

# GOVERNMENT'S EFFORTS IN MANAGING MUNICIPAL SOLID WASTE

## Executive Summary

1. In 2013, Hong Kong generated 5.49 million tonnes of municipal solid waste (MSW), of which 3.48 million tonnes (63%) were disposed of at landfills and the remaining 2.01 million tonnes (37%) were recovered for recycling. Compared to the published statistics five years ago, the MSW quantity disposed of at landfills had increased by 6.4% from 3.27 million tonnes in 2009 to 3.48 million tonnes in 2013, and MSW recovery rate had decreased from 49% in 2009 to 37% in 2013. In terms of weight, the quantity of the MSW disposed of at landfills every day in 2013 was equivalent to that of about 650 double-decker buses. However, the MSW-generation quantities and the MSW-recovery rates estimated by the Environmental Protection Department (EPD) had subsumed unknown quantities of import recyclables being processed for export (see paras. 3 and 8 below).

2. As the executive arm of the Environment Bureau (ENB), the EPD is responsible for implementing waste management policies and strategies. In December 2005, the EPD published the “Policy Framework for the Management of Municipal Solid Waste (2005-2014)” (2005 Policy Framework) which set out strategies, targets and action plans on avoidance and minimisation; reuse, recovery and recycling; and bulk reduction and disposal of MSW. In May 2013, the ENB published the “Hong Kong Blueprint for Sustainable Use of Resources (2013-2022)” (2013 Blueprint) which set out targets to reduce the per-capita-per-day MSW disposal rate. The Audit Commission (Audit) has recently conducted a review to examine the Government’s efforts in managing MSW with a view to identifying areas for improvement.

### **Reduction in municipal solid waste**

3. *MSW-generation quantities and MSW-recovery rates having incorrectly subsumed unknown quantities of import recyclables.* MSW-generation quantity and MSW-recovery rate are two key performance indicators on Government’s actions in managing MSW. The former is the sum of the quantity of MSW disposed

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of at landfills and the quantity of locally-generated MSW recovered for recycling. The latter is a function of the quantity of MSW recovered and the quantity of MSW generated. The 2005 Policy Framework set a target to reduce the MSW-generation quantity by 1% per annum up to 2014, using 2003 as the base year. Accordingly, the MSW-generation quantities were expected to decrease by 5% from 5.77 million tonnes in 2005 to 5.48 million tonnes in 2010. However, due to the inclusion of unknown quantities of import recyclables in the estimation, these two indicators had been over-estimated by the EPD. Mainly due to increases in the quantities of import recyclables from 2005 to 2010, the over-estimation had become more apparent during the period where the former had increased by 15% from 6.01 million tonnes to 6.93 million tonnes, and the latter from 43% to 52%. These two indicators had dropped to 5.49 million tonnes and 37% respectively in 2013. In estimating the quantities of locally-generated recyclables recovered for export, the EPD had made use of statistics on domestic-export recyclables compiled by the Census and Statistics Department (C&SD) which were based on the information contained in trade declaration forms submitted by exporters to the Customs and Excise Department (C&ED). In this connection, import recyclables that had been processed in Hong Kong for export had been classified as “domestic exports” for trade declaration purposes. Therefore, the quantities of domestic-export recyclables comprised both locally-generated and import quantities. The over-estimation of the quantities of MSW recovered (and MSW generated) had distorted the effectiveness of the Government’s efforts to increase MSW recovery and recycling (see para. 8 below and paras. 2.2, 2.5 to 2.11 and 2.15).

4. Since April 2014, in order to facilitate the collection of reliable data on the quantities of locally-generated recyclables recovered for export, the C&SD and the C&ED have taken actions to collect additional information from exporters in order to differentiate between export recyclables that are generated locally and those imported from overseas (paras. 2.20 to 2.22).

5. *Time targets for implementing producer responsibility schemes (PR schemes) and MSW charging scheme not met.* The 2005 Policy Framework set time targets for implementing PR schemes on six products, namely plastic shopping bags (PSBs) in 2007, waste electrical and electronic equipment in 2007, vehicle tyres in 2007, glass beverage bottles in 2008, packaging materials in 2008 and rechargeable batteries in 2009, and for introducing an MSW charging bill to the Legislative Council (LegCo) in 2007. However, Audit noted that Phase 1 and Phase 2 of the PR scheme on PSBs were only implemented in July 2009 and April 2015 respectively, and up to August 2015, six to eight years later than the

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time targets, PR schemes on the other five products had not been implemented. Moreover, the MSW charging bill would only be submitted to LegCo in the 2016-17 legislative session, nine years later than the time target (paras. 2.23, 2.26, 2.31, 2.32, 2.40 and 2.43).

6. *Need to be more comprehensive in reporting the impact of the PR scheme on PSBs.* In 2007 and 2008, the EPD informed LegCo of the introduction of the PR scheme on PSBs, with the objective of inculcating behavioural changes to reduce the excessive use of PSBs. In July 2009, the EPD launched Phase 1 of the PR scheme on PSBs (PSB Phase 1) under which prescribed retailers (mainly supermarkets, convenience stores and personal-item stores) meeting specified requirements were required to charge customers not less than 50 cents for each PSB distributed. Audit noted that, based on the EPD's landfill-survey results, the number of PSBs bearing the features of supermarkets, convenience stores or personal-item stores (pertinent PSBs) being disposed of at landfills had decreased from 657 million weighing 13,493 tonnes in 2009 to 116 million (82% decrease) weighing 1,949 tonnes (86% decrease) in 2013. However, the number of other PSBs had increased from 4,021 million weighing 64,942 tonnes in 2009 to 4,506 million (12% increase) weighing 65,222 tonnes (0.4% increase) in 2013. Although the reduction of 11,544 tonnes (13,493 less 1,949 tonnes) of pertinent PSBs being disposed of at landfills from 2009 to 2013 was notable, its impact in reducing the total quantity of MSW being disposed of at landfills (3.48 million tonnes in 2013) was quite small. However, in informing LegCo that PSB Phase 1 had been implemented successfully, the EPD only informed LegCo of the reduction in the number of pertinent PSBs but not the reduction in their weight. The additional information would provide a more comprehensive account of the effects on landfills by the implementation of PSB Phase 1 (paras. 2.39 to 2.48).

7. Audit also noted that the number of pertinent PSBs (see para. 6) being disposed of at landfills based on the EPD's landfill-survey results was significantly greater than that of PSBs distributed by registered retailers at registered outlets based on their returns. For example, in 2012, landfill surveys found 156 million of pertinent PSBs whereas registered retailers reported that their registered outlets had only distributed 59.5 million of PSBs (para. 2.49).

### Recovery of municipal solid waste

8. ***Over-estimation of MSW-recovery rates.*** Waste recovery comprises processes of waste recycling, composting and energy generation, aiming to extract the maximum benefits from products, postpone the consumption of virgin resources, and reduce the quantity of waste disposed of at landfills so as to minimise landfill use. MSW-recovery rate is a key performance indicator of Government's efforts made in MSW recovery. The 2005 Policy Framework set a target of achieving an MSW-recovery rate of 50% by 2014 and the 2013 Blueprint stated that 55% of MSW would be recycled by 2022. While the published MSW-recovery rates had increased from 43% in 2005 to 52% in 2010, the rate had dropped to 37% in 2013. As elaborated in paragraph 3, Audit found that the inclusion of import recyclables processed for export in the estimation of the MSW generation and recovery quantities had led to distortion of the MSW-recovery rates and thereby the MSW recycling performance in the past years (paras. 3.2, 3.4 and 3.6 to 3.13).

9. ***Need to take action to increase recovery of waste plastics.*** Audit noted that, in 2013, only 26% of waste plastics were recovered (which included unknown quantities of import recyclable plastics — see para. 3), comparing with 90% of waste metals and 61% of waste paper. According to the EPD, recovery of waste plastics produced a lower profit margin because of the high labour cost involved in sorting recyclable plastics and high transportation cost. Hence, the waste-plastics recovery rate was lower than those of the other recyclables (paras. 3.11 and 3.14 to 3.19).

10. ***Lack of statistics on collected recyclables being disposed of at landfills.*** In order to facilitate the collection of recyclables, the Government provided waste-separation bins at public places. The Food and Environmental Hygiene Department incurred about \$9,000 for engaging contractors to collect a tonne of recyclables from waste-separation bins for delivery to approved recyclers. Moreover, government contractors would separate recyclables collected from waste-separation bins into contaminated ones and non-contaminated ones. According to the EPD, for hygiene reasons, only non-contaminated recyclables can be recovered for recycling. Hence, the contaminated recyclables would be disposed of at landfills and the non-contaminated ones transported to approved recyclers.

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However, due to the lack of reporting requirements in the contracts for collecting recyclables, the Government did not have statistics on the quantities of recyclables collected from waste-separation bins which were disposed of at landfills due to contamination or other reasons (paras. 3.24 and 3.36 to 3.38).

### Recycling of municipal solid waste

11. In order to support local recycling industries, the Government spent \$308 million to develop a 20-hectare EcoPark in Tuen Mun to provide long-term land at affordable cost for use by recyclers. EcoPark was developed under two phases, comprising six land lots under Phase 1 (Lots 1 to 6) which had been made available for leasing since December 2006, and ten lots under Phase 2 (Lots 7 to 16) which had been made available for leasing from October 2009 to July 2012 (paras. 4.2 to 4.4).

12. *Some tenancy requirements not being complied with.* Audit examination revealed that: (a) from 2011 to 2014, the reported recyclables throughput of the tenant of Lot 1 only attained 16% to 85% of throughput requirements stated in the tenancy agreement; (b) the tenant of Lot 3 only commenced recycling operation in May 2010, 24 months later than the time specified in the tenancy agreement. The operation was later suspended for 20 months from November 2011 to June 2013 and again for 8 months from January to September 2015; (c) up to August 2015, five years later than the operation-commencement time of August 2010 specified in the tenancy agreement, recycling operation at Lot 4 had not commenced; and (d) up to August 2015, 29 months later than the operation-commencement time of April 2013 specified in the tenancy agreements of Lots 9, 10 and 14, recycling operation at these three land lots had not commenced (paras. 4.6 to 4.21).

13. *Some tenants being permitted to use vacant land lots free of charge.* Audit examination revealed that, from July 2012 to August 2015, the EPD had permitted five EcoPark tenants (tenants of Lots 3, 8, 11, 13 and 14 ) to use certain areas in vacant Lots 15 and 16 for storage purposes free of charge for periods ranging from three to six months for each period of permission (para. 4.23).

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### Treatment and disposal of municipal solid waste

14. ***Target for reducing MSW disposal at landfills not met.*** The 2005 Policy Framework set a target of reducing the percentage of MSW disposed of at landfills from 60% in 2004 to 25% in 2014, with the remaining 50% of MSW being recovered and 25% being treated by an integrated waste management facility. However, Audit noted that, in 2013, more than 63% of MSW were disposed of at landfills (paras. 5.2 and 5.12).

15. ***Rising MSW disposal at landfills in recent years.*** The 2013 Blueprint set a target of reducing the per-capita-per-day MSW disposal quantities from 1.27 kilogram (kg) in 2011 to 1 kg or less by 2017, and further to 0.8 kg or less by 2022. However, Audit noted that the per-capita-per-day MSW disposal quantities had increased from 1.27 kg in 2011 to 1.35 kg in 2014, representing a 6.3% increase (paras. 5.13, 5.14 and 6.3).

16. ***LegCo not provided with quantifiable information and assumptions relating to serviceable lives of landfills.*** Hong Kong has three landfills that occupy 271 (100 + 61 + 110) hectares of land and have an aggregate design capacity of 139 million cubic metres (m<sup>3</sup>). In March 2012, the EPD informed LegCo that, given that 79 million m<sup>3</sup> of the total landfill capacity had been used up as of end 2011, the three landfills would reach their capacities commencing from 2014 to 2018. Based on the total quantity of waste disposed of at the three landfills from 1993 to 2011 and the landfill capacity being used up during the period, Audit estimated that the remaining serviceable lives of the three landfills could last for some years after 2018. According to the EPD, its estimated years of the remaining serviceable lives of the three landfills were based on the assumptions that some landfill capacities would be reserved for other uses and there would be growth in the quantities of MSW, construction waste and special waste being disposed of at landfills in the forthcoming years. However, the EPD had not provided LegCo with the related quantifiable information and the underlying assumptions (paras. 5.16 to 5.20).

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### Way forward

17. Owing to the disposal of large quantities of MSW at landfills in the past years, Hong Kong's limited landfill space (after implementing extension works) will be progressively used up in the coming two decades. In December 2014, in applying for LegCo funding approval of \$9.6 billion for the extension works for two of the three landfills, the EPD estimated that their useful lives would extend to 2023 and 2028. The EPD also commissioned a detailed study with a view to extending the serviceable life of the remaining landfill to 2033-34. Subject to the FC funding approval for extension works of a landfill and after completing the approved and proposed extension works, the three landfills would occupy a total of 554 hectares of land, which is approximately the size of 550 standard football pitches. In view of the scarcity of land in Hong Kong, both the Government and the community need to make utmost efforts on minimising MSW disposal at landfills, which will help preserve the precious landfill space for use by this generation and future generations (paras. 1.7, 6.8 and 6.9).

### Audit recommendations

18. **Audit recommendations are made in the respective sections of this Audit Report. Only the key ones are highlighted in this Executive Summary. Audit has *recommended* that the Government should:**

#### *Reduction in municipal solid waste*

- (a) **take measures to obtain accurate statistics on the quantities of locally-generated recyclables recovered for export for estimating the MSW-generation quantities and recovery rates (para. 2.34(a)(i));**
- (b) **expedite actions to implement the PR schemes and the MSW charging scheme (para. 2.34(c) and (d));**
- (c) **strengthen actions with a view to improving the accuracy of statistics collected for evaluating the effectiveness of PR schemes in future (para. 2.52(b));**

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### *Recovery of municipal solid waste*

- (d) **vigilantly monitor significant fluctuations in the MSW-recovery rates and ascertain the causes as soon as possible in future (para. 3.20(a));**
- (e) **consider providing appropriate assistance through the Recycling Fund to promote the sustainable development of the waste-plastics recycling industry (para. 3.20(c));**

### *Recycling of municipal solid waste*

- (f) **explore ways and means to effectively enforce tenants' compliance with requirements stated in EcoPark tenancies (para. 4.30(a));**
- (g) **charge reasonable rental for temporary use of vacant land lots by profit-making organisations (para. 4.30(d));**

### *Treatment and disposal of municipal solid waste*

- (h) **strengthen efforts with a view to reducing MSW generation and increasing MSW recovery (para. 5.21(a));**
- (i) **in seeking funding approval for landfill extension works in future, provide LegCo with quantifiable information and the underlying assumptions in estimating the remaining serviceable lives of landfills (para. 5.21(b)); and**

### *Way forward*

- (j) **strengthen efforts to clearly publicise the significant landfill problem (para. 6.15(a)).**

## Response from the Government

19. The Government agrees with the audit recommendations.