MONITORING OF SOLID WASTE IN HONG KONG

Waste Statistics for 2018

Environmental Protection Department

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Waste Statistics for 2018

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Cover photos

Top left: Aerial view of Organic Resources Recovery Centre Phase 1 in North Lantau

Bottom left: Recycling of air conditioners at WEEE·PARK in EcoPark

Top right: Recycling plant for waste rubber tyres in EcoPark

Bottom right: Community Green Station in Tuen Mun

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Abbreviations

AFCD	Agriculture, Fisheries and Conservation Department
AWCP	Animal Waste Composting Plant
C&D	Construction and Demolition
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
GMC	Glass Management Contractor
IETS	Island East Transfer Station
IWTS	Island West Transfer Station
KBTS	Kowloon Bay Transfer Station
MSW	Municipal Solid Waste
N/A	Not Available
NENT	North East New Territories Landfill
NLTS	North Lantau Transfer Station
NT	New Territories
NWNTTS	North West New Territories Transfer Station
OITF	Outlying Islands Transfer Facilities
O·PARK	Organic Resources Recovery Centre
PET	Polyethylene Terephthalate
RTS(s)	Refuse Transfer Station(s)
SENT	South East New Territories Landfill
SLCP	Shaling Composting Plant
STTS	Shatin Transfer Station
tpd	tonnes per day
T · PARK	Sludge Treatment Facility
WEEE	Waste electrical and electronic equipment
WEEE·PARK	WEEE Treatment and Recycling Facility
WENT	West New Territories Landfill
WKTS	West Kowloon Transfer Station

1. Introduction

Introduction

This report presents the statistics on disposal and recovery/recycling of solid waste generated in Hong Kong in 2018. The information contained in this report is compiled from the data collected from various sources, including the ongoing solid waste monitoring work at waste treatment facilities undertaken by the Environmental Protection Department (EPD). The classification of solid waste and the methodology adopted in data collection are explained in Appendix 1, whereas terms related to Waste Management System of Hong Kong are elaborated in Appendix 2. Figures presented in this report may not add up to the respective totals due to rounding.

Key observations of the local waste disposal and resource recovery scene are summarised in the ensuing paragraphs, with a view to facilitating readers to have a quick overview of the achievements and challenges of our waste management efforts. Detailed statistics on waste disposal and resource recovery are provided in Chapters 2 and 3 respectively.

Waste Disposal in 2018

Total Solid Waste

Solid waste comprises municipal solid waste (MSW), overall construction waste, and special waste. In 2018, the total quantity of solid waste disposed of at the strategic landfills was 5.87 million tonnes. The average daily quantity was 16,096 tonnes per day (tpd), which has increased by 3.7% as compared to 2017 (**Plate 2.1**).

Municipal Solid Waste

Municipal solid waste includes three categories: domestic waste, commercial waste and industrial waste.

In 2018, the quantity of MSW disposal was 11,428 tpd (4.17 million tonnes), which represented an increase of 6.5% as compared to 2017. The growth was partly attributed to the increase in wastes as a result of the extensive damage caused by super typhoon Mangkhut, which hit Hong Kong in September 2018. The increase in MSW disposal was also partly associated with the growth of local economy in 2018. Discounting the factor of population growth, the disposal rate of MSW was 1.53 kg/person/day, as compared to 1.45 kg/person/day in 2017. If data from September to November are excluded (the disposal quantity of these three months was more affected by Typhoon Mangkhut), the disposal rate of MSW would be 1.50 kg/person/day.

The major component of MSW is domestic waste. Its quantity of disposal was 6,712 tpd (2.45 million tonnes) in 2018, which has increased by 4.8% as compared to 2017. On the other hand, the quantity of commercial and industrial (C&I) waste disposed of was 4,716 tpd (1.72 million tonnes) in 2018, which has increased by 8.9% when compared to 2017. Generally speaking, C&I waste arising correlates with the level of consumption activities. The increase in C&I waste disposal in 2018 could be partly due to the growth of local economy.

Plates 2.8 and 2.9 show the composition of MSW disposed of at landfills in 2018.

Of the 11,428 tonnes of MSW landfilled each day in 2018, some 3,565 tonnes (31% of MSW) were ***food waste***, which has decreased by 2.6% as compared to 2017. Domestic food waste disposal rate remained at 0.32 kg/person/day in 2018, while C&I food waste disposal rate decreased from 0.18 kg/person/day in 2017 to 0.15 kg/person/day in 2018.

The second largest constituent of MSW was ***waste paper***. Some 2,702 tonnes per day (24% of MSW) were disposed of at landfills in 2018, increasing by 6.7% as compared to 2017. The third largest constituent of MSW was ***waste plastics***, with a daily disposal quantity of 2,343 tonnes per day (21% of MSW) in 2018, increasing by 10.3%.

Overall Construction Waste

The quantity of overall construction waste disposed of at landfills in 2018 was 4,081 tpd (1.49 million tonnes), which has decreased by 3.0% as compared to 2017. The decrease in disposal may be associated with the increase in construction waste disposal charges with effect from April 2017. In recent years, the reuse rate of inert materials sorted out from construction waste has remained at above 90%, and was 92% in 2018. These materials were delivered to the public fill reception facilities and other outlets for beneficial direct reuse.

Special Waste

In 2018, the quantity of special waste disposed of at landfills was 587 tpd (0.21 million tonnes), which has increased by 2.0% as compared to 2017. As from April 2015, the Sludge Treatment Facility (T ▪ PARK) in Tuen Mun has started treating dewatered sewage sludge from major sewage treatment works managed by Drainage Services Department by incineration, leading to a cumulative reduction of 88% in disposal of dewatered sludges at landfills in 2018 as compared with 2014. On average, 1,075 tonnes of dewatered sewage sludges per day was treated at the T ▪ PARK in 2018.

Resource Recovery in 2018

As one of the world's most service-oriented economies, Hong Kong's capacity to consume raw or recycled materials in local production is severely limited, compared to countries that rely heavily on primary or secondary industries to sustain and promote their economies. As a result, over 90% of MSW recyclables locally recovered are exported for recycling outside Hong Kong.

In 2018, the quantity of MSW recyclables recovered was 1.78 million tonnes, which decreased by 2.9% as compared to 2017. 92% of the recovered materials were exported to the Mainland and other countries for recycling in 2018 with an export value of $6.3 billion as compared to $4.2 billion in 2017 (**Plate 3.7**). The overall MSW recovery rate was 30%, which has decreased from 32% in 2017 (**Plate 3.2**). Similar to other industries that constitute our economy, the local recycling industry is subject to fluctuations induced by business cycles and market conditions. The challenging conditions of international markets that persisted for years are expected to continue to affect the overall performance of the recycling industry. Moreover, authorities in nearby cities and countries have further tightened their import control regimes in recent years. Local recyclables not meeting the import standards could no longer enter such places for further processing. In response, the local waste recovery industry expanded local recycling in 2018. The quantity of MSW recyclables recovered for local

recycling was 145,000 tonnes, which increased from 58,000 tonnes in 2017. Among them, the commissioning of Organic Resources Recovery Centre Phase 1 (O·PARK1) promoted local recycling of food waste. In 2018, the quantity of plastic recyclables recycled locally increased by threefold compared with 2017.

Plate 3.3 shows the quantity of recovered recyclables from MSW by type. The recovery performance of selected types of recyclables is summarised below.

Metal recyclables have the highest recovery rate at 90% in 2018 among all recyclable types, as they are highly reusable and relatively valuable in international markets. There is a strong economic incentive for the recycling industry to recover metal waste as far as practicable.

Waste electrical and electronic equipment (WEEE) has the second highest recovery rate among MSW recyclables, at 63% in 2018. Similar to metal recyclables, the recyclable value of WEEE is relatively high which attracts local recyclers to actively engage in WEEE recovery. The commissioning of the Government's WEEE Treatment and Recycling Facility (WEEE PARK) in March 2018 and other initiatives under the producer responsibility scheme on WEEE further promoted beneficial recycling and reuse of the regulated WEEE.

Paper recyclables' recovery rate declined from 46% in 2017 to 41% in 2018, which was partly attributed to an increasing quantity of waste paper disposed of at landfills. Also, the export quantity of paper recyclables continued to decrease as importing economies had tightened their import control.

Plastics recyclables' recovery rate decreased from 13% in 2017 to 7% in 2018. The local recycling industry has gradually shifted its mode of operation in response to tightening of import control by importing economies. The quantity of plastic recyclables recycled locally showed an upsurge from 13,700 tonnnes in 2017 to 55,800 tonnes in 2018. However, since it takes time for the local recycling industry to adjust, they are unable to absorb more waste plastics at the moment.

2. Waste Quantities and Characteristics

Plate 2.1 Disposal of total solid waste at landfills in 2018 - By main waste category

Waste category[1]			Average daily quantity (tpd) and year-on-year growth rate	
a.	**Municipal solid waste**		**11,428**	(6.5%)
	(i)	**Domestic waste**	**6,712**	(4.8%)
	(ii)	**Commercial and industrial waste**	**4,716**	(8.9%)
b.	**Overall construction waste**		**4,081**	(-3.0%)
c.	**Special waste[2]**		**587**	(2.0%)
d.	**Total waste received at landfills (a+b+c)**		**16,096**	(3.7%)

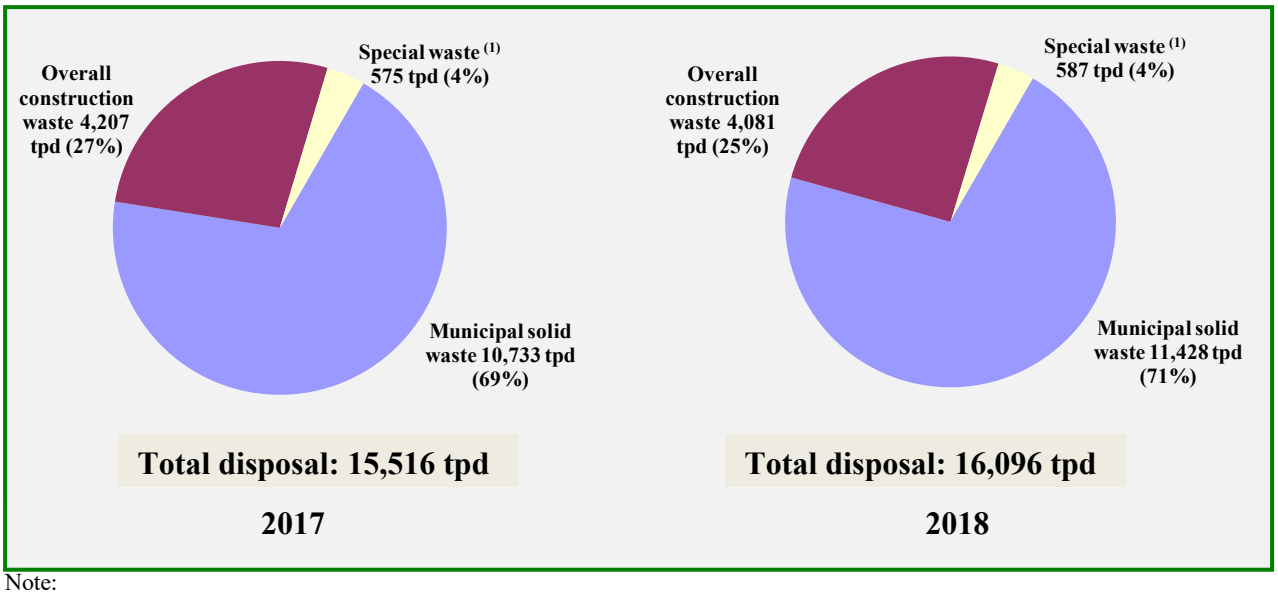
Notes:

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

(2) The quantity does not include special waste not disposed of at landfills. From April 2015 onwards, dewatered sewage sludge from major sewage treatment works managed by Drainage Services Department has been treated by incineration at T▪PARK, and the residue and ash of incineration have been disposed of at the West New Territories Landfill (WENT).

(3) Figures in brackets refer to year-on-year (y-o-y) growth rates.

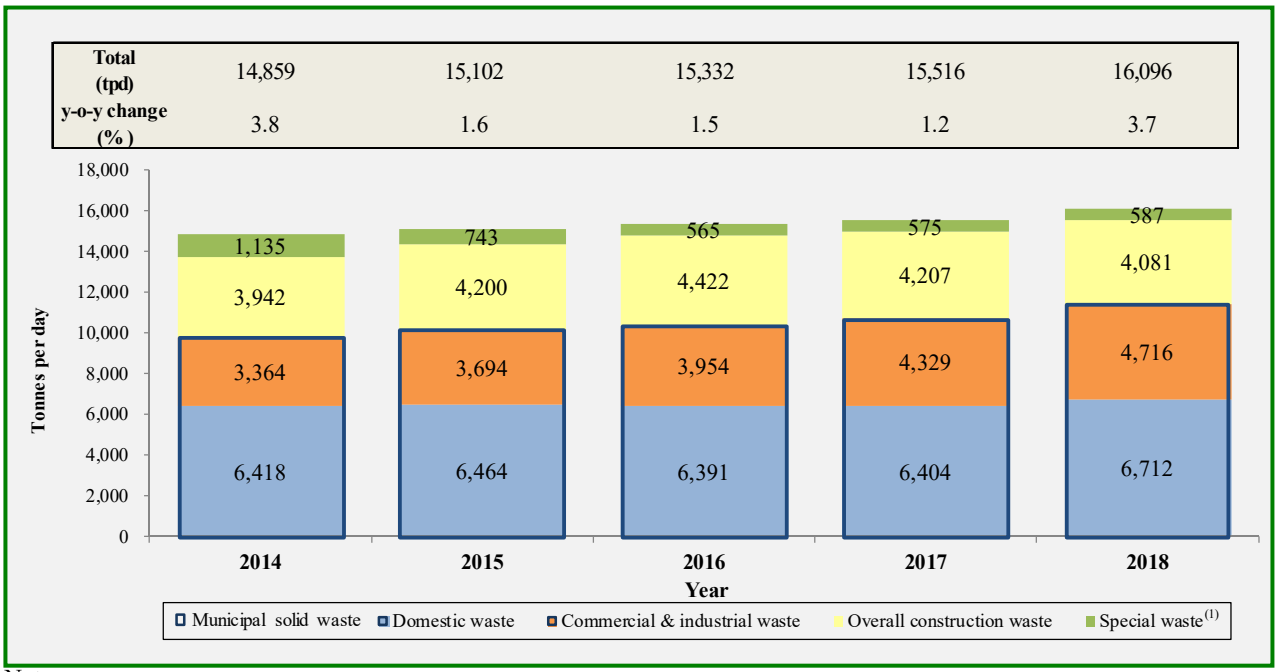
Plate 2.2 Disposal of total solid waste at landfills in 2017 and 2018 - By main waste category



Note:

(1) The quantity does not include special waste not disposed of at landfills. From April 2015 onwards, dewatered sewage sludge from major sewage treatment works managed by Drainage Services Department has been treated by incineration at T • PARK, and the residue and ash of incineration have been disposed of at WENT.

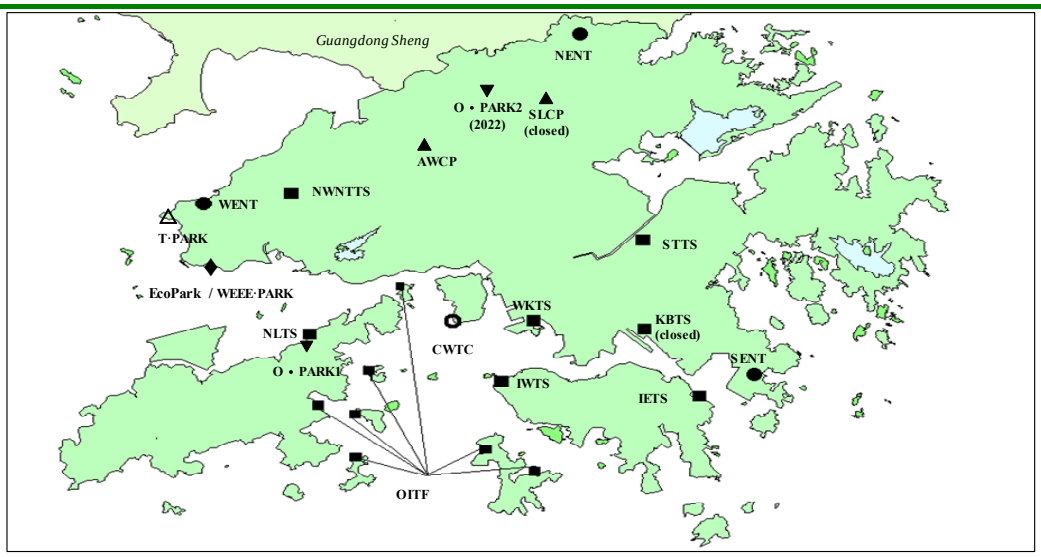
Plate 2.3 Disposal of total solid waste at landfills from 2014 to 2018 - By main waste category



Note:

(1) The quantity does not include special waste not disposed of at landfills. From April 2015 onwards, dewatered sewage sludge from major sewage treatment works managed by Drainage Services Department has been treated by incineration at T • PARK, and the residue and ash of incineration have been disposed of at WENT.

Plate 2.4 Waste management facilities in Hong Kong



Landfill	●	WENT - West New Territories Landfill SENT - South East New Territories Landfill (1) NENT - North East New Territories Landfill
RTS	■	IETS - Island East Transfer Station(2) IWTS - Island West Transfer Station(2) WKTS - West Kowloon Transfer Station(2) OITF - Outlying Islands Transfer Facilities(2) NLTS - North Lantau Transfer Station(2) STTS - Shatin Transfer Station(3) NWNTTS - North West New Territories Transfer Station(4) KBTS - Kowloon Bay Transfer Station(5)
CWTC	◘	CWTC - Chemical Waste Treatment Centre
Composting Plant	▲	AWCP - Animal Waste Composting Plant SLCP - Shaling Composting Plant(6)
EcoPark/WEEE·PARK	♦	EcoPark/WEEE Treatment and Recycling Facility (7)
O·PARK	▼	Organic Resources Recovery Centre (8)
Sludge Treatment Facility	△	T ▪ PARK (9)

Notes:

(1) From 6 January 2016 onwards, SENT Landfill has been designated to accept only C&D waste.

(2) Waste from IETS, IWTS, WKTS, OITF and NLTS was transferred to WENT by sea.

(3) Waste from STTS was transferred to NENT by road.

(4) Waste from NWNTTS was transferred to WENT by road.

(5) KBTS was closed in April 2005 and converted to a temporary waste recycling centre for conducting pilot recycling projects. The pilot projects were completed and the temporary waste recycling centre was decommissioned in September 2018 to give way to the development of permanent beneficial uses of the site.

(6) SLCP has stopped operation since October 2010.

(7) From March 2018 onwards, WEEE·PARK at EcoPark has commenced operation to turn regulated WEEE into valuable secondary raw materials through a series of detoxification, dismantling and recycling processes.

(8) From July 2018 onwards, O·PARK1 at Siu Ho Wan has commenced operation to convert food waste into biogas for electricity generation whilst the residues from the process be produced as compost for landscaping and horiculture use. O·PARK2 at Sha Ling is scheduled for commissioning in 2022.

(9) From April 2015 onwards, dewatered sewage sludge from major sewage treatment works managed by Drainage Services Department has been treated by incineration at T ▪ PARK, and the residue and ash of incineration have been disposed of at WENT.

Plate 2.5 Total solid waste received by RTSs and landfills in 2018 - By main waste category

Disposal facility - RTS	Average daily quantity (tpd) and year-on-year growth rate							
	MSW		Overall construction waste		Special waste[1]		Total	
IETS - Island East Transfer Station	1,225	(2.6%)	-	-	-	-	1,225	(2.6%)
STTS - Shatin Transfer Station	1,655	(10.1%)	-	-	-	-	1,655	(10.1%)
IWTS - Island West Transfer Station	1,153	(-0.7%)	-	-	-	-	1,153	(-0.7%)
WKTS - West Kowloon Transfer Station	2,700	(0.7%)	-	-	499	(6.1%)	3,199	(1.5%)
OITF - Outlying Islands Transfer Facilities	90	(2.7%)	47	(6.1%)	3	(-26.5%)	140	(2.9%)
NLTS - North Lantau Transfer Station	659	(3.7%)	-	-	1	(14.2%)	660	(3.7%)
NWNTTS - North West New Territories Transfer Station	1,260	(4.1%)	-	-	-	-	1,260	(4.1%)

Disposal facility - Landfill[2]	Average daily quantity (tpd) and year-on-year growth rates							
	MSW		Overall construction waste		Special waste[1]		Total	
WENT - West New Territories Landfill[2]	7,940	(4.3%)	624	(-16.5%)	345	(-4.9%)	8,909	(2.1%)
SENT - South East New Territories Landfill[3]	-	-	2,140	(-6.9%)	-	-	2,140	(-6.9%)
NENT - North East New Territories Landfill[2]	3,487	(11.9%)	1,317	(13.5%)	242	(13.9%)	5,046	(12.4%)
Landfills' total	11,428	(6.5%)	4,081	(-3.0%)	587	(2.0%)	16,096	(3.7%)

Notes:

(1) Please refer to Plate 2.13b for special waste not disposed of at landfills. From April 2015 onwards, dewatered sewage sludge from major sewage treatment works managed by Drainage Services Department has been treated by incineration at T ▪ PARK, and the residue and ash of incineration have been disposed of at WENT.

(2) Solid waste delivered to RTSs will be transferred to specified landfills after compression. The quantities include solid waste directly delivered to landfills and those transferred from RTSs to landfills.

(3) From 6 January 2016 onwards, SENT Landfill has been designated to accept only C&D waste.

(4) Figures in brackets refer to year-on-year (y-o-y) growth rates.

Plate 2.6 Arisings of solid waste disposed of at landfills in 2018 - By district by main waste category

District[3]	Average daily quantity[1] [2] (tpd)			
	Domestic waste (a)	Commercial & industrial waste (b)	Municipal solid waste (c) =(a)+(b)	Overall construction waste (d)
Central & Western	332	223	555	149
Eastern	478	144	623	136
Southern	226	76	302	79
Wanchai	244	82	326	82
Hong Kong Island Sub-total	**1,281**	**525**	**1,806**	**445**
Kowloon City	295	122	417	155
Kwun Tong	479	232	711	298
Sham Shui Po	395	107	502	183
Wong Tai Sin	295	91	386	51
Yau Tsim Mong	541	280	821	233
Kowloon Sub-total	**2,006**	**832**	**2,838**	**919**
Kwai Tsing	337	414	750	164
North	356	478	834	243
Sai Kung	348	86	434	956
Sha Tin	467	524	991	215
Tai Po	314	187	501	132
Tsuen Wan	263	251	514	61
Tuen Mun	453	469	922	646
Yuen Long	741	707	1,448	97
NT- Mainland Sub-total	**3,278**	**3,117**	**6,395**	**2,513**
Cheung Chau	23	-	-	-
Hei Ling Chau	2	-	-	-
Lamma Island	7	-	-	-
Ma Wan	13	-	-	-
Mui Wo	19	-	-	-
North Lantau	76	-	-	-
Peng Chau	6	-	-	-
NT-Outlying Islands Sub-total	**146**	**243 [4]**	**389 [4]**	**203[4]**
Total	**6,712**	**4,716**	**11,428**	**4,081**

Notes:

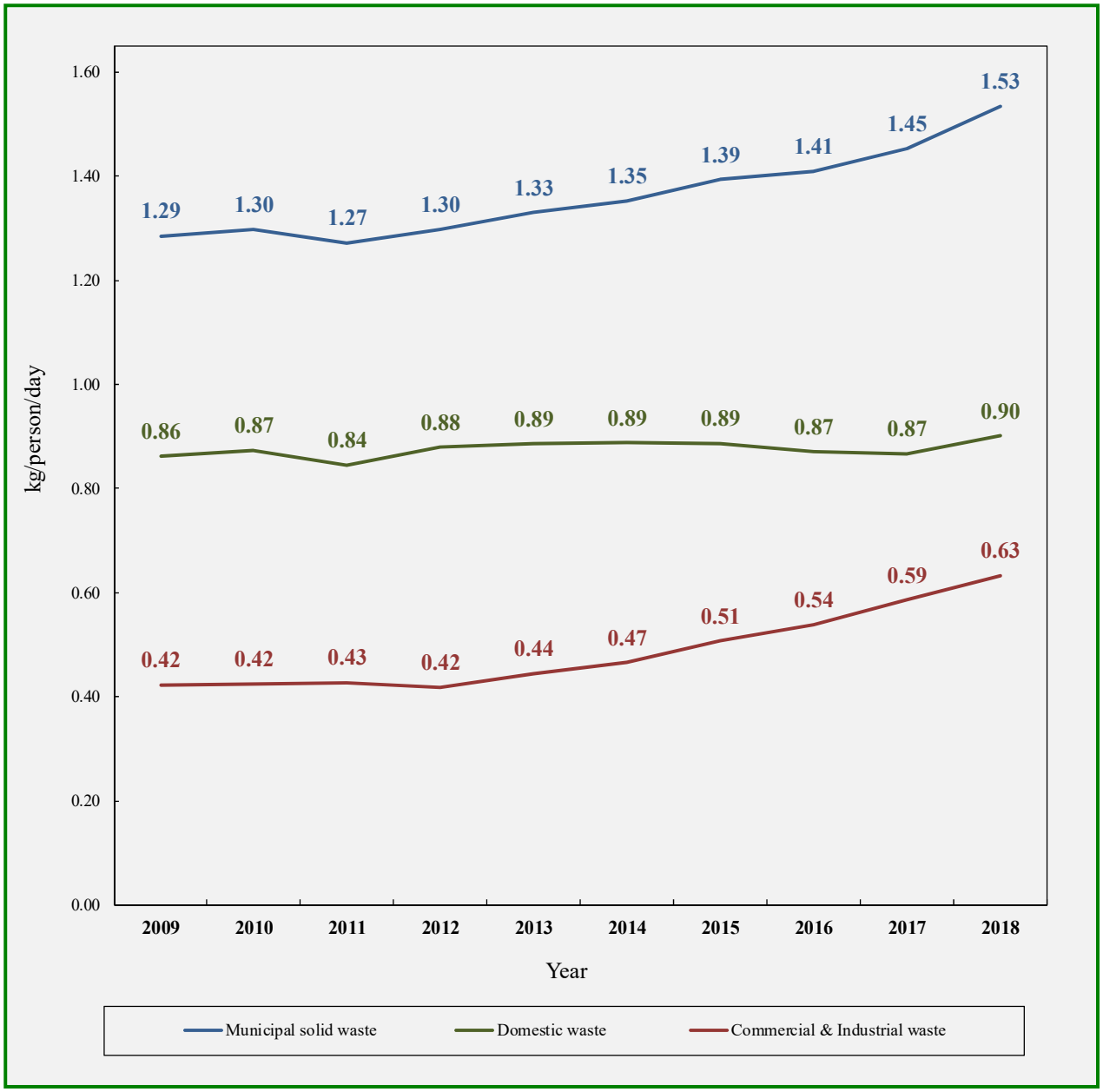
(1) The geographical distribution of solid waste arisings is mainly estimated from waste intake records taken at waste treatment facilities and should be regarded as indicative reference only.

(2) Special waste is not included.

(3) Districts under each main region are sorted in alphabetical order.

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

Plate 2.7 Per capita disposal rates of MSW, domestic waste and commercial & industrial waste from 2009 to 2018



Notes:

(1) The per capita disposal rates are calculated based on the population data (mid-year) updated by the C&SD in February 2019.

(2) Super typhoon Mangkhut, which hit Hong Kong in September 2018, resulted in extensive damage and increase in waste. If data from September to November are excluded (the disposal quantity of these three months was more affected by Typhoon Mangkhut), the disposal rate of municipal solid waste would be 1.50 kg/person/day.

Plate 2.8 Composition of MSW disposed of at landfills in 2018 - By waste type

Composition	Average daily quantity (tpd) and percentage shares by weight		
	Domestic waste (a)	Commercial & industrial waste (b)	Municipal solid waste (c)=(a)+(b)
Glass	**176** (2.6%)	**124** (2.6%)	**300** (2.6%)
Metals	**134** (2.0%)	**145** (3.1%)	**279** (2.4%)
Paper	**1,455** (21.7%)	**1,247** (26.4%)	**2,702** (23.6%)
Plastics	**1,244** (18.5%)	**1,099** (23.3%)	**2,343** (20.5%)
Putrescibles[(1)]	**2,696** (40.2%)	**1,227** (26.0%)	**3,923** (34.3%)
Textiles	**247** (3.7%)	**145** (3.1%)	**392** (3.4%)
Wood/Rattan	**69** (1.0%)	**383** (8.1%)	**452** (4.0%)
Household hazardous wastes (HHWs)[(2)]	**90** (1.3%)	**80** (1.7%)	**170** (1.5%)
Others[(1)(3)]	**601** (9.0%)	**265** (5.6%)	**866** (7.6%)
Total	**6,712** (100%)	**4,716** (100%)	**11,428** (100%)

Notes:

(1) As from reference year 2018, cotton personal care products have been excluded from Putrescibles and included under Others.

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

(3) Others include bulky items directly disposed of at landfills and other miscellaneous waste materials.

(4) Figures in brackets refer to percentage shares by weight in total disposal quantity of the corresponding waste type.

Plate 2.9 Composition of MSW disposed of at landfills in 2018 – By major waste type

Composition	Average daily quantity (tpd) and percentage shares by weight					
	Domestic waste (a)		Commercial & industrial waste (b)		Municipal solid waste (c) = (a) + (b)	
Glass						
- Glass bottles	**133**	(2.0%)	**79**	(1.7%)	**212**	(1.9%)
- Other glass	**43**	(0.6%)	**45**	(1.0%)	**88**	(0.8%)
(Glass) Sub-total	**176**	**(2.6%)**	**124**	**(2.6%)**	**300**	**(2.6%)**
Metals						
- Aluminium cans	**21**	(0.3%)	**12**	(0.3%)	**33**	(0.3%)
- Ferrous metals	**101**	(1.5%)	**117**	(2.5%)	**218**	(1.9%)
- Other non-ferrous metals	**11**	(0.2%)	**16**	(0.3%)	**27**	(0.2%)
(Metals) Sub-total	**134**	**(2.0%)**	**145**	**(3.1%)**	**279**	**(2.4%)**
Paper						
- Cardboard	**326**	(4.9%)	**445**	(9.4%)	**771**	(6.7%)
- Newsprint	**279**	(4.2%)	**118**	(2.5%)	**397**	(3.5%)
- Office paper	**77**	(1.1%)	**81**	(1.7%)	**158**	(1.4%)
- Tetrapak	**43**	(0.6%)	**24**	(0.5%)	**67**	(0.6%)
- Others (1)	**729**	(10.9%)	**580**	(12.3%)	**1,309**	(11.5%)
(Paper) Sub-total	**1,455**	**(21.7%)**	**1,247**	**(26.4%)**	**2,702**	**(23.6%)**
Plastics						
- Non-PET plastic bottles	**55**	(0.8%)	**19**	(0.4%)	**74**	(0.6%)
- PET plastic bottles	**81**	(1.2%)	**58**	(1.2%)	**139**	(1.2%)
- Plastic bags	**552**	(8.2%)	**300**	(6.4%)	**851**	(7.4%)
- Plastic dining wares	**105**	(1.6%)	**65**	(1.4%)	**169**	(1.5%)
- Polyfoam-dining wares	**28**	(0.4%)	**14**	(0.3%)	**41**	(0.4%)
- Polyfoam-others	**22**	(0.3%)	**22**	(0.5%)	**44**	(0.4%)
- Others (2)	**403**	(6.0%)	**622**	(13.2%)	**1,025**	(9.0%)
(Plastics) Sub-total	**1,244**	**(18.5%)**	**1,099**	**(23.3%)**	**2,343**	**(20.5%)**
Putrescibles						
- Food waste	**2,418**	(36.0%)	**1,147**	(24.3%)	**3,565**	(31.2%)
- Yard waste(3)	**274**	(4.1%)	**67**	(1.4%)	**341**	(3.0%)
- Others(4)	**4**	(0.1%)	**14**	(0.3%)	**17**	(0.2%)
(Putrescibles) Sub-total	**2,696**	**(40.2%)**	**1,227**	**(26.0%)**	**3,923**	**(34.3%)**

Notes:

(1) Other paper waste includes tissue paper, paper bags, etc.

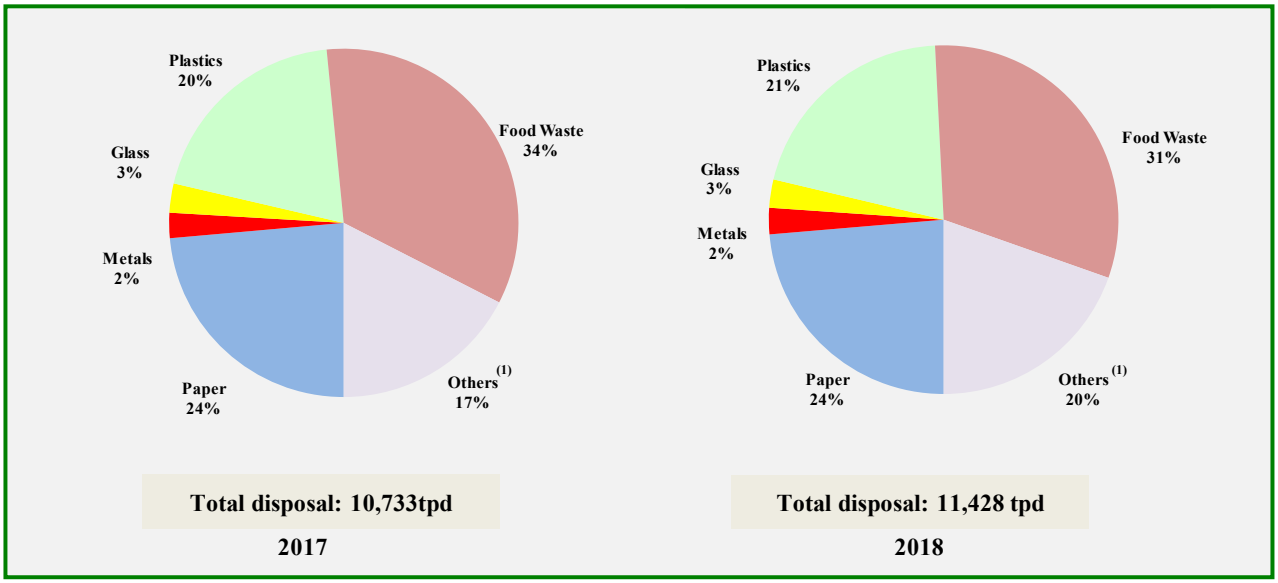
(2) Other plastics waste includes transparent stretch film for packaging, toys, off-cuts, scrap, etc.

(3) Super typhoon Mangkhut, which hit Hong Kong in September 2018, resulted in extensive damage and increase in waste. If data from September to November are excluded (the disposal quantity of these three months was more affected by Typhoon Mangkhut), the disposal quantity of municipal yard waste would be 171 tonnes per day.

(4) Other putrescibles waste includes other organic waste such as hair and cotton. As from reference year 2018, cotton personal care products have been excluded from Putrescibles.

(5) Figures in brackets refer to percentage shares by weight in total disposal quantity of the corresponding waste type.

Plate 2.10 Composition of MSW disposed of at landfills in percentages in 2017 and 2018 – By major waste type



Note:

(1) Others include putrescibles other than food waste, textiles, wood/rattan, household hazardous wastes, bulky items directly disposed of at landfills, and miscellaneous waste materials.

Plate 2.11 Composition of municipal food waste disposed of at landfills in percentages in 2017 and 2018 - By waste category

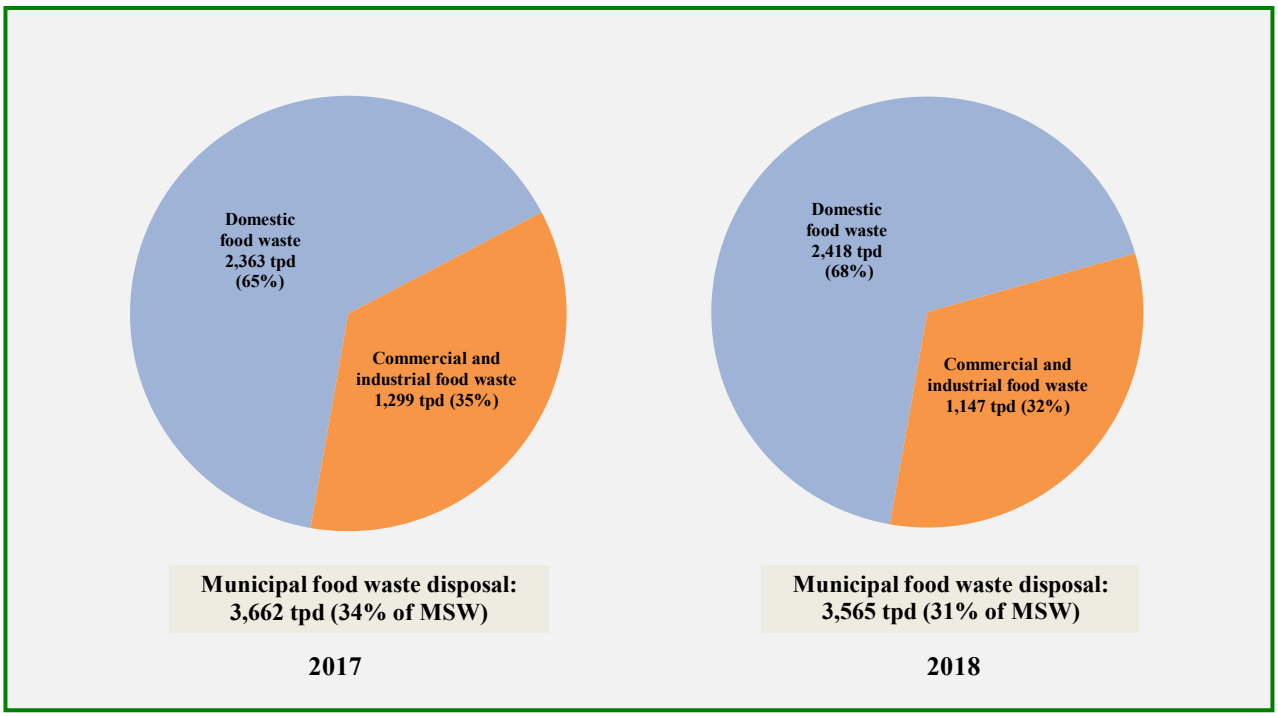
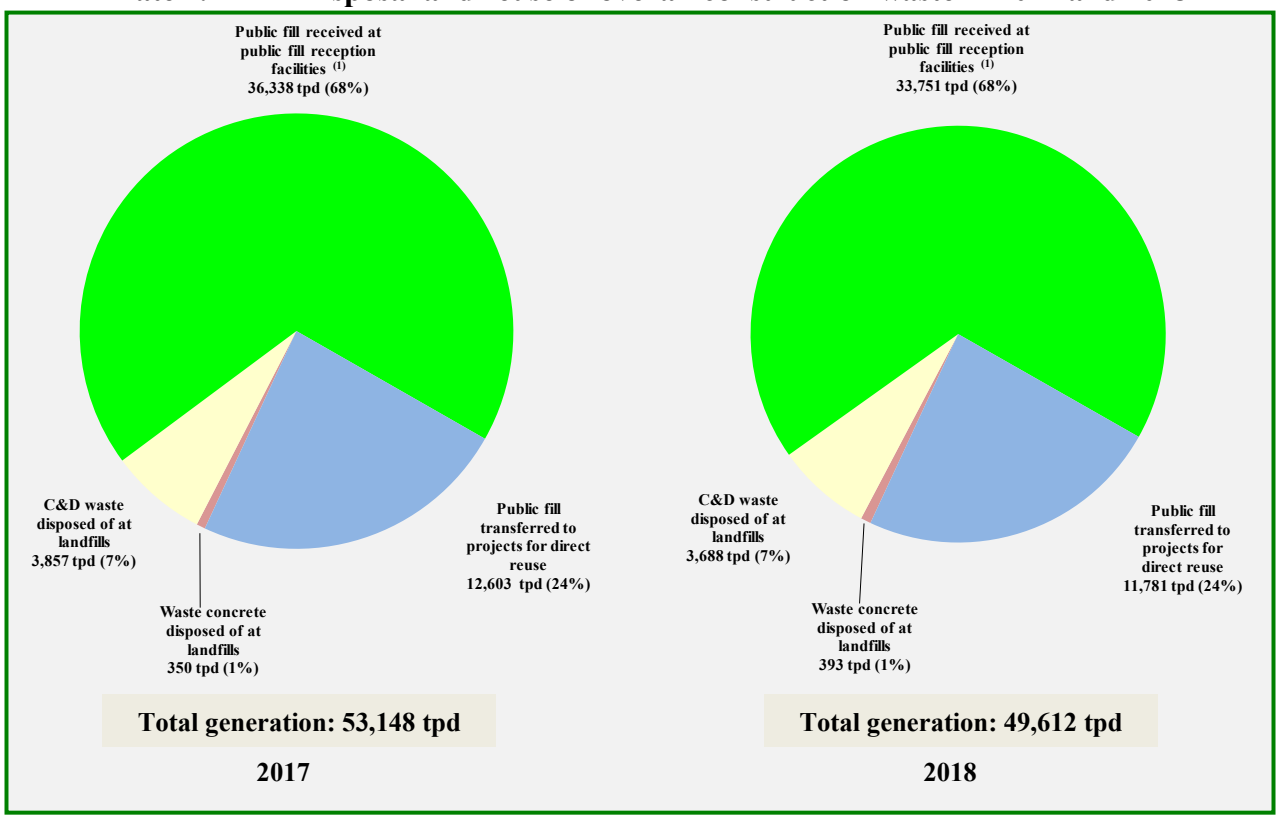


Plate 2.12 Disposal and reuse of overall construction waste in 2017 and 2018



Note:

(1) Public fill reception facilities (PFRFs) are managed by CEDD for receiving inert construction waste (also known as public fill) appropriate for reuse. At present, four PFRFs are in operation, namely Tseung Kwan O Area 137 Fill Bank, Tuen Mun Area 38 Fill Bank, Chai Wan Public Fill Barging Point and Mui Wo Temporary Public Fill Reception Facility.

Plate 2.13a Disposal of special waste at landfills in 2018 - By special waste type

Special waste type	Average daily quantity[1] (tpd)	
Abattoir waste	**11**	(-4.9%)
Animal carcasses and kennel waste	**4**	(13.1%)
Asbestos waste	**3**	(-17.4%)
Chemical waste other than asbestos waste	**7**	(2.5%)
Clinical waste (with package material) [2]	**1**	(-27.7%)
Condemned goods	**50**	(40.8%)
Dewatered dredged materials	**4**	(-44.4%)
Dewatered sludges[3]	**103**	(4.7%)
Dewatered waterworks sludge	**55**	(-1.4%)
Incineration ash and stabilised residue	**147**	(-3.4%)
Livestock waste[4]	**65**	(0.5%)
Sewage works screenings	**71**	(15.2%)
Waste tyres[5]	**66**	(-10.2%)
Disposal at Landfills Sub-total	**587**	(2.0%)

Notes:

(1) Some types of special waste may not arise and be disposed of daily throughout the whole year. The average daily quantity is obtained by dividing the total amount of waste disposed of at landfills in the whole year by the number of days in the whole year.

(2) Clinical waste is incinerated at CWTC except during normal maintenance or emergency shut-down maintenance of the incineration treatment system for more than two days. During the shutdown, clinical waste is packed and transferred to designated landfill for disposal in accordance with the Clinical Waste Disposal License of CWTC.

(3) Dewatered sludges originate from sewage treatment works managed by the Drainage Services Department, wastewater treatment facilities and grease trap waste treatment facility at refuse transfer stations managed by the EPD, and private sewage treatment plants. Except that dewatered sewage sludge from major sewage treatment works managed by Drainage Services Department is treated by incineration at T ▪ PARK, other dewatered sludges are disposed of at WENT and NENT Landfills.

(4) In 2018, the generation of livestock waste amounted to 160 tpd, out of which 65 tpd were disposed of at landfills. Livestock waste disposed of at landfills mainly include the livestock waste collected by the free collection service for solid livestock waste provided to local livestock farmers by the Government. The remaining livestock waste was treated by other environmentally-acceptable means such as on-site composting, aerobic treatment, and dry muck-out.

(5) Waste tyres are shredded or cut prior to disposal at landfills.

(6) Figures in brackets refer to year-on-year (y-o-y) growth rates. It should be noted that special waste types with small tpd figures may be subject to strong y-o-y fluctuations due to small base numbers.

Plate 2.13b Treatment of special waste in 2018 (Not disposed of at landfills) - By special waste type

Special waste type	Treatment method	Average daily quantity[1] (tpd)	
Chemical waste other than asbestos waste	**CWTC**	**39**	(-7.1%)
Clinical waste	**CWTC**	**6**	(7.4%)
Grease trap waste	**WKTS[2]**	**499**	(6.1%)
Horse stable waste	**AWCP**	**26**	(-0.4%)
Dredged mud and excavated materials	**Marine dumping[3]**	**16,712**	(-28.2%)
Dewatered sewage sludge[4]	**Incineration at T ▪ PARK**	**1,075**	(1.6%)
Furnace bottom ash	**Concrete manufacturing, stored in lagoon[5]**	**124**	(3.1%)
Pulverised fuel ash	**Concrete manufacturing, stored in lagoon[5]**	**1,263**	(9.2%)

Notes:

(1) Some types of special waste may not arise and be treated daily throughout the whole year. The average daily quantity is obtained by dividing the total amount of waste treated outside landfills in the whole year by the number of days in the whole year.

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

(3) The density of the dredged mud and excavated materials is assumed to be one tonne per cubic metre.

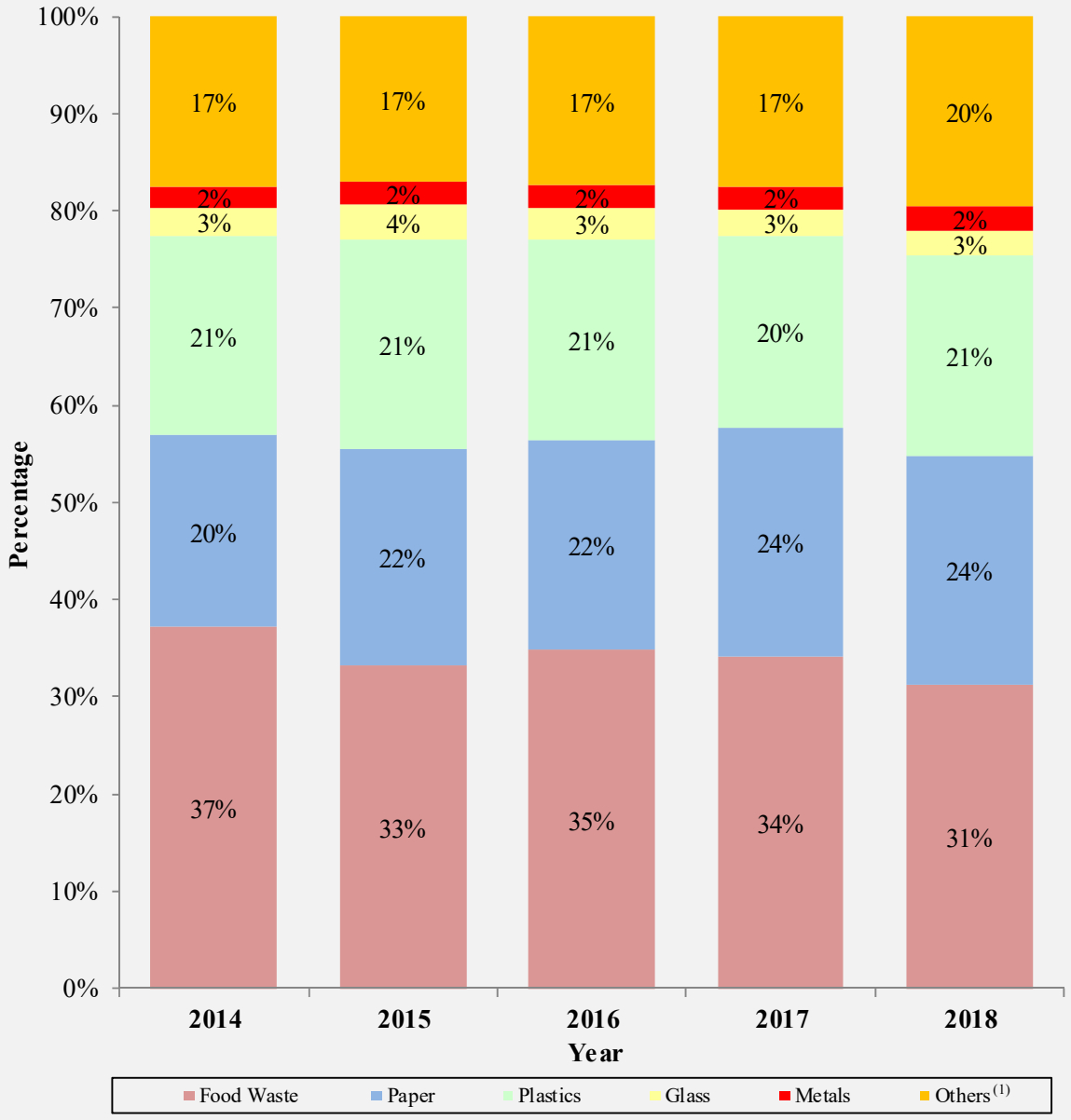
(4) Dewatered sewage sludge from major sewage treatment works managed by Drainage Services Department has been treated by incineration at T ▪ PARK from April 2015 onwards.

(5) Furnace bottom ash and pulverised fuel ash are wastes resulting from coal-fired electricity generation. Their figures are provided by the Power Companies.

(6) Figures in brackets refer to year-on-year (y-o-y) growth rates. It should be noted that special waste types with small tpd figures may be subject to strong y-o-y fluctuations due to small base numbers.

Plate 2.14 Composition of MSW disposed of at landfills in percentages from 2014 to 2018 – By major waste type

	2014	2015	2016	2017	2018
Total (tpd)	9,782	10,159	10,345	10,733	11,428
y-o-y change (%)	2.5	3.9	1.8	3.7	6.5

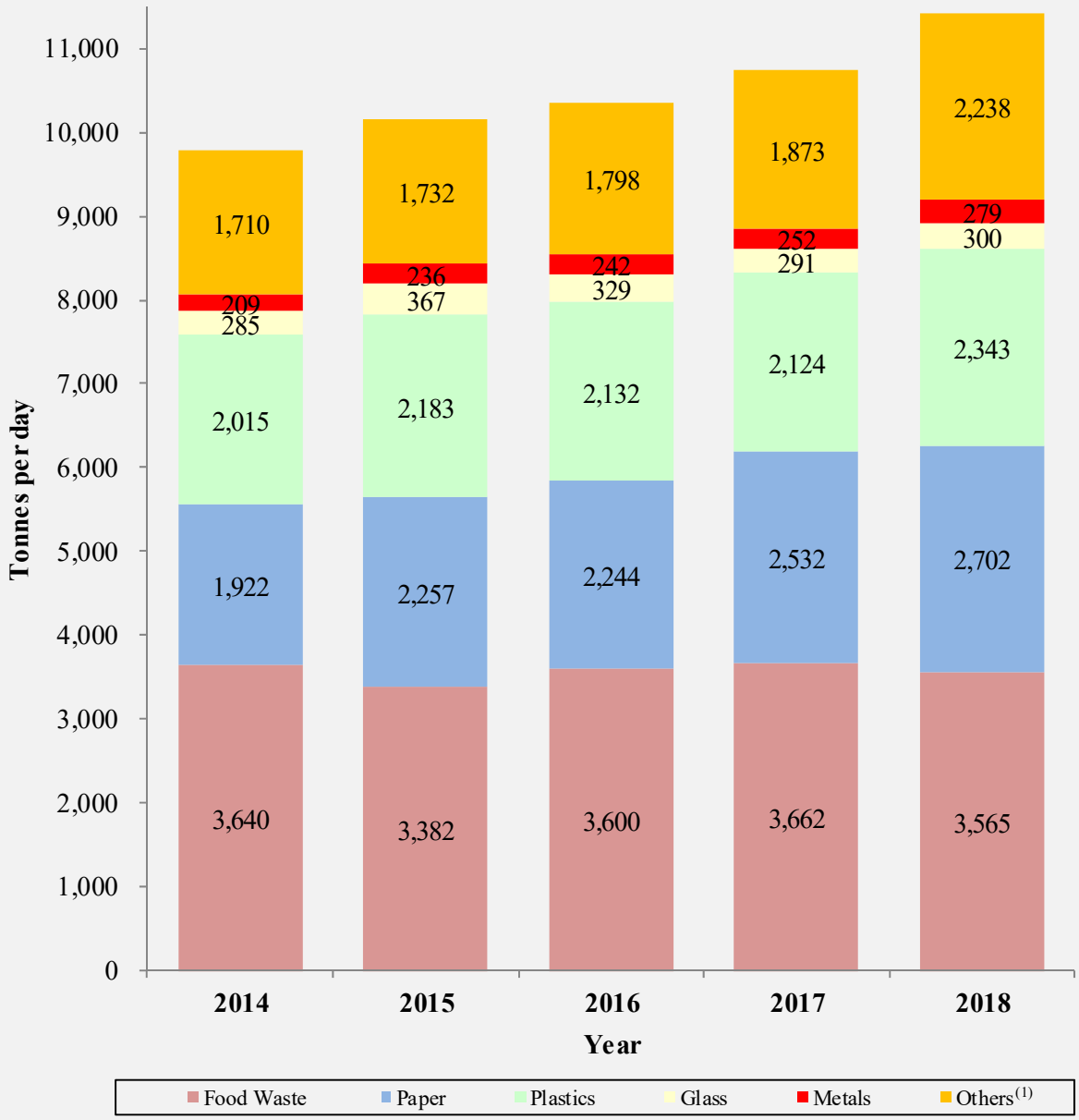


Note:

(1) Others include putrescibles other than food waste, textiles, wood/rattan, household hazardous wastes, bulky items directly disposed of at landfills, and miscellaneous waste materials.

Plate 2.15 Composition of MSW disposed of at landfills in quantities from 2014 to 2018 – By major waste type

	2014	2015	2016	2017	2018
Total (tpd)	9,782	10,159	10,345	10,733	11,428
y-o-y change (%)	2.5	3.9	1.8	3.7	6.5

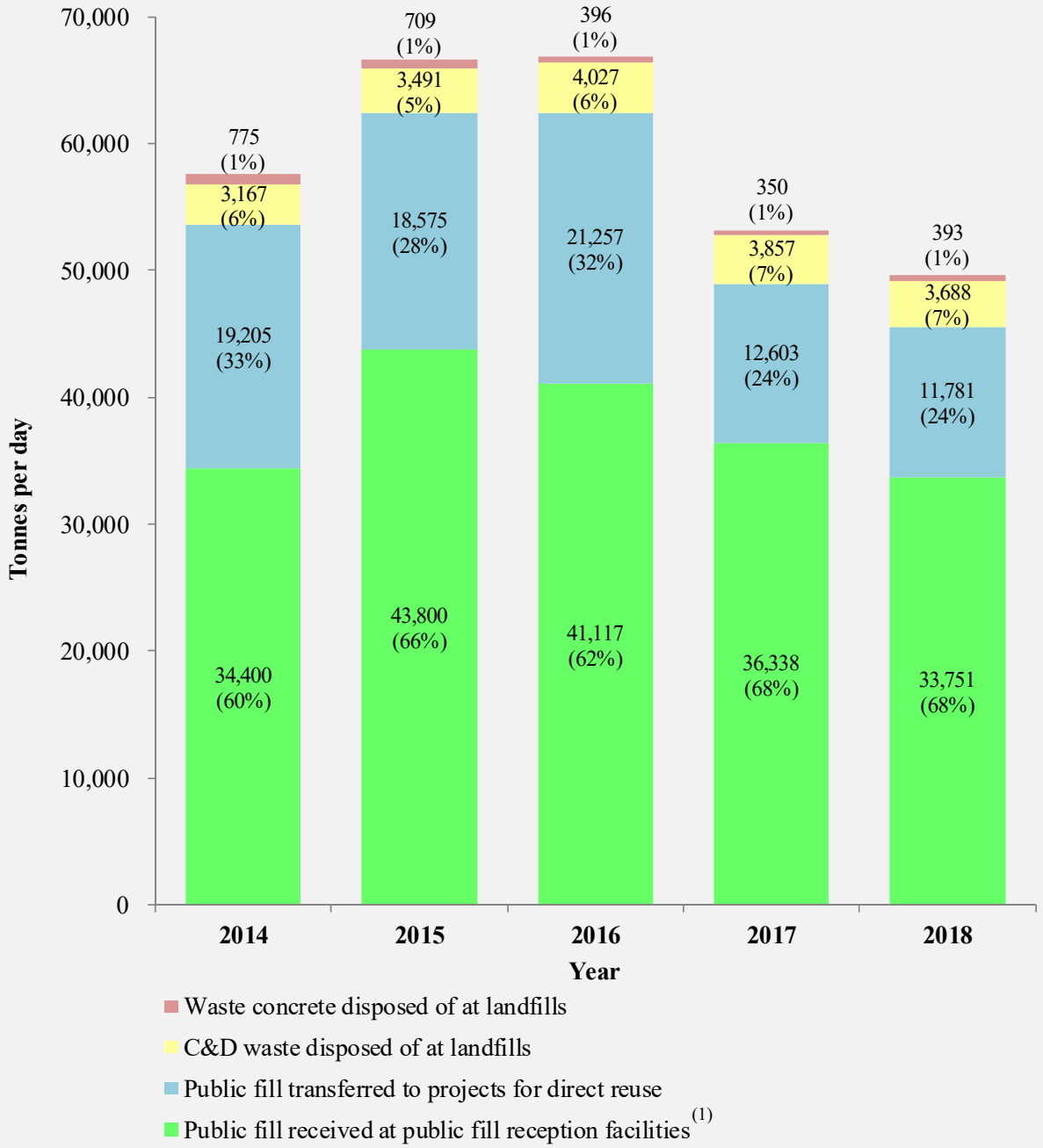


Note:

(1) Others include putrescibles other than food waste, textiles, wood/rattan, household hazardous wastes, bulky items directly disposed of at landfills and miscellaneous waste materials.

Plate 2.16 Disposal and reuse of overall construction waste from 2014 to 2018

	2014	2015	2016	2017	2018
Total (tpd)	57,547	66,575	66,796	53,148	49,612
y-o-y change (%)	-12.8	15.7	0.3	-20.4	-6.7



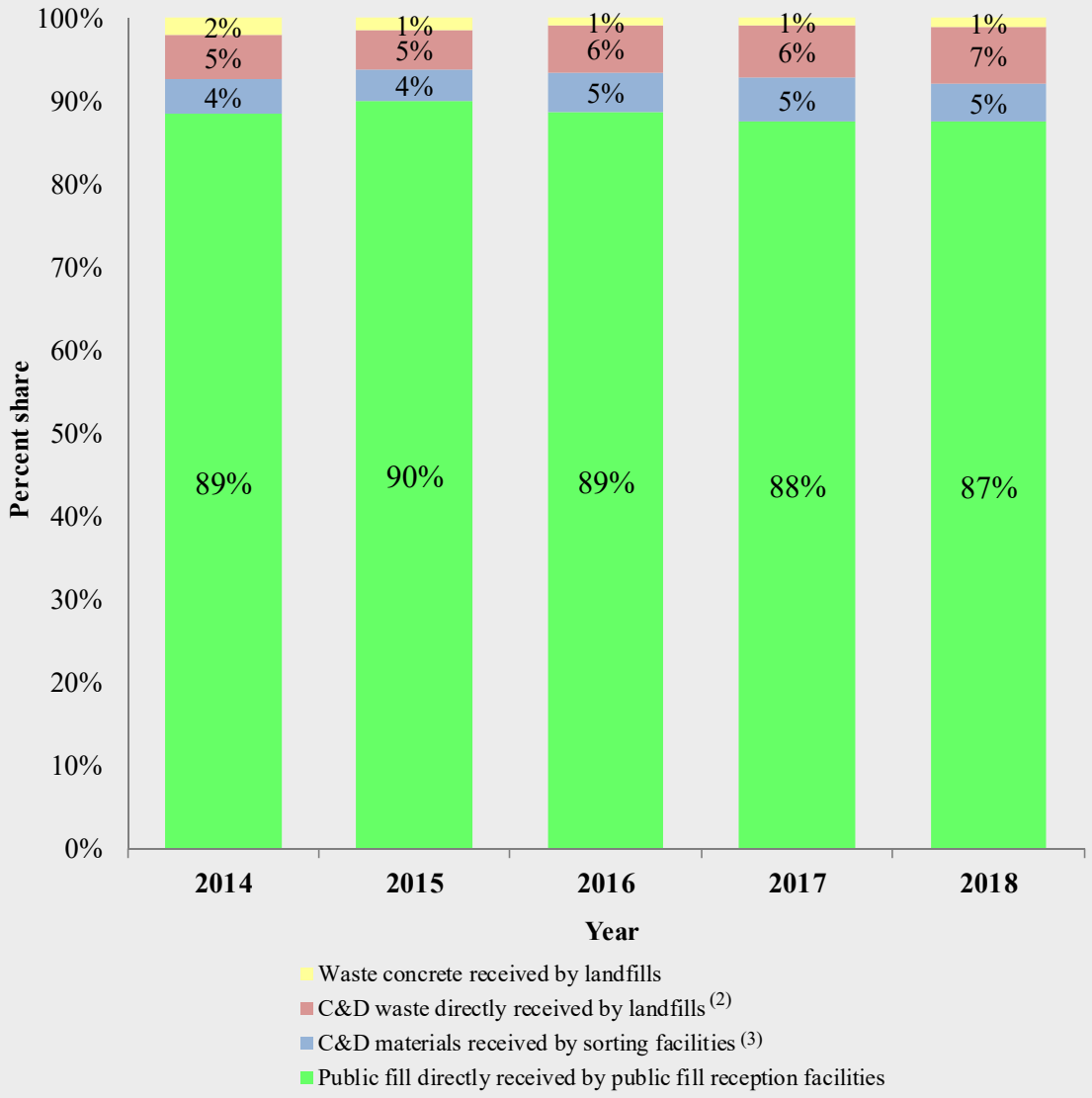
Notes:

(1) Public fill reception facilities (PFRFs) are managed by CEDD for receiving inert construction waste (also known as public fill) appropriate for reuse. At present, four PFRFs are in operation, namely Tseung Kwan O Area 137 Fill Bank, Tuen Mun Area 38 Fill Bank, Chai Wan Public Fill Barging Point and Mui Wo Temporary Public Fill Reception Facility.

(2) Figures in brackets refer to percentage shares by weight.

Plate 2.17 Overall construction waste received by treatment facilities from 2014 to 2018

	2014	2015	2016	2017	2018
Public fill reception facilities (tpd)	33,947	43,211	40,395	35,541	33,094
Sorting facilities (tpd)	1,591	1,863	2,191	2,124	1,762
Landfills (tpd)	2,811	2,917	2,940	2,895	2,974
Waste concrete (tpd)	*775*	*709*	*396*	*350*	*393*
C&D waste (tpd)	*2,037*	*2,208*	*2,544*	*2,545*	*2,581*



Notes:

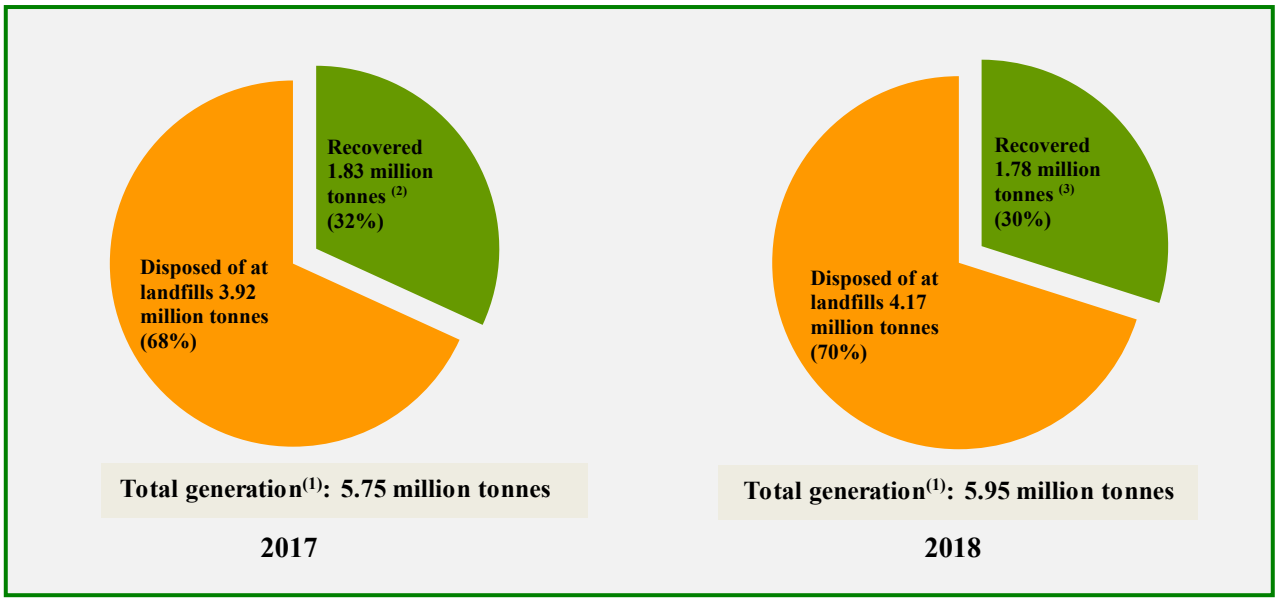
(1) Under the Construction Waste Disposal Charging Scheme, 71 dollars is charged per tonne of public fill disposed of at public fill reception facilities, 175 dollars per tonne of construction waste at sorting facilities and 200 dollars per tonne of construction waste at landfills.

(2) C&D waste directly received by landfills excludes C&D waste from sorting facilities, but includes a small quantity of C&D waste from OITF.

(3) After sorting, inert material will be transferred from sorting facilities to public fill banks, and non-inert construction and demolition waste (C&D waste) to landfills.

3. Resource Recovery and Recycling

Plate 3.1 Generation, disposal and recovery of MSW in 2017 and 2018



Notes:

(1) Generation of MSW is the sum of MSW disposed of at landfills and MSW recovered for recycling.

(2) A total of 1.83 million tonnes of recyclables were recovered for recycling in 2017, of which, 1.77 million tonnes (97%) were exported for recycling and 0.06 million tonnes (3%) recycled locally.

(3) A total of 1.78 million tonnes of recyclables were recovered for recycling in 2018, of which, 1.63 million tonnes (92%) were exported for recycling and 0.14 million tonnes (8%) recycled locally.

Plate 3.2 Recovery rates of MSW, domestic waste, and commercial and industrial waste from 2014 to 2018

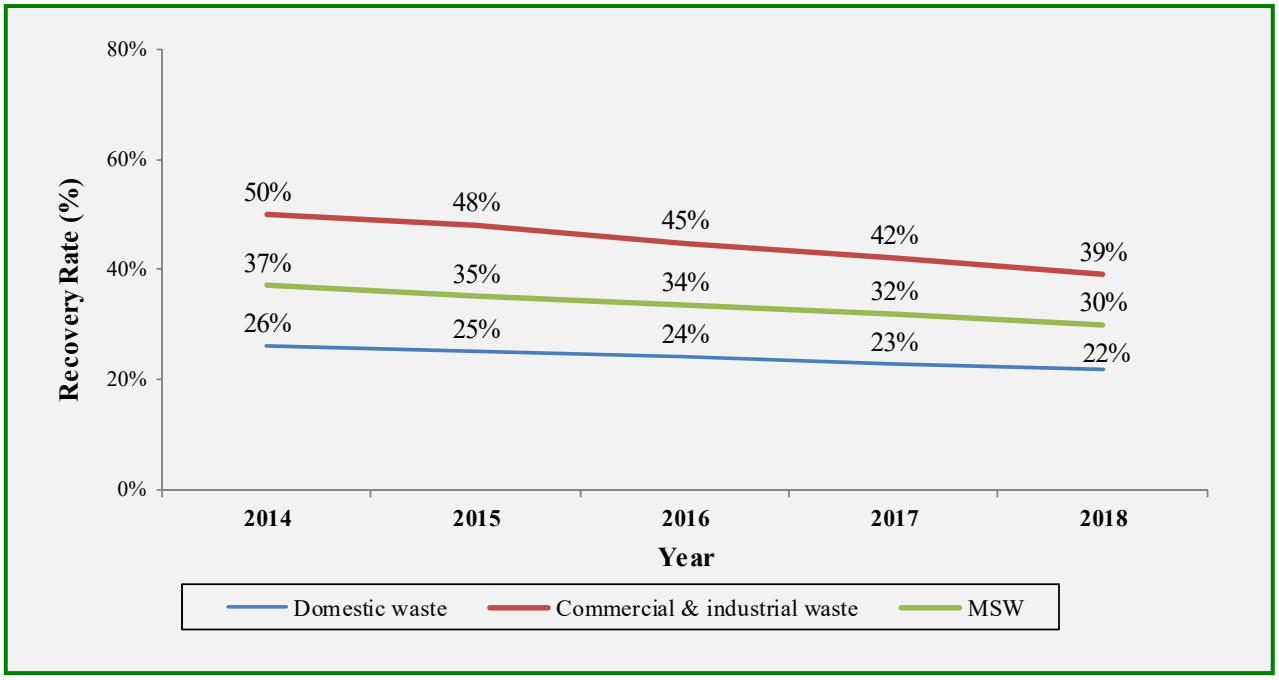


Plate 3.3 Recyclables recovered from MSW in 2018 - By type of recyclable

Recyclable type	Quantity of recovered recyclables (thousand tonnes)					
	Exported for recycling (a)		Recycled locally (b)		Total recovered for recycling (c) = (a) + (b)	
Paper	**694.6**	(42.5%)	**0.0**	(0.0%)	**694.6**	(39.1%)
Plastics	**8.4**	(0.5%)	**55.8**	(38.5%)	**64.2**	(3.6%)
Ferrous metals	**788.5**	(48.3%)	**0.3**	(0.2%)	**788.7**	(44.4%)
Non-ferrous metals	**125.7**	(7.7%)	**1.3**	(0.9%)	**126.9**	(7.1%)
Glass(1)	**0.1**	(0.0%)	**15.1**	(10.4%)	**15.1**	(0.9%)
Rubber tyres(2)	**0.1**	(0.0%)	**5.8**	(4.0%)	**5.8**	(0.3%)
Textiles	**0.2**	(0.0%)	**6.2**	(4.3%)	**6.4**	(0.4%)
Wood	**0.9**	(0.1%)	**5.0**	(3.4%)	**5.9**	(0.3%)
Food waste(3)	**0.0**	(0.0%)	**27.0**	(18.6%)	**27.0**	(1.5%)
Electrical and electronic equipment(4)	**14.3**	(0.9%)	**27.6**	(19.1%)	**42.0**	(2.4%)
Yard waste(5)	**0.0**	(0.0%)	**1.0**	(0.7%)	**1.0**	(0.1%)
Total	**1,632.7**	(100.0%)	**144.9**	(100.0%)	**1,777.6**	(100.0%)

Notes:

(1) Glass beverage bottles recovered for reuse through deposit-and-refund system operated by local beverage manufacturers are not included.

(2) The quantity includes reuse, retreading and recycling of vehicle tyres and retreading of aircraft tyres in Hong Kong.

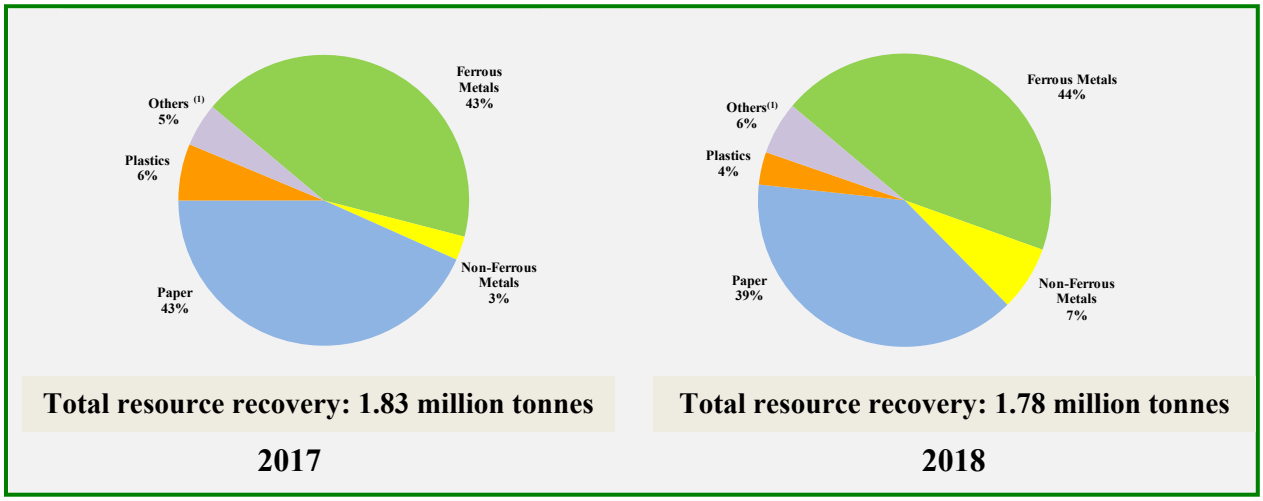
(3) The quantity of food waste recycled locally includes those recycled by industrial operators, those recycled at O·PARK and OITF, and those recycled at EPD's composting facilities at Kowloon Bay. The composting facilities at Kowloon Bay has ceased operation since July 2018.

(4) The quantity of waste electrical and electronic equipment recovered for recycling is compiled from the results of a biennial survey on "Generation & Disposal Practice of Used/ End-of-Life Electrical & Electronic Equipment and Batteries in Hong Kong" commissioned by EPD, and figures from market research and local recyclers.

(5) The quantity of yard waste recycled locally includes yard waste recycled on-site and off-site within Hong Kong.

(6) Figures less than 50 tonnes are shown as 0.0. Figures in brackets refer to percentage shares.

Plate 3.4 Recyclables recovered from MSW in percentages in 2017 and 2018 - By type of recyclable



Note:

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

Plate 3.5 Total quantities and export values of recyclable materials recovered from MSW from 2014 to 2018

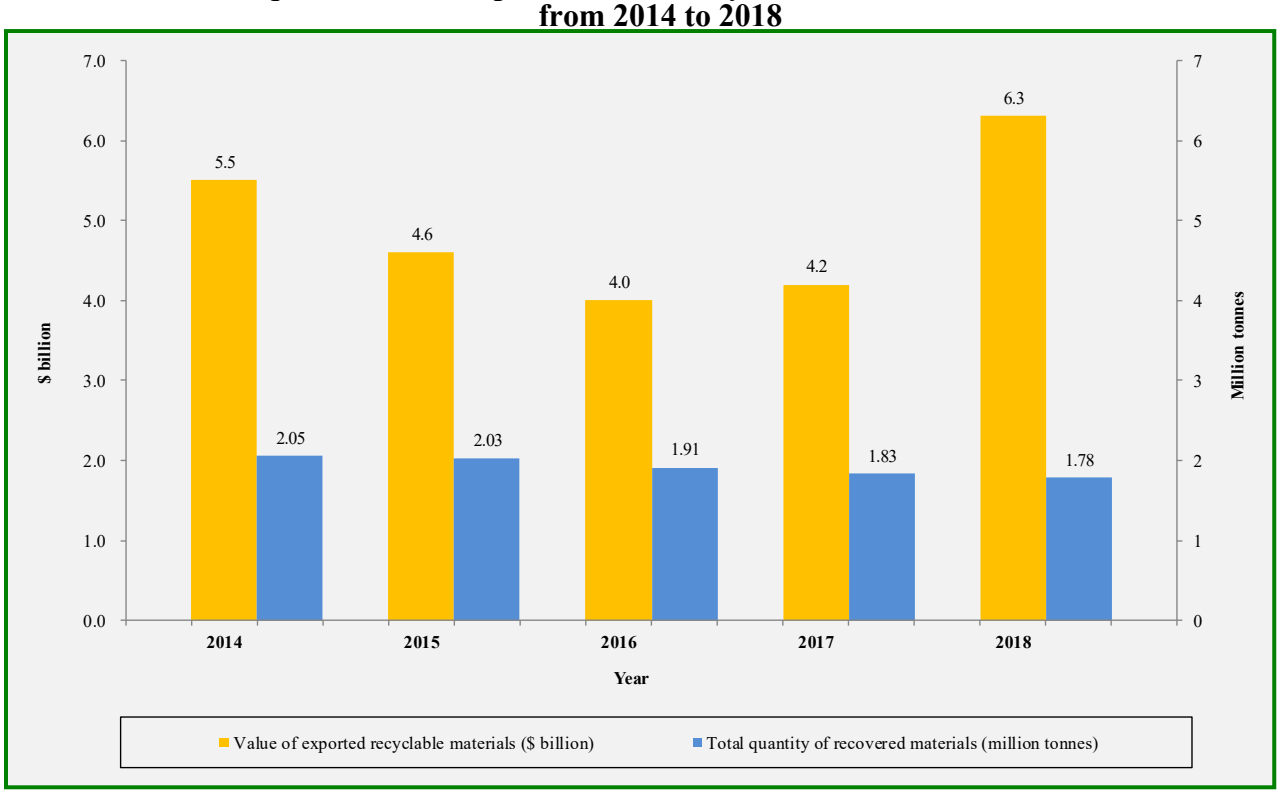
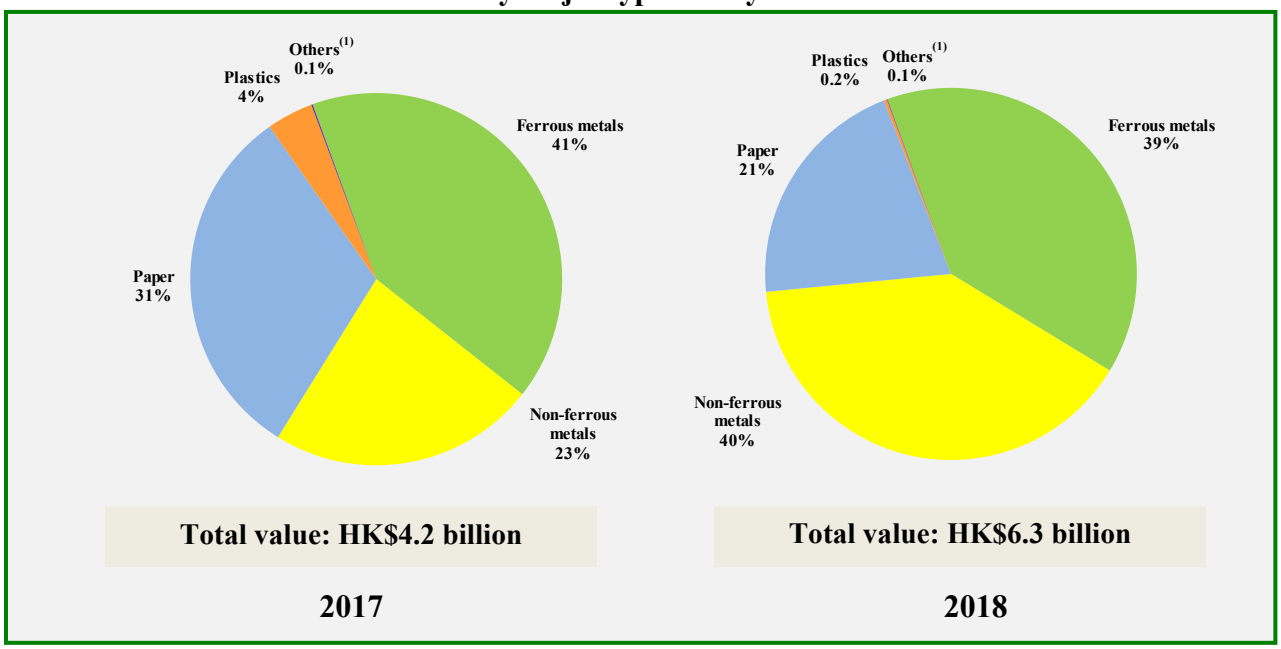


Plate 3.6 Values of exported recyclable materials recovered from MSW in percentages in 2017 and 2018 - By major type of recyclable material



Note:

(1) Others include glass, wood, textiles and rubber tyres only.

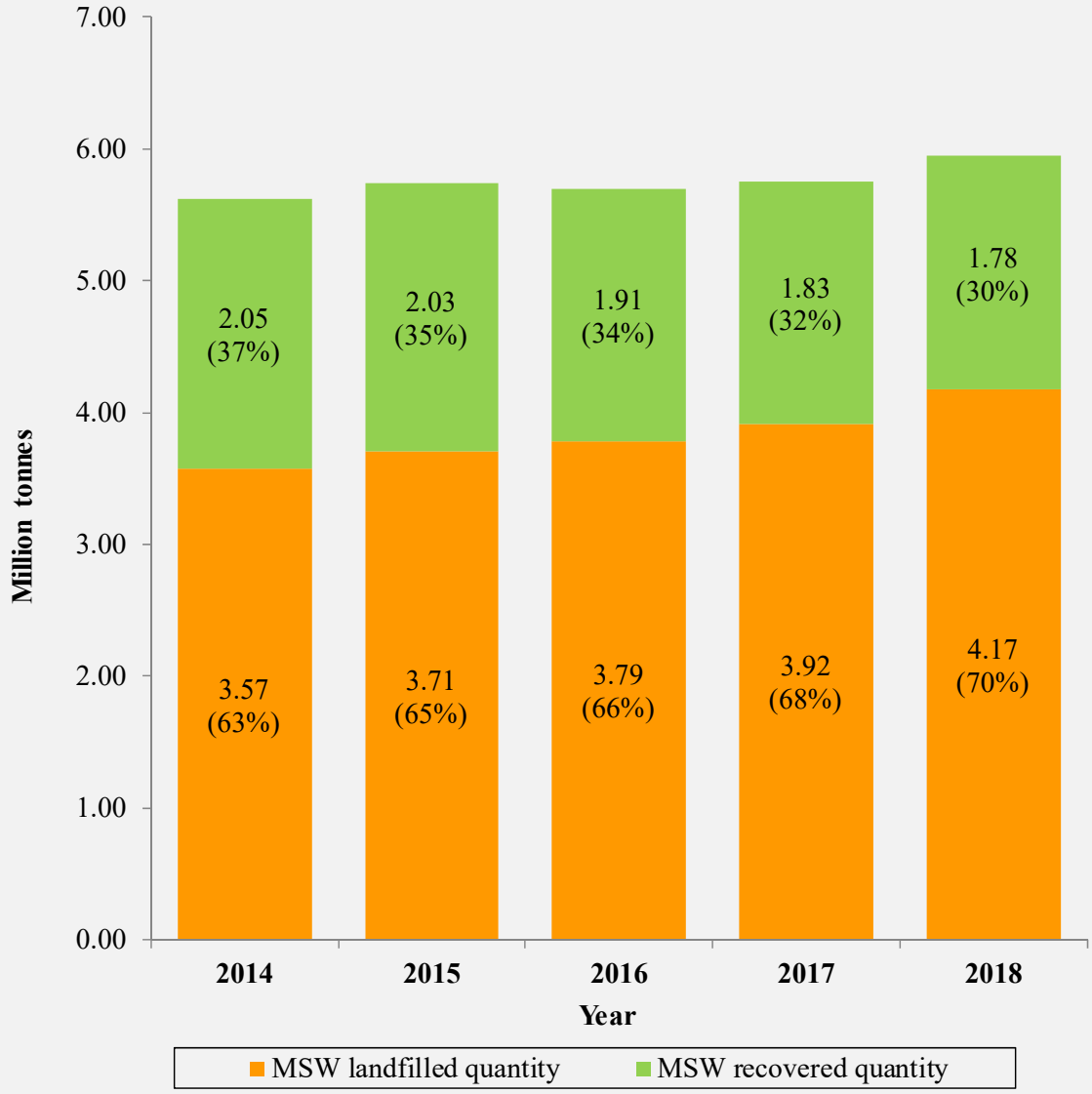
Plate 3.7 Quantities and values of exported recyclable materials recovered from MSW in 2018 - By major type of recyclable material

Recyclable type	Quantity (tonnes)		Value ($ thousand)		Value per unit weight ($ / tonne)
a. Ferrous metals					
- Alloy steel scrap	**18,576**	(2.4%)	**149,652**	(6.1%)	**8,056**
- Others[(1)]	**769,920**	(97.6%)	**2,309,564**	(93.9%)	**3,000**
(Ferrous metals) Sub-total	**788,496**	**(100.0%)**	**2,459,216**	**(100.0%)**	**3,119**
b. Non-ferrous metals					
- Aluminium	**55,712**	(44.3%)	**485,855**	(19.5%)	**8,721**
- Copper & alloys	**68,267**	(54.3%)	**1,769,384**	(71.0%)	**25,918**
- Precious metal	**1,267**	(1.0%)	**148,484**	(6.0%)	**117,183**
- Others[(1)]	**437**	(0.3%)	**86,668**	(3.5%)	**198,343**
(Non-ferrous metals) Sub-total	**125,683**	**(100.0%)**	**2,490,391**	**(100.0%)**	**19,815**
c. Plastics					
- Polyethylene (PE)	**1,594**	(19.0%)	**4,341**	(27.9%)	**2,723**
- Polyethylene terephthalate (PET) bottles	**115**	(1.4%)	**138**	(0.9%)	**1,198**
- Polyethylene terephthalate (PET) other than bottles	**114**	(1.4%)	**268**	(1.7%)	**2,340**
- Polypropylene (PP)	**509**	(6.1%)	**819**	(5.3%)	**1,608**
- Polystyrene & copolymers (PS)	**102**	(1.2%)	**192**	(1.2%)	**1,888**
- Polyvinyl chloride (PVC)	**433**	(5.2%)	**654**	(4.2%)	**1,512**
- Others[(1)]	**5,531**	(65.9%)	**9,173**	(58.9%)	**1,658**
(Plastics) Sub-total	**8,399**	**(100.0%)**	**15,586**	**(100.0%)**	**1,856**
d. Textiles					
- Cotton	**0**	(0.0%)	**0**	(0.0%)	**-**
- Man-made fibres	**0**	(0.0%)	**0**	(0.0%)	**-**
- Old clothing & other textile articles, rags, etc.	**195**	(100.0%)	**1,593**	(100.0%)	**8,170**
(Textiles) Sub-total	**195**	**(100.0%)**	**1,593**	**(100.0%)**	**8,170**
e. Wood & paper					
- Paper	**694,622**	(99.9%)	**1,295,248**	(99.9%)	**1,865**
- Wood (include sawdust)	**860**	(0.1%)	**790**	(0.1%)	**919**
(Wood & paper) Sub-total	**695,482**	**(100.0%)**	**1,296,038**	**(100.0%)**	**1,864**
f. Glass					
(Glass) Sub-total	**60**	**(100.0%)**	**12**	**(100.0%)**	**197**
g. Electrical and electronic equipment					
(Electrical and electronic equipment) Sub-total	**14,318**	**(100.0%)**	**N/A**		**N/A**

Notes:
(1) Others include waste and scrap not elsewhere classified under the respective type of recyclable material.
(2) Figures in brackets refer to percentage shares.

Plate 3.8 Generation, disposal and recovery of MSW from 2014 to 2018

	2014	2015	2016	2017	2018
Total (million tonnes)	5.62	5.74	5.70	5.75	5.95
y-o-y change (%)	(2.4%)	(2.1%)	(-0.7%)	(0.9%)	(3.5%)



Note:

(1) Generation of MSW is the sum of MSW disposed of at landfills and MSW recovered for recycling.

Plate 3.9 Recyclables recovered from MSW in percentages from 2014 to 2018 - By major type of recyclable

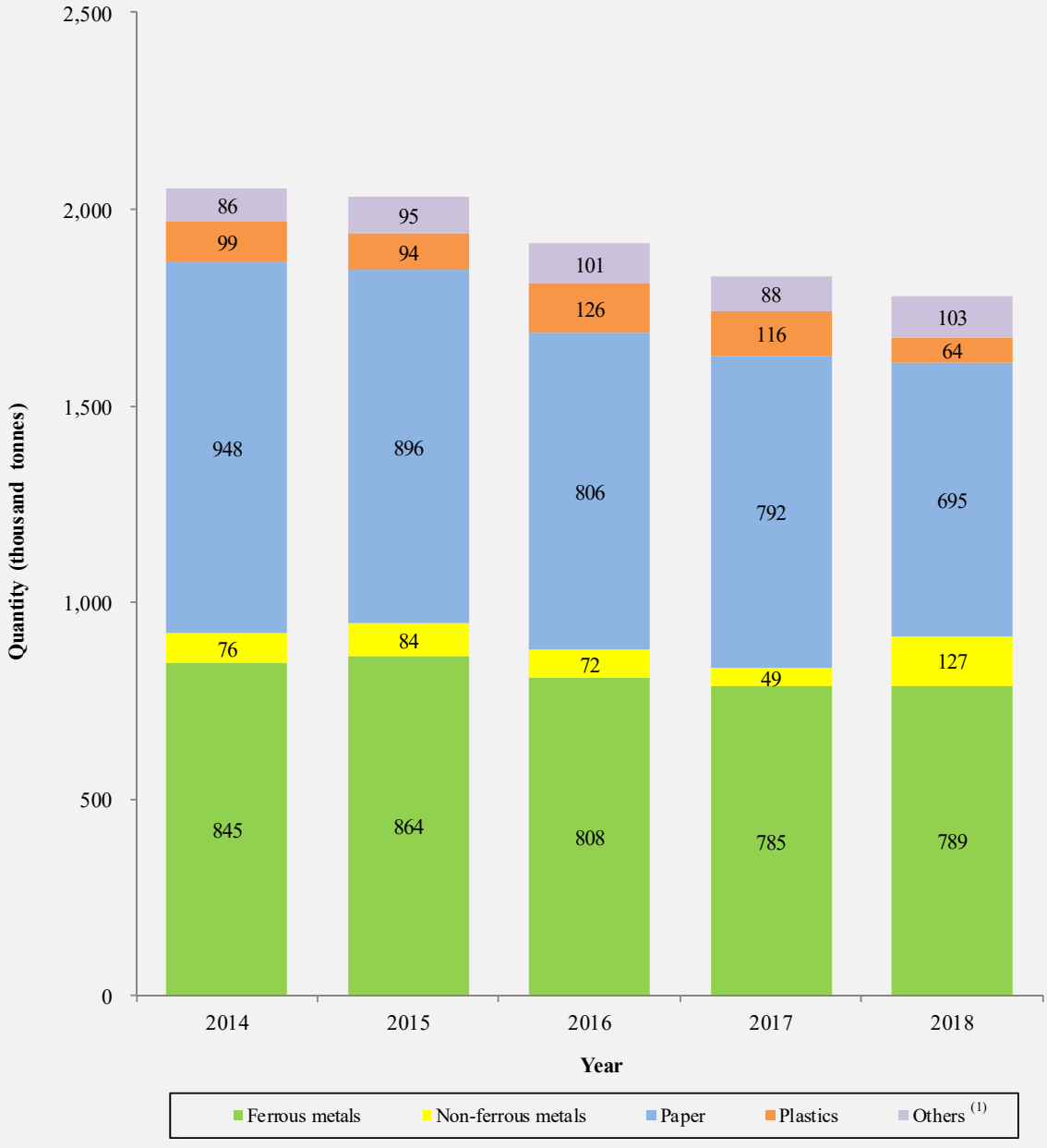
	2014	2015	2016	2017	2018
Total (million tonnes)	2.05	2.03	1.91	1.83	1.78
y-o-y change (%)	(2.2%)	(-1.0%)	(-5.9%)	(-4.3%)	(-2.9%)

Note:

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

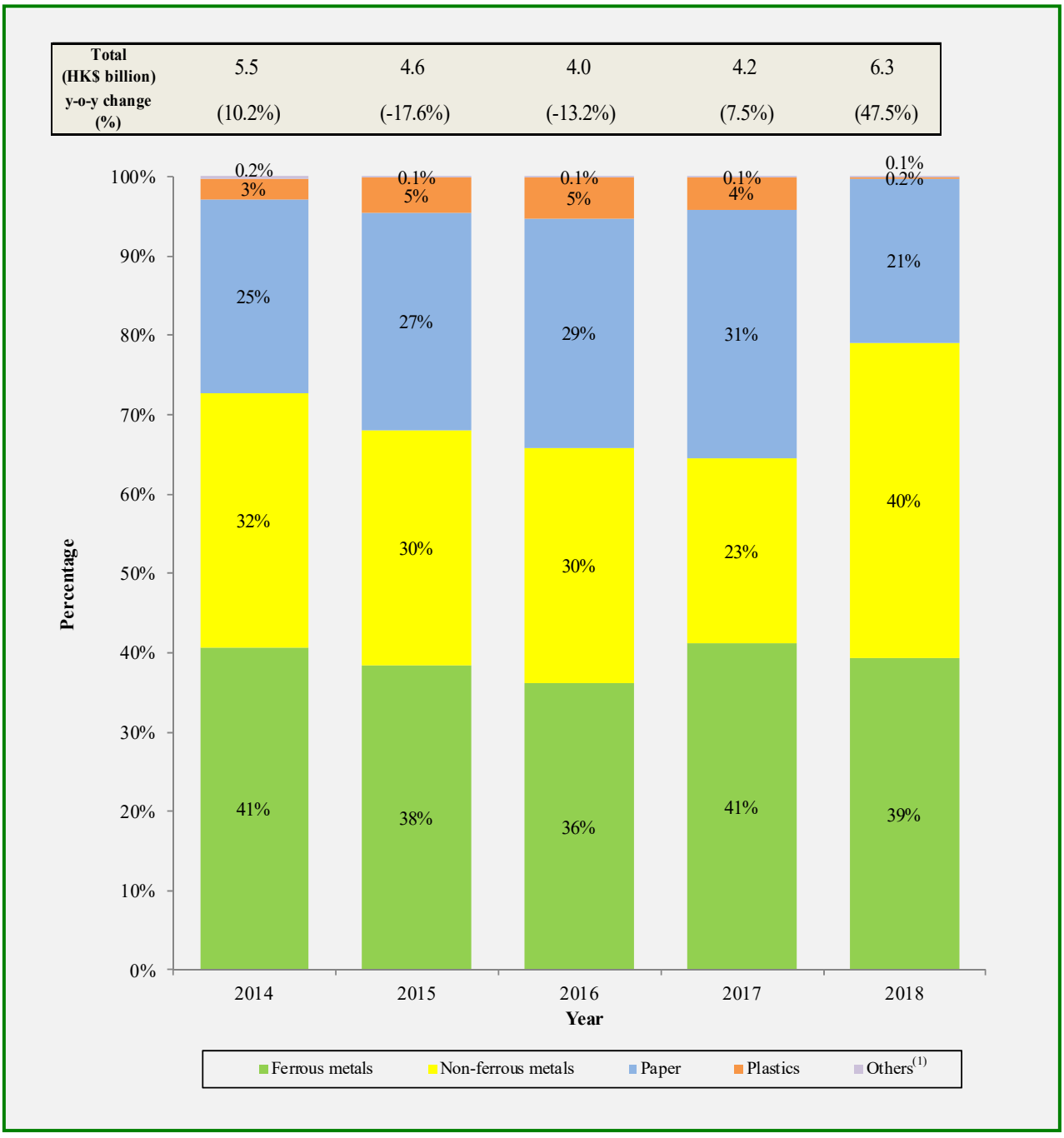
Plate 3.10 Recyclables recovered from MSW in quantities from 2014 to 2018 - By major type of recyclable

	2014	2015	2016	2017	2018
Total (million tonnes)	2.05	2.03	1.91	1.83	1.78
y-o-y change (%)	(2.2%)	(-1.0%)	(-5.9%)	(-4.3%)	(-2.9%)



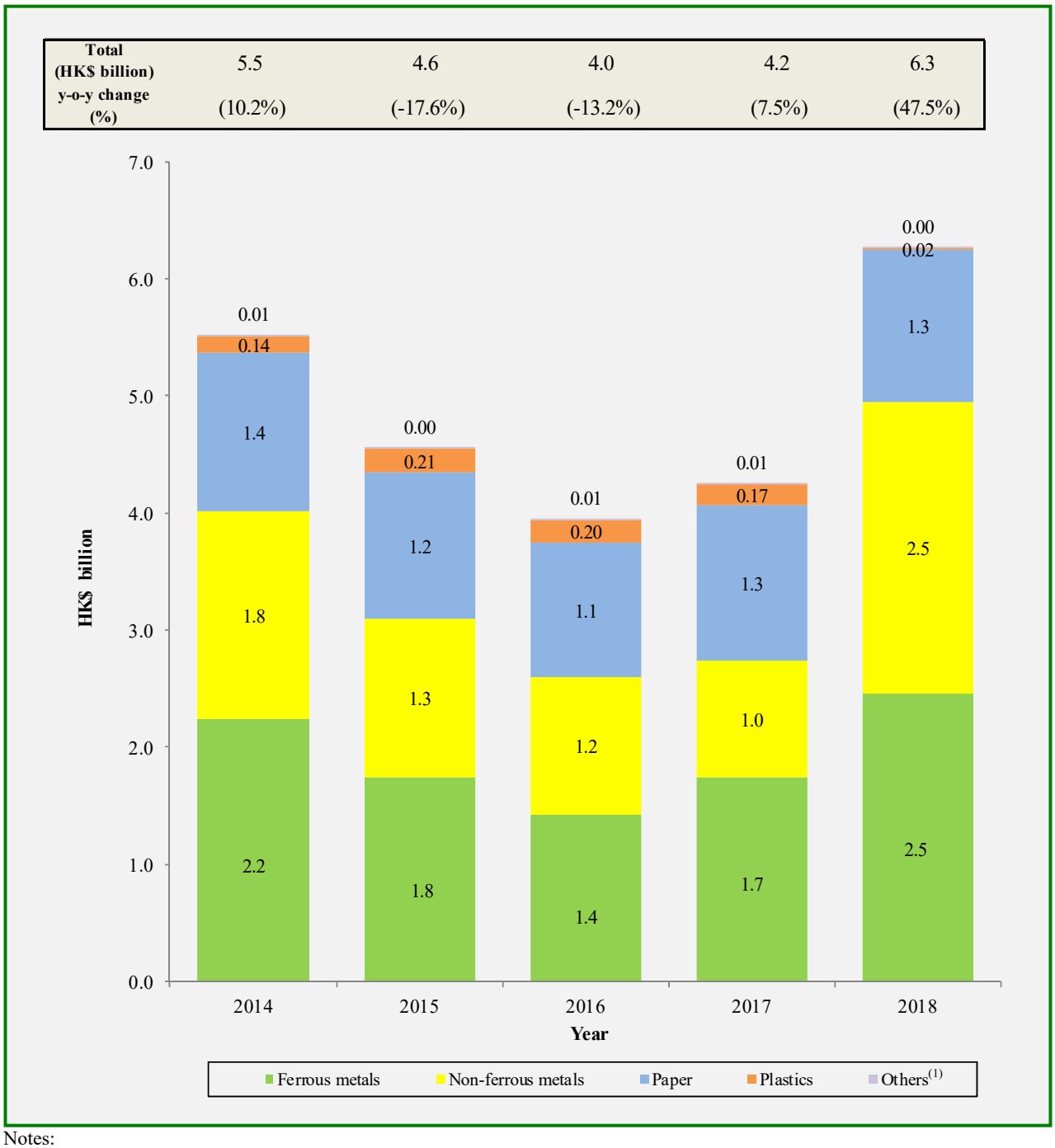
Note:
(1) Others include glass, wood, rubber tyres, textiles, food waste, electrical and electronic equipment, and yard waste.

Plate 3.11 Values of exported recyclable materials recovered from MSW in percentages from 2014 to 2018 – By major type of recyclable material



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

Plate 3.12 Values of exported recyclable materials recovered from MSW from 2014 to 2018 - By major type of recyclable material



Notes:

(1) Others include glass, wood, textiles and rubber tyres only.

(2) Values less than HK$5 million are shown as 0.00.

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 main 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 three categories: domestic waste, commercial waste and industrial waste.

- **Domestic waste** refers to household waste, waste generated from daily activities in institutional premises (e.g. schools, government offices) 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.

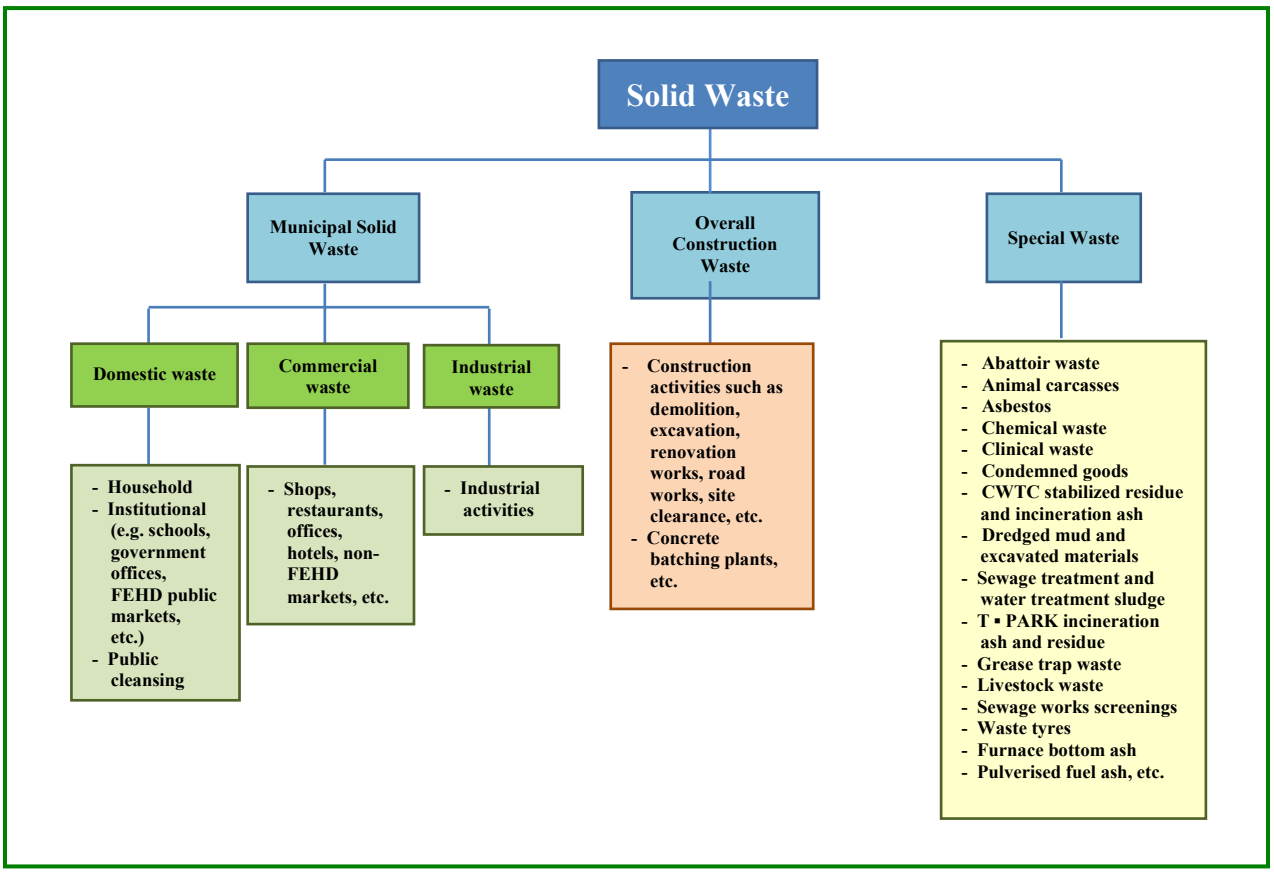
- Municipal solid waste contains a small portion of bulky items like furniture and domestic appliances which cannot be handled by conventional compactor type refuse collection vehicles. These items are regarded as **bulky waste** and are usually collected separately.

Overall construction waste includes waste or surplus materials arising from construction activities such as site clearance, refurbishment, renovation, demolition, land excavation and road works. It also includes waste concrete that is generated from concrete batching plants, cement plaster/mortar plants not set up inside construction sites. The overall construction waste is sorted into inert materials (called public fill) and construction and demolition (C&D) waste (basically non-inert waste), where inert materials like debris, rubble, concrete and earth are reused in construction sites, or as fill in reclamation sites when available. C&D waste are disposed of at landfills.

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 and incineration ash, dredged mud and excavated materials, sewage treatment and water treatment sludge, T ▪ PARK incineration ash and residue, 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



Monitoring 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 at landfills and RTSs;
- Results of waste recovery survey conducted on the local recycling industry;
- Statistics provided by relevant groups of EPD; and
- Statistics provided by other departments including FEHD, CEDD and C&SD.

Appendix 2: Terminology of Waste Management System

Under the statistical framework of solid waste, waste is an unwanted material or product which has been consumed, or is unsuitable for consumption as perceived by the generator. The interpretations of common terminology of Hong Kong's Waste Management System are detailed below[1].

- **Waste management system (WMS)** of Hong Kong comprises the public sector, private recyclers, and green groups in Hong Kong which engage in treatment of wastes or recyclables.

- **Waste disposal** is locally generated waste that are disposed of at strategic landfills managed by EPD.

- **Resource recovery** refers to recycling, reuse, or composting of locally recovered recyclables in Hong Kong or other economies. Resource recovery activities divert wastes from local landfills for further uses.

- **Waste generation** is waste locally generated in Hong Kong and passes through the WMS. The generation quantity of waste equals the sum of quantities of waste disposal and resource recovery.

- **Waste avoidance** refers to the reduction in the quantity of waste entering the WMS, as a result of preventing the creation of waste at source or treatment of waste outside of the WMS. For example, wastes directly recycled or reused at the place of generation by private sector (e.g. on-site composting) or exchange of unprocessed second-hand products are regarded as waste avoidance. Waste avoidance falls outside of the scope of WMS, and is not measured in waste statistics in this report.

- **Waste recovery rate** is calculated as the proportion of resource recovery in waste generation.

- **Per capita waste disposal rate** is the quantity of waste disposed of at landfills on a daily basis by an average person of the Hong Kong population.

[1] The terminology applies to municipal solid waste (MSW) and overall construction waste only.