(39.1%)	840	(28.2%)
~ Yard waste	61	(1.0%)	14	(0.5%)
~ Others[(3)]	288	(4.7%)	68	(2.3%)
(Putrescibles) Sub-total	2,747	(44.8%)	922	(30.9%)

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

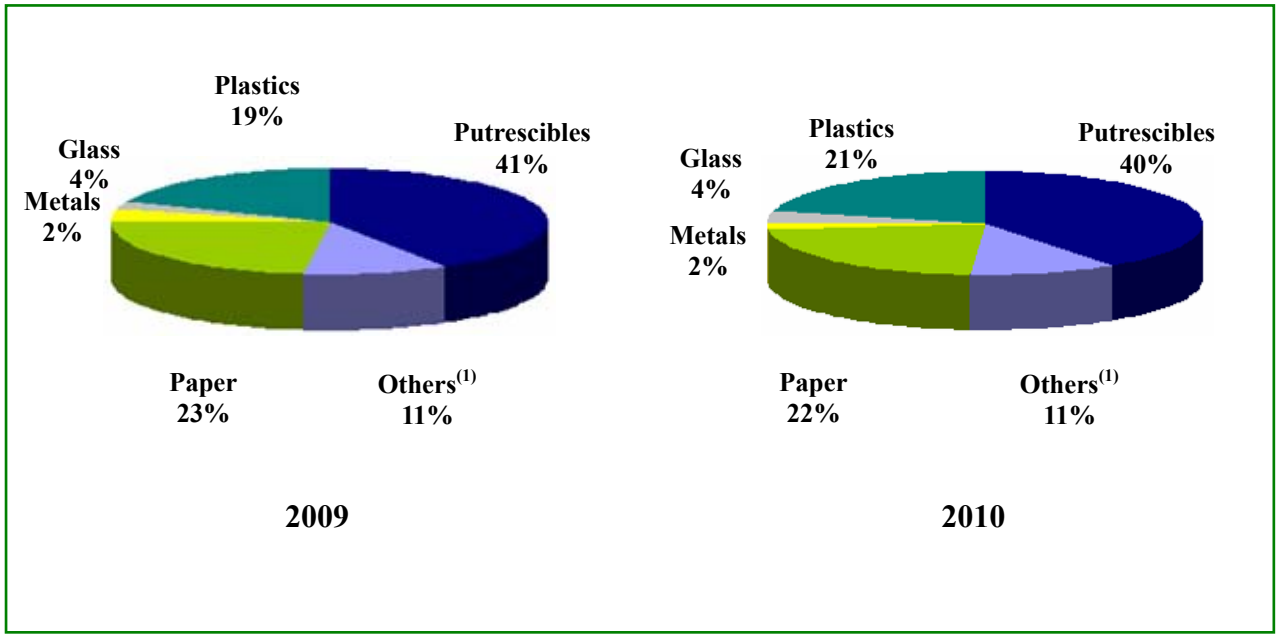
Notes:

(1) Other paper waste includes drink packs (e.g. tetrapaks), tissue paper, etc.

(2) Other plastic waste includes household utensils, packaging materials, toys, off-cuts, scrap, etc.

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

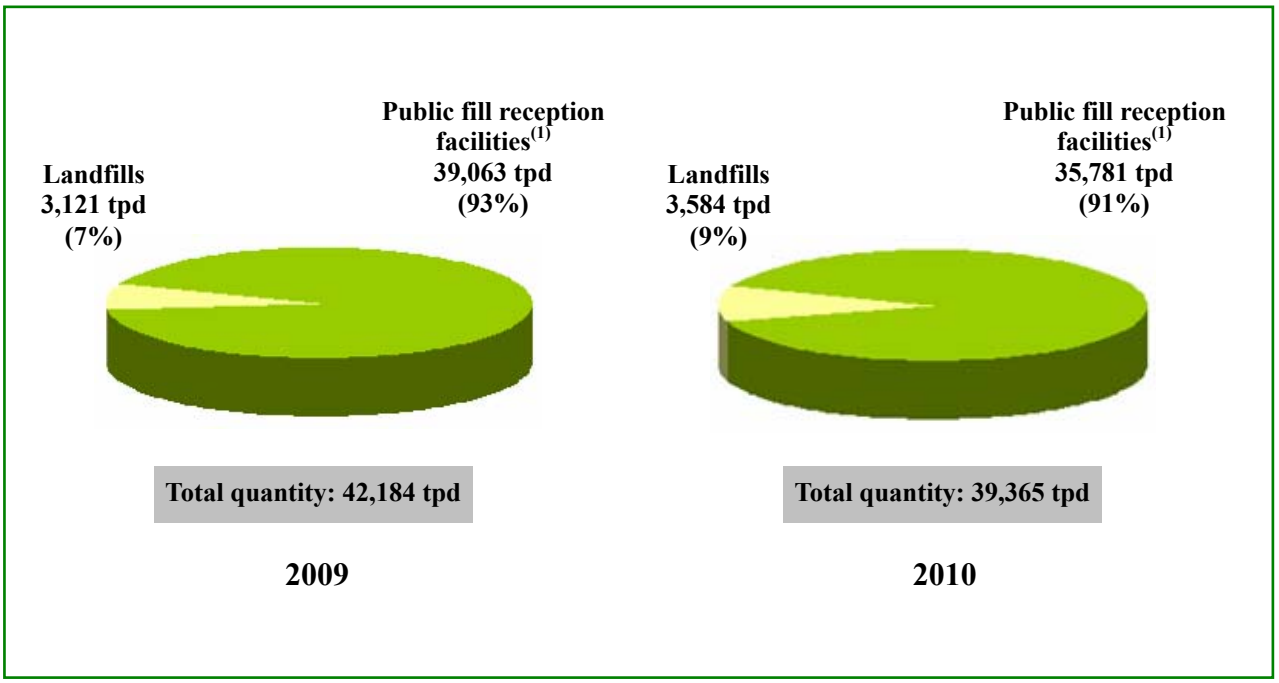
Plate 2.10 Composition of municipal solid waste in 2009 and 2010 – Major waste types



Note:

(1) Others include textiles, wood/rattan, household hazardous wastes and miscellaneous waste.

Plate 2.11 Disposal of construction waste by destination in 2009 and 2010



Note:

(1) Public fill reception facilities are managed by CEDD for receiving inert fill materials for reuse. In 2010, two major public fill reception facilities are in operation at Tseung Kwan O and Tuen Mun.

Plate 2.12 Disposal of special waste in 2010

Waste type	Disposal method	Average daily quantity[1] (tpd)
Abattoir waste	Landfill	10
Animal carcasses and kennel waste	Landfill	7
Asbestos waste	Landfill	6
Chemical waste other than asbestos waste	Landfill	7
Clinical waste	Landfill	6
Condemned goods	Landfill	16
CWTC stabilised residue and incineration ash	Landfill	14
Dewatered dredged materials	Landfill	3
Dewatered sewage sludge	Landfill	880
Dewatered waterworks sludge	Landfill	55
Livestock waste	Landfill	51
Sewage works screenings	Landfill	60
Waste tyres	Landfill[2]	4
	Landfill Sub-total	1,119
Chemical waste other than asbestos waste	CWTC	51
Grease trap waste	WKTS	465[3]
Horse stable waste	AWCP	8
Livestock waste	SLCP and other environmentally acceptable means[4]	170
Dredged mud and excavated materials	Marine dumping	103,836[5]
Furnace bottom ash	Concrete manufacturing, stored in lagoon[6]	113
Pulverised fuel ash	Concrete manufacturing, stored in lagoon[6]	1,112

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) Waste tyres are shredded or cut prior to disposal.

(3) The figure is the quantity of grease trap waste treated by the Grease Trap Waste Treatment Facility at WKTS.

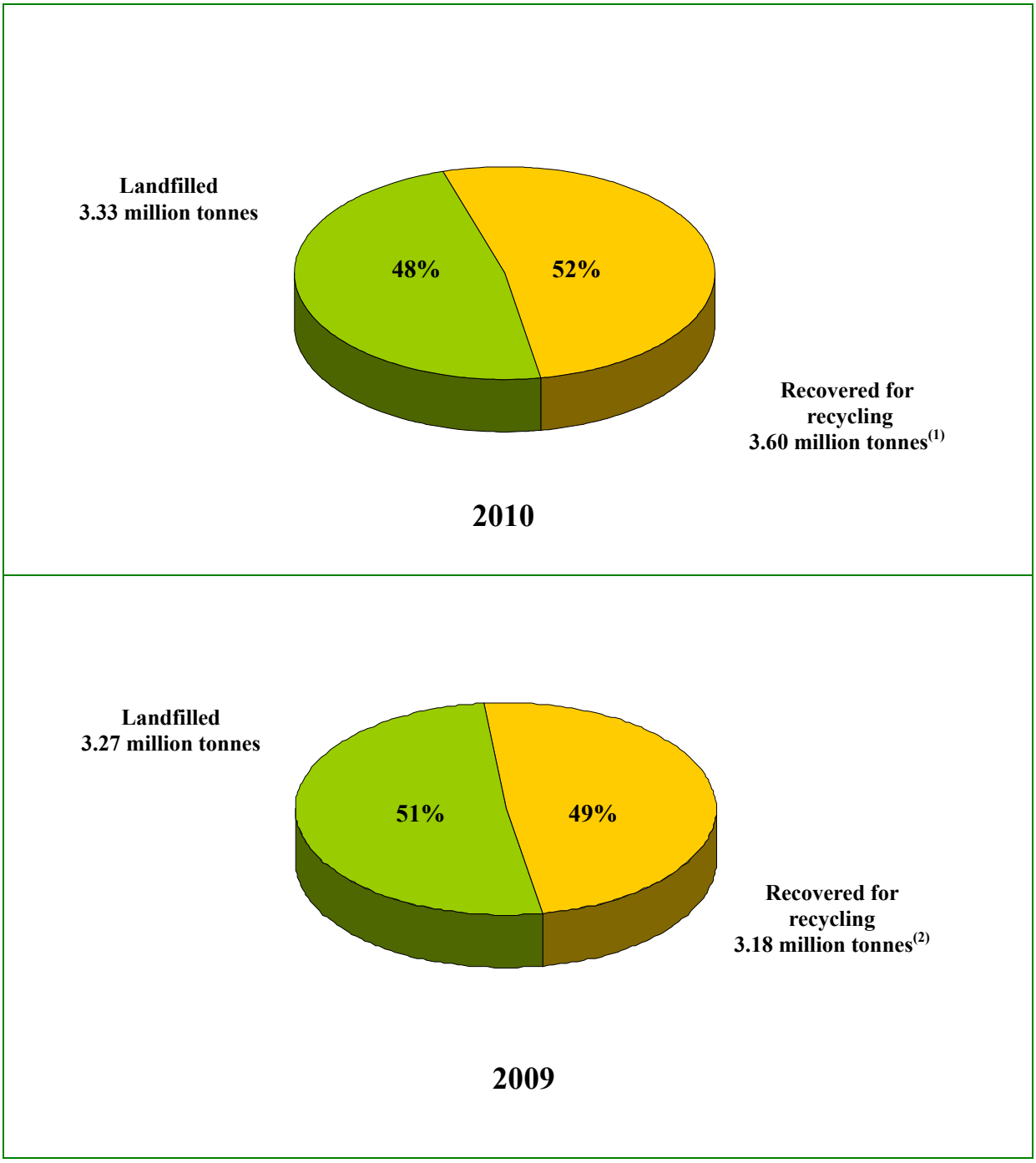
(4) Examples of environmentally acceptable means include on-site composting, aerobic treatment, dry muck-out, etc.

(5) The figure is calculated by assuming the density of the dredged mud and excavated materials to be one tonne per cubic metre.

(6) The figures are calculated by making reference to the information provided by the power companies.

3. Waste Recovery and Recycling

Plate 3.1 Recovery of municipal solid waste in 2009 and 2010



Note:

(1) 3.60 million tonnes of recyclable materials were recovered for recycling in 2010 of which 3.57 million tonnes (99%) were exported for recycling and 0.03 million tonne (1%) was recycled locally.

(2) 3.18 million tonnes of recyclable materials were recovered for recycling in 2009 of which 3.15 million tonnes (99%) were exported for recycling and 0.03 million tonne (1%) was recycled locally.

Plate 3.2 Municipal solid waste recovery rates in 2006 – 2010

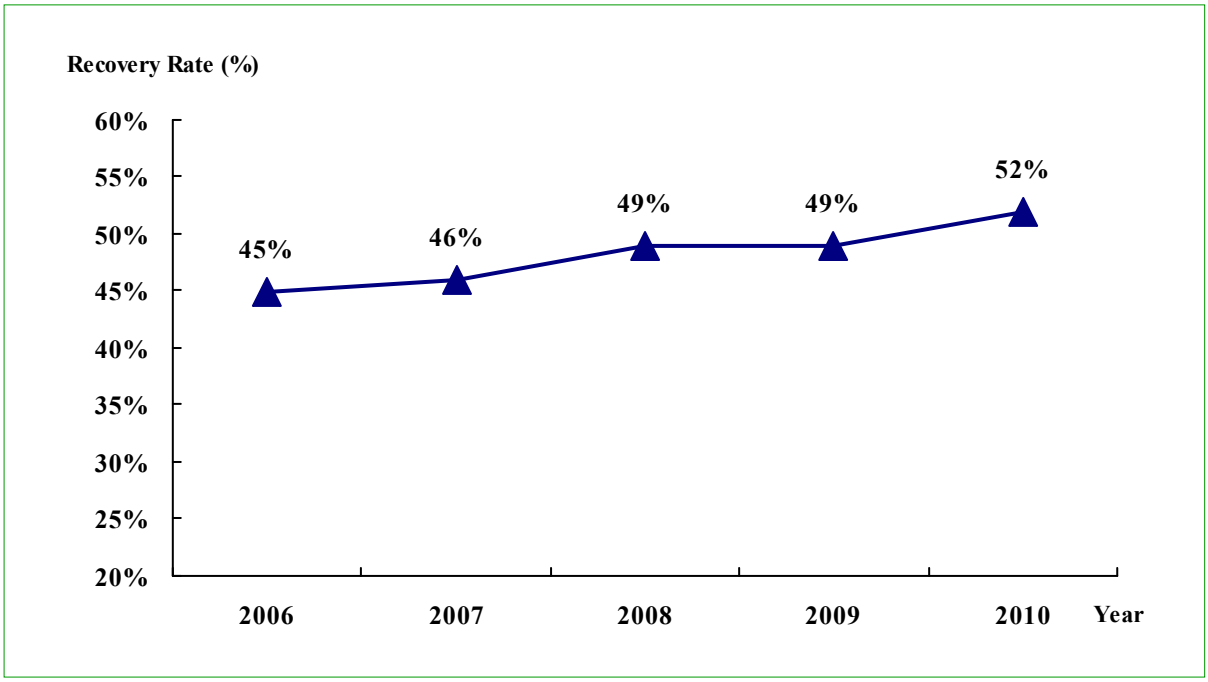


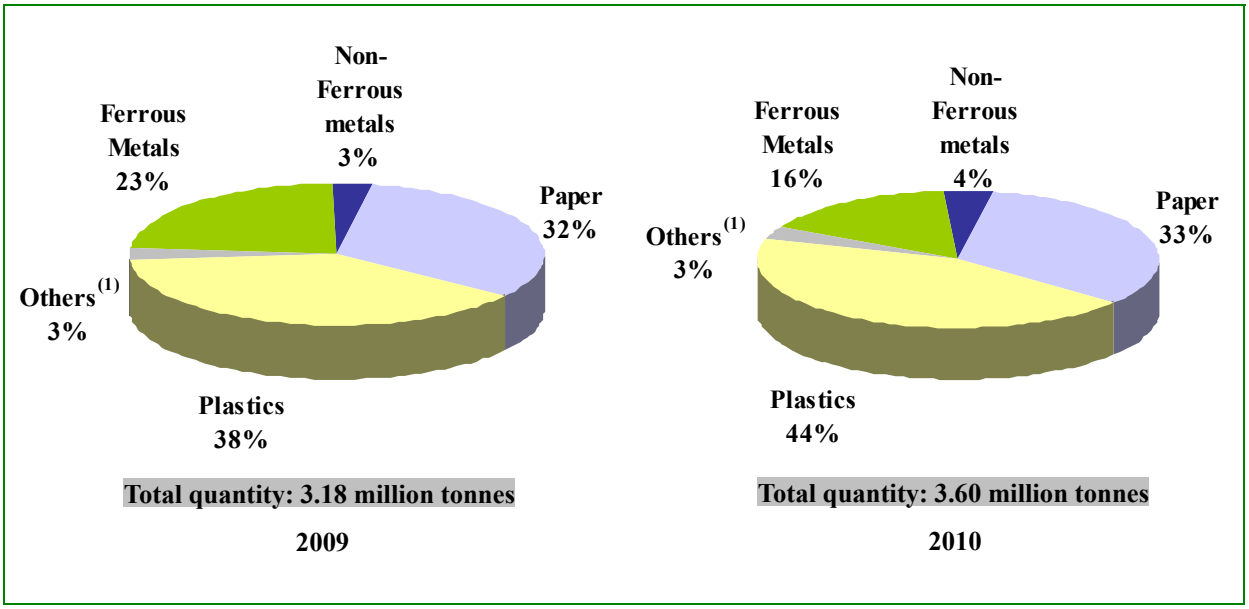
Plate 3.3 Recovered recyclable materials by type in 2010

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	1,195	0	1,195
Plastics	1,573	4	1,577
Ferrous metals	566	0	566
Non-ferrous metals	151	4	155
Glass	0	5[2]	5
Rubber tyres	0	10[3]	10
Textiles	20	0	20
Wood	16	0	17
Electrical and electronic equipment	51	10	61
Total	3,571	32	3,603

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

Notes:
(1) Figures are rounded off to the nearest thousand tonne.
(2) The quantity does not include glass beverage bottles recovered through deposit-and-refund system operated by local beverage manufacturers.
(3) The 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 2009 and 2010



Remark: Percentages may not add up to 100 due to rounding off.

Notes:
(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 2006 – 2010

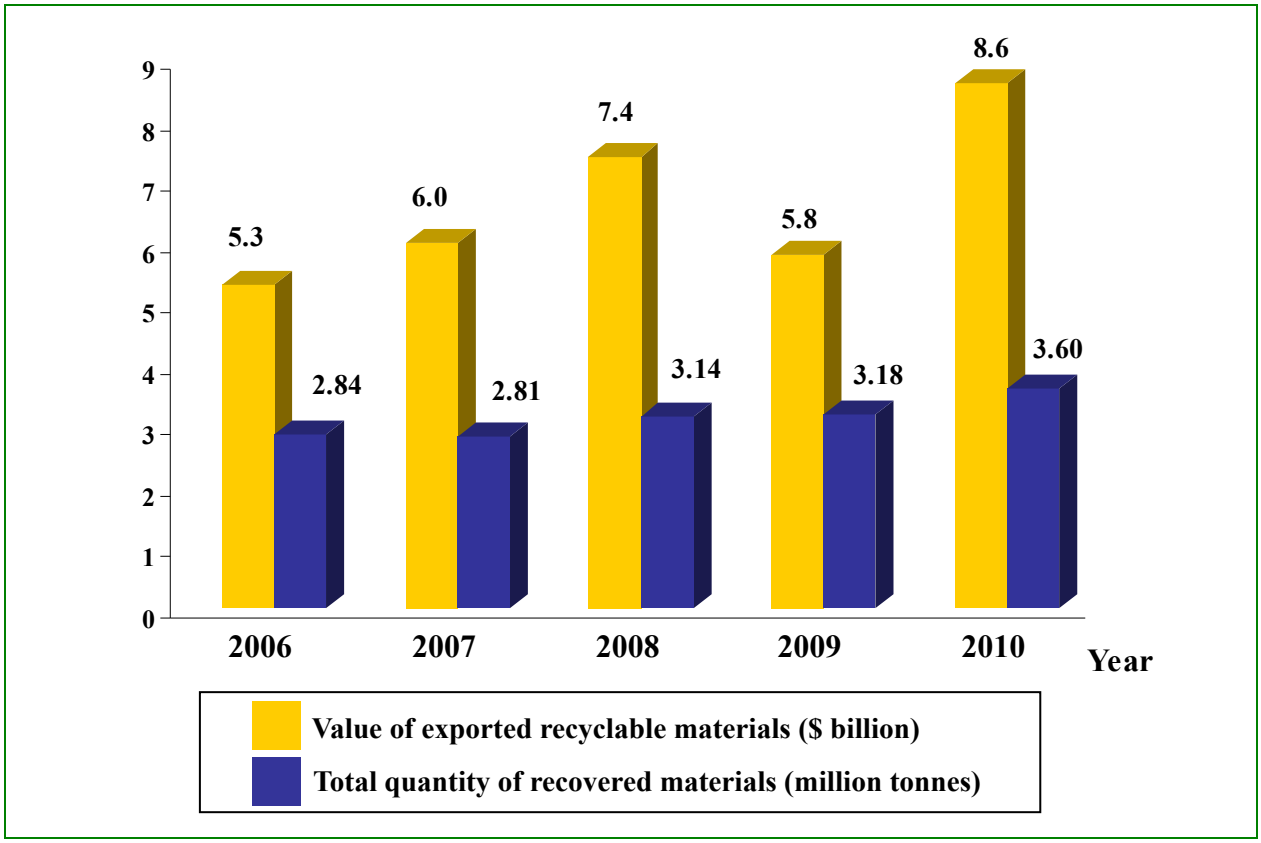
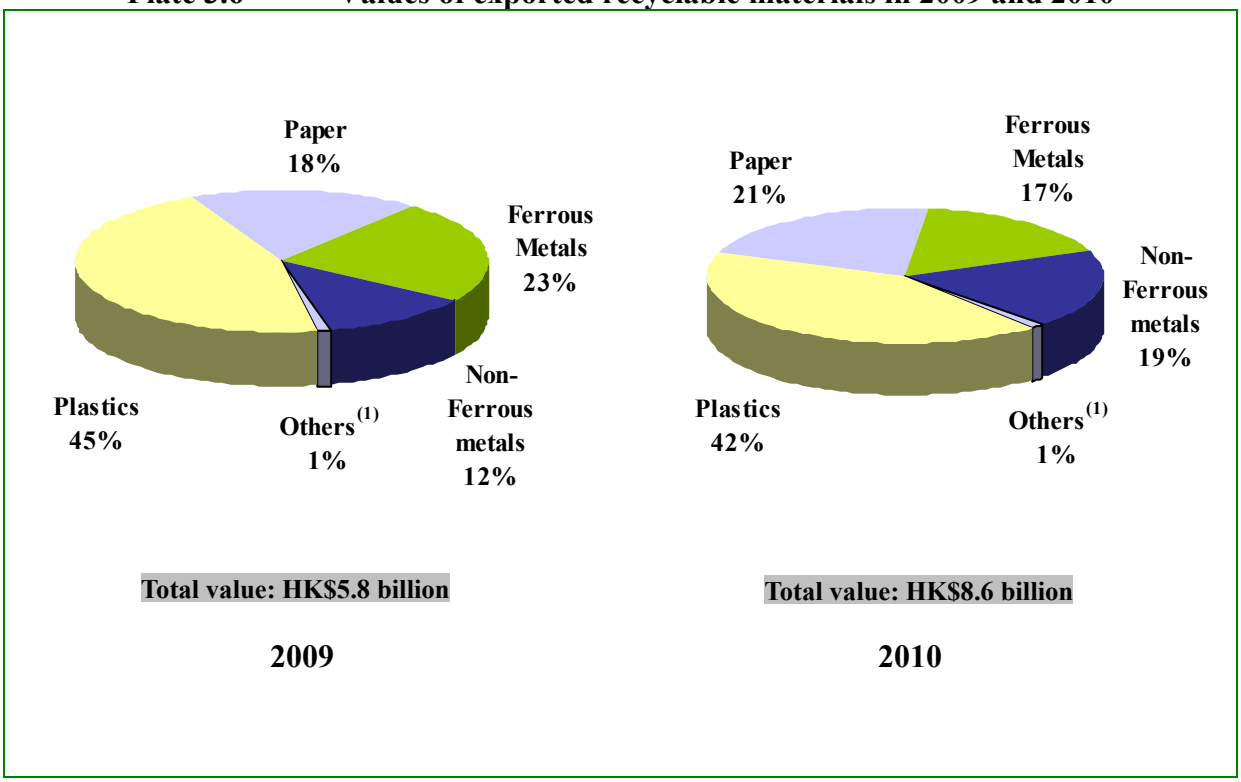


Plate 3.6 Values of exported recyclable materials in 2009 and 2010



Remark: Percentages may not add up to 100 due to rounding off.

Notes:
(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	20,924	238,957	11,420
~ Pig or cast iron	0	0	0
~ Tinplate	0	0	0
~ Other scraps	544,578	1,234,914	2,268
(Ferrous metals) Sub-total	565,502	1,473,871	2,606
b. Non-ferrous metals			
~ Aluminium	84,964	353,502	4,161
~ Copper & alloys	65,517	1,108,781	16,923
~ Lead	87	942	10,797
~ Metal ash & residues	45	510	11,224
~ Nickel	116	3,575	30,778
~ Precious metal (without scrap gold)	72	180,684	2,527,049
~ Tin	0	0	0
~ Zinc	0	0	0
(Non-ferrous metals) Sub-total	150,801	1,647,994	10,928
c. Plastics			
~ Polyethylene	521,804	1,641,946	3,147
~ Polystyrene & copolymers	89,472	146,153	1,634
~ Polyvinyl chloride	10,258	18,928	1,845
~ Others	951,521	1,800,645	1,892
(Plastics) Sub-total	1,573,055	3,607,672	2,293
d. Textiles			
~ Cotton	11,364	25,405	2,236
~ Man-made fibres	184	429	2,335
~ Old clothing & other textile articles, rags, etc.	8,178	17,470	2,136
(Textiles) Sub-total	19,725	43,304	2,195
e. Wood & paper			
~ Paper	1,194,535	1,795,052	1,503
~ Wood (include sawdust)	16,308	15,434	946
(Wood & paper) Sub-total	1,210,843	1,810,486	1,495
f. Glass			
~ Glass	11	17	1,554
(Glass) Sub-total	11	17	1,554
g. Electrical and electronic equipment	51,200	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, overall 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.

- **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.

- Municipal solid waste contains a small portion of 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.

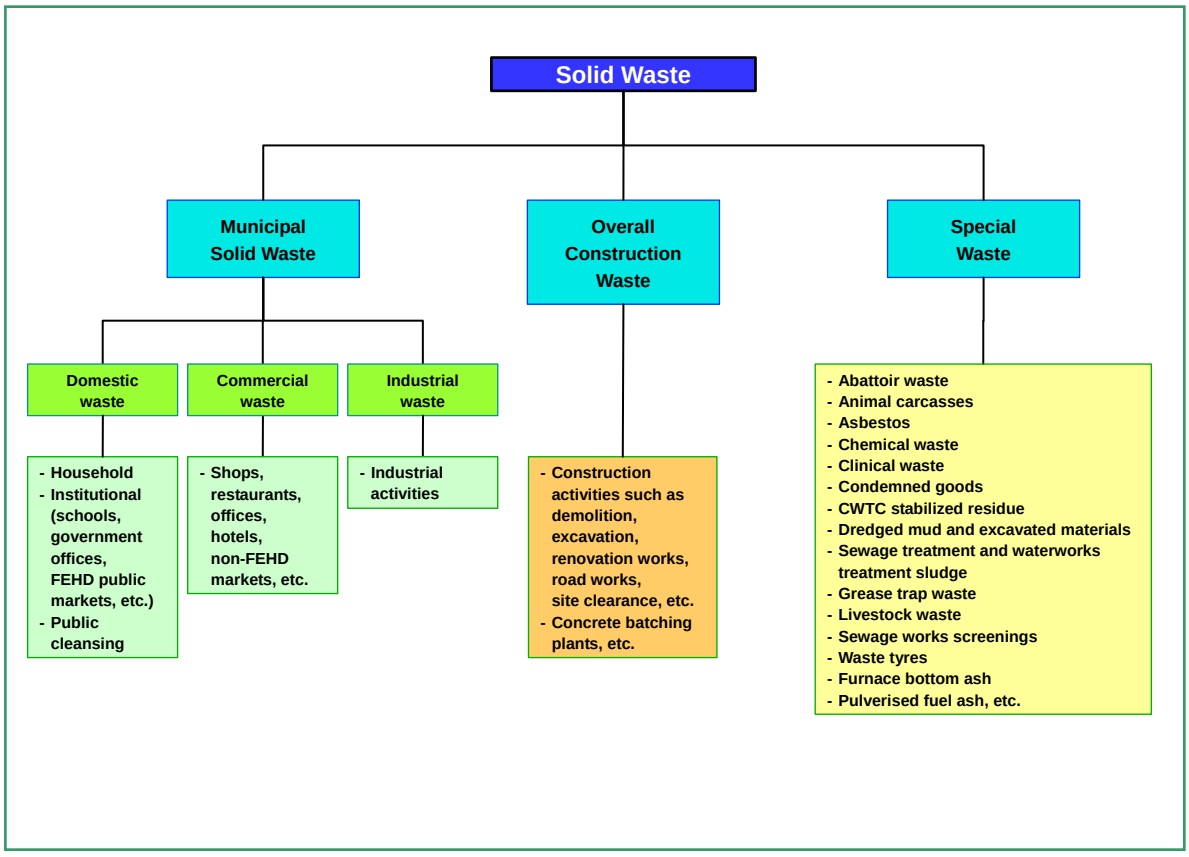
Overall construction waste is a mixture of waste or surplus materials arising from construction activities such as site clearance, excavation, refurbishment, renovation, demolition and road works. It also includes waste concrete that is generated from concrete batching plants and cement plaster/mortar manufacturing plants not set up inside construction sites. Overall construction waste may comprise a fraction of inert materials such as debris, rubble, earth and concrete, which, after proper sorting, can be recycled for use in site formation, land reclamation and construction.

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



Methodology

Solid waste data are mainly collected by the following sources:

- Waste intake records taken at waste management facilities;
- Results of annual survey on waste composition conducted in October - December 2010 at landfills and RTS;
- Results of waste recovery survey conducted in December 2010 - February 2011 by MVA Hong Kong Limited;
- Statistics provided by relevant groups of EPD, and
- Statistics provided by other departments including FEHD, CEDD and C&SD.