MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2013

Environmental Protection Department

Monitoring of Solid Waste in Hong Kong
Waste Statistics for 2013

Date of issue: **February 2015**

Work done by: **Statistics Unit,**
Environmental Protection Department

Security classification: **Unrestricted**

Cover photos

Top left: **Waste composition survey in progress**

Bottom left: **Operation in Landfill**

Top right: **Waste composition survey in progress**

Bottom right: **Locally collected recyclables**

Content

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
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 2013. 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 resource recovery and 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.

In this report, figures of various plates may not add up to total and percentages may not add up to 100 due to rounding off.

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 2013

Waste type[1]	Average daily quantity (tpd)
a. Domestic waste	6,359
b. Commercial waste	2,408
c. Industrial waste	780
d. Municipal solid waste (a+b+c)	9,547
e. Overall construction waste	3,591
f. Special waste[2]	1,173
g. All waste received at landfills (d+e+f) Total	14,311

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 2012 and 2013

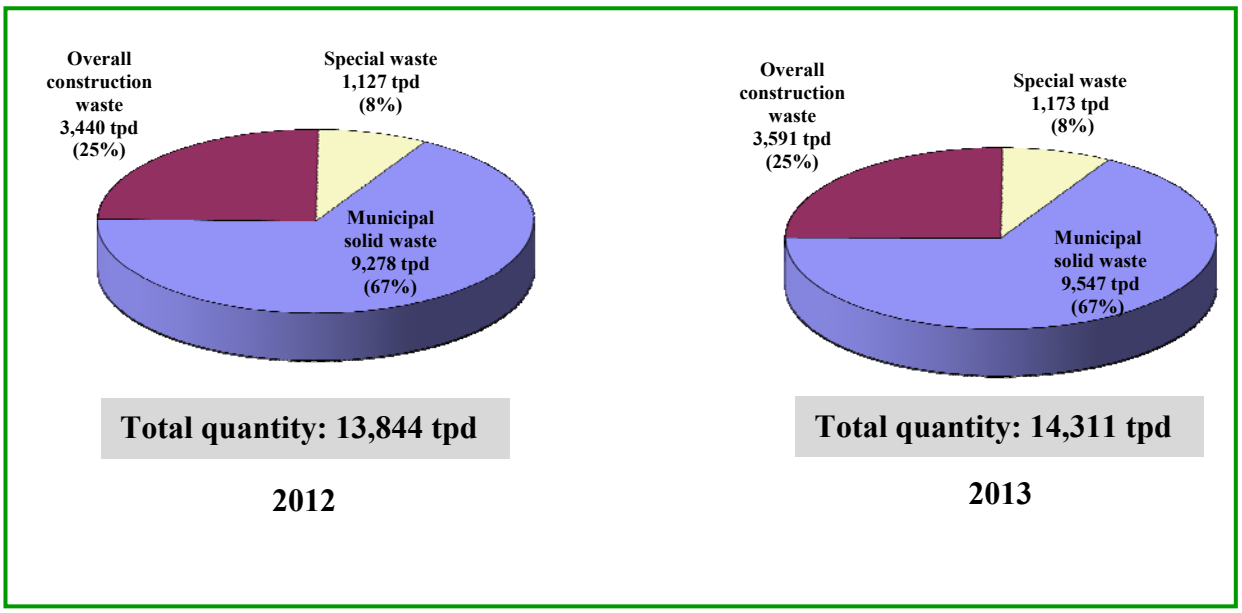
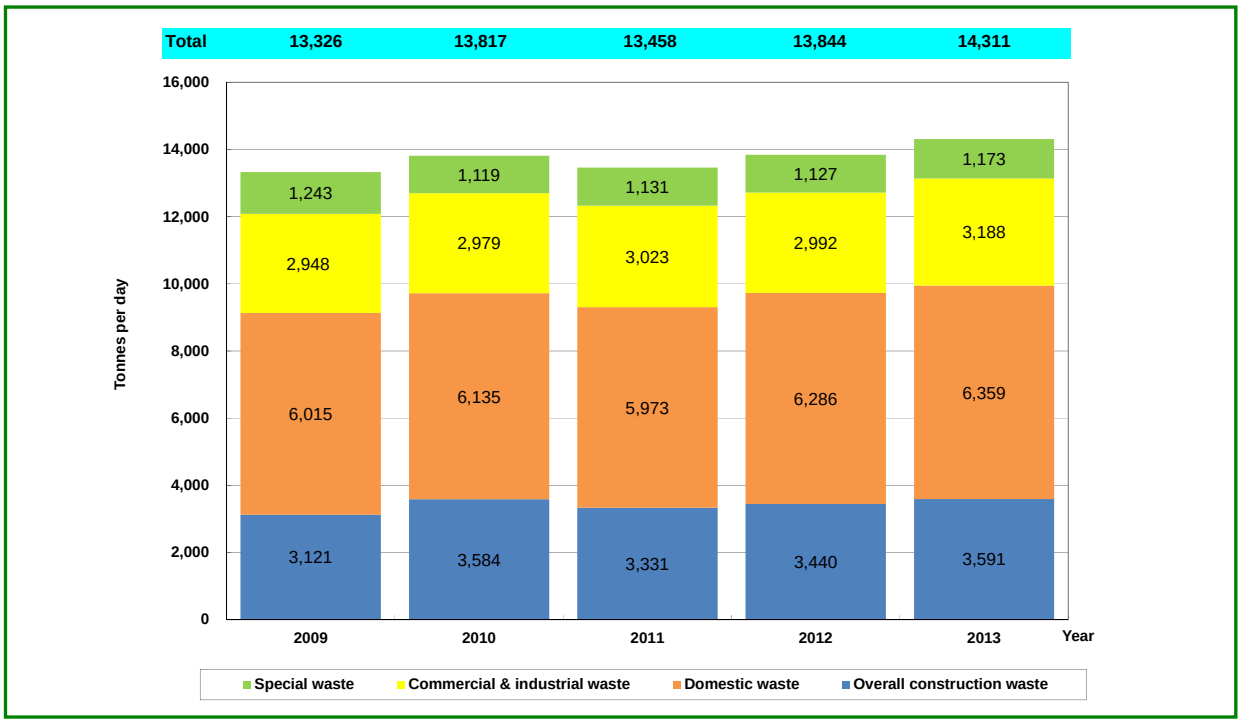


Plate 2.3 Disposal of solid waste at landfills from 2009 to 2013

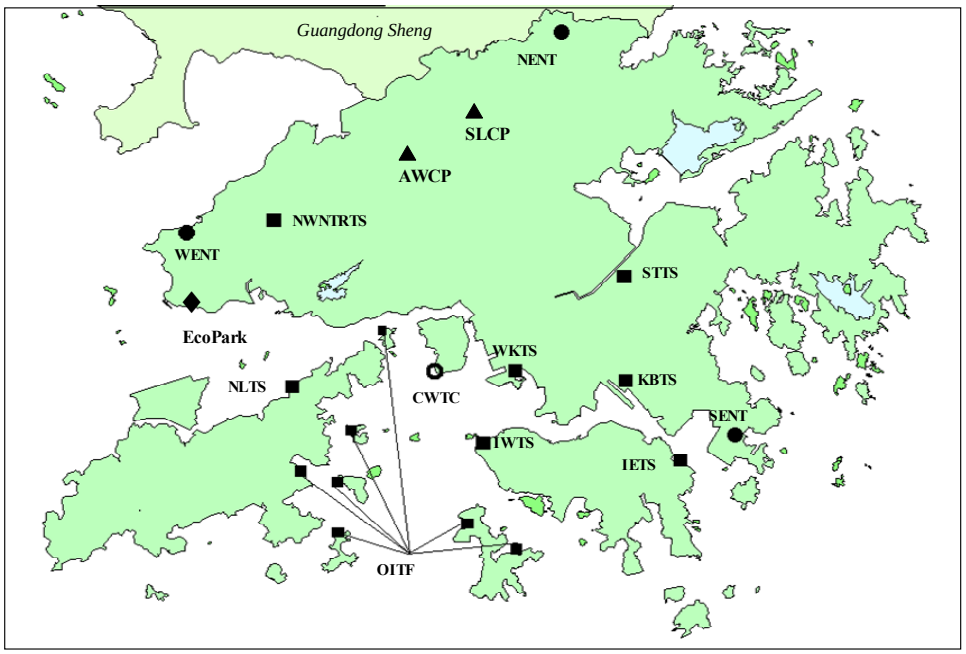


Remark: Figures may not add up to total due to rounding off.

Note:

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

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	○	CWTC - Chemical Waste Treatment Centre
Composting Plant	▲	AWCP - Animal Waste Composting Plant SLCP - Shaling Composting Plant(5)
EcoPark	♦	EcoPark

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.

(5) SLCP has stopped operation since October 2010.

Plate 2.5 Solid waste delivered to RTS and landfills in 2013

Disposal facility [1]	Average daily quantity tpd)			
	MSW	Overall construction waste	Special waste	Total
IETS - Island East Transfer Station	798	-	-	798
STTS - Sha Tin Transfer Station	1,118	-	-	1,118
IWTS - Island West Transfer Station	556	-	-	556
WKTS - West Kowloon Transfer Station	2,385	-	461	2,847
OITF - Outlying Islands Transfer Facilities	81	25	4	110
NLTS - North Lantau Transfer Station	189	-	1	190
NWNTRTS - North West New Territories Refuse Transfer Station	1,045	-	-	1,045
WENT - West New Territories Landfill	5,424[2]	700[2]	527	6,651[2]
SENT - South East New Territories Landfill	1,981	2,303	391	4,674
NENT - North East New Territories Landfill	2,142[2]	588	255	2,985[2]
Total	9,547	3,591	1,173	14,311

Notes:

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

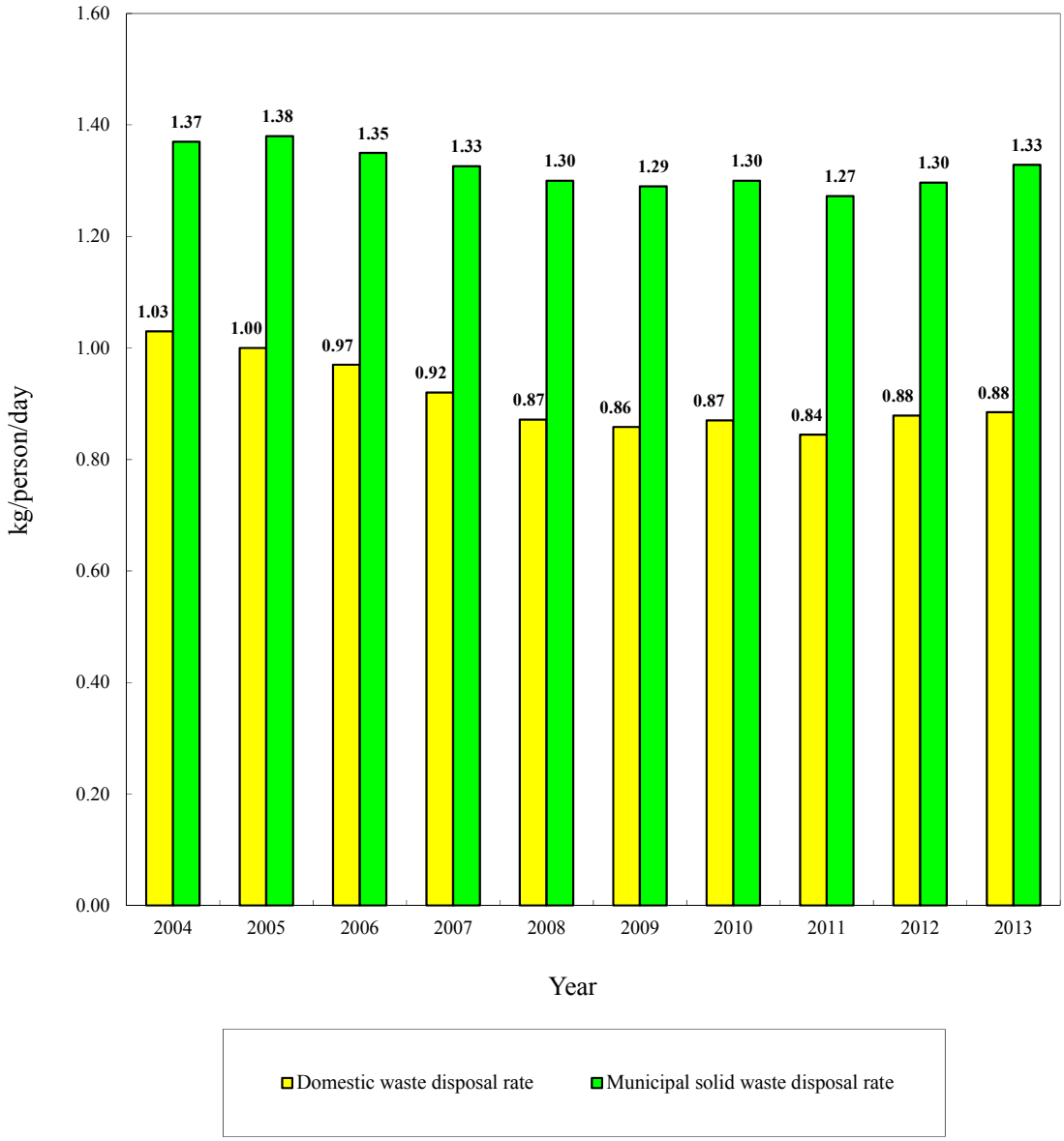
(2) The quantity includes the waste transferred from RTS.

Plate 2.6 Arisings of solid waste by district in 2013

District	Average daily quantity[1] [2] (tpd)			
	Domestic waste (a)	C&I waste (b)	Municipal solid waste (c) =(a)+(b)	Overall construction waste (d)
Central & Western	282	94	376	134
Wanchai	248	147	395	79
Eastern	453	140	593	71
Southern	221	88	309	127
Hong Kong Island Sub-total	1,204	468	1,672	411
Yau Tsim Mong	519	217	736	167
Sham Shui Po	352	159	512	91
Kowloon City	310	173	482	407
Wong Tai Sin	292	148	440	39
Kwun Tong	533	235	768	410
Kowloon Sub-total	2,006	931	2,937	1,114
Kwai Tsing	326	158	483	168
Tsuen Wan	253	159	413	100
Tuen Mun	393	288	681	449
Yuen Long	602	379	981	167
North	357	189	546	93
Tai Po	293	98	392	124
Sha Tin	428	153	581	134
Sai Kung	336	237	573	773
NT- Mainland Sub-total	2,989	1,662	4,651	2,008
Cheung Chau	27	-	-	-
Mui Wo	24	-	-	-
Peng Chau	7	-	-	-
Ma Wan	11	-	-	-
Lamma Island	9	-	-	-
Hei Ling Chau	3	-	-	-
North Lantau	79	-	-	-
NT-Outlying Islands Sub-total	160	127[3]	287[3]	58[3]
Total	6,359	3,188	9,547	3,591

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 from 2004 to 2013



Remark: The per capita disposal rates are calculated based on the population (mid-year) updated by the C&SD in August 2014.

Plate 2.8 Composition of municipal solid waste in 2013

Composition	Average daily quantity (tpd) and percentage by weight				
	Domestic waste (a)	Commercial waste (b)	Industrial waste (c)	Commercial & industrial waste (d)=(b)+(c)	Municipal solid waste (e)=(a)+(d)
Glass	248 (3.9%)	85 (3.5%)	21 (2.7%)	106 (3.3%)	353 (3.7%)
Metals	102 (1.6%)	56 (2.3%)	19 (2.5%)	75 (2.4%)	177 (1.9%)
Paper	1,195 (18.8%)	534 (22.2%)	93 (12.0%)	628 (19.7%)	1,823 (19.1%)
Plastics	1,212 (19.1%)	504 (20.9%)	150 (19.2%)	654 (20.5%)	1,866 (19.5%)
Putrescibles	3,100 (48.7%)	1,014 (42.1%)	75 (9.6%)	1,089 (34.2%)	4,189 (43.9%)
Textiles	176 (2.8%)	52 (2.1%)	43 (5.5%)	95 (3.0%)	270 (2.8%)
Wood/Rattan	97 (1.5%)	42 (1.7%)	255 (32.7%)	297 (9.3%)	394 (4.1%)
Household hazardous wastes (HHWs)[1]	82 (1.3%)	20 (0.8%)	17 (2.2%)	37 (1.2%)	118 (1.2%)
Others[2]	148 (2.3%)	101 (4.2%)	107 (13.7%)	208 (6.5%)	355 (3.7%)
Sub-total	6,359 (100%)	2,408 (100%)	780 (100%)	3,188 (100%)	9,547 (100%)

Remark: Figures denote quantities and percentages by wet weight.

Notes:

(1) Household hazardous wastes (HHWs) include paints, 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.

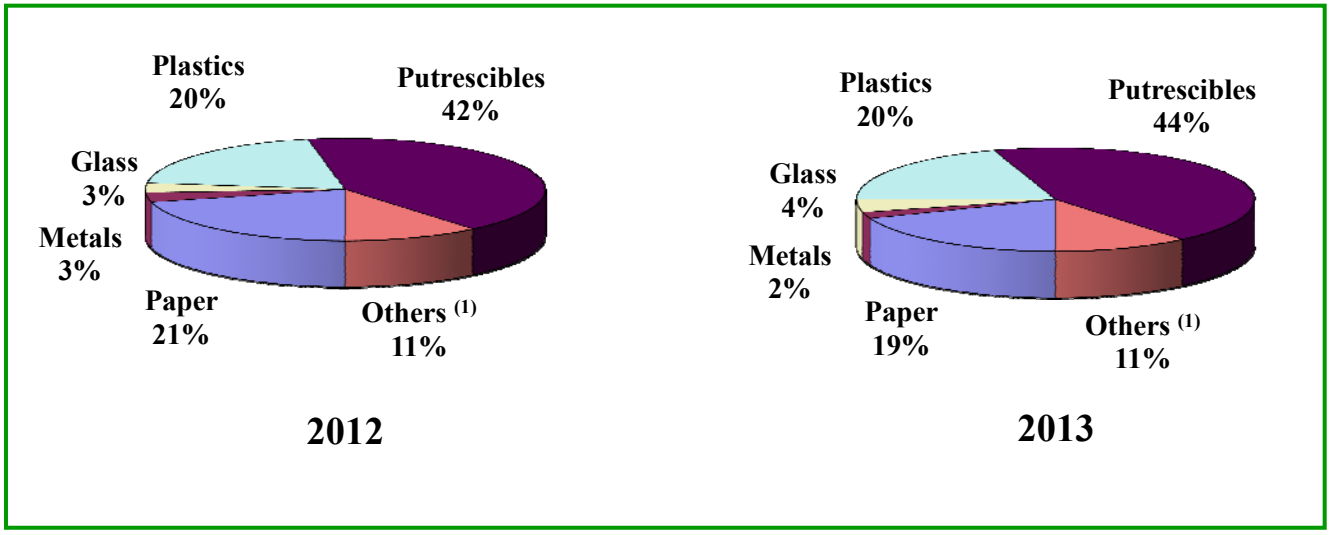
Plate 2.9 Composition of municipal solid waste in 2013 – Breakdown of major components

Composition	Average daily quantity (tpd) and percentage by weight		
	Domestic waste (a)	Commercial & industrial waste (b)	Municipal solid waste (c) = (a) + (b)
Glass			
- Glass bottles	184 (2.9%)	74 (2.3%)	258 (2.7%)
- Other glass	64 (1.0%)	31 (1.0%)	95 (1.0%)
(Glass) Sub-total	248 (3.9%)	106 (3.3%)	353 (3.7%)
Metals			
- Ferrous metals	81 (1.3%)	63 (2.0%)	144 (1.5%)
- Aluminium cans	14(0.2%)	7 (0.2%)	21 (0.2%)
- Other non-ferrous metals	7 (0.1%)	5 (0.2%)	13 (0.1%)
(Metals) Sub-total	102 (1.6%)	75 (2.4%)	177 (1.9%)
Paper			
- Cardboard	211 (3.3%)	167 (5.3%)	378 (4.0%)
- Newsprint	347 (5.5%)	87 (2.7%)	435 (4.6%)
- Office paper	83 (1.3%)	72 (2.3%)	155 (1.6%)
- Others[(1)]	554 (8.7%)	301 (9.4%)	855 (9.0%)
(Paper) Sub-total	1,195 (18.8%)	628 (19.7%)	1,823 (19.1%)
Plastics			
- Plastic bags	452 (7.1%)	188 (5.9%)	640 (6.7%)
- Polyfoam - dining wares	31 (0.5%)	12 (0.4%)	43 (0.5%)
- Polyfoam - others	24 (0.4%)	22 (0.7%)	46 (0.5%)
- PET plastic bottles	70 (1.1%)	59 (1.8%)	129 (1.4%)
- Non-PET plastic bottles	61 (1.0%)	16 (0.5%)	77 (0.8%)
- Others[(2)]	574 (9.0%)	357 (11.2%)	931 (9.8%)
(Plastics) Sub-total	1,212 (19.1%)	654 (20.5%)	1,866 (19.5%)
Putrescibles			
- Food waste	2,645 (41.6%)	1,003 (31.5%)	3,648 (38.2%)
- Yard waste	126 (2.0%)	29 (0.9%)	154 (1.6%)
- Others[(3)]	329 (5.2%)	57 (1.8%)	386 (4.0%)
(Putrescibles) Sub-total	3,100 (48.7%)	1,089 (34.2%)	4,189 (43.9%)

Remark: Figures denote quantities and percentages by wet weight.

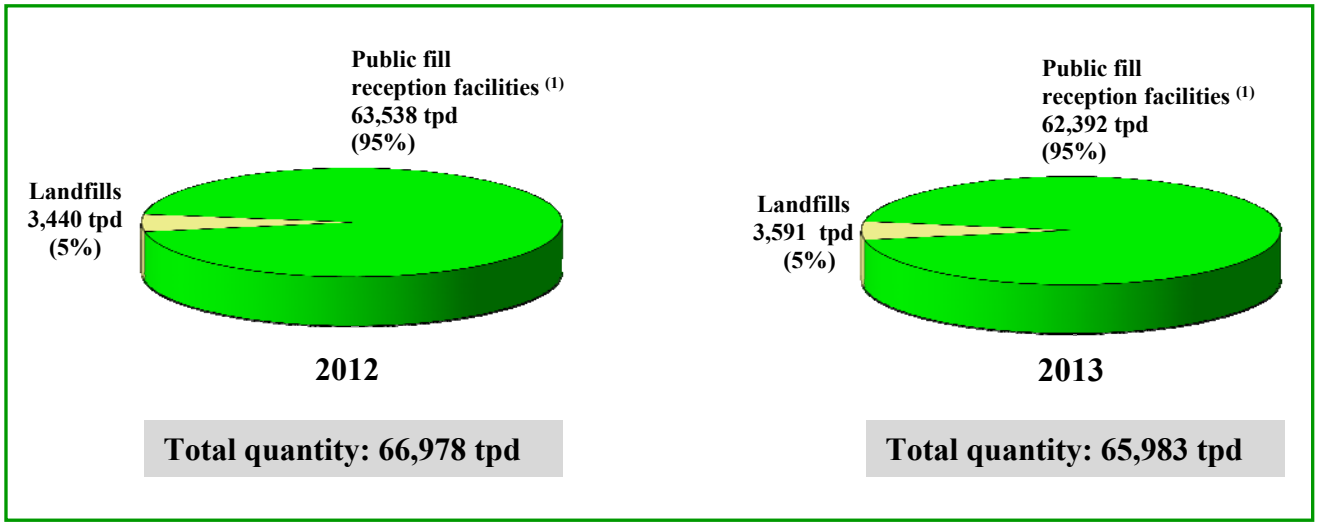
Notes:
(1) Other paper waste includes drink pack (tetrapak), tissue paper, etc.
(2) Other plastics waste includes household utensils, packaging materials, toys, off-cuts, scrap, etc.
(3) Other putrescibles waste includes cotton products, other organic waste, etc.

Plate 2.10 Composition of municipal solid waste in 2012 and 2013 – Major waste types



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

Plate 2.11 Disposal of construction waste by destination in 2012 and 2013



Note:
(1) Public fill reception facilities are managed by CEDD for receiving inert fill materials for reuse. In 2013, two major public fill reception facilities are in operation at Tseung Kwan O and Tuen Mun.

Plate 2.12 Disposal of special waste in 2013

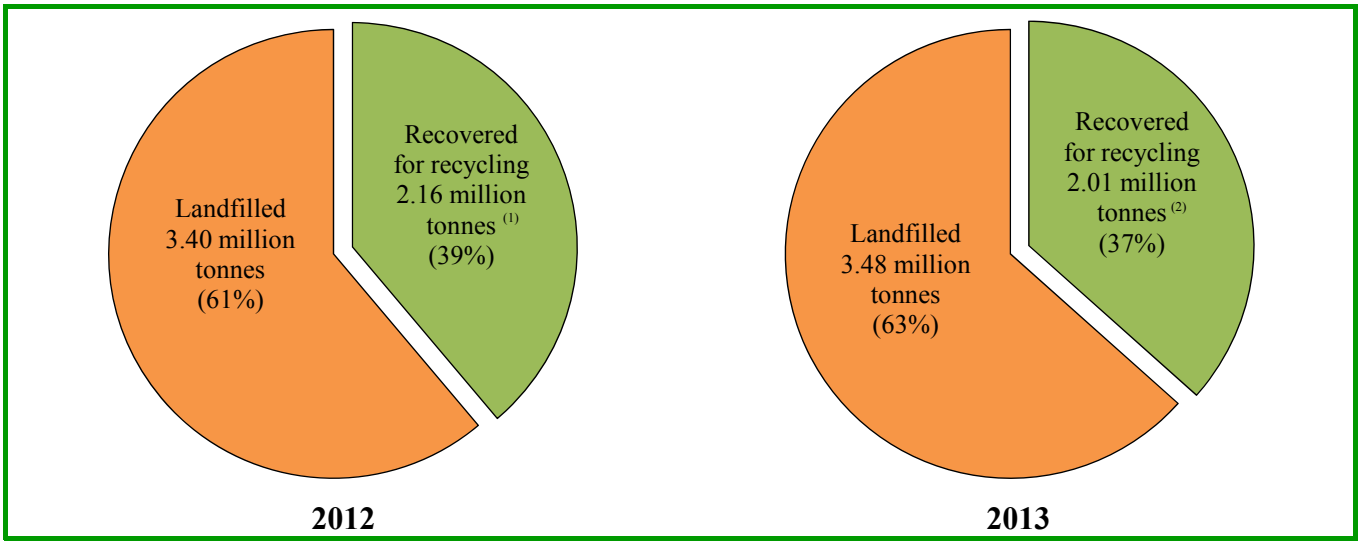
Waste type	Disposal method	Average daily
Abattoir waste	Landfill	8
Animal carcasses and kennel waste	Landfill	9
Asbestos waste	Landfill	3
Chemical waste other than asbestos waste	Landfill	7
Clinical waste (with packaging material)	Landfill	1
Condemned goods	Landfill	25
CWTC stabilised residue and incineration ash	Landfill	11
Dewatered dredged materials	Landfill	10
Dewatered sewage sludge	Landfill	900
Dewatered waterworks sludge	Landfill	50
Livestock waste	Landfill	59
Sewage works screenings	Landfill	65
Waste tyres	Landfill[2]	26
	Landfill sub-total	1,173
Chemical waste other than asbestos waste	CWTC	26
Clinical waste	CWTC	5
Grease trap waste	WKTS	461[3]
Horse stable waste	AWCP	22
Livestock waste	Other environmentally acceptable means[4]	163
Dredged mud and excavated materials	Marine dumping	81,918[5]
Furnace bottom ash	Concrete manufacturing, stored in lagoon[6]	122
Pulverised fuel ash	Concrete manufacturing, stored in lagoon[6]	1,308

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 composing, 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. Resource Recovery and Recycling

Plate 3.1 Recovery of municipal solid waste (MSW) in 2012 and 2013

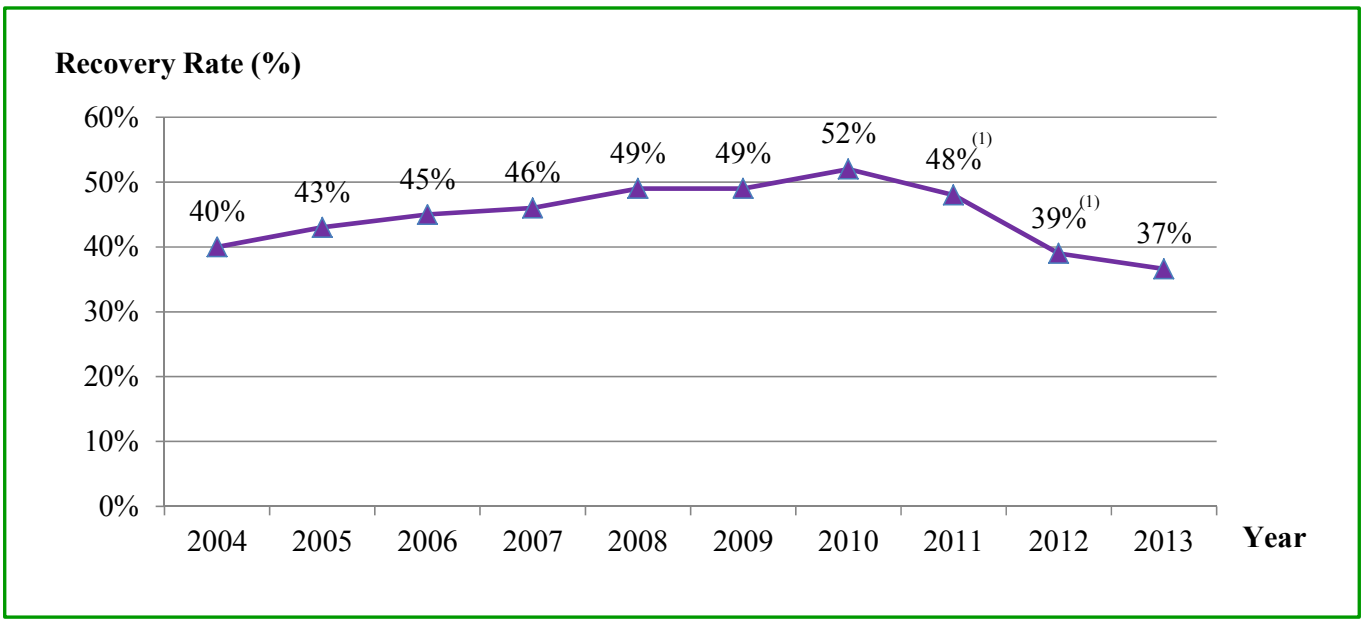


Notes:

(1) A total of 2.16 million tonnes of recyclable materials were recovered for recycling in 2012, of which, 2.10 million tonnes (97%) were exported for recycling and 0.06 million tonnes (3%) recycled locally.

(2) A total of 2.01.million tonnes of recyclable materials were recovered for recycling in 2013, of which, 1.87 million tonnes (93%) were exported for recycling and 0.14 million tonnes (7%) recycled locally.

Plate 3.2 MSW recovery rates from 2004 to 2013



Note:

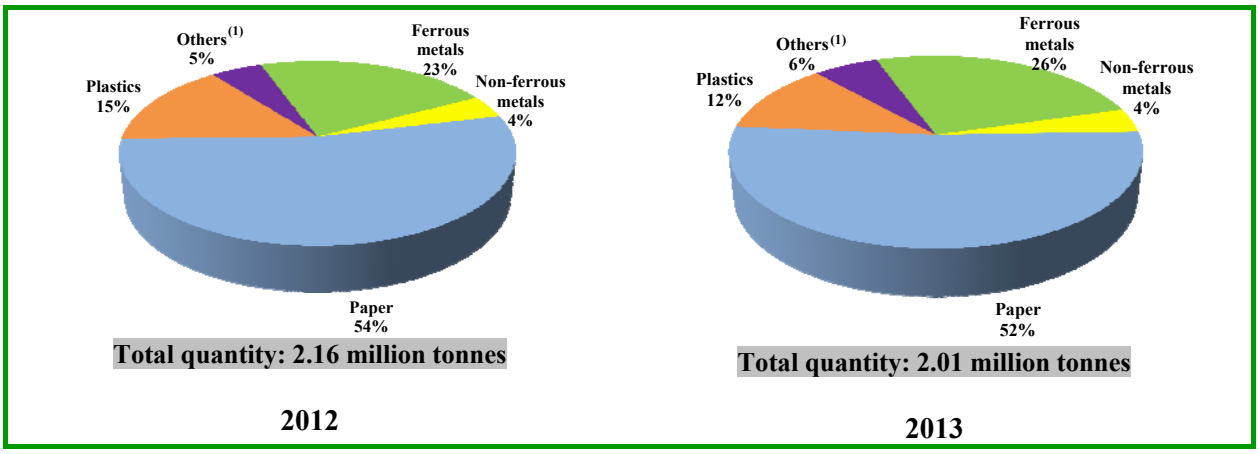
(1) The apparent decreases in MSW recovery rate in 2011 and 2012 are mainly due to substantial fluctuations in export statistics of waste plastics, whereas waste quantities remained at a steady level without significant increase (see Plates 2.3 and 2.7).

Plate 3.3 Recyclable materials recovered from MSW by type in 2013

Material type	Quantity of recovered recyclable materials (thousand tonnes)		
	Exported for recycling (a)	Recycled locally b)	Total recovered for recycling (c) = (a) + (b)
Paper	1,033.5	1.1	1,034.6
Plastics	191.0	51.7	242.7
Ferrous metals	510.2	12.9	523.1
Non-ferrous metals	74.8	3.8	78.6
Glass	0.1	10.0(1)	10.2
Rubber tyres	0.0	21.7(2)	21.7
Textiles	1.4	5.8	7.2
Wood	5.0	1.1	6.1
Food waste	0.0	28.6	28.6
Electrical and electronic equipment	49.6	6.2	55.8
Total	1,865.6	143.0	2,008.7

Notes:
(1) The quantity does not include glass beverage bottles recovered through deposit-and-refund system operated by local beverage manufacturers.
(2) The quantity includes reuse, retreading and recycling of vehicle tyres and retreading of aircraft tyres in Hong Kong.

Plate 3.4 Recyclable materials recovered from MSW by type in 2012 and 2013



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

Plate 3.5 Total quantities and export values of recyclable materials recovered from MSW from 2009 to 2013

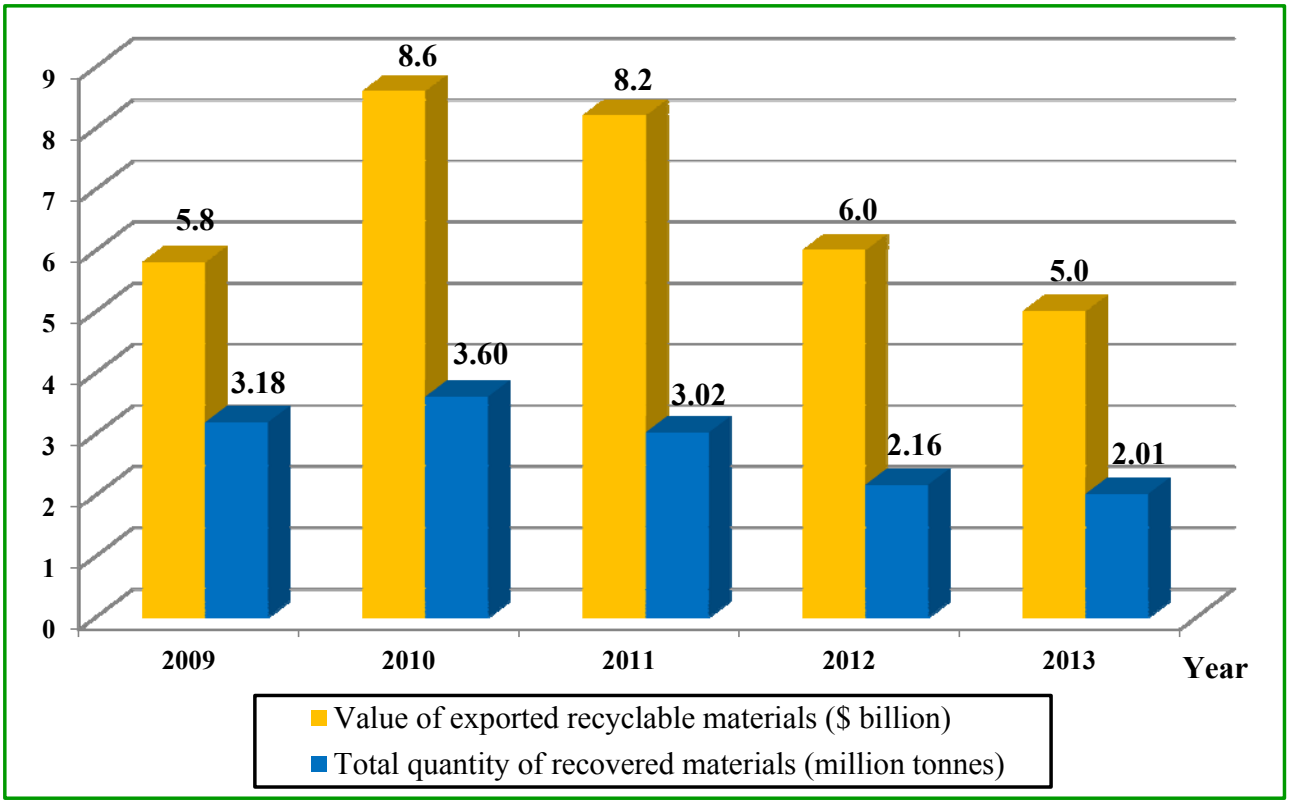
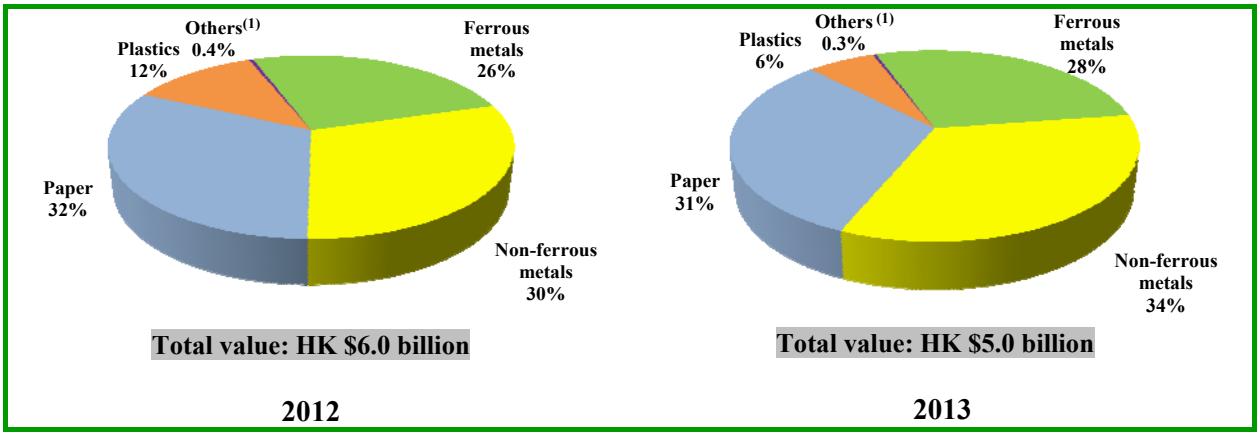


Plate 3.6 Values of exported recyclable materials recovered from MSW in 2012 and 2013



Note:
(1) Others include glass, wood and textiles.

Plate 3.7 Quantities and values of exported recyclable materials recovered from MSW by type

Category of recyclable materials	Quantity (tonnes)	Value ($ thousand)	Value per unit weight ($ / tonne)
a. Ferrous metals			
~ Alloy steel scrap	11,919	136,334	11,438
~ Pig or cast iron	0	0	0
~ Tinplate	0	0	0
~ Other scraps	498,271	1,276,954	2,563
(Ferrous metals) Sub-total	510,190	1,413, 288	2,770
b. Non-ferrous metals			
~ Aluminium	43,625	253,791	5,818
~ Copper & alloys	30,528	1,108,988	36,326
~ Lead	59	466	7,866
~ Metal ash & residues	399	4,687	11,754
~ Nickel	103	2,158	20,970
~ Precious metal (without scrap gold)	60	314,963	5,223,098
~ Tin	0	0	0
~ Zinc	20	93	4,706
(Non-ferrous metals) Sub-total	74,794	1,685,146	22,530
c. Plastics			
~ Polyethylene	15,018	36,653	2,441
~ Polystyrene & copolymers	12,864	24,121	1,875
~ Polyvinyl chloride	8,776	22,421	2,555
~ Others	154,342	234,951	1,522
(Plastics) Sub-total	191,000	318,146	1,666
d. Textiles			
~ Cotton	276	1,537	5,580
~ Man-made fibres	25	171	6,738
~ Old clothing & other textile articles, rags, etc.	1,068	9,119	8,538
(Textiles) Sub-total	1,369	10,828	7,909
e. Wood & paper			
~ Paper	1,033,500	1,579,283	1,528
~ Wood (include sawdust)	5,020	5,020	1,000
(Wood & paper) Sub-total	1,038,520	1,584,303	1,526
f. Glass			
~ Glass	144	118	823
(Glass) Sub-total			
g. Electrical and electronic equipment	49,618	N/A	N/A

Appendix 1: Classification of Solid Waste and Monitoring Methodology

Waste Classification and Terminology

Solid waste is classified into three main categories by making reference to the sources of waste and the institutional arrangements for waste collection and disposal. These three categories 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, 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.

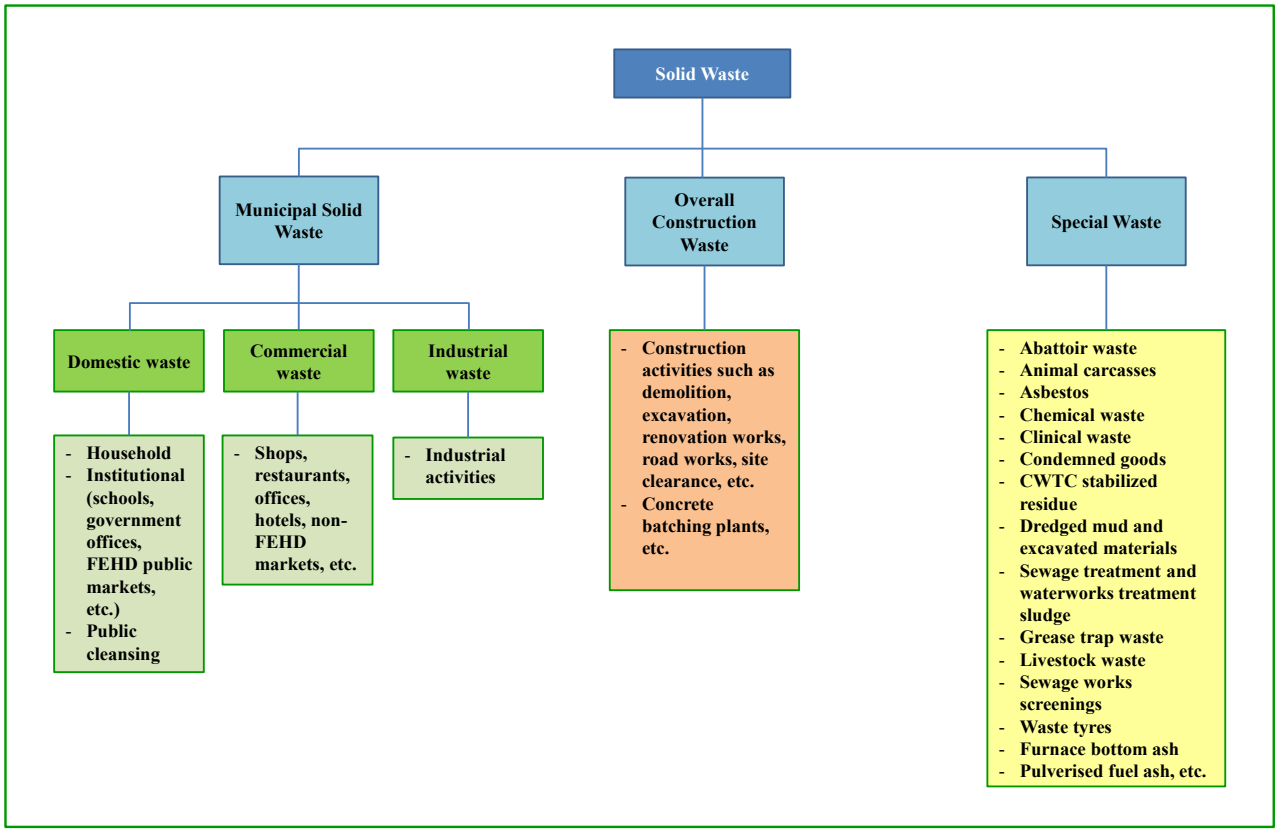
Overall construction waste is a mixture of waste or surplus materials arising from construction activities such as site clearance, excavation, refurbishment, renovation, demolition and road works. It also includes waste concrete that is generated from concrete batching plants and cement plaster/mortar 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 from the following sources:

- Waste intake records taken at waste management facilities;
- Results of annual survey on waste composition conducted from February to March 2013 and from October to December 2013 at landfills and RTS;
- Results of waste recovery survey conducted from May to October 2014 by URS Hong Kong Limited;
- Statistics provided by relevant groups of EPD; and
- Statistics provided by other departments including FEHD, CEDD and C&SD.