# MONITORING OF SOLID WASTE IN HONG KONG

## *Waste Statistics for 2017*


**Environmental Protection Department**

# Monitoring of Solid Waste in Hong Kong
## *Waste Statistics for 2017*


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|---|---|
| **Date of issue:** | **December 2018**<br>**(1st revision: January 2019)** |
| **Work done by:** | **Statistics Unit,**<br>**Environmental Protection Department** |
| **Security classification:** | **Unrestricted** |


**Cover photos**

| | |
|---|---|
| **Top left:** | **Community Green Station in Sham Shui Po** |
| **Bottom left:** | **Bird's eye view of North Lantau Transfer Station** |
| **Top right:** | **Recycling plant for waste wood in EcoPark** |
| **Bottom right:** | **Waste composition survey in progress under the supervision of EPD supervisor** |

*Remarks:* *The 1st revision includes update of 2015 Commercial and Industrial (C&I) food waste disposal rate to 2016 figure in Introduction section.*

# Contents

# 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 |
| 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 |
| NWNTRTS | North West New Territories Refuse 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 | Sha Tin Transfer Station |
| tpd | tonnes per day |
| WEEE | Waste electrical and electronic equipment |
| 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 2017. 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. Abbreviations used in this report are listed on page iv for ease of reference. Readers may wish to note that due to rounding off, figures of various plates may not add up to total and percentages may not add up to 100.

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 2017

### Total Solid Waste

Solid waste comprises municipal solid waste (MSW), overall construction waste, and special waste. In 2017, the total quantity of solid waste disposed of at the strategic landfills was 5.66 million tonnes. The average daily quantity was 15,516 tonnes per day (tpd), which has increased by 1.2% compared to 2016 (**Plate 2.1**). The growth rate of total solid waste disposal remained steady (it was 1.5% in 2016 and 1.6% in 2015).

### Municipal Solid Waste

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

In 2017, the quantity of MSW disposal was 10,733 tpd (3.92 million tonnes), which represented an increase of 3.7% compared to 2016. The major component of MSW is domestic waste. Its quantity of disposal was 6,404 tpd (2.34 million tonnes) in 2017, which has increased by 0.2% compared to 2016. Separately, the quantity of commercial and industrial (C&I) waste disposed of was 4,329 tpd (1.58 million tonnes) in 2017, which has increased by 9.5% when compared to 2016.

Discounting the factor of population growth, the disposal rate of MSW was 1.45 kg/person/day, compared to 1.41 kg/person/day in 2016. The disposal rate of domestic waste was 0.87 kg/person/day, remaining at the same level as in 2016. The relatively stable domestic waste disposal rate in recent years implies that the growth in domestic waste disposal has broadly been in line with the growth in population.

On the other hand, the disposal quantity of C&I waste rose by 9.5% compared to 2016. Generally speaking, commercial waste arising correlates with the level of consumption activities. The increase in commercial waste disposal in 2017 could be partly due to a vibrant local economy.

**Plates 2.8 and 2.9** show the composition of MSW disposed of at landfills in 2017.

Of the 10,733 tonnes of MSW landfilled each day in 2017, some 3,662 tonnes (34% of MSW) were ***food waste***, which has increased by 1.7% compared to 2016. Domestic food waste disposal rate remained at 0.32 kg/person/day in 2017, while C&I food waste disposal rate trended upwards from 0.17 kg/person/day in 2016 to 0.18 kg/person/day in 2017. We will continue promoting food waste avoidance, reduction and recycling particularly in C&I sectors. The commencement of Organic Resources Recovery Centre Phase 1 (O • PARK1) in July 2018 is expected to bring down food waste disposal and boost up recovery.

The second largest constituent of MSW was ***waste paper***. Some 2,532 tonnes per day (24% of MSW) were disposed of at landfills in 2017, increasing by 12.8% compared to 2016. The third largest constituent of MSW was ***waste plastics***, with a daily disposal quantity of 2,124 tonnes per day (20% of MSW) in 2017, dropping slightly by 0.4%.

The Government introduced the amendment bill on Municipal Solid Waste charging into the Legislative Council in November 2018. This charging scheme, if and when implemented, will provide necessary financial incentives to drive behavioural changes in the community, thus reducing overall MSW disposal.

Overall Construction Waste

The quantity of overall construction waste disposed of at landfills in 2017 was 4,207 tpd (1.54 million tonnes), which has decreased by 4.9% compared to 2016. In recent years, the reuse rate of inert materials sorted out from construction waste has remained at above 90%, and was 92% in 2017. These materials were delivered to the public fill reception facilities and other outlets for beneficial direct reuse.

Special Waste

In 2017, the quantity of special waste disposed of at landfills was 575 tpd (0.21 million tonnes), which has increased by 1.9% compared to 2016. In April 2015, the Sludge Treatment Facility (T ▪ PARK) in Tuen Mun started treating dewatered sewage sludge from major sewage treatment works managed by the Drainage Services Department by incineration, leading to a cumulative reduction of 88% in disposal of dewatered sludges at landfills in 2017 compared with 2014. On average, 1,058 tonnes of dewatered sewage sludges per day was treated at the T ▪ PARK in 2017.

## Resource Recovery in 2017

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 jurisdictions 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 2017, the total quantity of MSW recyclables recovered was 1.83 million tonnes, which decreased by 4.3% compared to 2016. 97% of the recovered materials were exported to the Mainland and other economies for recycling in 2017, with an export value of $4.2 billion compared to $4.0 billion in 2016 (**Plate 3.7**). The overall MSW recovery rate was 32%, which has decreased from 34% in 2016 (**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 markets outside Hong Kong that persisted in recent years are expected to continue to affect the overall performance of the recycling industry. Moreover, authorities in nearby economies 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.

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

*Metal recyclables* have the highest recovery rate at 90% in 2017 among all recyclable types, as they are highly reusable and relatively valuable in markets outside Hong Kong. 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 65% in 2017. Similar to metal recyclables, the recyclable value of WEEE is relatively high which attracts local recyclers to actively engage in WEEE recovery. The full commissioning of the Government's WEEE Treatment and Recycling Facility (WEEE PARK) in March 2018 and the implementation of the producer responsibility scheme on WEEE in August 2018 will further promote beneficial recycling and reuse of the regulated WEEE.

*Paper recyclables*' recovery rate declined from 50% in 2016 to 46% in 2017, which was partly attributed to a marked increase in the disposal quantity of waste paper. Also, the export quantity of paper recyclables continued to decrease as importing economies had tightened their import control.

*Plastics recyclables'* recovery rate slightly decreased from 14% in 2016 to 13% in 2017. The quantity of plastic recyclables recovered from MSW decreased by 8% compared to 2016, as the reduction in exports of plastic recyclables more than offset the expansion of local recycling of plastic recyclables.

# 2. Waste Quantities and Characteristics

**Plate 2.1 Disposal of total solid waste at landfills in 2017 - By main waste category**

| Waste category[1] | | | Average daily quantity (tpd) | |
|---|---|---|---|---|
| **a.** | **Municipal solid waste** | | **10,733** | (3.7%) |
| | **(i)** | **Domestic waste** | **6,404** | (0.2%) |
| | **(ii)** | **Commercial waste** | **3,220** | (6.3%) |
| | **(iii)** | **Industrial waste** | **1,109** | (19.8%) |
| **b.** | **Overall construction waste** | | **4,207** | (-4.9%) |
| **c.** | **Special waste[2]** | | **575** | (1.9%) |
| **d.** | **Total waste received at landfills (a+b+c)** | | **15,516** | (1.2%) |

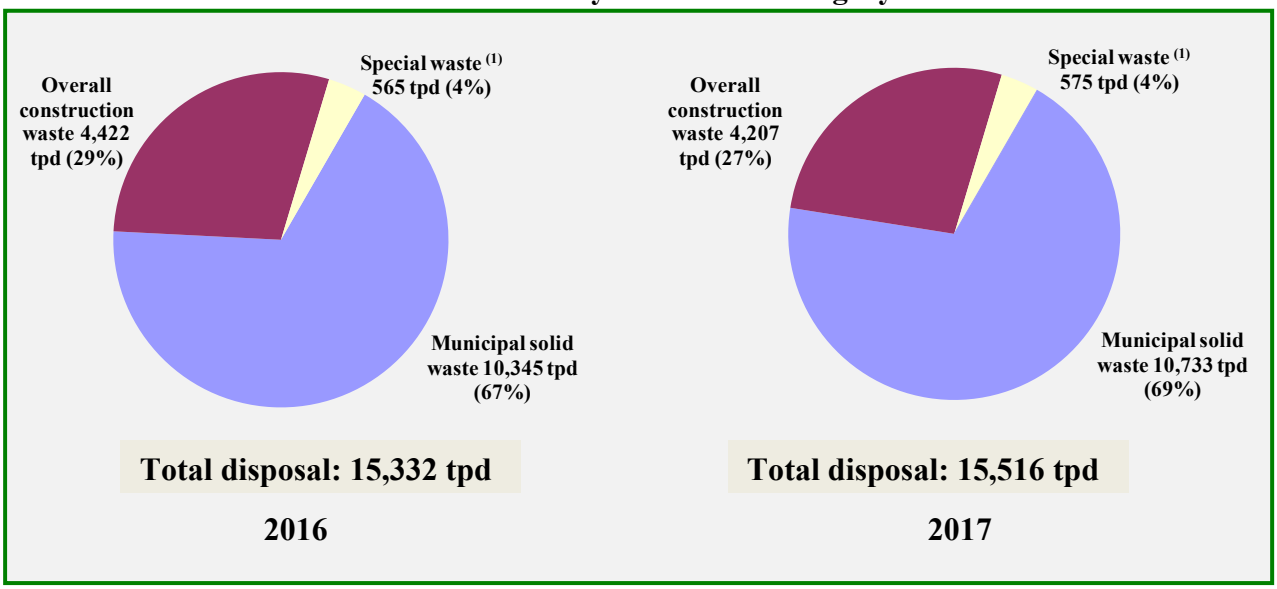
Notes:

(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 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.

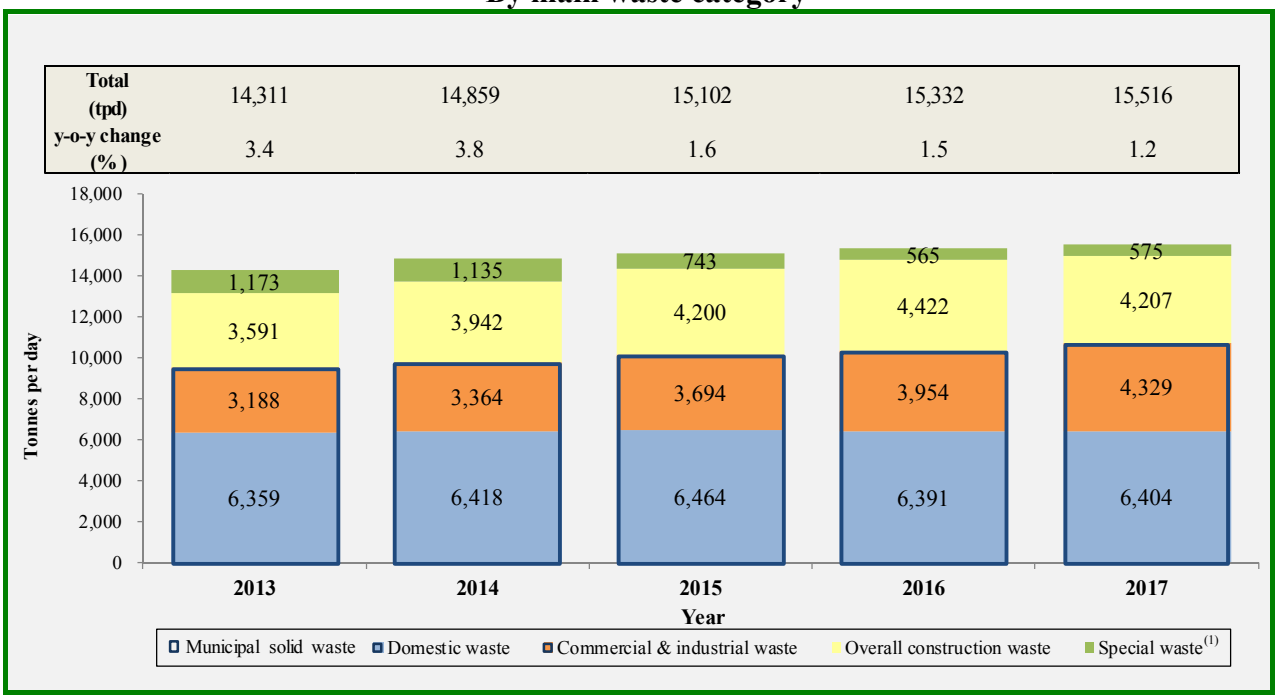
## Plate 2.2 Disposal of total solid waste at landfills in 2016 and 2017 - By main waste category




Note:

(1) The quantity does not include special waste not disposed of at landfills. From April 2015 onwards, dewatered 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.

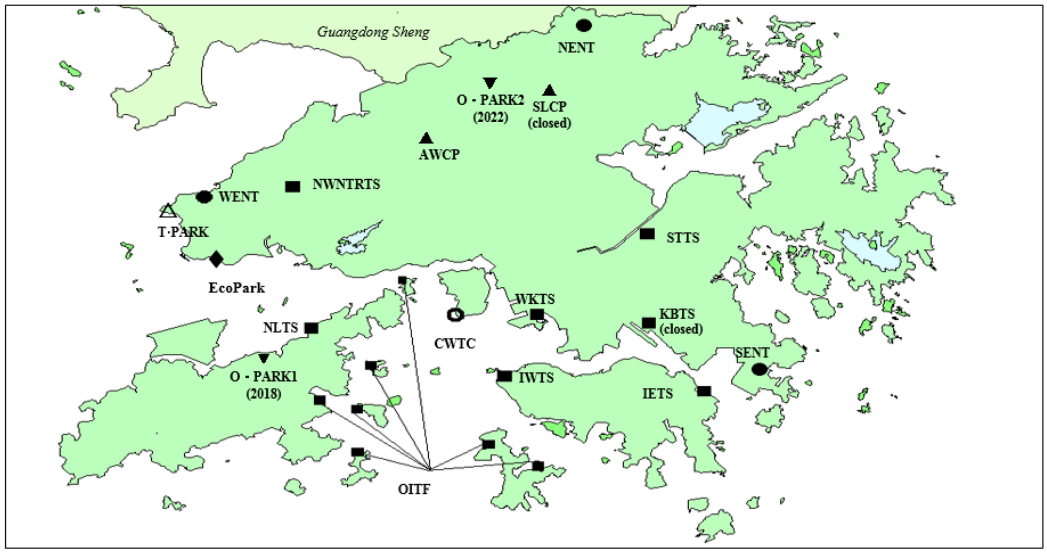
## Plate 2.3 Disposal of total solid waste at landfills from 2013 to 2017 - By main waste category




Note:

(1) The quantity does not include special waste not disposed of at landfills. From April 2015 onwards, dewatered 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 - Sha Tin Transfer Station(3) |
| | | NWNTRTS - North West New Territories Refuse 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 | ♦ | EcoPark |
| O • PARK | ▼ | Organic Resources Recovery Centre (7) |
| Sludge Treatment Facility | △ | T ▪ PARK (8) |

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 NWNTRTS was transferred to WENT by road.

(5) KBTS was closed in April 2005 and converted to a waste recycling centre.

(6) SLCP has stopped operation since October 2010.

(7) O • PARK1 at Siu Ho Wan commenced operation in July 2018, whilst O • PARK2 at Shaling is scheduled for commissioning in 2022.

(8) From April 2015 onwards, dewatered 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 2017 - By main waste category

| Disposal facility - RTS | Average daily quantity (tpd) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | MSW | | Overall construction waste | | Special waste[1] | | Total | |
| IETS - Island East Transfer Station | 1,194 | (1.7%) | - | - | - | - | 1,194 | (1.7%) |
| STTS - Sha Tin Transfer Station | 1,503 | (9.8%) | - | - | - | - | 1,503 | (9.8%) |
| IWTS - Island West Transfer Station | 1,161 | (4.5%) | - | - | - | - | 1,161 | (4.5%) |
| WKTS - West Kowloon Transfer Station | 2,681 | (0.6%) | - | - | 471 | (26.9%) | 3,152 | (3.8%) |
| OITF - Outlying Islands Transfer Facilities | 87 | (4.3%) | 45 | (-1.2%) | 4 | (-4.4%) | 137 | (2.1%) |
| NLTS - North Lantau Transfer Station | 636 | (0.2%) | - | - | 1 | (-17.7%) | 636 | (0.1%) |
| NWNTRTS - North West New Territories Refuse Transfer Station | 1,211 | (3.9%) | - | - | - | - | 1,211 | (3.9%) |

| Disposal facility - Landfill[2] | Average daily quantity (tpd) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | MSW | | Overall construction waste | | Special waste[1] | | Total | |
| WENT - West New Territories Landfill | 7,616[2] | (2.9%) | 747[2] | (-26.8%) | 363[2] | (-6.6%) | 8,726[2] | (-1.0%) |
| SENT - South East New Territories Landfill[3] | - | - | 2,300 | (-7.4%) | - | - | 2,300[3] | (-8.0%) |
| NENT - North East New Territories Landfill | 3,117[2] | (6.6%) | 1,160 | (26.1%) | 213[2] | (21.0%) | 4,490[2] | (11.7%) |
| Landfills' total | 10,733 | (3.7%) | 4,207 | (-4.9%) | 575 | (1.9%) | 15,516 | (1.2%) |

Notes:

(1) Please refer to Plate 2.13b for special waste not disposed of at landfills. From April 2015 onwards, dewatered 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 2017 - 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 | 338 | 223 | 561 | 163 |
| Eastern | 452 | 155 | 607 | 106 |
| Southern | 230 | 66 | 295 | 90 |
| Wanchai | 232 | 101 | 332 | 87 |
| Hong Kong Island Sub-total | 1,251 | 544 | 1,796 | 445 |
| Kowloon City | 310 | 101 | 411 | 248 |
| Kwun Tong | 469 | 244 | 712 | 376 |
| Sham Shui Po | 374 | 100 | 473 | 148 |
| Wong Tai Sin | 282 | 85 | 367 | 41 |
| Yau Tsim Mong | 538 | 305 | 843 | 249 |
| Kowloon Sub-total | 1,973 | 834 | 2,807 | 1,062 |
| Kwai Tsing | 356 | 386 | 742 | 157 |
| North | 311 | 322 | 633 | 149 |
| Sai Kung | 326 | 94 | 421 | 1,048 |
| Sha Tin | 443 | 477 | 920 | 144 |
| Tai Po | 301 | 160 | 460 | 81 |
| Tsuen Wan | 265 | 249 | 514 | 62 |
| Tuen Mun | 409 | 450 | 859 | 740 |
| Yuen Long | 620 | 583 | 1,203 | 123 |
| NT- Mainland Sub-total | 3,032 | 2,722 | 5,753 | 2,504 |
| Cheung Chau | 23 | - | - | - |
| Hei Ling Chau | 2 | - | - | - |
| Lamma Island | 7 | - | - | - |
| Ma Wan | 15 | - | - | - |
| Mui Wo | 19 | - | - | - |
| North Lantau | 76 | - | - | - |
| Peng Chau | 5 | - | - | - |
| NT-Outlying Islands Sub-total | 148 | 229[4] | 377[4] | 196[4] |
| Total | 6,404 | 4,329 | 10,733 | 4,207 |

Notes:

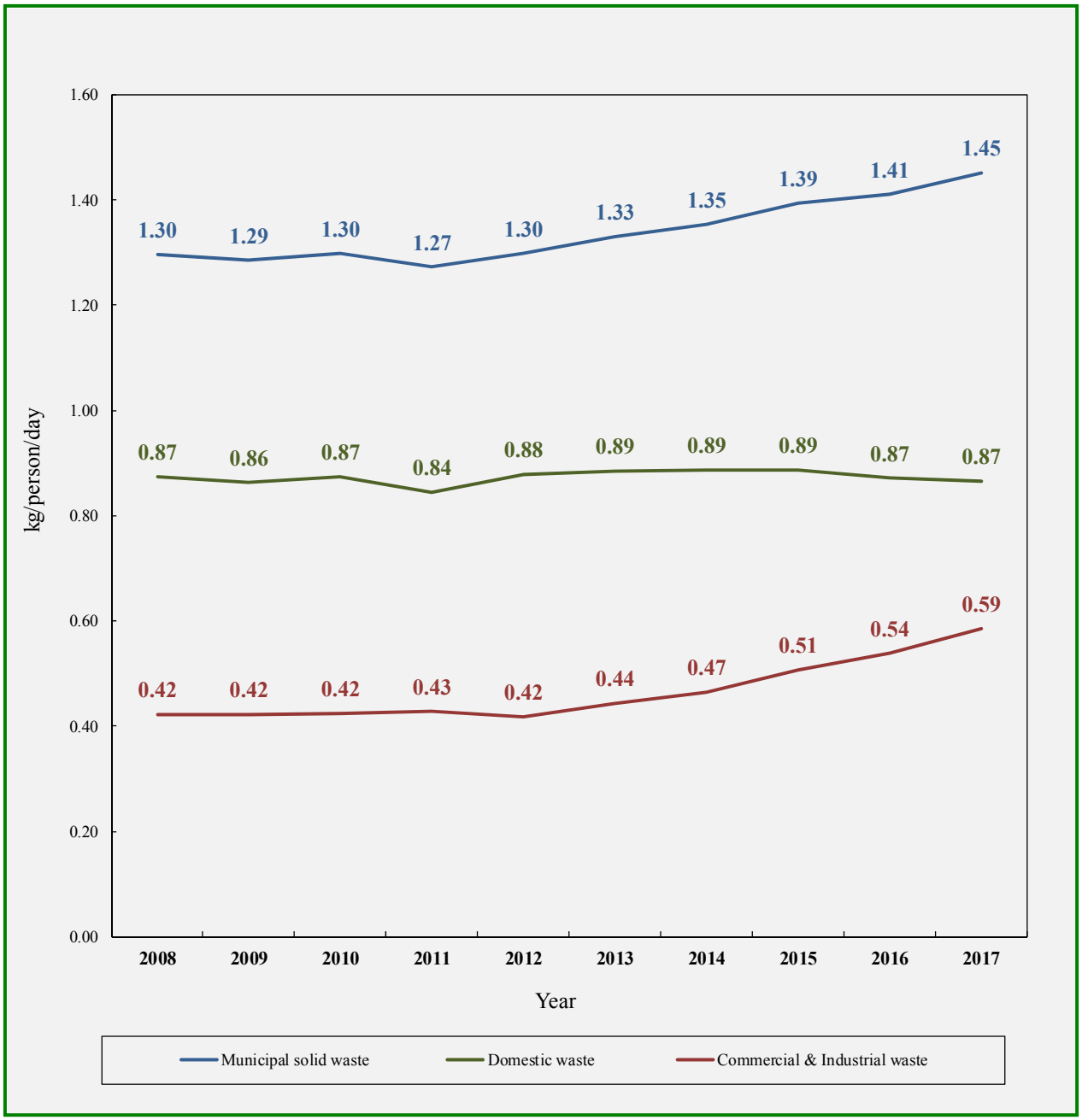
(1) The geographical distribution of solid waste arisings is mainly estimated from waste intake records taken at waste treatment facilities and should be regarded as indicative reference only.

(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 2008 to 2017**




Note:

(1) The per capita disposal rates are calculated based on the population data (mid-year) updated by the C&SD in August 2018.

## Plate 2.8 Composition of MSW disposed of at landfills in 2017 - By waste type

| Composition | Average daily quantity (tpd) and percentage shares by weight | | | | |
|---|---|---|---|---|---|
| | Domestic waste (a) | Commercial waste (b) | Industrial waste (c) | Commercial & industrial waste (d)=(b)+(c) | Municipal solid waste (e)=(a)+(d) |
| **Glass** | **182** (2.8%) | **96** (3.0%) | **13** (1.1%) | **109** (2.5%) | **291** (2.7%) |
| **Metals** | **117** (1.8%) | **88** (2.7%) | **47** (4.3%) | **135** (3.1%) | **252** (2.3%) |
| **Paper** | **1,446** (22.6%) | **803** (24.9%) | **283** (25.6%) | **1,086** (25.1%) | **2,532** (23.6%) |
| **Plastics** | **1,217** (19.0%) | **679** (21.1%) | **228** (20.5%) | **907** (20.9%) | **2,124** (19.8%) |
| **Putrescibles** | **2,827** (44.1%) | **1,263** (39.2%) | **170** (15.3%) | **1,433** (33.1%) | **4,260** (39.7%) |
| **Textiles** | **247** (3.9%) | **69** (2.1%) | **54** (4.9%) | **123** (2.8%) | **370** (3.4%) |
| **Wood/Rattan** | **78** (1.2%) | **114** (3.6%) | **137** (12.4%) | **252** (5.8%) | **330** (3.1%) |
| **Household hazardous wastes (HHWs)[(1)]** | **140** (2.2%) | **32** (1.0%) | **51** (4.6%) | **84** (1.9%) | **224** (2.1%) |
| **Others[(2)]** | **152** (2.4%) | **76** (2.3%) | **125** (11.3%) | **201** (4.6%) | **352** (3.3%) |
| **Total** | **6,404** (100%) | **3,220** (100%) | **1,109** (100%) | **4,329** (100%) | **10,733** (100%) |

Notes:

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

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

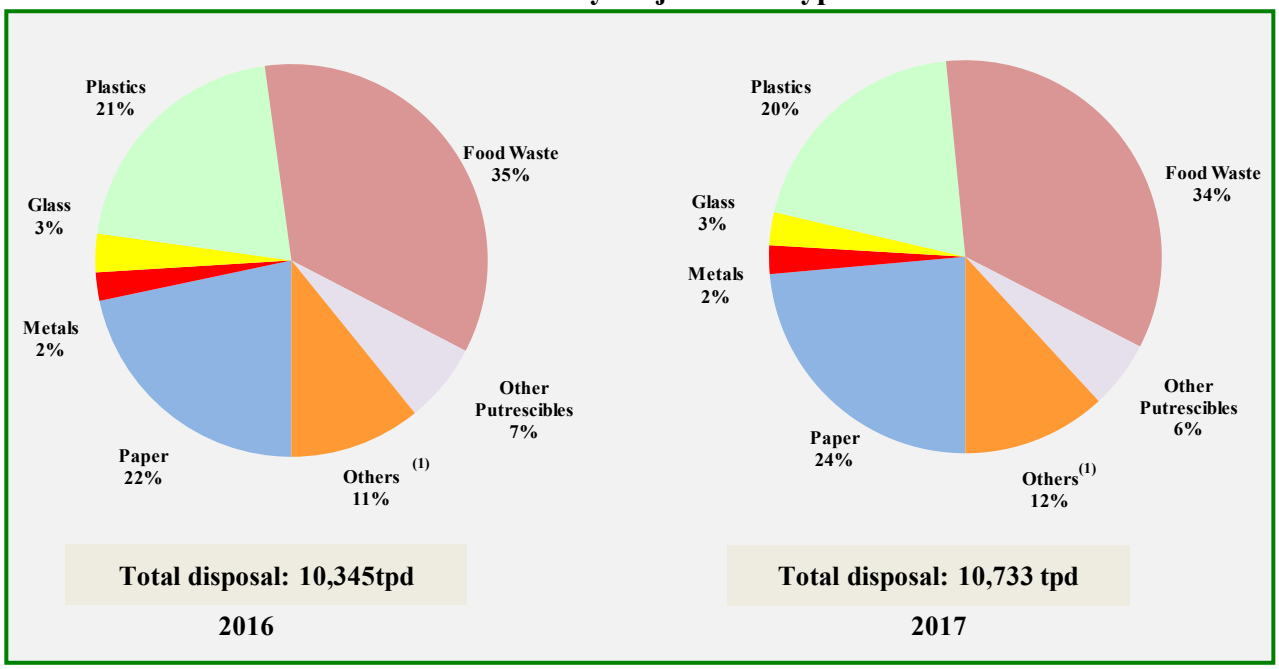
(3) Figures in brackets refer to percentage shares by weight.

## Plate 2.9 Composition of MSW disposed of at landfills in 2017 – 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** | (2.1%) | **87** | (2.0%) | **220** | (2.1%) |
| **- Other glass** | **48** | (0.8%) | **22** | (0.5%) | **70** | (0.7%) |
| **(Glass) Sub-total** | **182** | **(2.8%)** | **109** | **(2.5%)** | **291** | **(2.7%)** |
| **Metals** | | | | | | |
| **- Aluminium cans** | **18** | (0.3%) | **12** | (0.3%) | **30** | (0.3%) |
| **- Ferrous metals** | **92** | (1.4%) | **109** | (2.5%) | **201** | (1.9%) |
| **- Other non-ferrous metals** | **6** | (0.1%) | **15** | (0.3%) | **21** | (0.2%) |
| **(Metals) Sub-total** | **117** | **(1.8%)** | **135** | **(3.1%)** | **252** | **(2.3%)** |
| **Paper** | | | | | | |
| **- Cardboard** | **268** | (4.2%) | **399** | (9.2%) | **667** | (6.2%) |
| **- Newsprint** | **309** | (4.8%) | **105** | (2.4%) | **415** | (3.9%) |
| **- Office paper** | **90** | (1.4%) | **63** | (1.5%) | **154** | (1.4%) |
| **- Tetrapak** | **46** | (0.7%) | **33** | (0.8%) | **79** | (0.7%) |
| **- Others** (1) | **732** | (11.4%) | **486** | (11.2%) | **1,219** | (11.4%) |
| **(Paper) Sub-total** | **1,446** | **(22.6%)** | **1,086** | **(25.1%)** | **2,532** | **(23.6%)** |
| **Plastics** | | | | | | |
| **- Non-PET plastic bottles** | **53** | (0.8%) | **19** | (0.4%) | **72** | (0.7%) |
| **- PET plastic bottles** | **81** | (1.3%) | **56** | (1.3%) | **137** | (1.3%) |
| **- Plastic bags** | **514** | (8.0%) | **279** | (6.5%) | **793** | (7.4%) |
| **- Plastic dining wares** | **95** | (1.5%) | **71** | (1.6%) | **166** | (1.5%) |
| **- Polyfoam-dining wares** | **26** | (0.4%) | **12** | (0.3%) | **39** | (0.4%) |
| **- Polyfoam-others** | **15** | (0.2%) | **29** | (0.7%) | **44** | (0.4%) |
| **- Others** (2) | **432** | (6.8%) | **441** | (10.2%) | **873** | (8.1%) |
| **(Plastics) Sub-total** | **1,217** | **(19.0%)** | **907** | **(20.9%)** | **2,124** | **(19.8%)** |
| **Putrescibles** | | | | | | |
| **- Food waste** | **2,363** | (36.9%) | **1,299** | (30.0%) | **3,662** | (34.1%) |
| **- Yard waste**(3) | **121** | (1.9%) | **45** | (1.0%) | **166** | (1.5%) |
| **- Others**(4) | **342** | (5.3%) | **89** | (2.1%) | **431** | (4.0%) |
| **(Putrescibles) Sub-total** | **2,827** | **(44.1%)** | **1,433** | **(33.1%)** | **4,260** | **(39.7%)** |

Notes:
(1) Other paper waste includes tissue paper, paper bags, etc.
(2) Other plastics waste includes packaging materials, toys, off-cuts, scrap, etc.
(3) Yard waste not disposed of at landfills is not included. For example, part of the yard waste collected by AFCD is treated in country parks managed by the Department.
(4) Other putrescibles waste includes cotton personal care products, other organic waste, etc.
(5) Figures in brackets refer to percentage shares by weight.

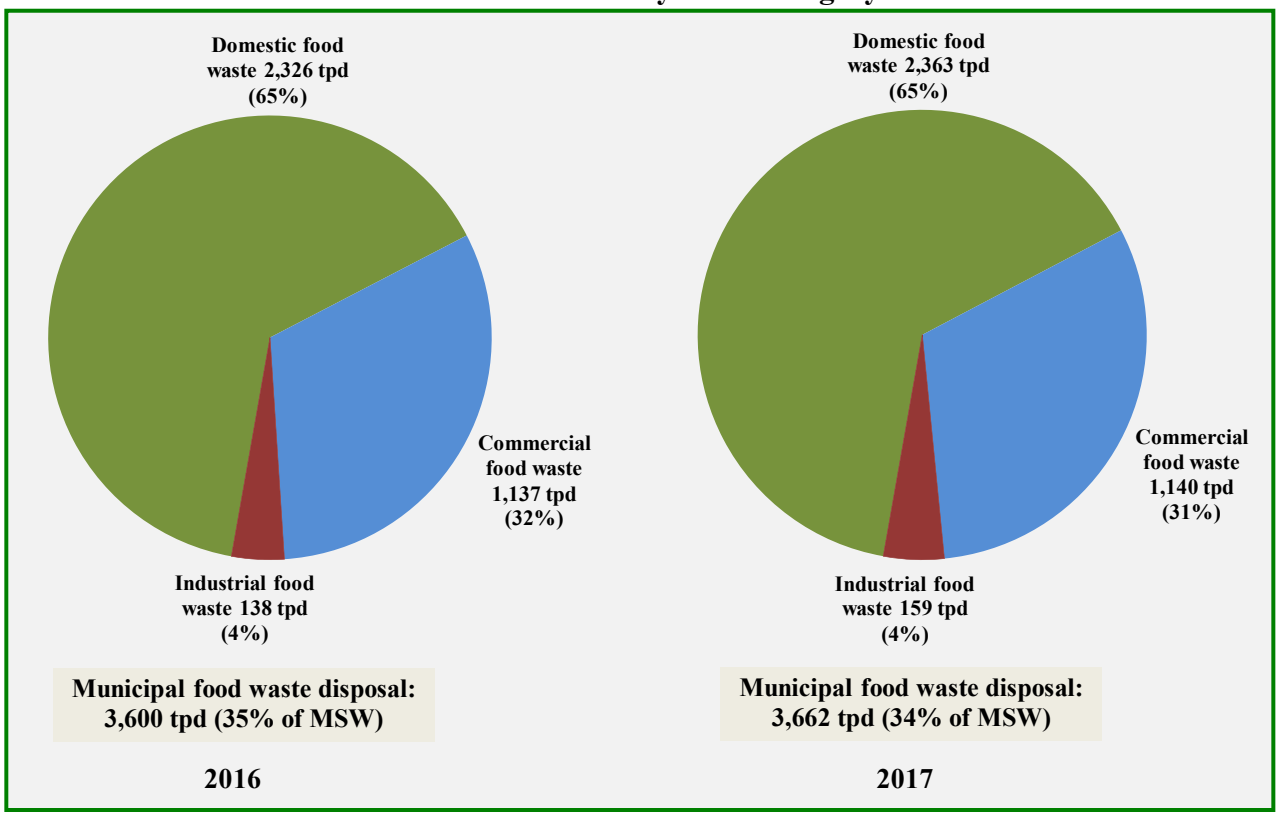
**Plate 2.10 Composition of MSW disposed of at landfills in percentages in 2016 and 2017 – By major waste type**



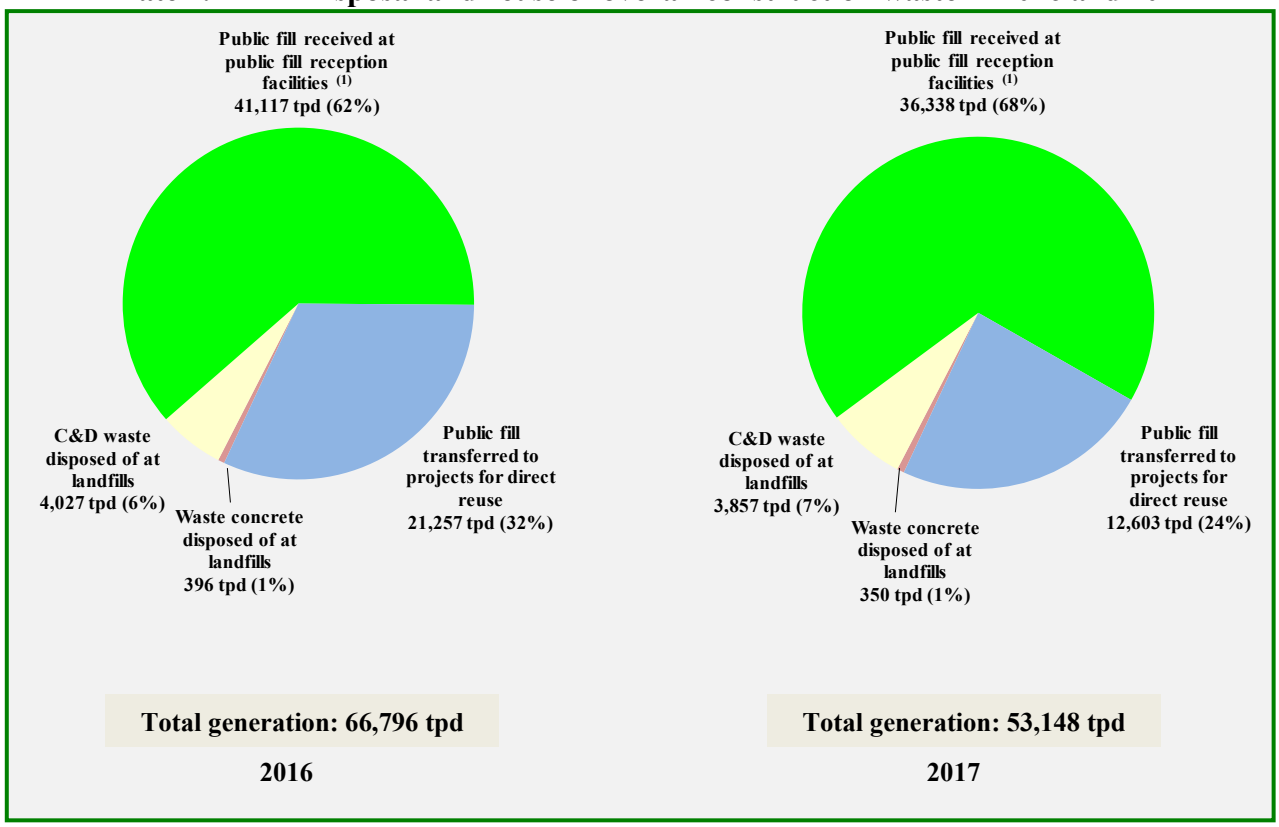

Note:

(1) Others include 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 2016 and 2017 - By waste category**



## Plate 2.12 Disposal and reuse of overall construction waste in 2016 and 2017




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 2017 - By special waste type

| Special waste type | Average daily quantity[1] (tpd) | |
|---|---|---|
| **Abattoir waste** | **12** | (37.0%) |
| **Animal carcasses and kennel waste** | **4** | (-45.9%) |
| **Asbestos waste** | **4** | (-5.0%) |
| **Chemical waste other than asbestos waste** | **7** | (-23.7%) |
| **Clinical waste (with package material)** [2] | **1** | (15.0%) |
| **Condemned goods** | **36** | (10.0%) |
| **Dewatered dredged materials** | **7** | (70.0%) |
| **Dewatered sludges**[3] | **98** | (45.0%) |
| **Dewatered waterworks sludge** | **56** | (-4.5%) |
| **Incineration ash and stabilised residue** | **152** | (-12.3%) |
| **Livestock waste**[4] | **65** | (2.7%) |
| **Sewage works screenings** | **62** | (-4.9%) |
| **Waste tyres**[5] | **73** | (2.9%) |
| **Disposal at Landfills Sub-total** | **575** | (1.9%) |

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 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 2017, 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 2017 (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** | **41** | (19.0%) |
| **Clinical waste** | **CWTC** | **6** | (3.5%) |
| **Grease trap waste** | **WKTS[2]** | **471** | (26.9%) |
| **Horse stable waste** | **AWCP** | **26** | (24.6%) |
| **Dredged mud and excavated materials** | **Marine dumping[3]** | **23,288** | (-56.5%) |
| **Dewatered sewage sludge[4]** | **Incineration at T ▪ PARK** | **1,058** | (-7.5%) |
| **Furnace bottom ash** | **Concrete manufacturing, stored in lagoon[5]** | **120** | (4.4%) |
| **Pulverised fuel ash** | **Concrete manufacturing, stored in lagoon[5]** | **1,156** | (-6.4%) |

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.

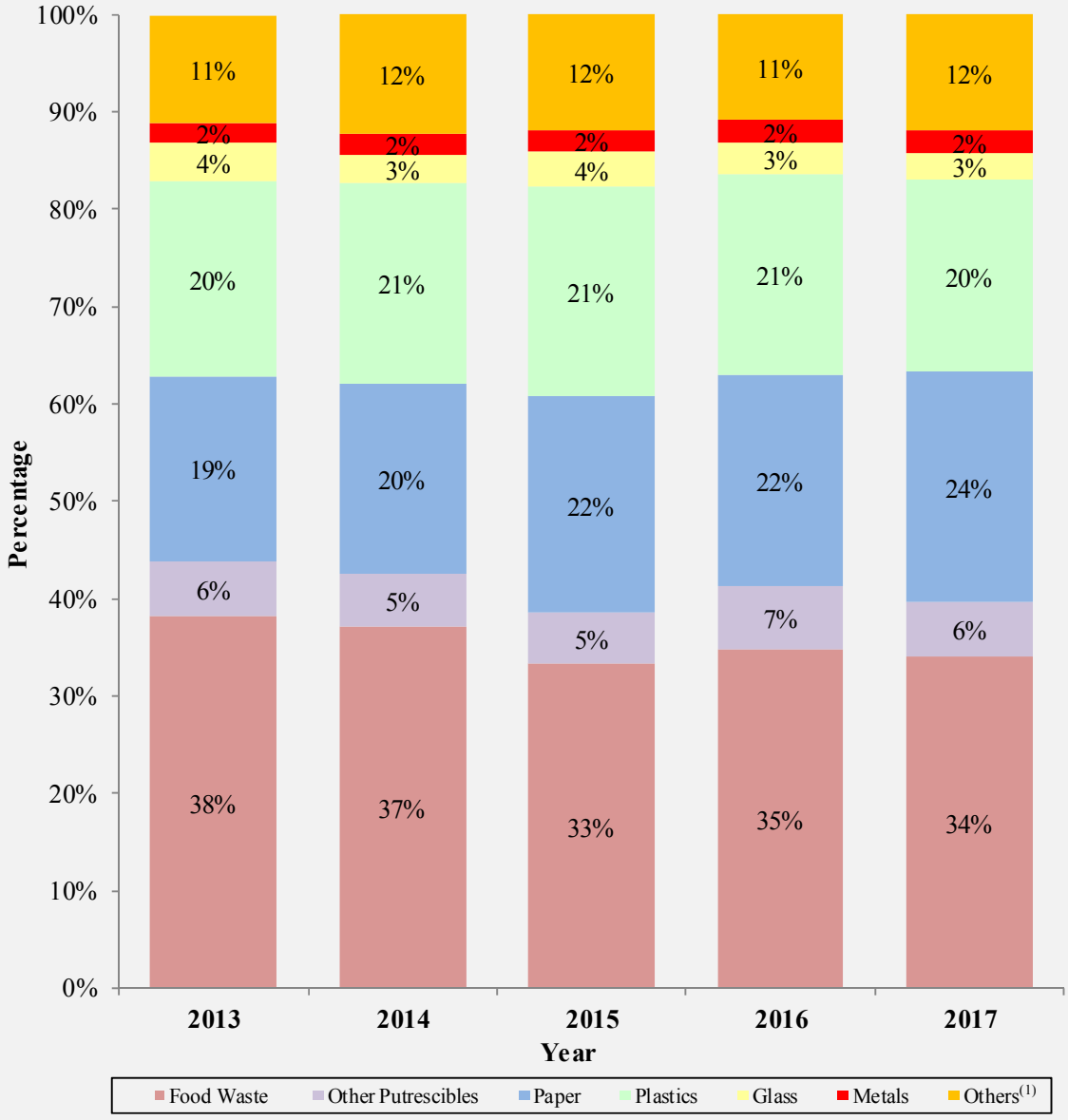
(4) Dewatered sewage sludge from major sewage treatment works managed by Drainage Services Department has been treated by incineration at T ▪ PARK from April 2015 onwards.

(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 2013 to 2017 – By major waste type**

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Total (tpd) | 9,547 | 9,782 | 10,159 | 10,345 | 10,733 |
| y-o-y change (%) | 2.9 | 2.5 | 3.9 | 1.8 | 3.7 |

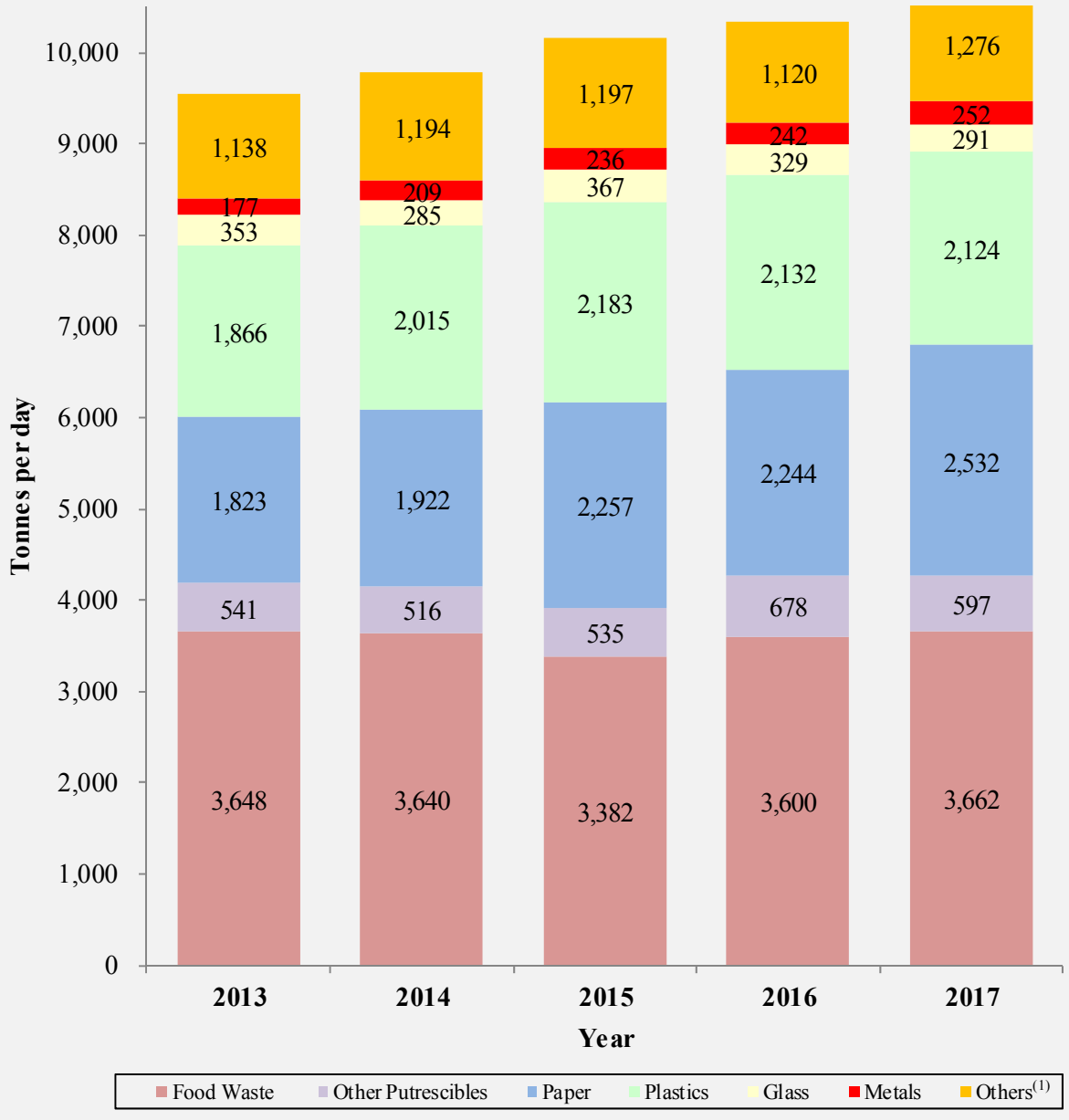



Note:

(1) Others include 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 2013 to 2017 – By major waste type**

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Total (tpd) | 9,547 | 9,782 | 10,159 | 10,345 | 10,733 |
| y-o-y change (%) | 2.9 | 2.5 | 3.9 | 1.8 | 3.7 |

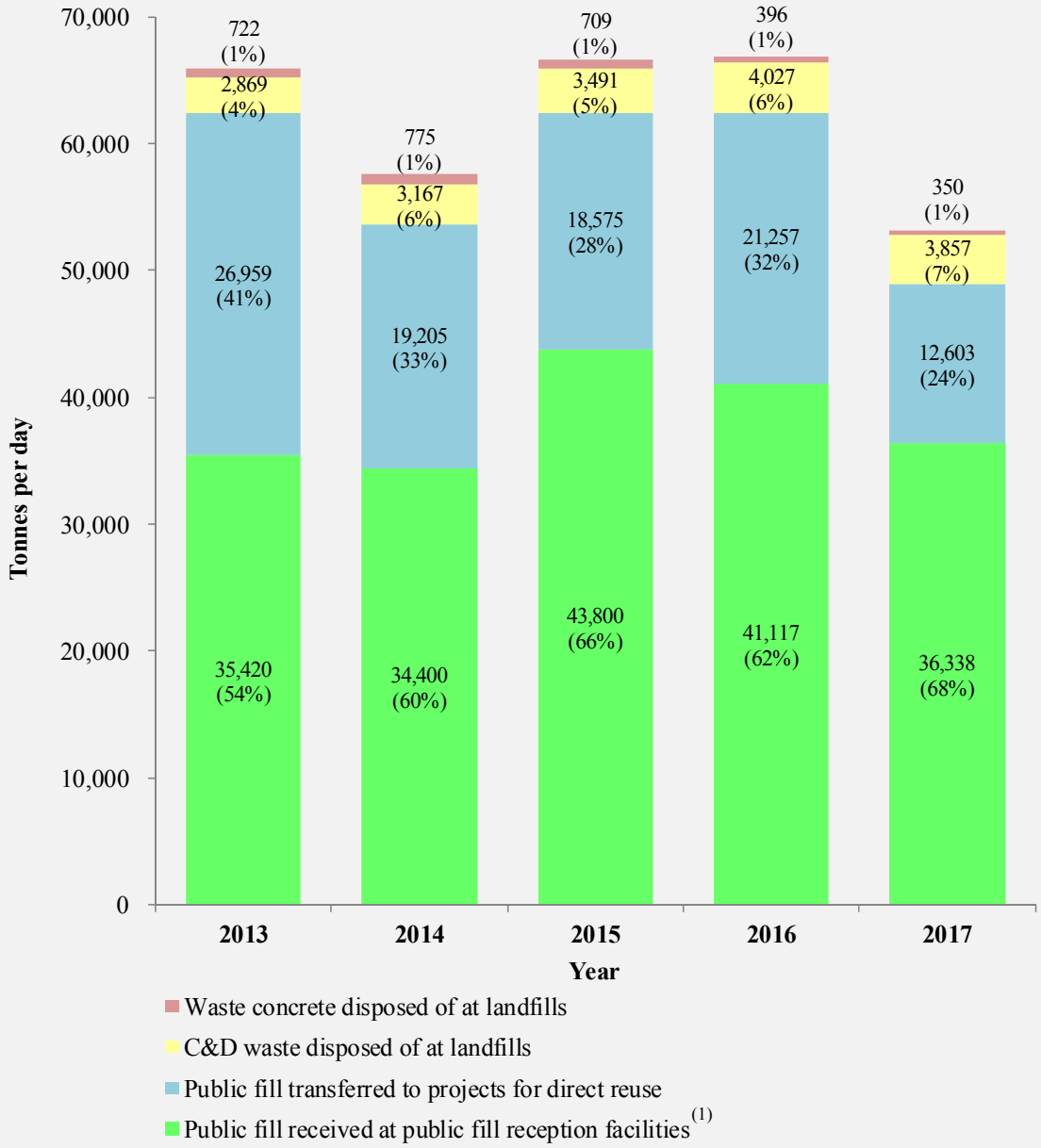



Note:

(1) Others include 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 2013 to 2017**

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Total (tpd) | 65,971 | 57,547 | 66,575 | 66,796 | 53,148 |
| y-o-y change (%) | -1.7 | -12.8 | 15.7 | 0.3 | -20.4 |



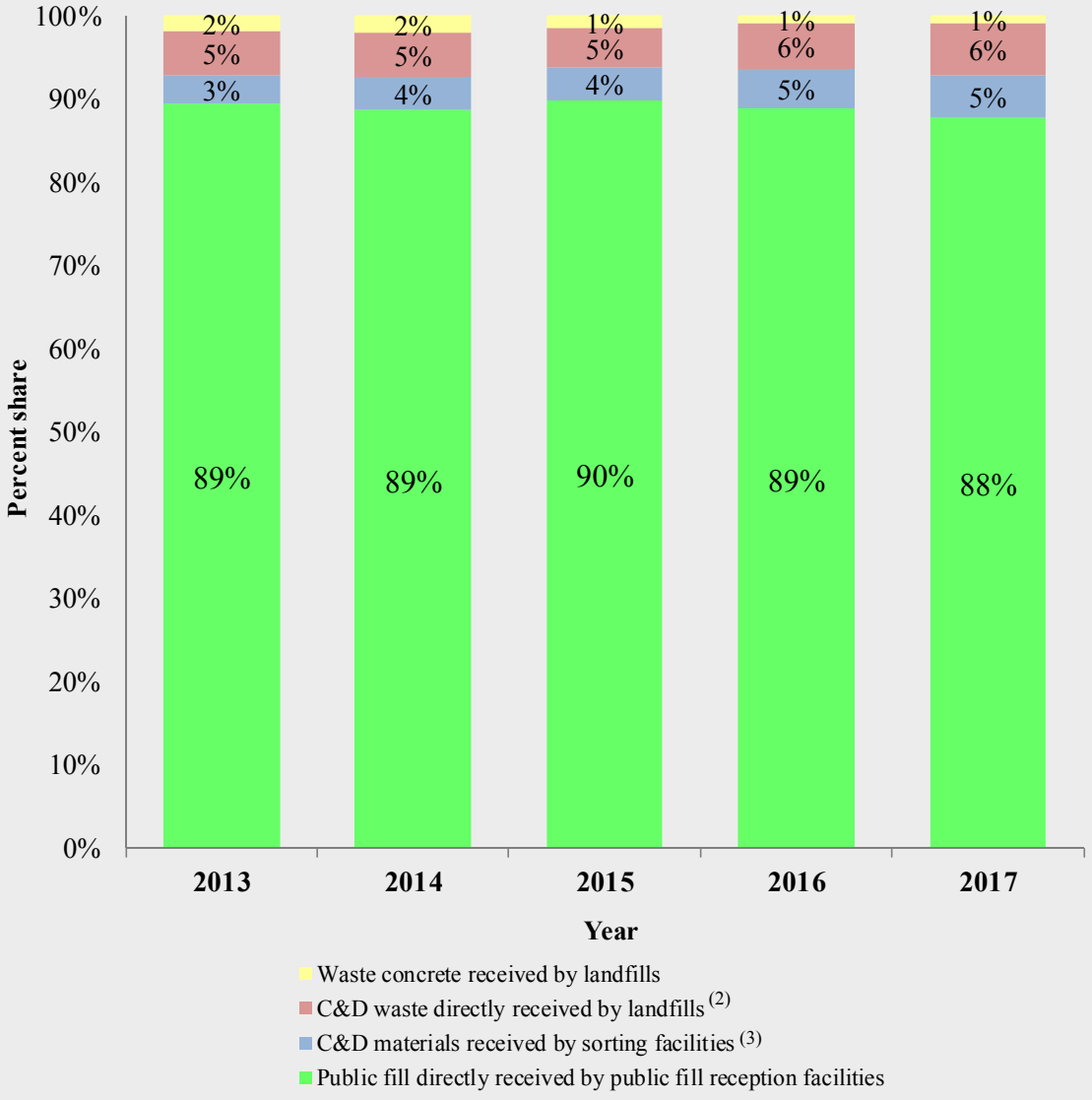

Notes:

(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 2013 to 2017**

| | | | | | |
|---|---|---|---|---|---|
| **Public fill reception facilities (tpd)** | 34,867 | 33,947 | 43,211 | 40,395 | 35,541 |
| **Sorting facilities (tpd)** | 1,361 | 1,591 | 1,863 | 2,191 | 2,124 |
| **Landfills (tpd)** | 2,759 | 2,811 | 2,917 | 2,940 | 2,895 |
| *Waste concrete (tpd)* | *722* | *775* | *709* | *396* | *350* |
| *C&D waste (tpd)* | *2,037* | *2,037* | *2,208* | *2,544* | *2,545* |




Notes:

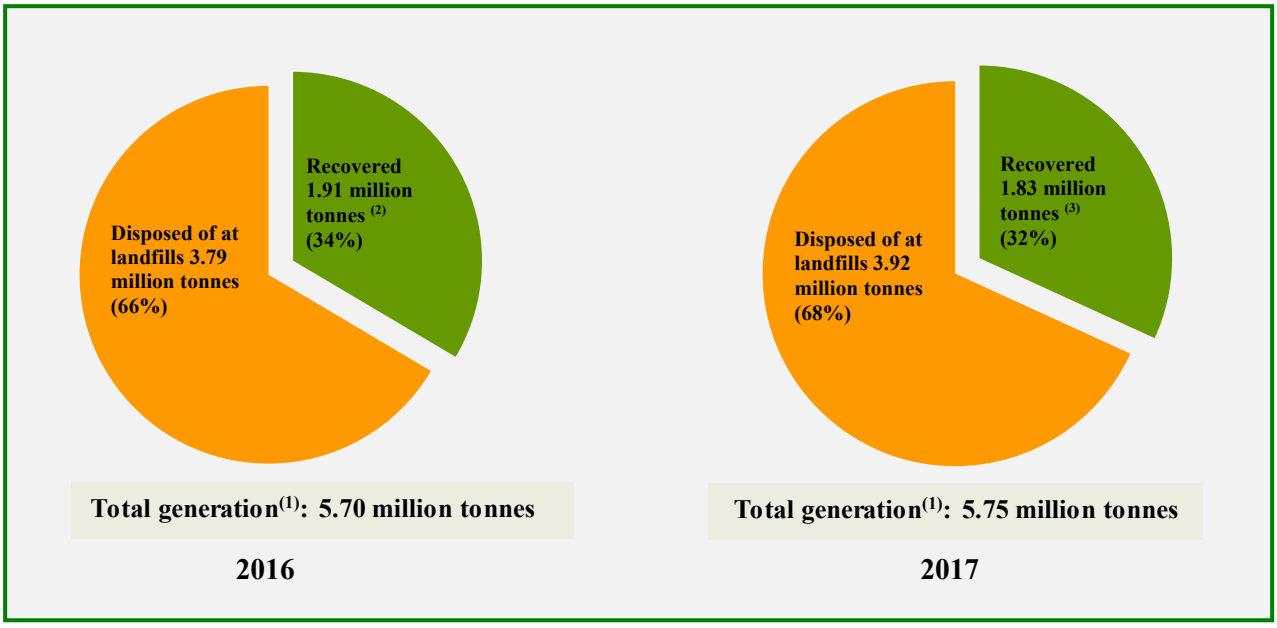
(1) Under the Construction Waste Disposal Charging Scheme, 71 dollars is charged per tonne of public fill disposed of at public fill reception facilities, 175 dollars per tonne of construction waste at sorting facilities and 200 dollars per tonne of construction waste at landfills.

(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 2016 and 2017**



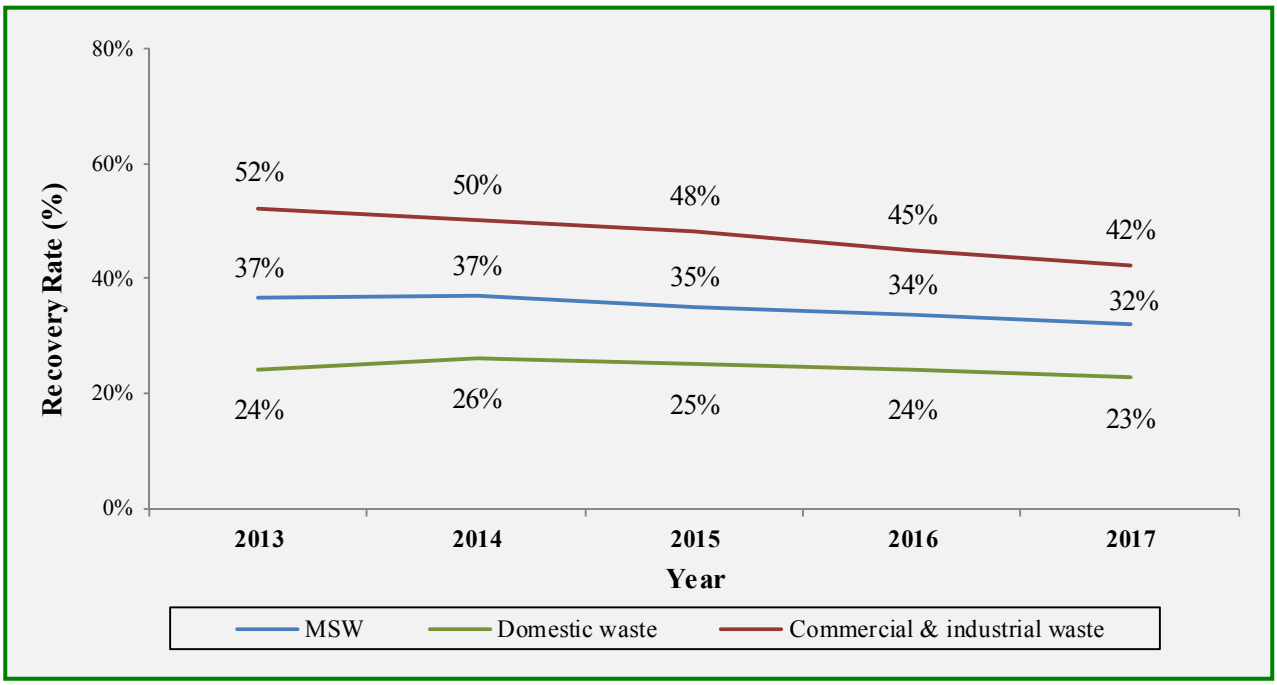

Notes:

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

(2) A total of 1.91 million tonnes of recyclables were recovered for recycling in 2016, of which, 1.86 million tonnes (97%) were exported for recycling and 0.06 million tonnes (3%) recycled locally.

(3) 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.

**Plate 3.2 Recovery rates of MSW, domestic waste, and commercial and industrial waste from 2013 to 2017**



## Plate 3.3 Recyclables recovered from MSW in 2017 - 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** | **792.5** | (44.7%) | **0.0** | (0.0%) | **792.5** | (43.3%) |
| **Plastics** | **102.0** | (5.8%) | **13.7** | (23.7%) | **115.6** | (6.3%) |
| **Ferrous metals** | **784.3** | (44.2%) | **1.1** | (1.9%) | **785.4** | (42.9%) |
| **Non-ferrous metals** | **47.7** | (2.7%) | **1.0** | (1.8%) | **48.7** | (2.7%) |
| **Glass**(1) | **0.7** | (0.0%) | **10.4** | (18.0%) | **11.0** | (0.6%) |
| **Rubber tyres**(2) | **0.1** | (0.0%) | **9.2** | (16.0%) | **9.3** | (0.5%) |
| **Textiles** | **0.6** | (0.0%) | **2.5** | (4.3%) | **3.0** | (0.2%) |
| **Wood** | **0.0** | (0.0%) | **1.3** | (2.2%) | **1.3** | (0.1%) |
| **Food waste**(3) | **0.0** | (0.0%) | **14.6** | (25.4%) | **14.6** | (0.8%) |
| **Electrical and electronic equipment**(4) | **45.1** | (2.5%) | **3.9** | (6.8%) | **49.0** | (2.7%) |
| **Total** | **1,772.9** | (100.0%) | **57.7** | (100.0%) | **1,830.6** | (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.

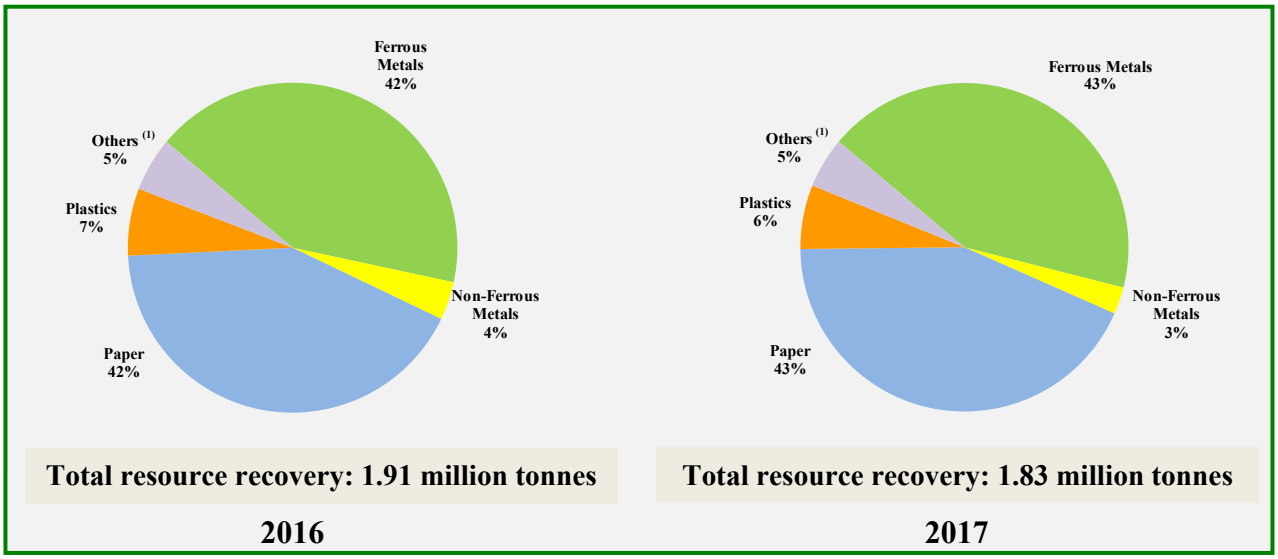
(3) The quantity of food waste recycled locally includes those recycled by industrial operators, those recycled at OITF, and those recycled at EPD's composting facilities at Kowloon Bay.

(4) The volume 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.

(5) Figures less than 50 tonnes are shown as 0.0.

(6) Figures in brackets refer to percentage shares.

## Plate 3.4 Recyclables recovered from MSW in percentages in 2016 and 2017 - By type of recyclable




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 2013 to 2017**

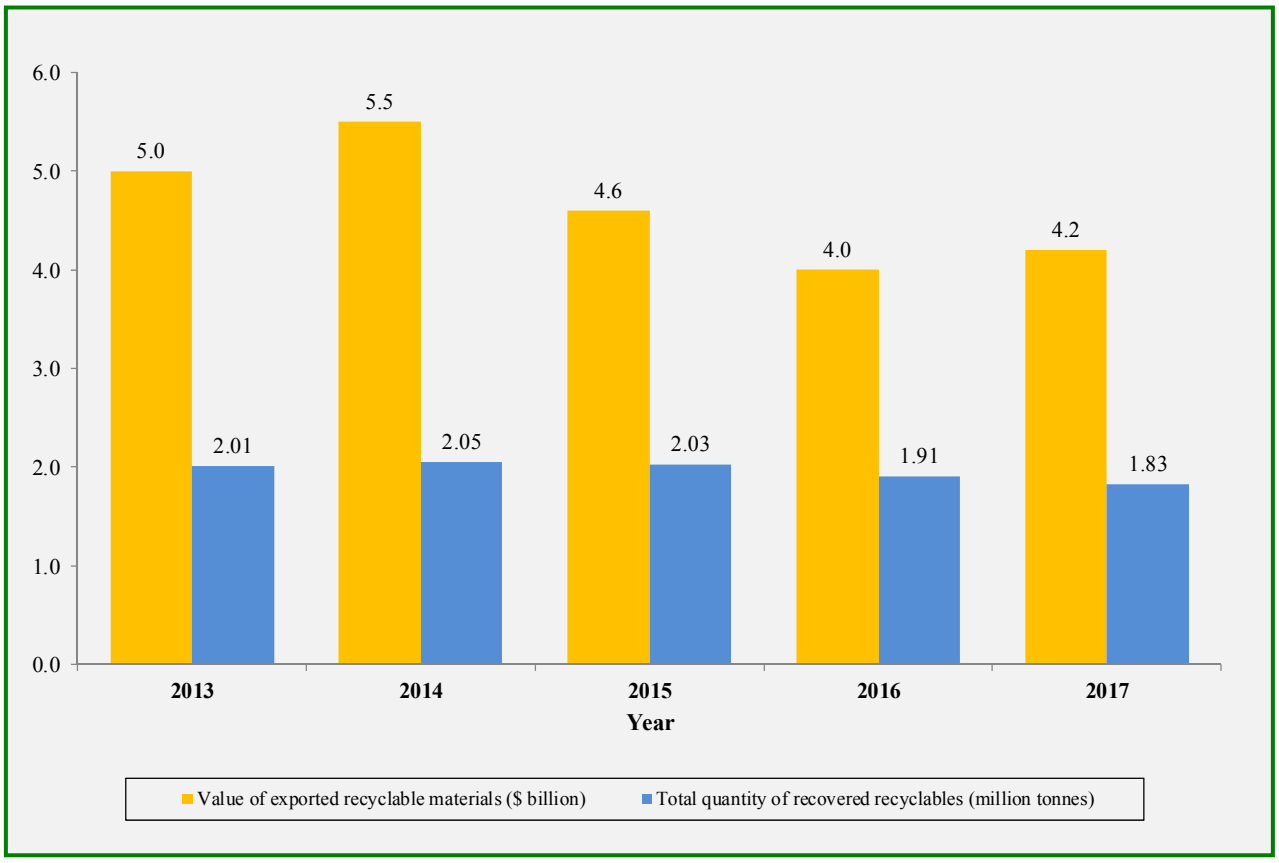
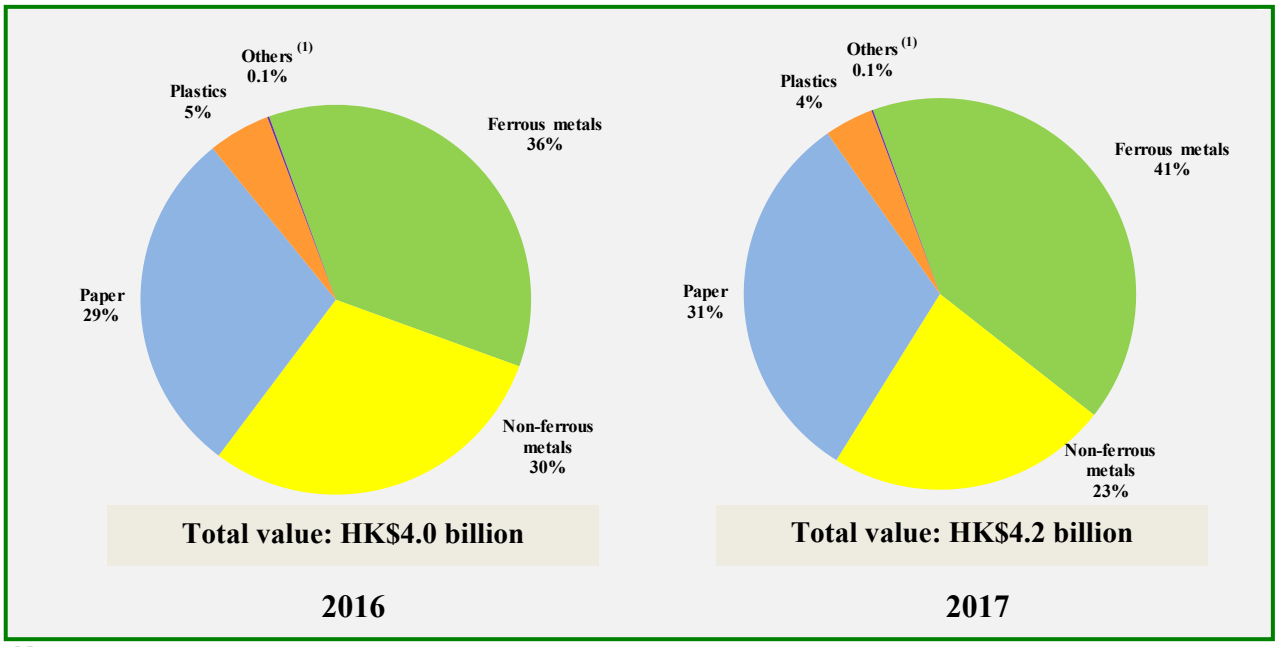



**Plate 3.6 Values of exported recyclable materials recovered from MSW in percentages in 2016 and 2017 - By major type of recyclable material**




Note:

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

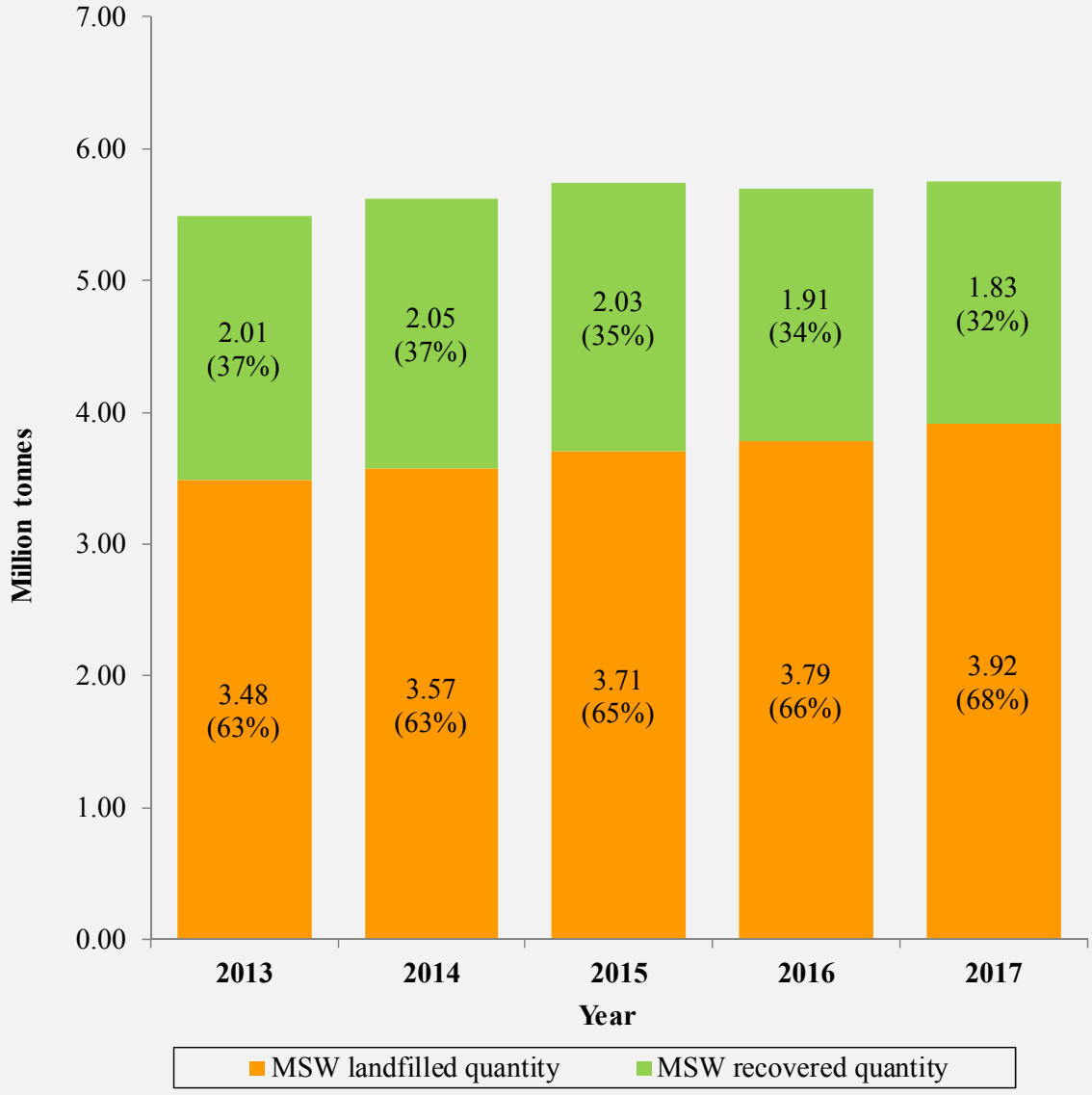
**Plate 3.7 Quantities and values of exported recyclable materials recovered from MSW in 2017 - By major type of recyclable material**

| Recyclable type | Quantity (tonnes) | | Value ($ thousand) | | Value per unit weight ($ / tonne) |
|---|---|---|---|---|---|
| **a. Ferrous metals** | | | | | |
| - Alloy steel scrap | 14,218 | (1.8%) | 136,398 | (7.8%) | 9,593 |
| - Pig or cast iron | 0 | (0.0%) | 0 | (0.0%) | - |
| - Tinplate | 0 | (0.0%) | 0 | (0.0%) | - |
| - Other scraps | 770,110 | (98.2%) | 1,612,363 | (92.2%) | 2,094 |
| (Ferrous metals) Sub-total | 784,329 | (100.0%) | 1,748,761 | (100.0%) | 2,230 |
| **b. Non-ferrous metals** | | | | | |
| - Aluminium | 33,320 | (69.9%) | 326,629 | (33.1%) | 9,803 |
| - Copper & alloys | 13,904 | (29.2%) | 497,492 | (50.4%) | 35,780 |
| - Lead | 19 | (0.0%) | 286 | (0.0%) | 14,802 |
| - Metal ash & residues | 12 | (0.0%) | 30 | (0.0%) | 2,554 |
| - Nickel | 86 | (0.2%) | 1,456 | (0.1%) | 16,878 |
| - Precious metal | 332 | (0.7%) | 138,375 | (14.0%) | 416,439 |
| - Tin | 4 | (0.0%) | 463 | (0.0%) | 127,798 |
| - Zinc | 0 | (0.0%) | 0 | (0.0%) | - |
| - Others[1] | 15 | (0.0%) | 22,519 | (2.3%) | 1,487,863 |
| (Non-ferrous metals) Sub-total | 47,693 | (100.0%) | 987,250 | (100.0%) | 20,700 |
| **c. Plastics** | | | | | |
| - Polyethylene (PE) | 20,726 | (20.3%) | 33,443 | (19.5%) | 1,614 |
| - Polyethylene terephthalate (PET) bottles[2] | 3,656 | (3.6%) | 13,707 | (8.0%) | 3,750 |
| - Polyethylene terephthalate (PET) other than bottles[2] | 9,429 | (9.2%) | 14,709 | (8.6%) | 1,560 |
| - Polypropylene (PP) | 17,266 | (16.9%) | 27,054 | (15.8%) | 1,567 |
| - Polystyrene & copolymers (PS) | 24,449 | (24.0%) | 38,483 | (22.5%) | 1,574 |
| - Polyvinyl chloride (PVC) | 18,629 | (18.3%) | 28,881 | (16.9%) | 1,550 |
| - Others[3] | 7,818 | (7.7%) | 15,027 | (8.8%) | 1,922 |
| (Plastics) Sub-total | 101,973 | (100.0%) | 171,305 | (100.0%) | 1,680 |
| **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. | 576 | (100.0%) | 3,934 | (100.0%) | 6,832 |
| (Textiles) Sub-total | 576 | (100.0%) | 3,934 | (100.0%) | 6,832 |
| **e. Wood & paper** | | | | | |
| - Paper | 792,475 | (100.0%) | 1,334,709 | (100.0%) | 1,684 |
| - Wood (include sawdust) | 0 | (0.0%) | 0 | (0.0%) | - |
| (Wood & paper) Sub-total | 792,475 | (100.0%) | 1,334,709 | (100.0%) | 1,684 |
| **f. Glass** | | | | | |
| (Glass) Sub-total | 678 | (100.0%) | 271 | (100.0%) | 401 |
| **g. Electrical and electronic equipment** | | | | | |
| (Electrical and electronic equipment) Sub-total | 45,079 | (100.0%) | N/A | | N/A |

Notes:
(1) Other non-ferrous metal recyclables include waste and scrap not elsewhere classified.
(2) Breakdown trade statistics (bottles and other than bottles) under waste polyethylene terephthalate (PET) will be compiled as from the reference year of 2017, after an amendment to the relevant commodity codes under the Hong Kong Harmonized System with effect from 1 January 2017.
(3) Other plastic recyclables include waste, parings and scrap not elsewhere classified.
(4) Figures in brackets refer to percentage shares.

**Plate 3.8 Generation, disposal and recovery of MSW from 2013 to 2017**

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Total (million tonnes) | 5.49 | 5.62 | 5.74 | 5.70 | 5.75 |
| y-o-y change (%) | (-1.2%) | (2.4%) | (2.1%) | (-0.7%) | (0.9%) |

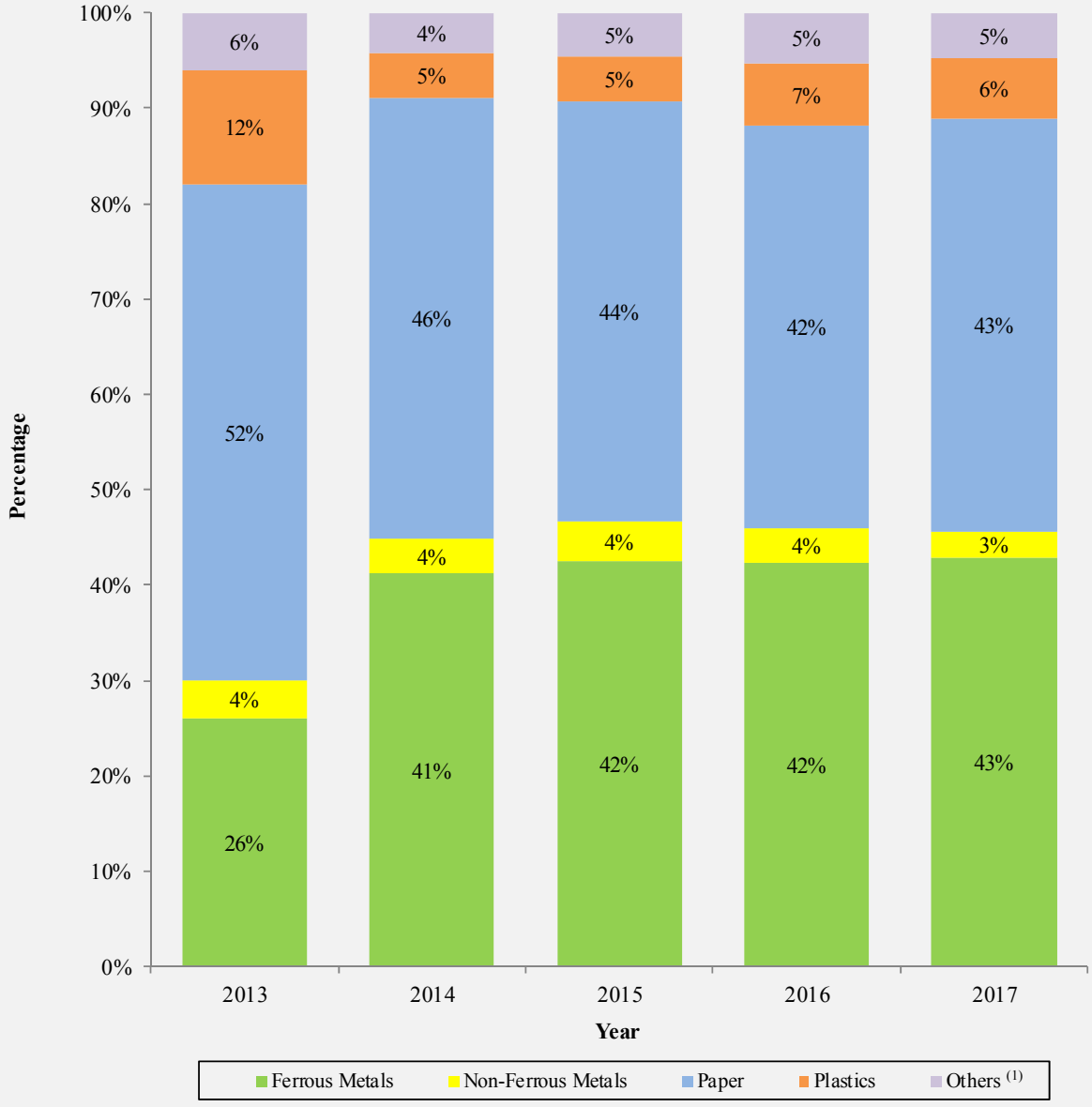



Note:

(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 2013 to 2017 - By major type of recyclable

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Total (million tonnes) | 2.01 | 2.05 | 2.03 | 1.91 | 1.83 |
| y-o-y change (%) | (-7.1%) | (2.2%) | (-1.0%) | (-5.9%) | (-4.3%) |

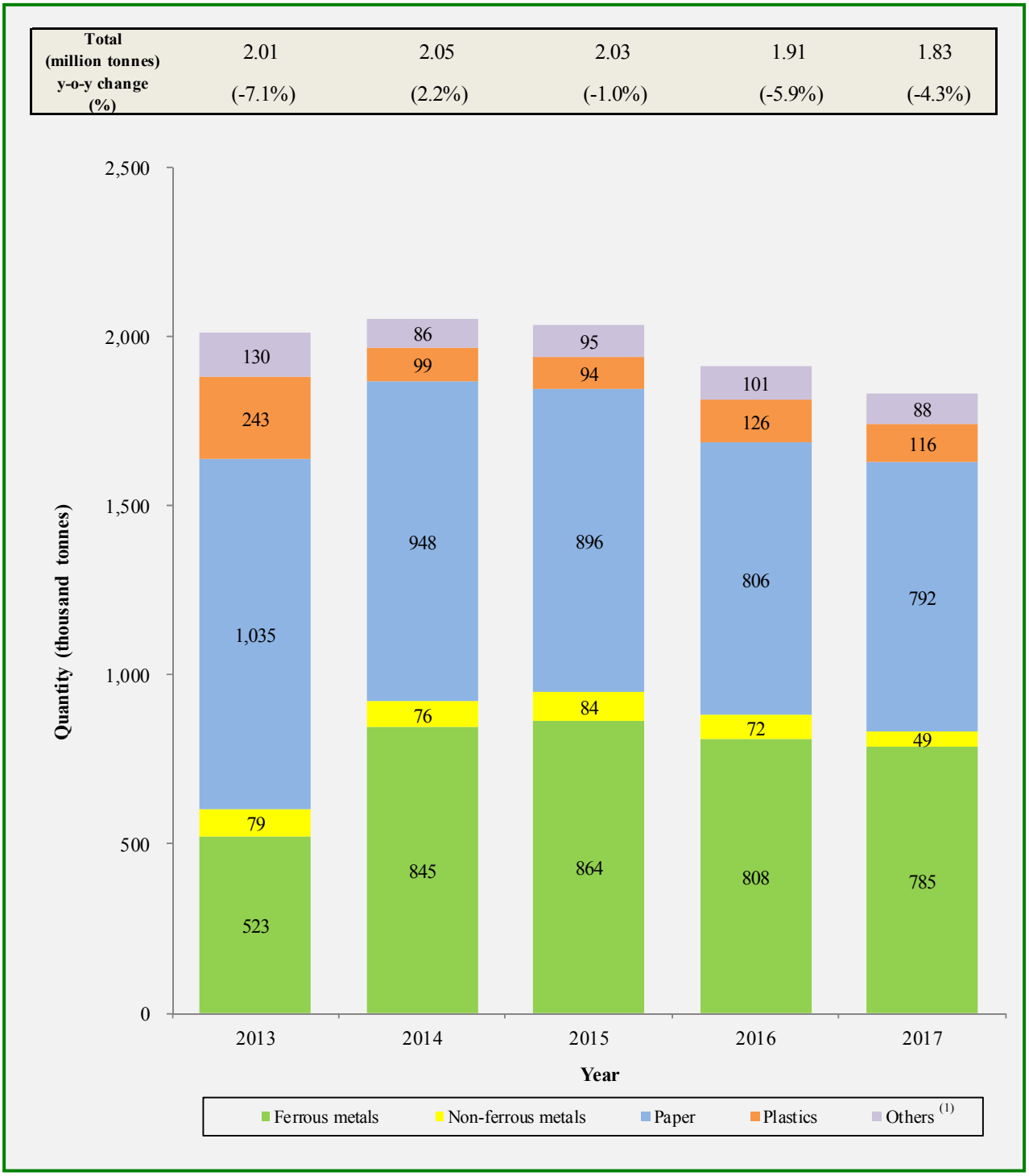



Note:

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

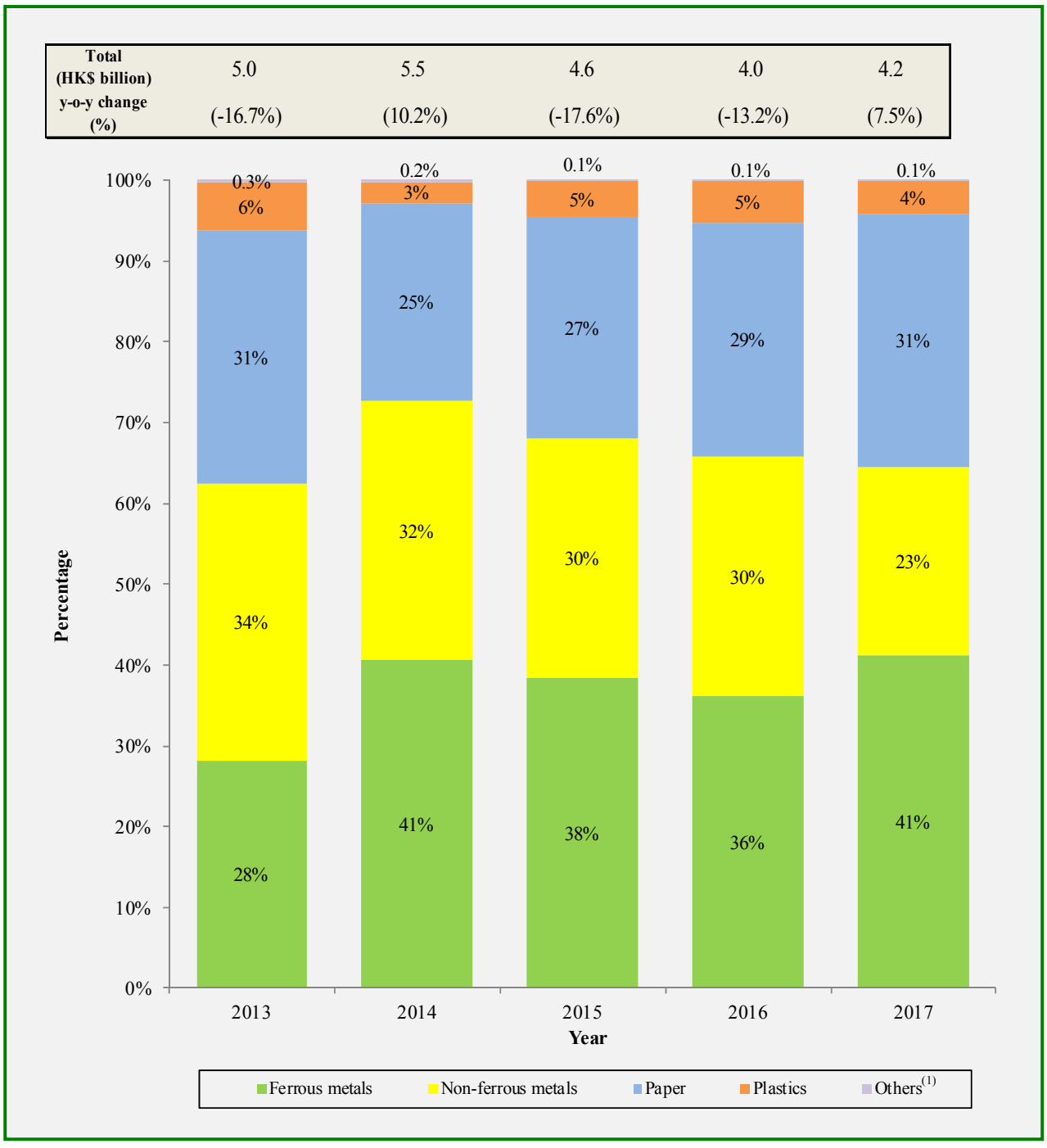
## Plate 3.10 Recyclables recovered from MSW in quantities from 2013 to 2017 - By major type of recyclable

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Total (million tonnes) | 2.01 | 2.05 | 2.03 | 1.91 | 1.83 |
| y-o-y change (%) | (-7.1%) | (2.2%) | (-1.0%) | (-5.9%) | (-4.3%) |




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

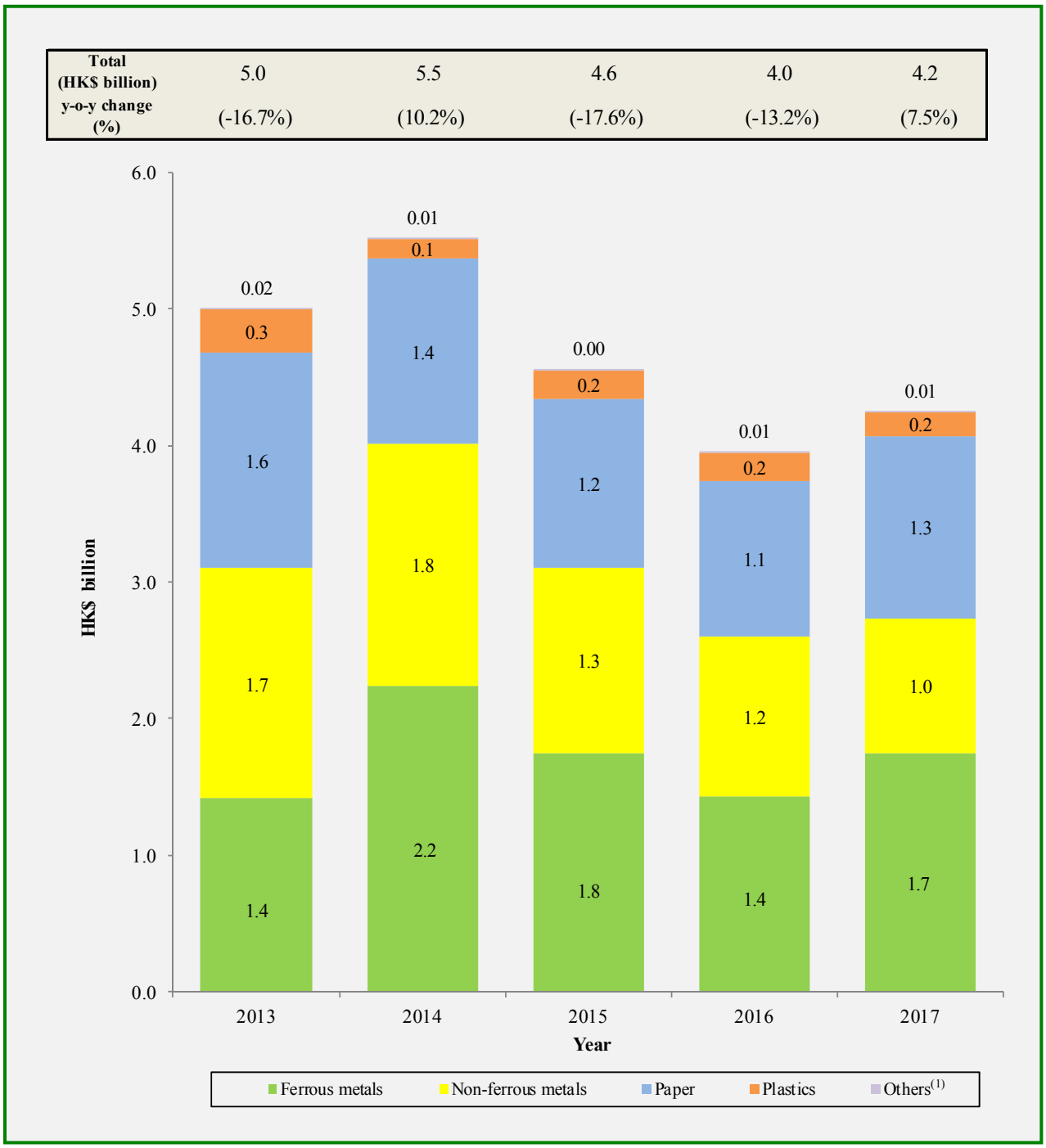
**Plate 3.11 Values of exported recyclable materials recovered from MSW in percentages from 2013 to 2017 – By major type of recyclable material**




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

**Plate 3.12 Values of exported recyclable materials recovered from MSW from 2013 to 2017 - By major type of recyclable material**

| | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Total (HK$ billion) | 5.0 | 5.5 | 4.6 | 4.0 | 4.2 |
| y-o-y change (%) | (-16.7%) | (10.2%) | (-17.6%) | (-13.2%) | (7.5%) |




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.

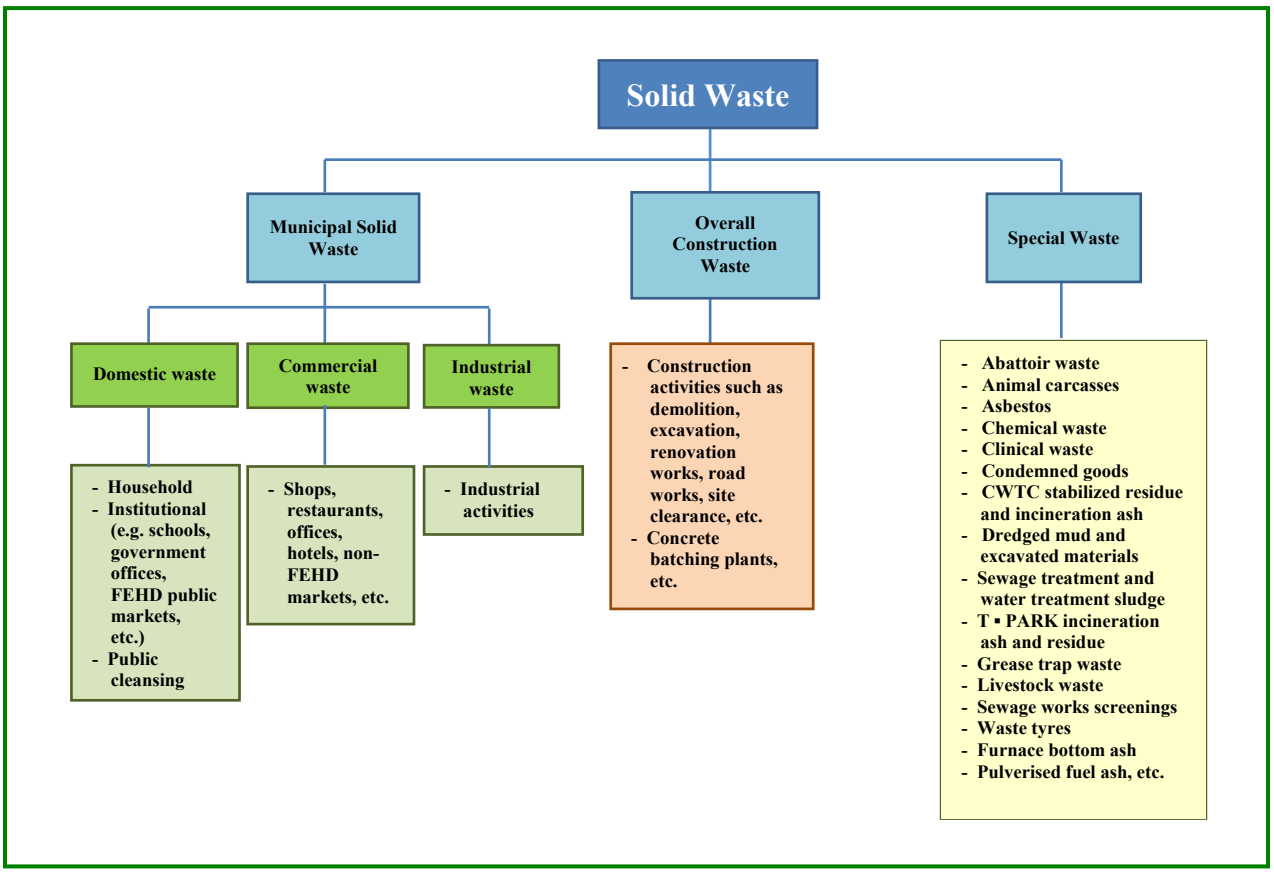
- Municipal solid waste contains a small portion of bulky items like furniture and domestic appliances which cannot be handled by conventional compactor type refuse collection vehicles. These items are regarded as **bulky waste** and are usually collected separately.

**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 (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.