

Observations of the Public Accounts Committee on the Report of the Director of Audit on the Accounts of the Government of the Hong Kong Special Administrative Region for the year ended 31 March 2015 1 29

Government's efforts in managing municipal solid waste

A.	Introduction	1 - 9	30 - 33
B.	Reduction in municipal solid waste	10 - 31	34 - 45
C.	Recovery of municipal solid waste	32 - 43	46 - 52
D.	Recycling of municipal solid waste	44	52 - 53
E.	Treatment and disposal of municipal solid waste	45 - 58	53 - 59
F.	Way forward	59 - 61	59 - 62
G.	Conclusions and recommendations	62 - 64	62 - 73

2. Reduction and recycling of food waste

A.	Introduction	1 - 9	74 - 77
B.	Reduction in food waste	10 - 35	77 - 89
C.	Recycling of food waste	36 - 75	89 - 105
D.	Way forward	76 - 79	106 - 108
E.	Conclusions and recommendations	80 - 82	109 - 122

Appendix 6	<u>Witnesses who appeared before the Committee</u>	241
		-
		243

Appendices relating to Chapter 1 of Part 8: "Government's efforts in managing municipal solid waste"

Appendix 7	<u>Opening statement made by Acting Secretary for the Environment at the public hearing on 7 December 2015</u>	244
		-
		249

Appendix 8	<u>Reply dated 21 December 2015 from Director of Environmental Protection</u>	250
		-
		293

Appendix 9	<u>Reply dated 15 December 2015 from Commissioner for</u>	294
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Census and Statistics

Appendix 10 Reply dated 14 December 2015 from Commissioner of Customs and Excise	295 - 296
Appendix 11 Reply dated 3 December 2015 from Director of Environmental Protection	297 - 300
Appendix 12 Reply dated 22 December 2015 from Director of Environmental Protection	301 - 304
Appendix 13 Letter dated 11 January 2016 from Director of Environmental Protection	305 - 308
Appendices relating to Chapter 2 of Part 8: "Reduction and recycling of food waste"	
Appendix 14 Opening statement made by Secretary for the Environment at the public hearing on 12 December 2015	309 - 319
Appendix 15 Letter dated 13 January 2016 from Director of Environmental Protection	320 - 342
Appendix 16 Letter dated 23 December 2015 from Director of Environmental Protection	343 - 389
Appendix 17 Letter dated 22 December 2015 from Commissioner of Correctional Services	390 - 396
Appendix 18 Letter dated 22 December 2015 from Chief Executive, Hospital Authority	397 - 399
Appendix 19 Letter dated 24 December 2015 from Director of Food and Environmental Hygiene	400 - 405
Appendix 20 Letter dated 22 December 2015 from Secretary for Education	406 - 409
Appendix 21 Letter dated 6 January 2016 from Secretary for Education	410 - 412
Appendix 22 Letter dated 2 December 2015 from Director of	413

REPORT OF THE PUBLIC ACCOUNTS COMMITTEE ON THE REPORTS OF THE DIRECTOR OF AUDIT ON THE ACCOUNTS OF THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION FOR THE YEAR ENDED 31 MARCH 2015 AND THE RESULTS OF VALUE FOR MONEY AUDITS (Report No. 65) http://www.legco.gov.hk/yr15-16/english/pac/reports/pac_rpt_65.htm

Environmental Protection	-
	416
Appendix 23 File minute dated 27 July 2010 from the Environmental Protection Department to Secretary for the Environment	417
	-
	421
Appendix 24 Summary of key features/items for inclusion of updated and modified requirements to the tender documents in 2013 for Organic Waste Treatment Facility Phase 1 project as compared to that of the tender exercise in 2011	422
	-
	429

A. Introduction

The Audit Commission ("Audit") conducted a review to examine the Government's efforts in managing municipal solid waste ("MSW").

Background

2. MSW¹, commonly called "trash" or "garbage", includes wastes such as durable goods (e.g. tyres, furniture), nondurable goods (e.g. newspapers, plastic plates/cups), containers and packaging (e.g. milk cartons, plastic wrap), and other wastes (e.g. yard waste, food waste²). It comprises solid waste from households, commercial and industrial ("C&I") sources, but excludes construction and demolition waste, chemical waste and other special waste. The most common items disposed of as MSW are paper, food, plastics and metals.

3. In 2014, Hong Kong, with a population of 7.27 million, produced 5.62 million tonnes of MSW. Out of the 5.62 million tonnes of MSW, 3.57 million tonnes (63%) were disposed of at landfills and the remaining 2.05 million tonnes (37%) were recovered for recycling. Compared to the published statistics in 2010, MSW quantity disposed of at landfills had increased by 7.2% from 3.33 million tonnes in 2010 to 3.57 million tonnes in 2014, and MSW recovery rate had decreased from 52% to 37%. Subject to the Legislative Council ("LegCo") Finance Committee ("FC")'s funding approval for West New Territories Landfill extension works and after completing the approved and proposed extension works for the other two landfills, namely, Southeast New Territories Landfill and Northeast New Territories Landfill, the existing three landfills in Hong Kong would reach their capacities from 2023 to 2034.

4. As the executive arm of the Environment Bureau ("ENB"), the Environmental Protection Department ("EPD") is responsible for implementing waste management policies and strategies.

1 Hong Kong generates several types of solid waste. It includes MSW, which comes from domestic, commercial and industrial sources; construction waste, which arises from construction, renovation and demolition activities; and other special wastes such as chemical waste and livestock waste. In 2014, a total of 5.42 million tonnes of waste were disposed at landfills, of which 66% (3.57 million tonnes) were MSW.

2 Please see Chapter 2 of Part 8 of this Report for "Reduction and recycling of food waste".

5. In December 2005, EPD published the "Policy Framework for the Management of Municipal Solid Waste (2005-2014)" ("the 2005 Policy Framework"), which set out strategies, targets and action plans on avoidance and minimization; reuse, recovery and recycling; and bulk reduction and disposal of MSW. The waste reduction and recycling targets and related action plans were updated in January 2011 ("the 2011 Review"). In May 2013, ENB published the "Hong Kong Blueprint for Sustainable Use of Resources (2013-2022)" ("the 2013 Blueprint"), which set out targets to reduce the per-capita-per-day MSW disposal rate from 1.27 kilogram ("kg") in 2011 to 1 kg or less by 2017, and further to 0.8 kg or less by 2022.

6. As of March 2014, the capital costs of providing the three landfills and the refuse-transfer-station network were \$4,129 million and \$2,724 million respectively. In 2014-2015, the estimated recurrent expenditure of EPD's waste management programme was \$2,049 million, of which \$705 million (34%) and \$419 million (20%) were for meeting the operation costs of the three landfills and the refuse-transfer-station network respectively. The estimated operation cost (including collection and transfer cost) of disposing of a tonne of MSW was \$520.

The Committee's Report

7. The Committee's Report sets out the evidence gathered from witnesses. The Report is divided into the following parts:

- Introduction (Part A) (paragraphs 1 to 9);
- Reduction in municipal solid waste (Part B) (paragraphs 10 to 31);
- Recovery of municipal solid waste (Part C) (paragraphs 32 to 43);
- Recycling of municipal solid waste (Part D) (paragraph 44);
- Treatment and disposal of municipal solid waste (Part E) (paragraphs 45 to 58);
- Way forward (Part F) (paragraphs 59 to 61); and
- Conclusions and recommendations (Part G) (paragraphs 62 to 64).

Public hearings

8. The Committee held two public hearings on 7 and 29 December 2015 to receive evidence on the findings and observations of the Director of Audit's Report ("Audit Report").

Opening statement by the Acting Secretary for the Environment

9. **Ms Christine LOH Kung-wai, Acting Secretary for the Environment**, made an opening statement at the beginning of the Committee's first public hearing held on 7 December 2015, the summary of which is as follows:

- reducing the per-capita-per-day MSW disposal was the key objective of the 2013 Blueprint. There were many areas in the 2013 Blueprint that were a continuation from the 2005 Policy Framework, but there were also areas of departure. A major point of departure was the adoption of a single target to reduce per-capita-per-day MSW disposal because this was the most pertinent objective;
- if the per-capita-per-day perspective was used to look at how Hong Kong had done since 2005, the per-capita-per-day MSW disposal in 2014 was 1.35 kg, showing a slight decrease as compared to 1.38 kg in 2005;
- as pointed out in the Audit Report, the MSW recovery rate increased from 43% in 2005 to 52% in 2010, but then dropped significantly to 37% in 2013. In fact, the Administration noticed in 2012 major fluctuations in the domestic-export statistics on recyclable plastics. The Administration took the initiative to commission an independent consultant in late 2012 to undertake a study to look into this. The study concluded that the current methodology used was the most appropriate approach for Hong Kong as a free trading port. In response to the consultant's recommendations, EPD, the Census and Statistics Department ("C&SD") and the Customs and Excise Department ("C&ED") had taken improvement measures;
- the Administration shared the concern raised in the Audit Report about the implementation progress of the producer responsibility schemes ("PR schemes") and MSW charging scheme. The Audit Report set out the reasons for the longer-than-expected time required, particularly

the fact that each scheme had to go through comprehensive public consultation and stringent legislative vetting procedures;

- the development of the EcoPark was one of the Government's key measures to support the local environmental industry. Since 2012, 10 tenants at EcoPark had successively commenced operation. Two tenants were taking forward the planning and construction of their plants, while another had finished construction and machine installation and was ready for trial runs;
- when estimating the time for landfills reaching design capacity, the Government would take account of factors such as historical trends of waste disposal and projections of population growth. That said, EPD would take on board Audit's recommendation that when submitting future funding applications, EPD should make every effort to provide LegCo with the basic assumptions and quantifiable information used in estimating the remaining serviceable lives of landfills;
- the Administration commenced a long-term planning study on waste disposal infrastructure in September 2015. Based on the concepts of achieving a circular economy and building a smart city, the study would identify the additional strategic and regional facilities required in Hong Kong for bulk transfer and disposal of MSW, with a view to reducing the reliance on landfills and achieving sustainable development in the long run; and
- the Administration would continue to actively take forward the measures set out in the 2013 Blueprint, and would strengthen its efforts to clearly publicize the significant landfill problem. While the Administration was fully aware of citizens' aspirations for a quality environment, the Administration had to drive behavioural changes within the community to reduce waste at source and enhance participation in waste recovery. The Administration would endeavour to formulate waste management policies from new perspectives, and would collaborate with LegCo and every sector in society to ensure their smooth implementation, with a view to building a better living environment.

The full text of Acting Secretary for the Environment's opening statement is in *Appendix 7*.

B. Reduction in municipal solid waste

MSW-generation quantities having incorrectly subsumed unknown quantities of import recyclables

10. According to paragraph 2.8 (b) of the Audit Report, EPD conducted annual waste recovery surveys to obtain related statistics for locally-generated recyclables recovered for local use. The Committee asked how these surveys were conducted, and about the Administration's views on the accuracy and reliability of the data gathered by using these surveys in estimating the quantities of locally-generated MSW recovered for local use.

11. **Mr George NG Wai-wah, Senior Statistician of EPD**, said at the public hearing and **Ms Anissa WONG Sean-ye, Director of Environmental Protection**, explained in her letter dated 21 December 2015 (*Appendix 8*) that:

- for quantity of waste disposal, EPD obtained the relevant statistics compiled based on weighbridge data recorded at entrances of waste treatment facilities, supplemented by data obtained from the Waste Composition Survey on the composition of waste disposed of at landfills by waste type;
- for quantity of waste recovered, there was no environmental legislation at present mandating the recording and declaration of the quantities of general recyclables collected and processed by the recycling businesses. Therefore, EPD compiled the statistics based on domestic-exports statistics of recyclables which measured the quantities of locally-generated recyclables exported for recycling outside Hong Kong. These statistics were supplemented by data obtained from the Waste Recovery Survey ("WRS") which measured the quantities of locally-generated wastes recycled locally into recycled products. There was no overlapping in these two sets of data;
- EPD commissioned a survey contractor every year to conduct the annual WRS with the following major operation features:
 - (a) WRS questionnaire was designed in a way to ensure that the quantities of locally-generated recyclables recycled locally into final recycled products could be accurately captured;

Government's efforts in managing municipal solid waste

- (b) prior to data collection, frontline field interviewers received appropriate training in the presence of EPD's officers;
 - (c) the WRS contractor performed telephone/face-to-face interviews using a well-structured questionnaire to obtain the required recovery data from companies in the recycling industry. Each interview took about 30 minutes;
 - (d) in completing the survey, about 1 500 companies were interviewed. These companies were from the full listing of companies in the local recycling industry updated annually based on the latest Central Register of Establishments maintained by C&SD. The listing was supplemented by the directory of local waste collectors and recyclers maintained by EPD. All companies and green groups identified in the survey were fully enumerated under WRS; and
 - (e) in recent years, WRS achieved response rates ranged from 75% to 77%, which were statistically acceptable considering that the WRS was a voluntary survey;
- the accuracy and reliability of the waste statistics related to waste disposal was beyond doubt as they were based on factual weighbridge data recorded at entrances of waste treatment facilities;
 - the accuracy of the quantities of waste recovery mainly depended on the accuracy of the declared domestic exports statistics of recyclables, as most of the locally-generated recyclables were exported for recycling. For instance, for the years 2013 and 2014, the proportion of locally-generated recyclables exported for recycling were 93% and 98% respectively of the total quantity of waste recovery; and
 - as for WRS, the data accuracy very much depended on the provision of sufficient and accurate data by the recyclers concerned. EPD had no statutory authority to verify the reported data with supporting business documents. Notwithstanding this, EPD conducted verification checks with the responding companies by selecting a random sample of the survey returns submitted by the survey contractor. In light of above, EPD had reasons to be confident on the accuracy and reliability of WRS to be at least as good as that of other surveys professionally conducted on voluntary basis.

12. The Committee noted from paragraph 2.12 and Table 2 of the Audit Report that the aggregates of the quantities of "import recyclables" plus "local recyclables recovered for export" significantly exceeded the quantities of export recyclables in 2009-2011. The Committee asked for the reasons for such significant discrepancy and the possibility that a vast quantity of import recyclables had been disposed of at the local landfills in that period.

13. **Director of Environmental Protection** said at the public hearing and stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- based on EPD's analysis of the relevant data and with reference to Consultant Study commissioned in late 2012 on Comprehensive Review on Estimation of Waste Recovery Rate ("the Consultant Study")³, EPD assessed the "excess" of "the aggregates of the quantities of import recyclables plus local recyclables recovered for export" against the "quantities of export recyclables" in 2009-2011 could basically be attributed to the amount of "re-export recyclables" wrongly declared as "domestic-exports of recyclables" by export declarants;
- there was no practical means to ascertain the exact extent of mis-reporting of re-exports as domestic exports during the three years as it was not possible to re-verify past export declarations with the declarants;
- EPD's assumptions (i.e. 30% to 40% of re-exports were mis-reported) were conservative in light of the findings of the Consultant Study that a majority of recyclers and traders were actually confused and could not tell the difference between re-exports of recyclables and domestic exports; and
- amongst the different types of imported recyclables, plastic recyclables constituted the major proportion (about 80% to 84%) in recent years. Despite the rise in the quantities of declared imported recyclables particularly those of plastics recyclables in the range of 4.0 to 4.8 million tonnes in 2009-2011, the annual disposal quantity of waste plastics at landfills had remained relatively stable in the range of 0.6 to 0.7 million tonnes.

³ Please refer to paragraph 2.16 in the Audit Report for details of the Consultant Study.

14. The Committee further asked how EPD could prevent the disposal of import recyclables at local landfills. **Director of Environmental Protection** explained at the public hearing and stated in her letter dated 21 December 2015 (*Appendix 8*) that in line with the international practices adopted by other countries/places, Hong Kong laws strictly prohibited the disposal of imported waste locally. It was an offence to import waste for disposal in Hong Kong. EPD had close surveillance at landfills and refuse transfer stations on all incoming waste loads to prevent illegal disposal of imported recyclables. All vehicles entering a waste disposal facility must stop at the weighbridge for weighing and inspection. The drivers were required to open hood covers of their vehicles to facilitate inspection of the waste transported via closed circuit television system. If it was suspected that imported recyclables were delivered to the landfill for disposal, EPD would not only intercept and trace the source but also contacted the owners to facilitate recycling of the waste so as to effectively prevent the disposal of imported recyclables at landfills. On interception of any attempt to dispose of imported recyclables in landfills, enforcement action would be taken. In the execution of the above control, EPD had not found loads of imported recyclables disposed of at landfills.

15. According to paragraph 2.16 of the Audit Report, EPD commissioned a consultant to review the abnormal fluctuations of MSW-recovery rates in 2012 and the consultant reported in February 2014 that the fluctuations were likely due to the incorrect treatment of import recyclable plastics as locally-generated waste plastics recovered for export. The Committee enquired about the follow-up actions that EPD, C&SD and C&ED had taken to rectify the incorrect treatment by the relevant traders and exporter.

16. **Director of Environmental Protection** explained at the public hearing and in her letter dated 21 December 2015 (*Appendix 8*) that the relevant departments, including EPD, C&SD and C&ED had implemented enhancement measures in the collection of export data of recyclables, which included preparing additional guidelines and training workshops to help recyclers and export trade declarants to better understand the declaration requirements (in particular regarding the definition of "domestic export" and "re-export" applicable to recyclable materials), strengthening checking of export declarations and collecting additional data from export trade declarants on the source of recyclable plastics declared as domestic export on a sample basis.

17. **Mr Leslie TANG Wai-kong, Commissioner for Census and Statistics**, explained at the public hearing and in his letter dated 15 December 2015 (*Appendix 9*) that C&SD had implemented the following measures since April 2014

to facilitate declarants of domestic exports of waste plastics to understand declaration requirements and relevant definitions with a view to lodging trade declarations of domestic exports and re-exports properly:

- six thematic workshops were arranged during April 2014 to November 2015 for traders and recyclers of waste plastics. During the workshops, guidelines on export declaration requirements of waste plastics were provided to the participants (over 70 representatives from over 60 traders and recyclers); and
- the enhanced quality check procedures had been implemented since April 2014 by selecting a sample of trade declarants of domestic exports of waste plastics. The sampled declarants needed to provide supplementary information on the declared waste plastics, including whether the waste plastics were recovered locally or processed from imported waste and type of processing in Hong Kong. The procedures were to confirm that the declarants clearly understood the definition of domestic exports and re-exports and used the correct code for declaration.

18. **Commissioner for Census and Statistics** further explained that according to the results of the enhanced quality check procedures on domestic exports of waste plastics, in the second quarter of 2014, around 10% of the domestic exports of waste plastics should be re-exports. In the third quarter of 2015, the corresponding percentage was less than 1%. This reflected that the measures implemented since April 2014 had been effective in enabling traders of domestic exports of waste plastics to clearly understand the definition of domestic exports and re-exports and correctly declare domestic exports and re-exports.

19. **Mr Roy TANG Yun-kwong, Commissioner of Customs and Excise**, said at the public hearing and stated in his letter dated 14 December 2015 (*Appendix 10*) that C&ED would work together with C&SD to strengthen the verification of the information on export declarations by randomly selecting trade declarants of domestic exports of recyclable plastics and requiring them to provide supplementary information on the declared recyclable plastics, including whether the recyclable plastics were recovered locally or processed from imported recyclable materials and type of processing in Hong Kong. C&ED would investigate all irregularities cases referred by C&SD and would initiate prosecution against any person who knowingly or recklessly lodged any declaration that was inaccurate in any material particular.

Per-capita-per-day domestic MSW generation of Hong Kong comparing to other cities

20. With reference to Figure 6 in paragraph 2.18 of the Audit Report, the Committee enquired about the reasons for per-capita-per-day domestic MSW generation of Hong Kong higher than those of Taipei City, Seoul City and Metro Tokyo in 2011.

21. **Mr WONG Kam-sing, Secretary for the Environment**, said at the public hearing and **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- as different cities had different geographical, social, economic and cultural circumstances, it would be extremely difficult to draw definitive conclusions on reasons for variations in their communities' behaviour. It was also relevant to note that the compilation of statistics of different cities might vary due to the differences in definitions and methodologies;
- it was useful to examine the trend of waste arising in these cities based on comparable parameters and relate this with the implementation of specific policies or programmes. For this purpose, the Administration had plotted the trend of domestic/household MSW disposal in the three places and highlighted on the same chart their waste related policy developments (*Appendix 8*). The Administration had the following observations:
 - (a) in both Taipei and South Korea, development of incinerators and landfills proceeded before the implementation of mandatory MSW charging. This might have reflected the sense of urgency or critical situation felt by the community concerned on the waste situation, which might have driven waste reduction behaviour;
 - (b) the implementation of volume based MSW charging created the most significant impact on waste reduction. Other mandatory measures targeting at specific waste types helped further reduce waste generation but the impacts were less significant. In Hong Kong, the domestic MSW disposal rate showed reduction in 2004 and the trend continued until 2012, after which the rate remained stable and at the relatively low level as compared

with 2003. That could be attributed to a series of education and publicity measures that had been launched since 2004, as well as discussion on the critical situation of waste management and the need for additional treatment facilities such as incineration, extension of landfills, which started in 2005 along with the publication of a strategy-based Policy Framework document and consultation; and

- (c) updated and more focused plans for engaging the community attention to the imminent waste issues were made in the subsequent years, including the announcement of strategy on "Reduce, Recycle and Proper Waste Management" in 2011 and the issue of the 2013 Blueprint; and
- though the scale of reduction in domestic MSW arising in Hong Kong was smaller when compared with the other two places, Hong Kong had a similar trend of decline. With the implementation of the mandatory schemes which were either being considered by LegCo (i.e. PR schemes on waste electrical and electronic equipment ("WEEE") and glass beverage bottles) or under preparation (i.e. MSW charging), the Administration considered that it could drive behavioural change to reduce MSW disposal rate by 40% on a per-capita basis by 2022.

PR schemes

22. The Committee asked for the reasons for not meeting the time targets set in the 2005 Policy Framework for PR schemes on WEEE, vehicle tyres, glass beverage bottles, packaging materials and rechargeable batteries as revealed in paragraphs 2.24 and 2.26 of the Audit Report.

23. **Secretary for the Environment** said at the public hearing and **Director of Environmental Protection** supplemented at the public hearing and in her letter dated 21 December 2015 (*Appendix 8*) that:

- under the 2005 Policy Framework, it was the target to introduce three PR schemes into LegCo in 2007 for plastic shopping bags ("PSBs"), WEEE and vehicle tyres respectively, two in 2008 for glass beverage bottles and packaging materials respectively and one in 2009 for rechargeable batteries;

- the Administration introduced the legislative proposals for the first PR scheme for PSBs in 2007 as part of the Product Eco-responsibility Bill (which was subsequently enacted in 2008 as the Product Eco-responsibility Ordinance (Cap. 603)). The original legislative approach was that Cap. 603 would provide the framework for PR schemes whereas product-specific measures would be subsequently introduced through subsidiary legislation. This proposed approach echoed the ambitious timetables as set out in the Framework;
- the LegCo Panel on Environmental Affairs ("EA Panel") did not support this legislative approach. Instead it requested that each PR scheme should be implemented through legislative amendment to the enabling legislation and subject to the three-reading scrutiny of LegCo. More time was therefore needed to implement the various PR schemes under the latter legislative approach; and
- furthermore, the actual experience also demonstrated that it was impracticable to complete the necessary preparatory work in relation to research, analysis, trial (if needed), consultation and law drafting for a PR scheme within the target timeframe as originally proposed under the 2005 Policy Framework. Having reviewed the implementation of the PR schemes taking into account the latest development and the experience gained by the Administration, EPD had accorded priority to the PR schemes on the extension of PSBs, WEEE and glass beverage bottles for which the legislative proposals had been introduced into LegCo in May 2013, March 2015 and July 2015 respectively.

24. In reply to the Committee's enquiry regarding the progress and revised time targets for implementing the remaining three PR schemes on vehicle tyres, packaging materials and rechargeable batteries ("three remaining products"), **Director of Environmental Protection** said at the public hearing and stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- as committed under the 2013 Blueprint, the Government would conduct studies on the PR schemes for three remaining products between 2016 and 2018. In conducting the studies, EPD would take stock of the present position of the relevant products as an environmental problem in Hong Kong including their current waste generation rate and effectiveness of the existing recycling efforts. EPD would then assess the need of any enhanced efforts to promote

their recycling and proper disposal and whether a PR scheme should be introduced;

- in 2014, about 21 tonnes per day ("tpd") of waste vehicle tyres was disposed of at the landfills. Rechargeable batteries were counted towards household hazardous wastes alongside paints, pesticides, fuels, cylinders, electrical appliances, computer products, mercury-containing fluorescent lamps and medicines, etc. and about 160 tpd of household hazardous wastes was landfilled in the same year. As regards packaging materials, EPD did not have specific disposal figures as they were unable to trace the source or uses of the waste at the landfills solely on the basis of the nature of materials; and
- in case a PR scheme was considered necessary and appropriate for a particular product, EPD would conduct further research with a view to drawing up the initial proposals for the regulatory framework and other complementary measures for public consultation and trade engagement as soon as practicable. The actual timetable for introducing the legislative proposals into LegCo would depend on complexity of individual PR schemes, including the applicability of experience accumulated through the first three schemes. In case more than one PR scheme was pursued and if circumstances permitted, EPD would aim to expedite actions and would not rule out the possibility of an omnibus bill which might carry legislative proposals for multiple PR schemes.

25. **Acting Secretary for the Environment** added at the public hearing that the Administration was planning to introduce the PR scheme on a new product, i.e. plastic bottles, as the current generation rate of plastic bottles was very high.

26. The Committee asked about the current measures adopted by the Administration to encourage the recycling of the three remaining products before the relevant legislation was enacted. **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that with the support of the relevant trades, a voluntary PR scheme had been in place to promote the recycling and proper disposal of rechargeable batteries since April 2005. Since 2013, following targeted publicity through the Voluntary Agreement on Management of Mooncake Packaging, EPD had been monitoring the eco-friendliness of packaging methods of mooncake products through periodic surveys. As for vehicle tyres, EPD had been monitoring the waste generation and the annual waste statistics showed that its

landfill disposal dropped drastically from a daily average of 49 tpd in 2005 to 21 tpd in 2014 (and at one point less than 2 tpd in 2011). On the other hand, a piece of land in the EcoPark had been leased to a private recycler to develop a rubber vehicle tyre treatment plant, which was scheduled for commissioning in early 2016.

27. According to paragraph 2.42 of the Audit Report, in May 2011, EPD informed LegCo that Phase 1 of PR scheme on PSBs ("PSB Phase 1") had been implemented successfully, and that based on two landfill surveys conducted in mid-2009 (before PSB Phase 1) and mid-2010 (after PSB Phase 1), the number of pertinent PSBs (which bore the features of supermarkets, convenience stores and personal-item stores) disposed of at the landfills had decreased from 657 million in 2009 to 153 million in 2010 (77% reduction). In this regard, the Committee enquired about:

- whether guidelines had been issued by EPD for its landfill contractors to follow in making the estimation above; and
- the Administration's views on the accuracy of such data from the landfill surveys in reflecting the effectiveness of the first phase of the PR scheme on PSBs.

28. **Senior Statistician of EPD** said at the public hearing and **Director of Environmental Protection** stated in her letter dated 3 December 2015 (*Appendix 11*) that:

- detailed methodology concerning waste sampling, manual sorting, weighing and recording etc. were specified in the contract documents for the survey contractor who must follow such methodology as a mandatory contractual requirement. Appropriate training was provided to frontline field workers. Apart from briefing, real case examples were given to better illustrate how they were expected to categorize the PSBs by identification of their visible features. The survey contractor deployed supervisory staff to provide on-site guidance to the field workers and exercise quality control. EPD inspectorate staff were also present throughout the field work period to ensure that the surveying processes were properly carried out;
- on the whole, the disposal surveys were designed to meet an overall margin of error of around 10% at a 95% confidence level, which by

professional statistical standards means that the survey results (including the total disposal of PSBs) were valid; and

- in the Audit Report, observations were made that the number of "pertinent PSBs" found at landfills from the disposal surveys was significantly greater than that of PSBs distributed by registered retailers at registered outlets based on their returns. In response to these observations, the Administration had informed Audit that a registered retailer under PSB Phase 1 must submit a quarterly return providing information on, amongst other things, the total number of PSBs provided directly or indirectly to customers in each of his registered retail outlets during the reporting period. However, for the reasons as set out in paragraph 2.50 of the Audit Report, the Administration was unable to compile statistics on the number of PSBs belonging to registered retail outlets from the disposal surveys. Notwithstanding this limitation, the Administration considered that the number of PSBs disposed of at the landfills was still the most relevant indicator on the effectiveness of the environmental levy in reducing the use of PSBs.

29. In reply to the Committee's request, **Director of Environmental Protection** provided the methods used by EPD landfill contractors to estimate the number of pertinent PSBs disposed of at landfills in the landfill surveys in her reply dated 3 December 2015 (*Appendix 11*).

30. The Committee further asked about the measures to strengthen the gathering of reliable statistics in assessing the effectiveness of PR schemes. **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that since the Administration had extended the PR scheme on PSBs to cover the entire retail sector with effect from 1 April 2015, Audit's concern that some "pertinent PSBs" were distributed by non-registered retail outlets was no longer relevant. The Administration planned to strengthen its efforts in assessing the effectiveness of the extension in the PR scheme through:

- conducting periodic telephone surveys to gauge information on consumers' attitude and behavioural change in response to the PR scheme;
- reviewing the information published by the Hong Kong Retail Management Association which had agreed to coordinate the voluntary reporting of the relevant statistics by its members;

- commissioning dedicated surveys to assess the likely sources of the PSBs classified under the "Others" category; and
- as for the new PR schemes for WEEE and glass beverage bottles, their effectiveness would mainly be assessed on the basis of the amount of WEEE and glass containers recovered through the respective schemes. The relevant statistics could be compiled directly from the records that would be submitted by the management contractors.

Post-implementation review of the 2005 Policy Framework

31. In response to the Committee's enquiry on Audit's recommendation for the Administration to conduct a post-implementation review of the 2005 Policy Framework, **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- in the 2005 Policy Framework, the Administration set out targets to reduce waste generation, increase recovery rate and reduce disposal quantity. In light of the initial achievements and experience gathered, EPD thoroughly reviewed its positions and updated the targets and actions plans in 2011 to cope with the latest challenges;
- taking stock of the experience gained in the implementation of the Policy Framework and the 2011 Review, as well as the latest development in Hong Kong and elsewhere, the Administration had consolidated past actions and updated the relevant policy tools and implementation strategy in the 2013 Blueprint. The Administration had briefed EA Panel on the progress of its efforts in 2009, 2011, 2012 and 2013; and
- the Administration did not consider that the 2005 Policy Framework, the 2011 Review and the 2013 Blueprint were unrelated documents. The 2013 Blueprint represented continued refinement of the action plans and the timetables in the light of their experience and the social, economic and political developments. In the Administration's view, it would be more fruitful to focus on the implementation of the 2013 Blueprint at this stage. The Administration would brief EA Panel on the progress and initial achievements of the waste management measures promulgated in the 2013 Blueprint in 2016 when the waste statistics for 2015 was available.

C. Recovery of municipal solid waste

Over-estimation of MSW-recovery rates

32. The Committee noted that there was a drastic decline of the MSW-recovery rates, from 52% in 2010 to 37% in 2013 and 2014, possibly as a result of the erroneous inclusion of import materials in the statistics. As such, the Committee asked whether EPD would consider setting a new target for MSW-recovery rate.

33. **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- unlike the approach adopted in the 2005 Policy Framework, the 2013 Blueprint adopted a single target of reducing per-capita MSW disposal rate by 40% by 2022. This target was measurable in that it was based on direct weighbridge data recorded at the waste disposal facilities, and it was also more embracing as it quantified the combined effect of the different action plans for reducing waste generation at source and enhancing waste recovery and recycling;
- the 55% recovery rate mentioned in the 2013 Blueprint was not a target in itself. Rather it illustrated the different composition of the waste management structure in 2022 as compared with the base year of 2011 where the then recovery rate was 48%, if the Administration was able to achieve the various waste reduction measures set out in the 2013 Blueprint;
- if the recovery rate for 2011 needed to be adjusted due to mis-reporting by recyclers, then corresponding adjustment should be made for that in 2022 by using the same methodology. The end result was likely that the proportion of different components would remain the same; and
- as the Administration was now implementing in full steam the 2013 Blueprint action plans and mobilizing the community's participation in these plans, the Administration considered that it served no meaningful purpose to focus on past overtaken actions and to set a recovery target for the 2013 Blueprint when the emphasis should be on the more measurable MSW waste disposal rate.

Measures to raise the recovery rate of waste plastics

34. In response to the Committee's question regarding the measures to raise the recovery rate of waste plastics, **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that the Administration would continue to take multiple measures to promote recovery of waste plastics, including:

- to step up communication with property management companies and concerned parties to take initiatives to enhance the collection arrangement of recyclables such as enlisting their support for active participation in recycling, proper sorting of waste by their types, and rinsing the recyclables where possible;
- to continue to carry out promotional and publicity work under the Clean Recycling Campaign to drive behavioural change so as to enhance the cleanliness and the hygienic condition of waste plastics and other source separated recyclables. An enhancement in the quality and quantity of the recyclables increased their value and thereby reducing resource from being dumped at the landfills; and
- to leverage on the Recycling Fund to assist recyclers, including those which were small and medium-sized enterprises, in upgrading and expanding local recycling operations and network in the form of a matching fund. Through upgrading their operation, e.g., installing plastic washing and pelletizing machine, to enhance the value of recycled materials, they would be in a better position to tackle challenges posed by market fluctuations.

Source-separation Programme

35. As revealed in paragraph 3.34 of the Audit Report that in 2013, 1 008 (51%) of the 1 979 participating housing estates and 278 (32%) of the 860 participating C&I buildings did not provide EPD with the related statistics, which had adversely affected the assessment of the effectiveness of the Source-separation Programme ("SS Programme"). The Committee asked EPD to provide the measures to be taken to review the effectiveness of SS Programme.

36. **Mr Howard CHAN Wai-kee, Deputy Director of Environmental Protection(2)**, said at the public hearing and **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that EPD, in collaboration

with various stakeholders, had been taking multiple actions to raise public awareness of source separation of waste and clean recycling. These actions included promotion of the three-colour recycling bins system, educational and promotional activities to targeted recipients and publicity programmes on different themes to reach out to community members. All these efforts contributed to driving behavioural change of the public and cultivating a persistent habit to practise recycling frequently and properly. The Administration also planned to engage a consultant to conduct a review of the implementation of SS Programme and make recommendations to improve the programme, including how to encourage and strengthen the collection of statistics on recyclables collected by participating estates as well as to further enhance public awareness and participation rate, increase quantity of recyclables recovered. The Administration would refine its promotion strategy in the light of the review.

37. According to paragraph 3.37 of the Audit Report, due to the lack of reporting requirements in the recyclable collection service contracts, the Government did not have statistics on the quantities of recyclables collected from waste-separation bins ("WS bins") which were disposed of at landfills due to contamination or other reasons. The Committee asked:

- how EPD would monitor and review the effectiveness of the recyclables-collection scheme without the relevant statistics;
- whether EPD would consider requesting contractors to submit such information for public disclosure;
- measures to monitor the contractors to ensure that the non-contaminated recyclables would be transported to approved recyclers, and the results of these monitoring activities in the past years; and
- the total expenditure incurred for collecting recyclables from WS bins in the past five years.

38. **Director of Environmental Protection** explained at the public hearing and in her letter dated 21 December 2015 (*Appendix 8*) that:

- the Food and Environmental Hygiene Department ("FEHD") had engaged a contractor through outsourcing to provide recyclables collection service. The contractor was required to collect waste paper,

Government's efforts in managing municipal solid waste

metal and plastic from 2 850 public WS bins placed at locations such as pavements, refuse collection points, public markets, bus terminals and venues managed by schools, the Water Supplies Department and EPD. The expenditures incurred by FEHD on the contracts of collecting recyclables from WS bins over the past few years were:

Term of Service Contract	Contract Value (\$m)
August 2010 – July 2012	9.0
August 2012 – July 2014	12.9
August 2014 – July 2016	21.6

- according to the service contract, contractors must hand over the collected recyclables to the designated recycler for process. To improve monitoring and accountability, the service contract signed between FEHD and the contractor that took effect in August 2014 had included the following additional tender terms:
 - (a) to facilitate on-site monitoring, the contractor was required to use transparent plastic bags for collection of recyclables, and the bags should be printed with the words "used for collecting recyclables". Notices showing "FEHD contractor providing collection service for recyclables" should be displayed on both sides of the body of its collection vehicles;
 - (b) the contractor was required to nominate up to two local recyclers to receive and recycle plastic recyclables when submitting their bids for the contracts. Each recycler nominated should have independent capability and experience to properly process plastic recyclables at a designated recycling site; and
 - (c) FEHD might direct the contractor to change its recyclers if their performance was not satisfactory;
- FEHD had set up a comprehensive contract management mechanism under which the FEHD staff conducted regular and surprise checks to monitor the performance of the contractor. If any breach of contract provisions was found, the FEHD would take punitive actions accordingly, including issuing verbal warning, written warning and default notices. The monthly amount payable to the contractors who had received default notices would be deducted in the light of the breaches;

Government's efforts in managing municipal solid waste

- since August 2014, EPD had also set up an additional monitoring mechanism to ensure the plastic recyclables collected by FEHD's contractor would be properly processed by the engaged recycler. EPD had conducted site inspection to assess the recyclable processing ability of the nominated recycler and provided recommendation to FEHD at the tender stage. Since FEHD had awarded the contract in August 2014, EPD had conducted nine site visits to check the operation of the recycler;
- similar monitoring arrangement had been implemented to Agriculture, Fisheries and Conservation Department and Leisure and Cultural Services Department recyclables collection service contracts and it would be extended to cover paper and metal recyclables in the forthcoming contracts. Under the current FEHD contracts for the collection of the recyclables, the contractors were required to provide data on the quantity of recyclables collected. EPD would explore with FEHD how to enhance the disclosure of information related to the quantity of recyclables collected by the contractors and information on the amount of recyclables which were actually recovered or disposed of due to contamination;
- for WS bins placed at locations such as country parks, leisure and cultural facilities, public housing estates, government quarters and government office buildings, the maintenance and management were provided and paid for by relevant departments or property management companies. The costs incurred were generally included in the refuse disposal and cleansing management contracts as a whole and no breakdown of such items was available; and
- with a view to facilitating waste reduction and resource recovery, ENB would convene a Steering Group to review among other things the design and distribution of WS bins in public place and to recommend changes as appropriate.

39. With reference to paragraphs 3.39(a) and 3.40 of the Audit Report, the Committee further asked EPD to provide measures to strengthen promotion efforts to encourage participating housing estates and C&I buildings to provide EPD with statistics on recyclables collected from WS bins.

40. **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that at present, a list of participating housing estates/buildings and a list of award-winning housing estates and residential buildings in the annual competition under SS Programme was published on the EPD Hong Kong Waste Reduction website. While it was voluntary for participating housing estates and C&I buildings to provide statistics on recyclables collected from WS bins to EPD, the Administration planned to take the following measures to encourage them to report the relevant data to EPD:

- to organize commendation schemes to recognize the property management companies or their owners whose buildings had reported and attained increases in recyclables collected from WS bins. Subject to feedback from consultation with the stakeholders, the Administration was ready to promote transparency of the reports on the statistics to encourage participation of residents and workers in recycling;
- to provide guidelines to assist collectors and recyclers to provide summary and analysis of the types and quantity of recyclables collected from the participating housing estates and C&I buildings on a timely basis; and
- to organize training to frontline staff on the purpose and process to collate and compile the statistics from WS bins with a view to alleviating their perceived increase in workload or concerns on the additional resources required in the process.

41. Referring to Audit's recommendations in paragraphs 3.39(b) and 3.40 of the Audit Report, the Committee enquired about the progress on the publishing of the number of housing estates and the corresponding population which had provided EPD with statistics on recyclables collected and those not providing the statistics.

42. **Director of Environmental Protection** stated in her letter dated 22 December 2015 (*Appendix 12*) that the Administration had been publishing the list of all participating housing estates/buildings on the Hong Kong Waste Reduction Website. It would also publish on the website the number of housing estates/buildings and the corresponding population which had provided it with the statistics. As the two lists were publicly available, the Administration did not consider it necessary to publish a separate list singling out those housing estates not providing the statistics under a voluntary programme which aimed to incentivize

participation. The two lists would be updated regularly. To facilitate the public reading the information, the Administration would amend the website page layout and put the information on the "News & Events" page. The Administration planned that the revised website page and the figures be ready and published starting from April 2016.

43. In response to the Committee's enquiry on the progress on computing and publishing the per-household-per-day quantities of recyclables collected by the participating estates which had provided EPD with statistics on recyclables collected, **Director of Environmental Protection** stated in her letter dated 22 December 2015 (*Appendix 12*) that:

- the Administration would consider ways to disclose the per-household-per-day quantities of recyclable waste collected by participating estates/buildings without diminishing the original intent of incentivizing good waste reduction behaviour or affecting the overall participation rate of a voluntary programme; and
- as a first step, the Administration would consider publishing regularly an "overall average per-household quantities of recyclables collected for the programme". Together with the information on number of housing estates and corresponding population returning statistics, the Administration planned to have the overall average per-household quantity figure be published on the Hong Kong Waste Reduction Website, on the "News & Events" page, starting from April 2016.

D. Recycling of municipal solid waste

Operation of Ecopark

44. In response to the Committee's enquiry about the operation of EcoPark, **Director of Environmental Protection** said at the public hearing and stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- there were currently 13 tenants in the EcoPark engaging in processing a variety of waste types, including those identified for control under PR schemes, those that were difficult to recycle therefore had limited local recycling outlets such as food waste, waste wood and waste cooking oil, as well as those that lacked a robust market for the

processed materials such as waste rubber tyres. The total pledged capital investment by the tenants had exceeded \$300 million;

- as more tenants started commissioning their operations, the original projected annual throughput set at 58 600 tonnes in 2006 had been exceeded. In their tender returns, tenants had to pledge for minimum outputs. The current tenants had in total pledged to handle 200 000 tonnes in a full year upon full commissioning. In 2014, the amount of recyclables recovered by the EcoPark tenants amounted to over 150 000 tonnes;
- the Administration would continue to raise the community awareness of the Ecopark tenants so as to assist them in broadening their network in sourcing recyclables for treatment. General promotion on green procurement and importance of recycling would also be stepped up; and
- the Administration would also leverage on the EcoPark to disseminate information on proper recycling and cultivate a habit of recycling in daily lives of community members. Over 110 000 visitors had visited the EcoPark Visitor Centre since its opening in March 2010.

E. Treatment and disposal of municipal solid waste

Integrated waste management facility

45. With reference to paragraph 5.9 of the Audit Report, the Committee asked for the reasons for the postponement of the target of commissioning the integrated waste management facility ("IWMF") from mid-2010s to "2019 to 2022".

46. **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- the Administration carried out a comprehensive site search exercise in 2006 to identify suitable sites for developing the first phase of IWMF and following the completion of the site search exercise in early 2008, Shek Kwu Chau site and the Tuen Mun Tsang Tsui Ash Lagoons site were found suitable as potential sites. In order to ascertain the suitability of these two potential sites, the Administration commissioned the detailed Engineering Investigation and

Environmental Impact Assessment studies for both sites in November 2008. The engineering investigation and environmental studies for the two potential sites for IW MF Phase 1 were completed in 2011;

- the long time taken for the development of IW MF Phase 1 was due to the need to obtain public consensus on related issues. Since February 2011, the Administration had met with over 2 500 stakeholders and about 60 groups/organizations, and attended 70 meetings to explain the need of the project and to address their queries on various aspects of the project. The Administration consulted the Advisory Council on the Environment on the findings of the feasibility study and the proposed moving grate incineration technology on 14 December 2009. At District Council level, the Administration attended the Islands District Council meetings on 21 February 2011, 20 February 2012 and 16 December 2013;
- since 2002, the Administration had attended over 10 EA Panel meetings to explain the need and justifications for the project. However, the Administration was not able to secure the support of EA Panel to submit the funding proposal to the Public Works Subcommittee ("PWSC") until 28 March 2014. The proposal was endorsed by PWSC on 27 May 2014 after five meetings. It was then approved by FC on 9 January 2015 after 10 meetings; and
- after obtaining funding approval, the Administration commenced the pre-qualification exercise in March 2015 to invite interested companies to make submission for pre-qualification. Preparation work for tender documents was now in progress. The Administration planned to invite tenders from the pre-qualified tenderers for the design, build and operate of the IW MF Phase 1 in 2016 and commission the facility in 2023.

Rising trend in MSW-disposal at landfills

47. According to Table 14 in paragraphs 5.14 and 5.15 of the Audit Report, notwithstanding the various actions taken by EPD in recent years to reduce the MSW generation and increasing the MSW recovery, the rising trend in both the total quantities and per-capita quantities of MSW disposed of at landfills from 2011 to 2014 was a cause of concern. The Committee asked why there was a rising trend in MSW-disposal at landfills.

48. **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- to better understand the trend of MSW disposal rates, the Administration suggested that a longer term outlook on a per-capita basis should be adopted. The table at Chart 1 of *Appendix 8* could better illustrate the trend of MSW disposal rates over the past 10 years. The total MSW per-capita disposal rate actually was on a declining trend from 2005 to 2011 (from 1.38 kg/person/day in 2005 to 1.27 kg/person/day in 2011) but had since been on a slightly rising trend (1.35 kg/person/day in 2014). The declining trend could largely be attributed to the decline in domestic waste per-capita disposal rate (1.00 kg/person/day in 2005 to 0.89 kg/person/day in 2014). On the other hand, there had been a slightly rising trend in C&I waste per-capita disposal rate (from 0.37 kg/person/day in 2005 to 0.46 kg/person/day in 2014), offsetting the reduction in domestic waste;
- as economic growth generally increased the level of consumption and production activities which in turn might contribute to generating more waste, the rising trend of C&I waste disposal rate over the past 10 years was likely caused by increases in economic activities. As shown in Chart 2 of *Appendix 8*, the growth of per-capita-per-day C&I waste disposal rate over the last 10 years correlated normally with the growth of real Gross Domestic Product ("GDP"); and
- both the 2005 Policy Framework and the 2013 Blueprint recognized the importance of reducing waste at both the domestic and C&I sectors. Despite slight reduction of the overall MSW waste disposal rates over the past 10 years due to educational and policy waste measures, more efforts would need to be made if the Administration were to achieve the waste reduction target set out in the 2013 Blueprint. To this end, the Administration would vigorously pursue the various actions set out in the 2013 Blueprint and closely monitor progress of the various waste reduction measures in both the domestic and C&I sectors.

Estimation of the remaining serviceable lives of the landfills

49. According to paragraph 5.19 of the Audit Report, the historical MSW-disposal showed a weight-to-volume ratio of 1.24 tonnes of waste : 1 cubic meter ("m³") of landfill space. However, EPD had adopted a ratio of 1 tonne of

waste : 1 m³ of landfill space for estimating the remaining serviceable lives of the three landfills. The Committee asked why EPD had adopted this ratio in estimating the remaining serviceable lives of the landfills.

50. **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that construction waste represented about 50% of total waste disposed of at the landfills (1990-2005 average) prior to the implementation of construction waste disposal charging scheme in 2006, whilst thereafter the proportion was significantly reduced to about 25% (2006-2014 average). A ratio of 1.24 tonnes of waste : 1 m³ of landfill space was derived by the Audit based on historical information back to 1990s. However, inert construction waste (e.g. rock and concrete debris) had a higher weight-to-volume ratio as compared with ordinary MSW. In light of the significant reduction of inert construction waste requiring landfill disposal since 2006, EPD had adopted a more prudent and realistic assumption of a lower weight-to-volume ratio of 1 tonne of waste: 1 m³ in estimating the remaining serviceable lives of the three landfills.

51. As revealed in paragraph 5.20 of the Audit Report that in estimating the remaining serviceable lives of the three landfills, EPD had assumed that there would be growth in the MSW quantities, construction waste and special waste being disposed of at landfills in the coming years. The Committee queried the basis of such assumptions, and whether EPD had taken into account the effort made in recent years in reducing, recycling and recovery of MSW in arriving at such assumptions.

52. **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- in estimating the remaining serviceable lives of the three landfills in the course of planning of the landfill extension projects in 2011-2012, EPD had made reference to the best available information at that time, including projected annual population growth (of 0.8% to 1%) from C&SD, forecasted GDP growth rate (of 4% per annum) from the Economic Analysis and Business Facilitation Unit and the latest information on annual increase in construction waste disposal at landfills (of 14.8% from 2009 to 2010), and adopted the assumptions that there would be a 2.5% annual growth rate of MSW and a 10% annual growth rate of construction waste respectively. Regarding the generation of special wastes, the Administration adopted a moderate annual growth rate of 5% in the planning exercise, having regard to its

comparative minor share of 8% of the total waste disposal at landfills; and

- in adopting the above assumptions on MSW and construction waste growth rates, EPD had taken into account the impacts of the promotional efforts on waste reduction and recycling. Nevertheless, as landfills were the last resort for waste disposal, the Administration had been prudent in the planning assumptions.

53. The Committee noted that Acting Secretary for the Environment had stated in her opening remark that "[LegCo] Members were provided with the information they requested, including those on the assumptions adopted in the estimation". In this connection, the Committee asked for the assumptions provided to Members when scrutinizing funding applications in 2014, and whether these assumptions included the assumptions in paragraph 5.19 of the Audit Report.

54. **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- during the process of seeking funding approval from LegCo for the landfill extension projects, EPD provided information about the approach adopted in estimation of the remaining serviceable lives of landfills to EA Panel, PWSC and FC; and
- the detailed assumptions that EPD adopted in the projection were set out in paragraph 5.19 (a) to (d) of the Audit Report. These planning assumptions covered population growth, increases in economic activities, fluctuation of waste quantity, effectiveness of waste reduction measures, as well as information on landfill operation and landfill extension projects. In response to questions raised, factors taken into account in projecting the remaining capacity of the landfills were presented. The Administration had noted Audit's view that additional information on quantifiable data should also be presented in future funding applications and would do so in future applications.

55. In reply to the Committee's request, **Director of Environmental Protection** provided a table setting out the relevant information and discussion at LegCo about the approach adopted in estimation of remaining serviceable lives of the three landfills in her reply dated 21 December 2015 (*Appendix 8*).

56. According to the papers submitted by the Administration to EA Panel in 2008, 2012, 2013 and 2014, EPD had consistently changed the estimated remaining serviceable lives of the three landfills in Hong Kong. Under this circumstance, the Committee asked for the measures to improve the accuracy of such estimations, and the latest estimation of the remaining serviceable lives of the three landfills.

57. **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that the estimated serviceable lives of the landfills depended on a wide range of factors including population growth, level of economic and construction activities, implementation of waste reduction initiatives, provision of other upstream waste treatment facilities, development of landfill design, mode of landfill operation and implementation of landfill extension projects. As most of the contributing factors were dynamic in nature, the estimated serviceable lives of the landfills should be reviewed from time to time, having regard to the latest available information. This accounted for the necessary changes in the estimation upon review during the different stages of submissions to EA Panel from 2008 to 2014. With the funding approval of the LegCo on Southeast New Territories Landfill Extension and Northeast New Territories Landfill Extension in December 2014, it was anticipated that the increased serviceable lives of the three landfills would cope with the ultimate waste disposal need for the territories up to late 2020s. The estimated serviceable life of the West New Territories Landfill upon its extension would only be available upon completion of the relevant consultancy study.

Long-term planning study of waste disposal infrastructure

58. In reply to the Committee's enquiry regarding the details of the long-term planning study of waste disposal infrastructure commenced in September 2015 as mentioned by the Acting Secretary for the Environment in paragraph 16 of her opening remark at the public hearing on 7 December 2015, **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that:

- even upon the implementation of all waste reduction at source/reuse/recycling measures as set out in the 2013 Blueprint and "A Food Waste and Yard Waste Plan for Hong Kong (2014-2022)", there would still be a considerable amount of residual solid waste requiring disposal of at landfills. As the existing and currently planned waste management facilities would not be able to deal with all the waste sustainably in future, there was a need to carry out a study to identify additional strategic and regional waste treatment and bulk

waste transfer facilities for the management of solid waste to reduce reliance on landfills for waste disposal and to meet Hong Kong's longer term requirements;

- the Administration commissioned a study for planning of future waste management and transfer facilities in September 2015. The main objective of the study was to formulate, develop and produce a territory-wide plan and strategy on the provision of waste treatment and bulk waste transfer facilities for handling solid waste in an environmentally acceptable, sustainable and cost-effective manner to meet Hong Kong's sustainable development needs. The study would identify additional strategic and regional waste facilities required for bulk transfer and treatment of MSW and construction waste in line with smart city and circular economy concepts, draw up an outline action programme and develop the relevant planning guidelines for the identified waste facilities;
- the study would explore a variety of issues, including types and requirements, technology choices, optimal scales, spatial distribution, siting principles, site requirements, selection criteria, procurement options, potential broad geographical areas and indicative timing of the additional waste treatment and bulk waste transfer facilities; and
- according to the current programme, the study was expected to complete in the second quarter of 2017.

F. Way forward

59. In response to the Committee's question on the actions to be taken by the Administration to reduce MSW generation and increase MSW recovery, **Director of Environmental Protection** stated in her letter dated 21 December 2015 (*Appendix 8*) that the 2013 Blueprint analyzed the challenges and opportunities of waste management in Hong Kong, and mapped out a comprehensive strategy, targets, holistic policies and ten-year action plans for waste management with a view to tackling the waste problems in Hong Kong. The Administration endeavoured to implement the 2013 Blueprint and appeal to the public for support to achieve the targeted results. The Administration's major initiatives in the coming years included:

- driving behavioural change through mandatory schemes: Overseas experience had shown that implementing quantity-based charging

Government's efforts in managing municipal solid waste

could create financial incentive to drive changes in the public's waste-generating behaviour, thus achieving an overall reduction in waste disposal. The Administration was working towards implementing quantity-based charging in accordance with the views collected during the public engagement process. The Administration was now progressively implementing the PR schemes;

- continuing efforts on education and publicity: Environment and Conservation Fund would continue to fund projects by green groups and non-government organizations at community level to mobilize the local community to participate in waste reduction, source separation and clean recycling. The Administration would enhance its collaboration with government departments, district councils, schools, housing estates, property management companies, green groups and social services organizations in setting up more community recycling points to form a wider community recycling network to help develop the habit of clean recycling. The Administration was also progressively developing one community green station in each of the 18 districts, which would be run by non-profit making organizations to step up environmental education and enhance the logistics support in the collection of various low-value recyclables (such as electrical appliances, computers, plastic bottles, glass bottles, compact fluorescent lamps and rechargeable batteries) in the local community;
- promoting sustainable development of the recycling industry: The Administration had launched the \$1 billion Recycling Fund to assist recyclers to improve the collection network for recyclables, invest on machinery to lower the processing costs, develop value-adding recycled products, explore new market, obtain certification for the recycling process, attend training to enhance their skills and awareness of occupational safety and health, etc. The Administration would take heed of the advice and recommendations of the Advisory Committee on Recycling Fund, which comprised experts, academics and people with experience in business management and community service, as well as representatives from various business and industry associations, in operating the Fund. The Administration was stepping up co-operation with the industry to increase the operational capability of local recyclers and uplift the image of the industry, raise the standard of the occupational safety and health, enhance the training for current practitioners and attract more newcomers to join the industry;

Government's efforts in managing municipal solid waste

- promoting food waste reduction: The Administration would continue with the Food Wise Hong Kong Campaign to promote public awareness of the food waste problem in Hong Kong. The Administration would also encourage behavioral changes in various sectors of the community for reduction in food waste. The Administration would continue to give support to non-government organizations and encourage them to collect from business establishments, such as supermarkets, wet markets, restaurants, clubs, hotels, etc., food which was surplus but edible or was approaching but not reaching the expiry date for donation to the people in need; and
- strengthening infrastructural and land support: The Administration would continue to monitor the performance of tenants and usage of sites at the EcoPark; to encourage tenants to invest in advanced technologies and recycling processes; and to enhance the facilitation measures to address their operation needs at different stages of development. The Administration was conducting a study on land support required for continuable development of the recycling industry.

60. Estimation of the remaining serviceable lives of the three landfills was one of the most important factors in considering the Administration's funding applications for environmental projects, such as landfill extension, waste-to-energy facilities and organic waste treatment facilities, etc., by LegCo Members. During the scrutiny of landfill extension projects in 2014, some LegCo Members had repeatedly stressed their concerns that the Administration would slow down its efforts in putting forward policies and measures to reduce and recycle waste because of the provision of excessive waste disposal facilities, such as over-provision of landfill capacity and IWMF. As such, any variation in the estimation of the remaining serviceable lives of the three landfills would affect the overall waste management strategies and the priority and the timetable of implementing the relevant projects. In view of the inadequacies identified in the Audit Report on the estimation of the remaining serviceable lives of the three landfills and EPD's latest estimation, the Committee asked whether the Administration would develop a new blueprint setting out the revised waste management strategies, in particular whether additional resources and manpower would be allocated to enhancing the reduction and recycling of MSW.

61. **Director of Environmental Protection** stated in her letters dated 22 December 2015 (*Appendix 12*) and dated 11 January 2016 (*Appendix 13*) that:

- the underlying thinking of the 2013 Blueprint was to tackle waste problems from a resource re-circulation perspective. As part of waste reduction, the Administration encouraged the public to reuse and recycle as far as possible. Unavoidable waste would be turned into energy by modern technology while disposal at landfills would be the last resort. To measure the effectiveness of the comprehensive package of waste reduction measures set out in the 2013 Blueprint, the Administration had adopted a single target of reducing the MSW waste disposal rate on a per-capita basis by 40 percent by 2022. The accuracy and reliability of the waste statistics related to waste disposal was beyond doubt as they were based on factual weighbridge data recorded at entrances of waste treatment facilities. Other factors such as the fluctuations in waste recovery rates and the estimation of the serviceable lives of the three landfills would not diminish the impact of the various waste reduction measures, nor the waste reduction target set out in the 2013 Blueprint; and
- in the coming years, the Administration would endeavour to implement the 2013 Blueprint and appeal to the public for support to achieve the targeted results. While the 2013 Blueprint had only been implemented for a few years, the Administration had been constantly reviewing its waste management policies and initiatives to ensure they were responsive to new challenges posed by societal development, kept pace with public aspirations and were timely and adequate to address the needs of the industry.

G. Conclusions and recommendations

Overall comments

62. The Committee:

- expresses alarm and finds it unacceptable that despite the ambitious vision of the Administration in managing municipal solid waste ("MSW") as enshrined in the "Policy Framework for the Management of Municipal Solid Waste (2005-2014)" ("the 2005 Policy Framework"), the Environment Bureau ("ENB") and the Environmental Protection Department ("EPD") had demonstrated a lack of determination to execute the action plans in a professional and effective manner in order to achieve the targets set out in the 2005

Government's efforts in managing municipal solid waste

Policy Framework. As a result, the Administration had failed in meeting all the main waste management targets set out in the 2005 Policy Framework as follows:

- (a) MSW-generation quantities of 5.62 million tonnes in 2014 had exceeded the target of 5.25 million tonnes by 7%;
- (b) the published MSW-recovery rate was 37% in 2014, which had fallen short of the target level of 50% by 13%; and
- (c) the percentage of MSW disposed of at landfills was 63% in 2014 (3.57 million tonnes out of 5.62 million tonnes), which had exceeded the target level of 25% by 38%.

In addition, there have been substantial delays in the implementation of the policy tools proposed in the 2005 Policy Framework, including the producer responsibility schemes ("PR schemes"), the MSW charging scheme and the integrated waste management facility ("IWMF") project;

- finds it appalling and inexcusable that ENB and EPD had failed in their roles in compiling and providing useful, accurate and essential information to facilitate the discussion of the public and the Legislative Council ("LegCo") on waste management strategies and projects in a timely manner as evidenced by the following:
 - (a) despite that significant over-estimation of the MSW-generation quantities and MSW-recovery rates had existed for many years due to the negligence on the parts of ENB and EPD in including unknown quantities of import recyclables in the estimation, they had only since April 2014 adopted measures to improve the accuracy of these two key performance indicators on the Administration's actions in managing MSW. This had inevitably distorted the objective measurement of the effectiveness of the Administration's efforts to increase MSW recovery and recycling rates;
 - (b) ENB and EPD had consistently underestimated the remaining serviceable lives of the three landfills in their papers submitted to LegCo from 2008 to 2014 for funding applications for environmental infrastructure projects;

Government's efforts in managing municipal solid waste

- (c) the key performance indicators such as the MSW-generation quantities, the MSW-recovery rates, and the remaining serviceable lives of the three landfills are important factors in formulating waste management strategies and priorities by the Administration. They are also the key factors that LegCo Members had considered when the Administration submitted the funding applications for environmental infrastructure projects, such as landfill extensions, IWMF and the organic waste treatment facility ("OWTF"). The failure of ENB and EPD to compile more accurate estimations of these factors might lead to LegCo's decisions to approve waste management projects and prioritize the use of precious resources not in the best interests of Hong Kong; and
- (d) the accuracy of the statistics collected for evaluating the effectiveness of the measures on MSW reduction and recovery was in doubt given the following inadequacies: the method used by EPD to estimate the MSW recovery rate and the number of plastic shopping bags ("PSBs") bearing the features of supermarkets, convenience stores or personal-item stores ("pertinent PSBs") disposed of at landfills; the low response rate on the provision of statistics on the quantities of recyclables collected from waste-separation bins by participating housing estates and commercial and industrial ("C&I") buildings under the Source-separation Programmes;
- expresses serious disappointment that the current term Government has planned to conduct a study to review the need of implementing the PR schemes on three of the six products proposed by the previous term Government in the 2005 Policy Framework, i.e. vehicle tyres, packaging materials and rechargeable batteries. This policy shift might have disrupted the continuation of the policies on MSW management established by the previous term Government and affected the overall effectiveness of the policies. Moreover, ENB and EPD had not consulted LegCo or the public on the decision of the above policy shift, nor had they consulted LegCo or the public about their plan to introduce the PR scheme on a new product, i.e. plastic bottles;
- emphasizes that during the scrutiny of the funding applications for landfill extension projects in 2014, some LegCo Members had repeatedly stressed their concerns that the Administration would slow down its efforts in putting forward policies and measures to reduce and

Government's efforts in managing municipal solid waste

recycle waste because of the provision of excessive waste disposal facilities, such as over-provision of landfill capacity and IWMF. If more accurate estimations had been provided to LegCo, the funding applications for landfill extensions might have been deferred and the resources could have been used to enhancing the reduction and recycling of MSW or allocated to more urgent and useful community projects;

- notes that:
 - (a) in 2013, the Administration updated the relevant policy tools and implementation strategy in the "Hong Kong Blueprint for Sustainable Use of Resources (2013-2022)" ("the 2013 Blueprint"). The 2013 Blueprint set a target of reducing the per-capita-per-day MSW disposal from 1.27 kg (using 2011 as the base year) to 1 kg or less by 2017, and to 0.8 kg or less by 2022, and laid down action plans for the implementation of the PR schemes on waste electrical and electronic equipment ("WEEE") and glass beverage bottles, Phase 2 of the PR schemes on PSBs and the MSW charging scheme;
 - (b) according to the paper submitted by the Administration to LegCo Finance Committee in October 2014⁴, IWMF would be commissioned in 2022-2023; and
 - (c) EPD, the Census and Statistics Department ("C&SD") and the Customs and Excise Department ("C&ED") have implemented enhancement measures in the collection of data of export recyclables since 2014. C&SD has also implemented the enhanced quality check procedures since April 2014 by selecting a sample of trade declarants of domestic exports of waste plastics⁵ for checking. According to the results of the enhanced quality check procedures on domestic exports of waste plastics, less than 1% of the domestic exports of waste plastics should be re-exports in the third quarter of 2015;

4 Please refer to the paper submitted by the Environment Bureau to the Finance Committee in October 2014 (Enclosure to LC Paper No. FCR(2014-15)34A).

5 According to paragraph 2.10 of the Audit Report, traders may import recyclables, mainly waste plastics, from overseas.

- urges Secretary for the Environment to:
 - (a) consider developing a new and realistic blueprint setting out the revised waste management strategies having regard to the under-estimation of the remaining serviceable lives of the three landfills as well as the significant over-estimation of the MSW-generation quantities and MSW-recovery rates by the Administration, and consider allocating additional resources and manpower to enhancing the reduction and recycling of MSW;
 - (b) strengthen efforts to closely monitor the trend of per-capita-per-day MSW disposal and the implementation of all major environmental projects, and take early corrective actions in future with a view to meeting the targets set out in the 2013 Blueprint or any new blueprint to be developed by the Administration;
 - (c) strengthen efforts to continue the implementation of long-term policies formulated by the previous terms of Government as appropriate with a view to achieving the targets set with the consensus of the community;
 - (d) provide LegCo, in future, with more accurate estimation of the remaining serviceable lives of the three landfills as well as the underlying assumptions in the estimation with more quantitative information; and
 - (e) report to and consult LegCo and the public, in future, in a timely manner on any significant changes to major initiatives in MSW management; and

- urges Director of Environmental Protection to:
 - (a) take measures to improve the accuracy of statistics collected for evaluating the effectiveness of MSW related programmes;
 - (b) closely monitor the trend of important estimation relating to MSW, in particular the key performance indicators on Government's actions in managing MSW, to identify any anomalies or areas of concern and take appropriate follow-up actions as early as possible; and

- (c) expedite the implementation of IWMF, PR schemes, MSW charging scheme and OWTF with a view to meeting the targets set out in the 2013 Blueprint or any new blueprint to be developed by the Administration.

Specific comments

63. The Committee:

Reduction in MSW

- expresses alarm and finds it unacceptable that:
 - (a) the system used by EPD in estimating the key performance indicators on Government's actions in managing MSW had been faulty. Owing to the negligence on the parts of ENB and EPD in including unknown quantities of import recyclables in the estimation, two key performance indicators, namely the MSW-generation quantities and MSW-recovery rates, had been over-estimated;
 - (b) although under the trade-declaration system, "domestic exports" comprised both import recyclables processed in Hong Kong for export and locally-generated recyclables for export, ENB and EPD had adopted "domestic export" quantities as the locally-generated recyclable quantities and had not compared the figures with those gathered from its annual waste-recovery surveys, resulting in over-estimation of the latter;
 - (c) mainly due to increases in the quantities of import recyclables from 2005 to 2010, the MSW-generation quantity had increased by 15% from 6.01 million tonnes to 6.93 million tonnes during the period, and the MSW-recovery rate from 43% to 52%. Likewise, mainly due to decreases in the quantities of import recyclables after 2010, the MSW-generation quantity had decreased to 5.49 million tonnes and the MSW-recovery rate to 37% in 2013;
 - (d) partly due to the over-estimation of the MSW-generation quantities, in 2011, Hong Kong's per-capita-per-day domestic

Government's efforts in managing municipal solid waste

MSW generation of 1.36 kg was much higher than those of Taipei City's 1.00 kg, Seoul City's 0.95 kg and Metro Tokyo's 0.77 kg;

- (e) notwithstanding that the over-estimation of the MSW-generation quantities and MSW-recovery rates had existed for many years, ENB and EPD have only since April 2014 adopted improvement measures together with C&SD and C&ED to collect additional data from exporters with a view to distinguishing between import recyclables processed for export and locally-generated recyclables for export which are both reported as "domestic exports" under the trade-declaration system;
- (f) the excess quantities of import plus locally-generated recyclables over export recyclables gave rise to concerns that some import recyclables might have been disposed of at local landfills;
- (g) as of January 2016, seven to nine years after the time targets for implementing the PR schemes on six products were set in the 2005 Policy Framework, the PR schemes on five products, namely WEEE, vehicle tyres, glass beverage bottles, packaging materials and rechargeable batteries, had not been implemented;
- (h) as of January 2016, while the implementation of MSW charging would contribute to 20% reduction in MSW generation which would significantly help reduce the quantity of MSW disposal at landfills, the MSW charging bill would only be submitted to LegCo in 2016-2017 legislative session, nine years after the time target of 2007 set out in the 2005 Policy Framework;
- (i) while ENB and EPD had informed LegCo of the reduction in the number of pertinent PSBs being disposed of at landfills during the implementation of Phase 1 of the PR scheme on PSBs from 2009 to 2013, they had not informed LegCo of the insignificant impact of the PSB scheme on landfills which had only contributed to 11 544 tonnes of annual reduction in MSW disposed of at landfills as against the total quantity of 3.48 million tonnes of MSW disposal in 2013;
- (j) the number of pertinent PSBs being disposed of at landfills based on EPD's landfill-survey results was significantly greater than that of PSBs distributed by registered retailers at registered

outlets based on their returns, giving rise to concerns that the former might have been significantly over-estimated; and

- (k) EPD did not have statistics on the number of PSBs belonging to registered outlets being disposed of at landfills before and after the implementation of Phase 1 of the PR scheme on PSBs;
- recommends that Secretary for the Environment and Director of Environmental Protection should, in implementing similar schemes in future, in addition to the reduction in the number of PSBs being disposed of at landfills, provide LegCo with and publish information on the reduction in weight of PSBs being disposed of at landfills before and after implementation of the scheme;
- notes that:
 - (a) Secretary for the Environment and Director of Environmental Protection have agreed with the Audit Commission ("Audit")'s recommendations in paragraphs 2.34 and 2.52 of the Director of Audit's Report ("Audit Report"); and
 - (b) Commissioner for Census and Statistics and Commissioner of Customs and Excise have agreed with Audit's recommendations in paragraph 2.34(a) of the Audit Report;

Recovery of MSW

- expresses grave dismay and finds it unacceptable that:
 - (a) while the Food and Environmental Hygiene Department incurred about \$9,000 for engaging contractors to collect a tonne of recyclables from waste-separation bins in public places for delivery to approved recyclers, due to the lack of reporting requirements in Government contracts for collecting recyclables from waste-separation bins, EPD 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;
 - (b) ENB and EPD had used Hong Kong's over-estimated MSW-recovery rate of 48% in 2011 to compare with those of

Government's efforts in managing municipal solid waste

Japan of 21% in 2010, Singapore of 48% in 2011, Taiwan of 52% in 2011 and South Korea of 61% in 2009;

- (c) in 2013 and 2014, only 26% and 12% respectively of waste plastics were recovered as compared with the recovery rates of 90% and 92% respectively for waste metals, and 61% and 58% respectively for waste paper for the two years; and
 - (d) in 2013, under EPD's Source-separation Programme, 51% of the 1 979 participating housing estates and 32% of the 860 participating C&I buildings did not provide EPD with statistics of the quantities of recyclables collected from waste-separation bins, thus adversely affecting assessment of the effectiveness of the programme;
- recommends that Secretary for the Environment and Director of Environmental Protection should take actions to ascertain and publish the quantities of recyclables collected from waste-separation bins which are disposed of at landfills due to contamination or other reasons;
 - notes that:
 - (a) Secretary for the Environment and Director of Environmental Protection have agreed with Audit's recommendations in paragraphs 3.20 and 3.39 of the Audit Report; and
 - (b) ENB and EPD plan to engage a consultant to conduct a review of the implementation of the Source-separation Programme and make recommendations to improve the programme, and will refine their promotion strategy in the light of the review;

Recycling of MSW

- expresses concern that:
 - (a) from 2011 to 2014, the actual throughput of Lot 1 of EcoPark, which commenced operation in January 2011, only accounted for 16% to 85% of the required throughput as specified in the tenancy;

Government's efforts in managing municipal solid waste

- (b) at Lot 3 of EcoPark, the tenant only commenced recycling operation 24 months after the time specified in the tenancy, and had twice suspended the operation for 20 months and 8 months respectively;
 - (c) at Lot 4 of EcoPark, up to August 2015, the tenant had not commenced recycling operation five years after the commencement date specified in the tenancy, but EPD had not repossessed the site for re-letting;
 - (d) at Lots 9, 10 and 14 of EcoPark, up to August 2015, the tenants had not commenced recycling operation 29 months after the time specified in the tenancies;
 - (e) from July 2012 to August 2015, EPD had permitted five EcoPark tenants, including four who were profit-making organizations, to use areas in vacant Lots 15 and 16 for storage purposes free of charge for 92 days to 897 days; and
 - (f) from 2015-2016 onwards, of the 33 short-term-tenancy sites occupying a total area of 47 105 square metres for exclusive use by the recycling industry, 18 sites occupying a total area of 15 967 square metres (34%) would be taken back for land sale or other uses;
- notes that Secretary for the Environment and Director of Environmental Protection have agreed with Audit's recommendations in paragraph 4.30 of the Audit Report;

Treatment and disposal of MSW

- finds it appalling and inexcusable that:
- (a) although 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, more than 63% of MSW was disposed of at landfills in 2013 and 2014 respectively;
 - (b) notwithstanding various actions taken by EPD in recent years with a view to reducing MSW generation and increasing MSW recovery, the MSW quantity disposed of at landfills had increased by 8.8% from 3.28 million tonnes in 2011 to

Government's efforts in managing municipal solid waste

3.57 million tonnes in 2014, and the MSW per-capita-per-day quantity disposed of at landfills had increased by 6.3% from 1.27 kg in 2011 to 1.35 kg in 2014;

- (c) by comparing with Taipei city and South Korea, Hong Kong has only achieved about 14% decrease in the quantity of domestic/household MSW disposal over the past 20 years, while Taipei city and Seoul have achieved about 78% decrease and about 50% decrease in the quantity of domestic/household MSW disposal over the past 20 years and 18 years respectively⁶; and
 - (d) in informing LegCo in March 2012 that the three landfills would reach their capacities from 2014 to 2018, EPD did not provide LegCo with quantifiable information about the basis of estimation and the significant assumptions made in the estimation, such as using a conservative weight-to-volume ratio of 1 tonne of waste: 1 cubic metre of landfill space, and assuming annual growths in MSW and other waste being disposed of at landfills in spite of its stated efforts to reduce MSW generation and increase MSW recovery;
- notes that Secretary for the Environment and Director of Environmental Protection have agreed with Audit's recommendations in paragraph 5.21 of the Audit Report;

Way forward

- expresses serious concern that:
 - (a) with the implementation of the approved and proposed extension works, the three landfill sites would occupy a total area of 554 hectares of land, which is approximately the size of 550 standard football pitches. Notwithstanding this, Hong Kong's limited landfill space in the three landfills will be progressively used up in 8, 13 and 19 years respectively from present;
 - (b) owing to the scarcity of land, further extension of the three landfills or finding a place for developing a new landfill will be very difficult; and

⁶ Please refer to paragraph (e) of *Appendix 8* for the trend of domestic/household MSW disposal in the three places provided by EPD.

- (c) despite the fact that a proposal for providing a waste-to-energy facility for MSW treatment was made as early as 1998, such facility would only be provided in 2023, and it would only then treat 1.1 million tonnes of MSW a year as against the total quantity of 3.57 million tonnes of MSW disposed of at landfills in 2014; and
- notes that Secretary for the Environment and Director of Environmental Protection have agreed with Audit's recommendations in paragraph 6.15 of the Audit Report.

Follow-up action

64. The Committee wishes to be kept informed of the progress made in implementing the various recommendations made by the Committee and Audit.

A. Introduction

The Audit Commission ("Audit") conducted a review of the reduction and recycling of food waste by the Government.

Background

2. Food waste comprises waste produced during food production, processing, wholesale, retail and preparation, as well as after meal leftovers and expired foods. At present, 99% of Hong Kong's food waste is disposed of at landfills together with other municipal solid waste ("MSW")¹. This current practice of disposing of biodegradable food waste at landfills is not sustainable and is environmentally undesirable as it depletes the limited landfill space, creates odour nuisance, generates leachate and landfill gases that require further mitigation measures to deal with, and squanders the useful organic contents.

3. In 2014, there were on average about 3 640 tonnes per day ("tpd") of food waste disposed of at landfills, which constitutes 37% of MSW disposed of at landfills² and is the largest MSW category being landfilled. Out of the 3 640 tpd, 72% (about 2 607 tpd) of the food waste came from households and 28% (about 1 033 tpd) from food-related commercial and industrial ("C&I") sources such as restaurants, hotels, wet markets, food production and processing industries. Compared to the actual food-waste disposal in 2004, the quantity of food waste disposed of at landfills had increased by 13% from 1.181 million tonnes to 1.329 million tonnes in 2014.

4. As the executive arm of the Environment Bureau ("ENB"), the Environmental Protection Department ("EPD") is responsible for implementing waste management policies and strategies.

5. In December 2005, EPD published the "Policy Framework for the Management of Municipal Solid Waste (2005-2014)" ("the 2005 Policy Framework"), which set out strategies, targets and action plans on avoidance and minimization; reuse, recovery and recycling; and bulk reduction and disposal of MSW, which included food waste and yard waste. The waste reduction and

1 Please see Chapter 1 of Part 8 of this Report for "Government's efforts in managing MSW".

2 There were on average 9 782 tpd of MSW disposed of at landfills in 2014.

Reduction and recycling of food waste

recycling targets and related action plans were updated in January 2011. In May 2013, ENB published the "Hong Kong Blueprint for Sustainable Use of Resources (2013-2022)" ("the 2013 Blueprint"), which set out targets to reduce the per-capita-per-day MSW disposal rate from 1.27 kilogram ("kg") in 2011 to 1 kg or less by 2017, and further to 0.8 kg or less by 2022. In February 2014, ENB published "A Food Waste and Yard Waste Plan for Hong Kong (2014-2022)" ("the 2014 Food Waste Plan") which set out a target to reduce food-waste disposal at landfills by 40% by 2022, using 2011 as the base year.

6. In 2014-2015, the estimated recurrent expenditure of EPD's waste (including food waste) management programme was \$2,049 million. The estimated operation cost (including collection and transfer cost) of disposing of a tonne of MSW (including food waste) was \$520.

The Committee's Report

7. The Committee's Report sets out the evidence gathered from witnesses. The Report is divided into the following parts:

- Introduction (Part A) (paragraphs 1 to 9);
- Reduction in food waste (Part B) (paragraphs 10 to 35);
- Recycling of food waste (Part C) (paragraphs 36 to 75);
- Way forward (Part D) (paragraphs 76 to 79); and
- Conclusions and recommendations (Part E) (paragraphs 80 to 82).

Public hearings

8. The Committee held two public hearings on 12 and 29 December 2015 to receive evidence on the findings and observations of the Director of Audit's Report ("Audit Report").

Opening statement by Secretary for the Environment

9. **Mr WONG Kam-sing, Secretary for the Environment**, made an opening statement at the beginning of the Committee's first public hearing held on 12 December 2015, the summary of which is as follows:

- the 2005 Policy Framework proposed to recover about 500 tonnes of food waste generated from C&I activities through source separation of food waste for biological treatment, such as composting and anaerobic digestion. Since then, the Government had implemented various pilot schemes promoting on-site food waste treatment and planned for the development of Organic Waste Treatment Facilities ("OWTFs") Phases 1 and 2. For promoting on-site food waste treatment, ENB and the Education Bureau ("EDB") jointly invited all schools in the territory to sign a Green Lunch Charter, which encouraged them to stop using disposable containers and adopt on-site meal portioning where possible to reduce food waste. The Environment and Conservation Fund ("ECF") would provide subsidies for existing schools to install the necessary equipment, while the standard design of new schools would cater for the mode of on-site meal portioning. Moreover, food waste recycling projects were also implemented in private housing estates for them to source-separate food waste for recycling to useful compost, and at the same time educate the public to reduce food waste;
- over the past decade, the Government had adopted a progressive approach in implementing various measures for enhancing community mobilization and education, facilitating different sectors in practising food waste reduction and source separation, as well as fostering behavioural changes, so as to get ready for the large-scale food waste recycling activities in future. Building on the efforts made and experience gained in the past years, the current-term Government had further consolidated the relevant strategies and measures, with the Food Waste Plan launched last year to provide a clear and holistic approach and strategy for its future work; and
- despite the continuous increase in economic activities and number of visitors in Hong Kong, the total amount of food waste disposed of in 2014 (about 1.33 million tonnes) did not show further increase as compared to 2013. Over the past two years, there had been noticeable changes in the awareness and behaviours in the community, e.g. the habit of taking food home after meals or more participation of the C&I sector in food donation, etc. The Administration would keep up its

efforts in promoting further reduction in food waste among various sectors according to the strategies and course of action set out in the Food Waste Plan.

The full text of Secretary for the Environment's opening statement is in *Appendix 14*.

B. Reduction in food waste

Government's strategies and measures

10. According to paragraph 4.5 of the Audit Report, the Government's actions taken before the publication of the 2014 Food Waste Plan to address the food-waste problem were piecemeal. The Committee asked whether the Secretary for the Environment agreed with this view, in particular whether the progress and achievement of the actions taken by the Administration so far to address this problem had not been satisfactory.

11. **Secretary for the Environment** said at the public hearing and **Ms Anissa WONG Sean-ye**, **Director of Environmental Protection**, supplemented in her letter dated 13 January 2016 (*Appendix 15*) that:

- a number of the actions and measures were initiated and launched before the promulgation of the 2014 Food Waste Plan. These measures and actions included, among others, the launch of Food Wise Hong Kong Campaign ("FW Campaign") in 2013, the private food waste treatment facility at EcoPark, and the planning & implementation of OWTFs; and
- ENB and EPD had been implementing the above actions step by step in a progressive manner. These past efforts were by no means "piecemeal" as they had been taken forward in line with the strategies and action items set out in the 2005 Policy Framework which covered food waste as well, and the 2013 Blueprint. These efforts served to achieve the action plans and target set out in the 2014 Food Waste Plan.

12. Upon the Committee's request, **Director of Environmental Protection** provided in her reply dated 13 January 2016 (*Appendix 15*) a table setting out the progress of major measures listed in the 2014 Food Waste Plan.

Reduction and recycling of food waste

13. In response to the Committee's enquiry about the reasons for per-capita-per-day domestic food-waste generation of Hong Kong 85% higher than those of Taipei and Seoul in 2013, **Secretary for the Environment** said at the public hearing and **Director of Environmental Protection** supplemented at the public hearing and in her letter dated 23 December 2015 (*Appendix 16*) that:

- Hong Kong was primarily a service economy with a strong tourist component and had only a very limited agricultural base to provide suitable outlets (e.g. animal feed or compost) for food waste. This was different from other cities (e.g. Taipei) with a relatively large agricultural base around the city providing an important outlet for food waste. Also other cities had put in place MSW charging in 1990s or early 2000s which had proven to be very effective in reducing waste generation. Given the differences in socio-economic characteristics and the different stage of the policy development, the food waste management practices among different cities therefore could not be readily compared;
- Charts A and B of paragraph (a) of *Appendix 16* showed the trend of food waste in Hong Kong since 2004, and the key actions and measures taken on education and awareness, promotion of at source separation and recycling, as well as preparation for treatment facilities on food waste treatment. It was worthy to note that the combined efforts of these actions and measures had helped to moderate or stabilize the rate of growth of food-waste disposal despite the continuing rise in the economy and population in Hong Kong; and
- the Administration published the 2014 Food Waste Plan with a target of reducing food waste disposal at landfills by 40% in 2022. As an initial indication, the amount of food waste disposed of at landfills in 2014 was slightly reduced to 1.329 million tonnes, representing some 0.2% reduction in comparison with the 1.331 million tonnes in 2013. Using a per-capita basis, it also represented a reduction of some 1%, from 0.508 kg/person/day in 2013 to 0.503 kg/person/day in 2014.

14. According to paragraph 2.6(a) of the Audit Report, the 2005 Policy Framework set the target of reducing the quantity of MSW (including food waste) by 1% per annum up to 2014, using 2003 as the base year. However, according to Figure 3 in paragraph 2.11 of the Audit Report, from 2004 to 2013, the actual quantity of food-waste disposal had increased by 13% from 1.18 million tonnes to 1.33 million tonnes. The Committee asked for the reasons for the increase in the

Reduction and recycling of food waste

quantity of food-waste disposal in this period, and the measures taken by EPD to tackle the food-waste problem during this period.

15. **Secretary for the Environment** said at the public hearing and **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that:

- from 2004 to 2013 when the actual quantity of food waste disposal had increased by 13%, Hong Kong's annual Gross Domestic Product ("GDP") had increased from \$1,317 billion to \$2,132 billion (a 62% increase), the annual number of visitors from 22 million to 54 million (a 145% increase), and population from 6.8 million to 7.2 million (a 6% increase);
- the domestic food waste disposal on a per-capita basis had dropped from about 0.42 kg/person/day in 2003 (base year of the 2005 Policy Framework) to about 0.36 kg/person/day in 2014, by about 14%. Within the same period, C&I food waste had increased from about 0.08 kg/person/day to about 0.14 kg/person/day, showing some correlation with the increasing trend in GDP and the number of tourists in Hong Kong. From 2005 to 2014, the total restaurant receipts in Hong Kong increased by some 29% in real terms (according to the volume index of total restaurant receipts compiled by the Government); and
- the Administration had put forward proposals and action plans, and had taken actions to tackle the problem of food waste from 2005 and 2013 as shown in the following:
 - (a) from 2005 to 2009, the Administration had developed the Kowloon Bay Pilot Composting Plant ("the Pilot Plant") to prepare for large-scale food-waste recycling in future; and initiated the site search, the environmental impact assessment ("EIA") and Engineering Feasibility Study for OWTF Phase 1;
 - (b) in April 2009 and January 2011, ENB submitted the paper "Update on the Progress of The Key Initiatives in the Policy Framework for the Management of MSW (2005-2014)" to the Legislative Council ("LegCo") Panel on Environmental Affairs ("EA Panel") on the relevant initiatives, including ECF's support for on-site treatment, as well as planning and development of

Reduction and recycling of food waste

OWTF Phases 1 and 2. From 2009 to 2011, the Administration had formed a partnership programme with key food waste generators in the C&I sector with a view to setting up the delivery and collection protocol, so that their food waste generated could be delivered for treatment at OWTFs when commissioned. The Administration had also launched the Food Waste Recycling Projects in Housing Estates and completed the EIA for OWTF Phase 1;

- (c) in March 2012, ENB submitted the Paper "Reduce, Recycle and Proper Waste Management" to EA Panel and further updated the progress of various initiatives and plans. From 2011 to 2013, the Administration had carried out the pre-qualification and tendering for OWTF Phase 1 (and the retendering for OWTF Phase 1 due to very high returned tender prices). The Administration had also initiated a further site search for more OWTFs in addition to OWTF Phases 1 and 2; and
- (d) from 2013 to late 2015, the Administration had launched the FW Campaign to raise awareness and enhance community support to prevent and reduce food waste. EIA and feasibility studies for OWTF Phase 2 were also completed. The Administration had also discussed with the C&I sector on the delivery of food waste to OWTF Phase 1 and engaged a service contractor to facilitate the C&I sector to make arrangement for delivering food waste to OWTF Phase 1.

16. The Committee noted from paragraph 2.7 of the Audit Report that in the 2014 Food Waste Plan, ENB for the first time, set a target of reducing food-waste disposal at landfills by 40% by 2022, using 2011 as the base year. According to Figure 3 in paragraph 2.11 of the Audit Report, food-waste disposal had increased from 1.31 million tonnes in 2011 to 1.33 million tonnes in 2013. In view of the increase in food-waste disposal during this period and the inadequacies identified in the Audit Report on the reduction and recycling of food waste, the Committee asked for the measures, including setting any mid-term targets, enhancement of monitoring mechanisms, etc., to be taken by EPD to achieve the 40% food-waste reduction target by 2022.

17. **Secretary for the Environment** said at the public hearing and **Director of Environmental Protection** supplemented in her letter dated 23 December 2015 (*Appendix 16*) that:

- the 2014 Food Waste Plan analyzed the current situation of food waste in Hong Kong, and mapped out a comprehensive strategy, targets, policies and action plans in the coming years with a view to tackling the challenge faced in Hong Kong to meet the target of reducing food-waste disposal at landfills by 40% by 2022, using 2011 as the base year;
- ENB had taken into consideration the growth in GDP when setting the specific target for reducing food waste disposal at landfills by 40% by 2022 in the 2014 Food Waste Plan;
- the 2014 Food Waste Plan also set out the four main components of food waste management, including:
 - (a) prevention and reduction of food waste at source, such as the implementation of FW Campaign;
 - (b) donation of surplus food for human consumption;
 - (c) recycling to recover energy and nutrients, in particular the collection and transportation of food waste to OWTF for treatment; and
 - (d) the availability of adequate facilities to treat and disposed of food waste.

The above four measures must be implemented step by step in order to achieve the target in the 2014 Food Waste Plan;

- based on the experience of other places, it would take some time before the Administration could achieve meaningful reduction in the quantities of food waste being disposed of at the landfills. The Administration had therefore not set a mid-term target in the 2014 Food Waste Plan. As the Plan had only been introduced for one year, the Administration was working diligently to implement/launch all necessary policy measures and programmes to achieve the target and make any corrective/enhancement actions as necessary to ensure that the food waste reduction target would be met; and

Reduction and recycling of food waste

- the Administration was conducting a food waste survey and audit for the food and beverage sector with a view to providing information to evaluate the effectiveness of the FW Campaign in the sector. Ultimately, the question of whether the Administration was on track to meeting the reduction target set in the 2014 Food Waste Plan would be captured in its annual waste disposal survey.

FW Campaign

18. According to paragraph 2.26 of the Audit Report, in order to monitor the progress of the implementation of the FW Campaign and assess the extent of achievement in food-waste reduction, EPD requested the signees of the Food Wise ("FW") Charter to submit returns on their food-waste reduction through implementing planned actions. However, according to paragraphs 2.29 and 2.31 of the Audit Report, only 26 (2.5%) of the total 1 027 returns that should have been submitted by signees of the FW Charter contained measurable food-waste-reduction data, and EPD had only called for 808 returns (79%) and omitted to call for 219 returns (21%). In this regard, the Committee enquired about:

- the actions to be taken by EPD to encourage the submission of returns;
- the measures taken/to be taken by EPD to prevent recurrence of the omission to call for returns; and
- how EPD would monitor and review the effectiveness of the FW Campaign given the low response rate.

19. **Mr Elvis AU Wai-kwong, Assistant Director (Nature Conservation and Infrastructure Planning) of EPD**, said at the public hearing and **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that:

- although the Charter Scheme was on a voluntary basis, EPD would strengthen its efforts to encourage and facilitate FW Charter signees to provide returns and related measurable data, such as issuing reminders and contacting signees to understand the difficulties they had. In addition, EPD would enhance the efforts to consolidate good experiences and practices including those of the charter signees and share them through the network of the FW Campaign, including its

Reduction and recycling of food waste

website and facebook so that signees could make reference to them to learn and build up their food waste reduction and monitoring practices;

- EPD would deploy additional resources to strengthen the efforts in checking the procedures of calling for returns to ensure that no omission would happen again; and
- FW Charter was one of the nine programmes under the FW Campaign. Signing the FW Charter was only one of the many ways that government departments, non-governmental organizations ("NGOs") and private organizations could contribute to the food-waste reduction efforts. The effectiveness of the FW Campaign should not be measured merely by the response rate of returns from signees of the FW Charter Scheme. Instead, this Campaign was to promote the behavioural changes, educate/establish and adopt good practices in various sectors of the community. The effectiveness of the campaign should be assessed holistically through more scientific and subjective approach, such as the food waste survey and audit for the food and beverage sector, and ultimately the disposal quantity of food waste at landfills.

20. In reply to the Committee's request, **Director of Environmental Protection** provided the total expenditure for the FW Campaign and the actions taken by EPD in each stage of the Campaign in her reply dated 23 December 2015 (*Appendix 16*).

Coordination among government departments

21. The Committee noted from paragraph 2.17(b) of the Audit Report that one of the objectives of the FW Campaign was for EPD to coordinate efforts within the Government and public institutions to lead by example in food-waste reduction. According to paragraphs 2.22 and 2.24 of the Audit Report, as of June 2015, of the 12 government departments invited by EPD from May to October 2013 to sign the FW Charter, eight had not signed the Charter. Of the eight government departments, six signed the FW Charter only after Audit had commenced the review. In this regard, the Committee asked for the actions taken by EPD from October 2013 to June 2015 to follow up this matter with the government departments which had not signed the FW Charter.

22. **Director of Environmental Protection** explained at the public hearing and in her letter dated 23 December 2015 (*Appendix 16*) that:

- from October 2013 to June 2015, EPD worked together with government departments in implementing the FW Campaign and helping to promote food wise message. Representatives from government departments including the Food and Environmental Hygiene Department ("FEHD") and Housing Department ("HD") attended various meetings of Project Steering Committee and Sub-Committee of FW Campaign to make contributions to the Campaign. They also participated in working groups on preparation of Good Practices Guides such that a total of six Food Waste Reduction Good Practice Guides had been issued and made available for the community for reference. In addition, EPD had also liaised with various government departments (including FEHD, HD, the Correctional Services Department ("CSD") and the Hong Kong Police Force) from time to time in providing FW posters for facilitating them to spread out the food wise messages;
- EPD also invited government departments having in-house catering services and/or food-waste generation establishments within the facilities managed by them to sign the FW Charter. Whilst some departments raised concerns on the requirements and commitments under the FW Charter, after clarifications and experience sharing of those departments that had signed the FW Charter, six additional government departments listed in Table 2 of the Audit Report³ had subsequently signed the FW Charter; and
- a number of initiatives and actions had also been taken by government departments for helping to reduce food waste. For example, HD implemented food waste reduction and recycling programme as detailed in Part 3 of the Audit Report.

23. In reply to the Committee's request, **Commissioner of Correctional Services** provided in his reply dated 22 December 2015 (*Appendix 17*) a list of measures that CSD had taken and would take to further minimize food waste in CSD institutions, in particular for those institutions with a relatively high per-person-in-custody-per-day quantity of food waste.

³ The six departments were the Auxiliary Medical Service, CSD, the Customs and Excise Department, the Hong Kong Police Force, the Government Property Agency and the Leisure and Cultural Services Department.

Reduction and recycling of food waste

24. Upon the Committee's request, **Chief Executive, Hospital Authority**, also provided in his reply dated 22 December 2015 (*Appendix 18*) the measures that the Hospital Authority ("HA") had taken and would take to further minimize food waste in HA hospitals, in particular for those hospitals with a relatively high per-in-patient-per-day food-waste quantity.

Food-waste reduction in the public markets under the management of FEHD

25. In response to the Committee's enquiry regarding the measures that FEHD had taken/would take to encourage the reduction of food waste in the public markets under its management, **Miss Vivian LAU Lee-kwan, Director of Food and Environmental Hygiene**, explained at the public hearing and in her letter dated 24 December 2015 (*Appendix 19*) that:

- FEHD had put in place a series of measures on reduction and recycling of food waste, such as:
 - (a) participation in EPD's FW Campaign and in drafting Food Waste Reduction Good Practice Guide for the market sector;
 - (b) installation since end-2012 on a trial basis a food waste composter at a public market (i.e. Tai Shing Street Market) for on-site conversion of food waste into compost; and
 - (c) participation in the Food Waste Recycling Partnership Scheme ("the Partnership Scheme") organized by EPD, including nomination of some public markets to participate in the Scheme; and
- while resources and expertise permitted, FEHD would continue to work in collaboration with EPD and provide support to its food waste reduction initiatives. Measures under consideration included:
 - (a) FEHD planned to set aside some areas in certain public markets for suitable NGOs identified by EPD to set up food collection points in order to facilitate NGOs' collection of food donated by market stall tenants to the needy. FEHD and EPD were studying the specific arrangements; and
 - (b) EPD was planning source-separated food waste collection from public markets for delivering to and treatment at OWTF.

Reduction and recycling of food waste

FEHD and EPD were discussing the source-separated food waste collection arrangements and division of work.

Food-waste reduction at schools

26. According to paragraph 2.54(a) of the Audit Report, as stated in the 2009-2010 Policy Address, to further reduce food waste and disposable lunch boxes, schools were encouraged to stop using disposable containers and adopt on-site meal portioning where possible. According to paragraph 2.63 of the Audit Report, EPD's latest survey conducted in 2010 showed that only 12% of students taking lunch at school took lunch through the on-site meal portioning arrangement, and 46% of those students used disposable containers. In this regard, the Committee asked for the actions taken/to be taken by EPD to improve the above situation.

27. **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that:

- EPD and EDB issued a joint letter on 7 December 2015 to all primary and secondary whole-day schools encouraging those schools that had not yet adopted on-site meal portioning to apply for ECF for implementing on-site meal portioning;
- up to December 2015, applications from 114 whole-day schools had been approved by ECF and six applications were being considered. EPD, in collaboration with EDB, would continue to encourage whole-day schools to adopt green lunch practices including reviewing the relevant guidelines and circulars and commending schools with good performance. EPD together with EDB would also explore arranging sharing sessions with schools on the successful implementation of on-site meal portioning and other green lunch practices in schools; and
- according to the surveys on 114 schools adopting on-site meal portioning funded by ECF, it was estimated that around 56 000 students had benefited from taking lunch at school through on-site meal portioning. These students would no longer take lunch using disposable containers. EPD, with the support from EDB, was now considering conducting a survey on the lunch practice of all whole-day schools in 2016, including the use of disposable lunch boxes and food-waste quantities. Based on the data collected from the

Reduction and recycling of food waste

survey, they would also review the targets on reduction of using disposable lunch boxes at schools.

28. In response to the Committee's enquiry on the actions that would be taken by EDB to further promote green lunch practices among schools, **Mr Kevin YEUNG Yun-hung, Under Secretary for Education**, said at the public hearing and **Secretary for Education** stated in his letter dated 22 December 2015 (*Appendix 20*) that through circulars and guidelines, EDB would advise schools to formulate policies and follow the principles of reducing waste and minimizing wastage at all times in meal arrangements, and to implement appropriate measures to ensure that the lunch suppliers would provide students with healthy and green lunch.

29. **Secretary for Education** further explained that students' conscious effort to reduce food waste was a determining factor for the effectiveness of the measures. All along, elements of environmental education had been infused in different subjects of the school curriculum to nurture in students a sense of responsibility towards the environment and encourage them to take positive initiatives in improving the environment. EDB would continue its efforts to raise students' awareness and consciousness of environmental protection including reducing food waste through development of learning and teaching resources. In collaboration with EPD, professional development programmes would also be organized for teachers to enhance their professionalism and share the good practices of schools in this regard.

30. According to paragraphs 2.74 and 2.75 of the Audit Report, of the 32 schools approved with ECF funding in or after July 2011 (they were required to provide food-waste quantities as a condition of receiving ECF funding), only five schools (16%) had provided food-waste quantities both before and after adopting on-site meal portioning, and 15 schools (47%) had not provided any related information. The Committee asked for the follow-up actions that the Administration had taken on this issue and the difficulties encountered by the 15 schools that had not provided the latest information.

31. **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that the ECF Secretariat issued follow-up letters on 3 November 2015 to all the 32 schools approved with ECF funding in or after July 2011 reminding them to provide food waste quantities both before and after adopting on-site meal portioning as required under the conditions of receiving funding from ECF. As at 15 December 2015, out of the 32 schools, 26 schools had

Reduction and recycling of food waste

already provided the food waste quantities after adopting on-site meal portioning. Some schools which had already implemented on-site meal portioning before the 2015-2016 school term explained that they had not maintained the old food waste data and had difficulties to provide the food waste quantities before adopting on-site meal portioning. As the submission of returns was an on-going exercise, EPD expected receiving more returns in the 2015-2016 school term.

32. **Under Secretary for Education** said at the public hearing and **Secretary for Education** stated in his letters dated 22 December 2015 and 6 January 2016 (*Appendices 20 and 21* respectively) that some schools might not have the required knowledge about how to measure food-waste quantities. EDB would liaise with EPD on issuance of guidelines to schools on the methodologies of measuring food-waste quantities. In collaboration with EPD, EDB would arrange to explain the relevant details to schools through suitable means such as seminars, sharing sessions or workshops.

33. As revealed in paragraph 2.81 of the Audit Report that four new schools installed with on-site meal portioning facilities had not adopted on-site meal portioning, the Committee asked for the progress of following up with these four new schools.

34. **Under Secretary for Education** said at the public hearing and **Secretary for Education** explained in his letters dated 22 December 2015 and 6 January 2016 (*Appendices 20 and 21* respectively) that:

- EDB issued letters to the four schools in late November 2015 to ascertain the reasons for not implementing on-site meal portioning. While one school had already implemented on-site meal portioning since the commencement of the 2015-2016 school year, site visits were paid to the remaining three schools to understand the problems encountered; and
- one school was found to have adopted food portioning in classroom which could achieve similar effect as on-site meal portioning. For the remaining two schools, despite the difficulties in implementing on-site meal portioning, they had also taken suitable green lunch measures, such as using reusable containers and cutlery. EDB would further liaise with these two schools in collaboration with EPD and offer assistance to help them overcome the difficulties. Other possible

Reduction and recycling of food waste

means to reduce food waste such as requiring lunch suppliers to portion cooked food and pack lunch in reusable and thermal containers before delivering to schools for distribution to students would also be explored.

35. In response to the Committee's enquiry on the actions that would be taken to ensure that new schools installed with on-site meal portioning facilities would adopt on-site meal portioning, **Secretary for Education** stated in his letter dated 22 December 2015 (*Appendix 20*) that during the design and building stage of the school premises, EDB would inform the school sponsoring body that on-site meal portioning facilities had been included as standard facilities and require them to adopt on-site meal portioning as far as practicable. Upon handing over of the school premises to the school, school development officers of EDB would follow up the implementation plan of the school and provide necessary assistance to ensure that the school would adopt on-site meal portioning unless there were exceptional circumstances with justifiable reasons. In the light of experience and different practices of schools in implementing on-site meal portioning, EDB also planned to review and explore viable measures to facilitate schools to adopt different modes of meal portioning taking into account the diversified circumstantial factors and school-based needs.

C. Recycling of food waste

The Pilot Plant

36. According to paragraphs 3.7 and 3.11 of the Audit Report, in April 2009 and March 2010, EPD informed EA Panel that the Pilot Plant would be capable of receiving up to four tpd of source-separated food waste from C&I premises, and this quantity of food waste could be perceived as the net quantity of food waste to be treated a day. The Committee asked why EPD had not clearly stated in the papers submitted to EA Panel that the four tpd figure included bulking agents and other non-food-waste materials.

37. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that:

- the four-tpd of source-separated food waste figure as stated in the papers submitted to EA Panel referred to the total capacity of organic

Reduction and recycling of food waste

waste (including food waste, bulking agents (e.g. bark chips and saw dust) and premature compost) that the Pilot Plant could handle. The addition of bulking agents and premature compost was required to achieve composting of food waste though the exact proportion of them to food waste was subject to trial for local conditions. As the Pilot Plant was to deal with "food waste", the Administration generalized to adopt the term "food waste" instead of referring to the various components of "organic waste" to be treated at the Pilot Plant; and

- there was no intention to mislead EA Panel in any way as the Pilot Plant was not set up as a regular waste treatment facility. Rather it was intended to be used for demonstration and educational purposes to encourage source separation of food waste among the C&I sector. In hindsight, the use of the term "organic waste" would better describe the actual process materials being used at the Pilot Plant.

38. The Committee noted from paragraph 3.12 of the Audit Report that in the first half of 2015, the average quantity of food waste treated at the Pilot Plant was 0.65 tpd, representing only 47% of its treatment capacity of 1.37 tpd (which was the equivalent of four tpd after considering the bulking agents and other non-food-waste materials). The Committee enquired about the reasons for the low utilization of the Pilot Plant and the measures taken/to be taken by EPD to improve this utilization rate.

39. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that:

- the Pilot Plant was set up as a demonstration facility which formed an integral part of the Partnership Scheme launched in 2010. The Partnership Scheme aimed to promote food waste collection and source-separation among the C&I sector. Since 2010, over 190 organizations had participated in the Partnership Scheme and their frontline staff had become familiar with the practices of collection and source-separation of food waste. Several good practice guides for the C&I sector had been developed through the Partnership Scheme for wider sharing within the C&I sector;
- the participation by C&I premises in the Partnership Scheme was on a voluntary basis. Each participant would commit to deliver food waste

Reduction and recycling of food waste

within an agreed project period of three to six months. The factors affecting the actual quantity of food waste delivered to the Pilot Plant included the business nature of the C&I premises, the quantity of food waste that could be source-separated, and their daily operations and resources for practising source separation together with the constraints of the collection and delivery within the premises and shopping malls before the delivery to the Pilot Plant; and

- ENB/EPD would strengthen the efforts to encourage more C&I premises to participate in the Partnership Scheme. They planned to conduct pro-active food waste collection services at FEHD's wet markets to facilitate stall owners to dispose of source-separated food waste conveniently near their stalls. They would also reach out to more individual restaurants, hotels and shopping malls to engage their participations, coupling with the provision of technical supports, guidelines and training to the C&I sector to facilitate their implementation on food waste reduction, source separation and recycling.

OWTFs

40. Regarding the daily capacities of 200 tpd and 300 tpd of food waste treated by OWTF Phases 1 and 2 respectively, the Committee asked whether these daily capacities represented the net food waste quantity or included other types of non-food-waste materials.

41. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** stated in her letter dated 2 December 2015 (*Appendix 22*) that:

- the food waste treatment processes adopted for OWTF Phases 1 and 2 were different from the one adopted for the Pilot Plant. The latter adopted a one stage aerobic composting process to turn food waste into compost. On the other hand, OWTF Phases 1 and 2 were designed for a 2-stage process, with stage 1 using anaerobic digestion as the core technology to produce energy; and stage 2 using composting to further process the residue to become compost as side products. During the anaerobic digestion process, no bulking or other agent was required; and

Reduction and recycling of food waste

- the design capacity of the OWTF Phases 1 and 2 for treating food waste was 200 tpd and 300 tpd respectively in the anaerobic digestion system.

42. The Committee noted from paragraphs 3.15 to 3.17 of the Audit Report that the projected commissioning dates for OWTF had been postponed repeatedly. For example, the projected commissioning date for OWTF Phase 2 had been postponed from 2017 under the 2013 Blueprint to end 2018 under the 2014 Food Waste Plan, and further to 2020 according to EPD. The Committee enquired about the reasons for the postponement and the updated progress of the implementation of OWTF Phases 1 to 3.

43. **Secretary for the Environment** said at the public hearing and **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that:

- in the 2014 Food Waste Plan, it was planned that the three OWTFs would be commissioned by 2022. This latest programme in the Food Waste Plan for the three OWTFs had taken into account the progress and the experience gained from the implementation of OWTF Phase 1, the preparation in the C&I sector for food waste source separation and the delivery as well as other latest relevant circumstances; and
- following the funding approval of OWTF Phase 1 on 24 October 2014, the Administration awarded the contract in December 2014 for commissioning the facilities in mid-2017. The EIA and Engineering Feasibility Study for OWTF Phase 2 had been completed and the project was anticipated to commence tendering in mid-2016 with a view to commencing operation by 2020. With this programme, the Administration planned to seek funding approval from LegCo for OWTF Phase 2 in 2017. A site in Shek Kong had also been earmarked for OWTF Phase 3 and the Administration would take forward its EIA and Engineering Feasibility Study in 2016, with a view to commencing its operation by 2022. The Administration would continue to take all necessary steps to expedite the programme wherever practicable.

Tender exercises for OWTF Phase 1

Consultancy services

44. According to paragraph 3.18 of the Audit Report, in August 2008, EPD appointed a consultant ("the Consultant") at a lump-sum price of \$6.2 million for carrying out engineering feasibility study, project cost estimation, EIA study and tendering for appointing a contractor for OWTF Phase 1. However, according to paragraphs 3.23 and 3.28 of the Audit Report, the tender exercise for the project carried out in 2011 was cancelled in the public interest. Audit examination revealed that some cost components had been omitted or significantly under-estimated in the project estimate of \$489 million, leading to significant under-estimation of the project cost made in 2010 (the estimated cost was \$1,532.8 million in 2014). Under the above circumstances, the Committee asked for reasons for significantly under-estimating the project cost in 2010, the scope of service provided by the Consultant and whether EPD had assessed its performance.

45. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that:

- EPD appointed a consultant in August 2008 for carrying out engineering feasibility study, project cost estimation, EIA study and tendering preparation and evaluation of the OWTF Phase 1 project;
- as this project was the first of its kind in Hong Kong with limited cost reference information, the actual process adopted for the project was to conduct EIA and engineering feasibility studies, develop the project requirements, prepare tender specifications and carry out the tender exercise before finalizing the project estimate and before the submission to the Public Works Subcommittee ("PWSC") for funding approval. Key requirements had been set out in the June 2011 tender document. After careful consideration, EPD considered it the most suitable and appropriate process to reflect the most up-to-date market prices and conditions, and to come up with a reliable project estimate for consideration by members of PWSC;
- EPD completed a detailed evaluation of the returned tenders including price analysis for the first tender exercise in March 2012. The analysis showed that the returned tender prices were unreasonably high when compared with the updated estimates based on the latest market

prices. EPD's assessment identified that the probable causes of the high returned tender prices were due to the high premium allowed for the escalating labour and construction costs, lack of local references in the local market, uncertain amount of waste to be collected, financial costing and requirement for fully standby equipment rather than any default of the Consultant's work. These factors were unforeseen before the return of the tenders; and

- EPD considered the Consultant had reasonably discharged its duties in accordance with the requirements under the assignment. EPD had followed the established administrative procedures for the management of consultants' performance to assess and evaluate the Consultant's performance quarterly throughout the consultancy study and the records showed that the overall performance of the Consultant was considered satisfactory throughout the consultancy study period.

46. In reply to the Committee's request, **Director of Environmental Protection** provided in her reply dated 13 January 2016 (*Appendix 15*) the extracts of the relevant provisions in the consultancy agreement made in relating to OWTF Phase 1 project on protecting the Government's interests against unsatisfactory performance of the Consultant.

47. According to paragraph 3.28(c) of the Audit Report, in September 2011, EPD requested the same Consultant to carry out a natural terrain hazard study at an additional cost of \$0.8 million. The Committee enquired about the reasons for EPD to further request the same Consultant to carry out the natural terrain hazard study at an additional cost of \$0.8 million.

48. **Director of Environmental Protection** explained in her letter dated 13 January 2016 (*Appendix 15*) that:

- it was noted that a natural terrain hazard study and any appropriate mitigation measures, if found necessary, should be carried out as part of the proposed development when the Permanent Government Land Allocation for this project was circulated for comment in June 2011. While awaiting the Lands Department to finalize the engineering conditions for the Permanent Government Land Allocation, it was considered necessary to instruct the Consultant to carry out the natural

Reduction and recycling of food waste

terrain hazard study to assess the requirements of the slope and natural terrain protection works;

- the Consultant had been involved in the agreement since 2008 and their extensive knowledge of the project would enable timely completion of the natural terrain hazard study without the need to familiarize with the project background and to review the relevant reports and documents again. This could minimize the time taken for the study and ensure better coordination; and
- the cost of the additional service to be charged by the Consultant was a lump sum fee of \$796,000. Given the large catchment area of the study and the scope of work listed above, it was considered reasonable to utilize the recommended level of manpower for this study. Based on the manpower requirements recommended by the Consultant, the scope of service, the man-hour charge rates, the cost of the additional service was assessed as reasonable and acceptable.

49. The Committee also noted from paragraph 3.25 of the Audit Report that, in July 2012, after consulting EPD's legal adviser, EPD instructed the same Consultant to carry out additional services relating to the re-tender exercise for the project at a lump-sum fee of \$1.8 million. The Committee asked why EPD had instructed the same consultant to carry out additional services relating to the re-tender exercise for the OWTF Phase 1 project.

50. **Director of Environmental Protection** explained in her letter dated 13 January 2016 (*Appendix 15*) that after the cancellation of the first tender exercise for the OWTF Phase 1 project in public interest in 2012, EPD needed to explore practicable measures to address the main causes of the unreasonably high returned tender prices, with a view to identifying appropriate revisions to the tender documents and initiating the re-tendering process. It was therefore necessary to instruct the Consultant to carry out additional services relating to the above via a supplementary agreement.

Parallel-tendering approach

51. According to paragraph 3.20 of the Audit Report, EPD had adopted the parallel-tendering approach in the OWTF Phase 1 project. The Committee asked

for the assessment made by EPD on the risks involved in initiating a procurement exercise before funding was secured for the project.

52. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** explained in her letter dated 13 January 2016 (*Appendix 15*) that:

- in deliberating on the appropriate tendering approach, EPD had assessed the risks involved in initiating a procurement exercise before funding was approved in accordance with the Financial Circular No. 2/2009. When EPD reported to EA Panel in April 2009 on the updated progress of the 2005 Policy Framework, the proposal for developing the OWTF Phase 1 was discussed. EPD also consulted the two relevant District Councils, Tsuen Wan District Council and Islands District Council, on the proposed OWTF Phase 1 project in 2010. EPD therefore considered that the risk for facing negative reaction leading to Government to abort the tender due to lack of funding or substantive last-minute changes to the scope of the proposed works low; and
- in addition, EPD considered that as the proposed OWTF would be the first of its kind in Hong Kong, there would be high degree of uncertainty in its cost estimates. Parallel tendering was recommended to provide reliable cost estimates before funding approval from LegCo was sought.

53. In reply to the Committee's request, **Director of Environmental Protection** provided in her reply dated 13 January 2016 (*Appendix 23*) the record showing the application made by EPD and the approval of the Secretary for the Environment for initiating parallel tendering for the OWTF Phase 1 project.

Significant under-estimation of project cost of OWTF Phase 1

54. According to paragraph 3.23(b) of the Audit Report, the tender prices of the OWTF Phase 1 project received were unreasonably high when compared with updated estimates, and the project cost could be reduced by introducing some cost-reduction measures as detailed in the paragraph. The Committee asked for the reasons for not incorporating the above cost-reduction measures in the original tender.

Reduction and recycling of food waste

55. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that:

- the probable causes of the high returned prices were more related to the high premium demanded for mitigating the construction, financing and operation risks perceived by the tenderers due to the market volatility since 2010. These factors were unforeseeable before the return of the tenders in the 2011 tender exercise. The Administration had subsequently identified scope to suitably adjust the performance requirements without adversely affecting the operational and environmental standards expected of the OWTF project. Having regard to the above, the Administration introduced appropriate measures to balance the construction and price risks to both the Administration and the Contractor with a view to lowering the capital and operating costs;
- the risk sharing measures were based on the actual feedback from the tenderers through the tendering process for this particular project to reflect their assessment of and responses to their perception of risks at the time of tendering in the light of the actual market conditions at that time; and
- the Administration carried out a re-tendering exercise through open tendering in February 2013 and awarded the contract in December 2014. The capital cost of the awarded contract was substantially lower than the returned tender prices in the 2011 tender exercise.

56. In reply to the Committee's request, **Director of Environmental Protection** provided in her reply dated 13 January 2016 (*Appendix 24*) a summary of key features/items for inclusion of updated and modified requirements to the tender documents in 2013 for OWTF Phase 1 project as compared to that of the tender exercise in 2011.

57. According to paragraph 3.27(b) of the Audit Report, ENB/EPD informed EA Panel in March 2014 that a reason for the significant increase in the project cost estimate was the need to operate the OWTF Phase 1 for 24 hours a day and to provide pre-treatment and waste-water treatment facilities. However, according to paragraph 3.28(b) of the Audit Report, the EIA report approved in February 2010 had

Reduction and recycling of food waste

already indicated that OWTF Phase 1 would be operated on a 24-hour daily basis, and pre-treatment and waste-water treatment facilities would be provided. The Committee asked why these associated costs had not been included in the project cost estimate of \$489 million made in 2010.

58. **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that upon the completion and approval of the EIA report in February 2010, EPD carried out detailed designs to develop the project specifications and requirements in accordance with the findings and recommendations in the approved EIA report and to meet other necessary service and operational requirements. These requirements included the detailed design and development works for the major equipment and facilities, namely the pre-treatment facilities, the anaerobic digestion process, the biogas treatment and storage facilities, the waste-water treatment facilities and the odour control facilities, to cater for scheduled maintenance, major overhauls, variation in quality of incoming food waste and inclement weather conditions to ensure the plant's continuous operation. These detailed design and development works and the corresponding project specifications and requirements had been properly incorporated in the 2011 tender documents.

59. The Committee also noted from paragraph 3.27(c) of the Audit Report that ENB/EPD informed EA Panel in March 2014 that a reason for the significant increase in the project cost estimate was the need to carry out natural terrain and slope protection cum mitigation works. However, according to paragraph 3.28(c), EPD only requested the Consultant to carry out a natural terrain hazard study in 2011, leading to the omission of the required slope mitigation works costing \$66.7 million in the project cost estimate of \$489 million made in 2010. The Committee asked why a natural terrain hazard study had not been conducted before making the project cost estimate in 2010, and the measure that EPD would take to prevent recurrence of such omissions.

60. **Director of Environmental Protection** explained in her letter dated 23 December 2015 (*Appendix 16*) that:

- before the close of tender in November 2011, EPD had taken the step to inform the tenderers on 21 September 2011 that slope mitigation and/or stabilization works might be required and the Contractor would be informed and might be required to undertake the necessary slope mitigation and/or stabilization and maintenance works via tender addendum;

Reduction and recycling of food waste

- the Consultant submitted the preliminary natural terrain hazard study Report to EPD on 29 November 2011 confirming that there were no insurmountable natural terrain hazard or slope instability issues that would affect the feasibility of the project. If the 2011 tender exercise was not cancelled on public interest ground, EPD could instruct the Contractor to carry out any necessary slope and natural terrain protection works via a variation order. The necessary natural terrain and slope protection mitigation requirements had been properly incorporated in the 2013 tender exercise and the cost of the required works had been reported in the paper submitted to EA Panel in March 2014. There was no omission of works and no implication on the overall project implementation and the project cost of the OWTF Phase 1 project; and
- in implementing a works project in future, the Administration would take measures to ensure that significant work requirements were included in a consultancy agreement. These measures would include the circulation of the draft consultancy brief to concerned government bureaux and departments for inputs and comments, and the undertaking of internal review of the draft consultancy brief before consultancy award.

61. The Committee further noted from paragraph 3.27(d) of the Audit Report that ENB/EPD informed EA Panel in March 2014 that a reason for the significant increase in the project cost estimate was the need to finalize the quantity of surplus electricity for the design of power generators and associated control system. However, according to paragraph 3.28(d) of the Audit Report, as early as November 2010, EPD had informed EA Panel that OWTF Phase 1 was a waste-to-energy facility and up to 28 million kilowatt-hour ("kWh")(EPD informed Audit in October 2015 that "28 million kWh" should read "14 million kWh") of surplus electricity could be exported every year for the adequate use of 3 000 households. The Committee asked why the associated cost had not been included in the project cost estimate of \$489 million made in 2010.

62. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** explained in her letter dated 23 December 2015 (*Appendix 16*) that as regards the quantity of surplus electricity for export from the project, the 14 million kWh per year as stated in the paper submitted to EA Panel in November 2010 was the estimate based on the information available at that time before the completion of the

Reduction and recycling of food waste

engineering feasibility study in February 2011. A detailed analysis and accurate assessment of the plant's internal power consumption and hence the amount of surplus energy available for export could only be carried out after the completion of the feasibility study in February 2011. It was also necessary to assess the impacts of variations in internal power consumption, which was subject to the Contractor's design, and make provisions in the tender specifications for such variations in defining the specifications and requirements of the power generation and surplus electricity export systems. The detailed design and development works and the corresponding specifications and requirements had been properly incorporated in the 2011 tender documents.

63. In addition, the Committee noted from paragraph 3.27(e) of the Audit Report that ENB/EPD informed EA Panel in March 2014 that a reason for the significant increase in the project cost estimate was that consultants' fees for contract administration and remuneration of resident site staff were later found to be required. However, according to paragraph 3.28(e) of the Audit Report, the related cost estimates should have been included in the original project estimate. The Committee asked why the associated cost had not been included in the project cost estimate of \$489 million made in 2010.

64. **Director of Environmental Protection** explained in her letter dated 23 December 2015 (*Appendix 16*) that upon the completion and approval of the EIA report in February 2010 and in parallel with the project tender preparation works, EPD carried out an in-house assessment of the requirements of the contract administration works and because of the practical need to commence the consultants selection process in parallel with the tendering process such that the works contract and the consultancy could be awarded at the same time, EPD sought the Secretary for the Environment's approval for initiating the consultant selection procedures before funding was secured in accordance with Financial Circular No. 2/2009. Secretary for the Environment's approval was obtained on 22 September 2011 for EPD to initiate the consultant selection process in January 2012.

65. As revealed in paragraph 3.31 of the Audit Report that partly owing to the cancellation of the 2011 tender exercise and re-tendering of the project in 2013, the commissioning of OWTF Phase 1 had been postponed by four years from March 2013 to mid-2017. During the four-year period, a substantial quantity of food waste had been/would be disposed of at landfills instead of being treated by the facility. The Committee asked whether EPD was aware of the consequence of cancelling the

tender exercise in 2011 at that time and measures to be taken by EPD to improve the implementation of works projects in future.

66. **Director of Environmental Protection** explained in her letter dated 23 December 2015 (*Appendix 16*) that:

- before completion of the OWTF network, food waste generated would have to be disposed of at landfills. Before commissioning the OWTF Phase 1 in 2017, the current practice of food waste disposal had to continue;
- the 2011 tender exercise was cancelled in the public interest. Its cancellation had not been caused by any under-estimation of project costs. The 2011 tender exercise could still have been completed successfully if not for the unreasonably high tender prices received. Assuming that if the returned tender in the first tender was not unreasonably high, the Administration would have gone through the internal resource allocation process to seek approval to increase the project estimate, which might take three to six months, and submitted the project to EA Panel and PWSC for approval, which might take another six to nine months. So the delay of the OWTF Phase 1 would only be the extra time required for the second tender exercise, which was necessitated by the unreasonably high tender prices received in the first tender exercise; and
- the above contract provided important cost information and reference data for EPD to come up with more accurate project cost estimate for future OWTFs. The Administration had already made use of this set of updated and relevant project cost data for estimating the project cost of further phases of OWTF.

Availability of cost breakdown information

67. According to paragraph 3.33 of the Audit Report, ENB/EPD informed EA Panel in March 2014 that they did not have the detailed breakdown information on the project cost of \$489 million estimated in 2010. However, according to paragraph 3.35 and Appendix G of the Audit Report, such information was in fact available. The Committee asked why EPD had not provided such information to EA Panel in March 2014.

Reduction and recycling of food waste

68. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** explained in her letter dated 23 December 2015 (*Appendix 16*) that:

- a rough preliminary capital cost estimate based on information collated from overseas anaerobic digestion technical suppliers for the development of large scale biological treatment facilities for a hybrid anaerobic plus composting treatment system was compiled in April 2007 under a consultancy study commissioned in 2006. This rough preliminary capital cost estimate formed the basis for EPD to form the initial capital cost estimate for OWTF Phase 1;
- in addition, the rough preliminary capital cost estimate was based on a design of hybrid system with part of the organic waste to be treated by anaerobic digestion while the remaining would be treated by aerobic composting. In the course of the engineering feasibility study for OWTF Phase 1, it was reviewed and confirmed that full anaerobic digestion for all the food waste received would be more suitable and cost effective for the extremely wet Hong Kong food waste. It was also proposed that the residues of anaerobic digestion (called digestate) should be treated by aerobic composting to render the residue suitable for use as soil conditioner; and
- as the rough preliminary capital cost estimates given in the Technical Feasibility Statement were not directly applicable to OWTF Phase 1, EPD did not consider that the various estimated cost components to be accurate reflection of the likely estimated costs, even though EPD had adopted the broad brush estimated figures with suitable price adjustments and changes in project design up to that time when preparing the crude estimated costs for the purpose of presentation to EA Panel in November 2010. As EPD had not accepted the rough preliminary capital cost estimates as accurate reflection of the eventual project cost, a direct comparison with the detailed cost breakdown provided to LegCo for OWTF Phase 1 would be very misleading.

Service contractor engaged by EPD

69. Regarding the service contractor who was engaged by EPD to liaise with the C&I sector to deliver source-separated food waste to OWTF Phase 1 for treatment upon its commissioning in mid-2017, **Director of Environmental Protection** provided in her letter dated 13 January 2016 (*Appendix 15*) the following details:

Reduction and recycling of food waste

- in November 2014, EPD commenced a 32-month service contract with a lump sum fee of \$1.353 million for a contractor to engage private C&I sector in source separation and delivery of food waste to the OWTF Phase 1; and
- the service contractor was a local environmental charitable organization founded in 1993. Since 2006, it had focused on raising public awareness on food waste in Hong Kong and had established close partnerships with different sectors such as shopping malls, schools and trade associations. From 2010 to 2014, the organization was also involved in service contracts for engaging C&I sector in participating in EPD's Partnership Scheme for delivery of source separated food waste to the Pilot Plant and implementing district based publicity and education activities on food waste reduction, source separation, collection and delivery.

Food-waste recycling in public rental housing estates and private housing estates

70. According to paragraph 3.45 of the Audit Report, more than 60% of respondent residents of public rental housing ("PRH") estates indicated in HD surveys that they would support and participate in food-waste recycling if it was implemented at their estates. However, only 6.2% of the 52 000 invited households had participated in the food-waste-recycling schemes. In view of the low response rate, the Committee asked the measures that HD would take to improve the participation rate if food-waste recycling was fully implemented in future.

71. **Mr Stanley YING Yiu-hong, Director of Housing**, explained at the public hearing and in his letter dated 23 December 2015 (*Appendix 25*) that:

- HD had implemented a number of initiatives on the promotion of reduction and recycling of food waste, in particular on the reduction of food waste at source; and
- it was an indication of HD tenants' awareness that over 60% of respondent tenants would support and participate in food waste recycling if it was implemented at their estates. However, the number of tenants that would participate in food waste separation and collection in a sustained manner depended on various factors. Some of the factors identified in HD's 2014 review of the trial schemes on food-waste recycling were:

Reduction and recycling of food waste

- (a) location of food waste collection bins might affect participation. In practice, location of bins would have to be determined taking into account the topography and layout of each estate and striking a balance between convenience and possible nuisance to residents;
- (b) food waste collection time and duration might affect participation. Longer collection hours were more convenient to tenants but might cause more nuisance, while shorter hours reduced nuisance but might be less conducive to participation; and
- (c) incentive schemes were useful and essential to arouse residents' interest especially at the inception of the scheme.

72. The Committee noted from paragraphs 3.54 of the Audit Report that the Government envisaged that 250 000 households (i.e. around 11% of the 2 270 000 households in Hong Kong) would participate in separation of food waste by 2022. The Committee enquired about the measures that EPD would take to achieve the participation rate of 11% of all households in Hong Kong in separation of food waste by 2022.

73. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** explained in her letters dated 23 December 2015 and 13 January 2016 (*Appendices 16 and 15* respectively) that:

- the figure of 250 000 households (about 11% of the 2 270 000 households in Hong Kong) as mentioned in the 2014 Food Waste Plan illustrated a possible scenario assuming OWTF Phases 1, 2 and 3 could be built by 2022 as scheduled in the 2014 Food Waste Plan;
- it was estimated on the basis of the spare capacity available from the three organic waste treatment facilities (a total capacity of about 800 tpd) to be built by 2022 after deducting the capacity needed for the C&I food waste, and then dividing it by the assumed average food waste per household per day; and

Reduction and recycling of food waste

- it was stated in the 2014 Food Waste Plan that achieving this magnitude of increase of food waste recycling required massive social mobilization, as well as collaboration with food-related business and estate managers. The FW Campaign would work hard to mobilize all stakeholders and the public. It was also anticipated that food separation would increase progressively in scale when MSW charging was in place. EPD would also ensure that OWTF Phase 1 to commence operation by 2017 and endeavour to take forward OWTF Phases 2 and 3 as early as practicable.

74. As revealed in paragraph 3.63 of the Audit Report that up to June 2015, 67% of the nine completed food waste recycling projects in private housing estates had not applied for the extended funding support after expiry of the original two-year period. The Committee asked for the measures that EPD would take to encourage private housing estates to apply for the extending funding support.

75. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** stated in her letter dated 23 December 2015 (*Appendix 16*) that:

- by June 2015 when the audit review was carried out, there were nine Phase 1 projects completed. Among the nine completed projects, three estates had applied for the extension scheme and were approved. For the six estates "not applied for extended funding support", some of them were considering to apply for the extension scheme;
- as at end November 2015, there were another two Phase 1 projects completed. Amongst those eight completed projects eligible for joining the extension scheme, four more applications were received and being processed; two estates declined to join because the estates were not willing to pay the remaining operation cost; and two estates were still pending their formal reply; and
- EPD would continue to provide technical support (including technical guidelines, information leaflets, hotline for technical enquiries, etc.) to those estates that had completed the initial phase of projects and joined the extended scheme.

D. Way forward

Food waste to be delivered to OWTF Phase 1

76. According to paragraph 3.15(a) of the Audit Report, OWTF Phase 1 would treat 200 tpd of food waste. At the public hearing on 29 December 2015, Director of Food and Environmental Hygiene and Assistant Director (Nature Conservation and Infrastructure Planning) of EPD mentioned that EPD had estimated that 40 tpd of food waste would be collected and delivered from 36 wet markets managed by FEHD to OWTF Phase 1 in mid-2017. In addition, according to paragraph 3.37 of the Audit Report, EPD envisaged in 2010 that 85.6 tpd and 114.4 tpd food waste to be delivered to OWTF Phase 1 would be provided by FEHD wet markets and private sector respectively.

77. Under the above circumstances, the Committee asked for:

- the specific measures to be taken by the Administration in achieving the above target of 40 tpd of food waste to be collected and delivered from the 36 wet markets to OWTF Phase 1 in mid-2017; and
- specific measures to be taken by ENB and EPD to ensure that the remaining 160 tpd of food waste is collected and delivered to OWTF Phase 1 for treatment upon its commissioning in mid-2017, in particular whether the Administration would provide incentives to encourage the delivery of source-separated food waste to OWTF Phase 1 for treatment.

78. **Assistant Director (Nature Conservation and Infrastructure Planning) of EPD** said at the public hearing and **Director of Environmental Protection** explained in her letter dated 13 January 2016 (*Appendix 15*) that:

- EPD was liaising with FEHD to explore the possibility of conducting the pro-active food waste collection at the 36 wet markets identified. In order to increase the amount of food waste to be collected, the proposed proactive mode of operation allowed the stall operators to dispose of source-separated food waste at a designated time, without the need to leave their stalls. EPD would also conduct educational and promotional work in parallel to encourage the stall operators to develop their practices for food waste separation at source;

Reduction and recycling of food waste

- to ensure the pro-active food waste collection could be implemented smoothly at the time of commissioning of OWTF Phase 1, EPD would work in collaboration with FEHD to conduct a six-month trial, starting from early 2016, at two of FEHD markets, i.e. North Kwai Chung Market and Po On Road Market and its associated cooked food centre. The contractor for this trial was required to collect source-separated food waste pro-actively from all stall operators in the markets and cooked food stalls at least twice per day during off peak hours and record the quantity of source-separated food waste collected at each round of collection. The collected source-separated food waste would be delivered to the Pilot Plant for treatment. The data collected in this trial would be useful for examining total collectable food waste from FEHD's markets and its cooked food centres, as well as the required resources and funds for proceeding with this pro-active operation. EPD would discuss with FEHD on the funding and resource arrangements for collection and delivery of source-separated food waste to the OWTF Phase 1;
- EPD did not see the need for arranging at government's cost a collection service to collect and deliver the food waste from the C&I sector to the OWTF Phase 1 as it was their responsibility to deliver the food waste as part of MSW to the current disposal facilities (either to refuse transfer stations or landfills). For those C&I establishments in the OWTF Phase 1 catchment, there was potential for them to save some transportation cost and enhance their environmentally friendly image. EPD's plan was for C&I establishments to be responsible for separating their food waste from their other MSW and deliver the separated food waste to the recycling facilities;
- EPD was liaising closely with various stakeholders and waste collectors to promote source separation and delivery of food waste to OWTF Phase 1 upon its commissioning, with particular focus on different key sectors (such as restaurant trade, developers of shopping malls, hotel trade, food factories, etc.) within the catchment of the OWTF Phase 1. EPD would provide technical support, guidelines and the associated trainings for the trades/sectors. EPD had also engaged a service contractor to facilitate the communication between the C&I sector and the waste collectors to implement food waste reduction, source separation, collection and transportation, etc. EPD was liaising with over 230 establishments to explore logistic arrangement for delivering food waste to OWTF Phase 1;

Reduction and recycling of food waste

- in parallel with the implementation of waste charging, the Administration was considering various measures to encourage the C&I sector to source separate and deliver food waste to OWTF Phase 1, including recognition for those who were prepared to deliver food waste to OWTF Phase 1 through publicity events to be attended by stakeholders and senior government officials, such as publicity on EPD's web and facebook and the FW platform, certificates/marks/logos etc. for displaying at their establishments, and issuing certificate showing carbon credit on the amount of food waste delivered to OWTF Phase 1 for treatment; and
- the Administration would continue to consider other appropriate measures taking into account the feedback from the liaison with the trades. The target remained that the food waste amount to be delivered to the OWTF Phase 1 would be able to meet its operational requirements at the early operational stage. The amount would then gradually grow to achieve its maximum design capacity of 200 tpd.

79. Regarding the Committee's question on the progress in identifying suitable sites for constructing additional OWTF to treat the remaining food waste that could be separated and collected for treatment, **Director of Environmental Protection** explained in her letter dated 23 December 2015 (*Appendix 16*) that:

- the 2014 Food Waste Plan envisaged Hong Kong needed to build a network of around five to six OWTFs in the long term with a total recycling capacity of about 1 300 to 1 500 tpd; and
- OWTF Phase 1 was already under construction at Siu Ho Wan (North Lantau). A site in Sha Ling of North District, and Shek Kong of Yuen Long had already been earmarked for OWTF Phases 2 and 3 respectively. The Administration was following up with the relevant departments, in particular the Planning Department, to identify suitable sites for additional OWTFs in other regions.

E. Conclusions and recommendations

<p>Overall comments</p>

80. The Committee:

- notes that the quantity of food waste disposed of at landfills had increased from 1.15 million tonnes in 2005 to 1.33 million tonnes in 2014 (a 16% increase in 10 years) owing to:
 - (a) the piecemeal approach of the Administration in addressing the food-waste problem before 2014;
 - (b) the lack of effective coordination among and support from government departments for the Administration's initiatives in reducing food waste; and
 - (c) the laxity and unprofessional approach of the Environmental Protection Department ("EPD") in implementing the organic waste treatment facility ("OWTF") project and the Food Wise Hong Kong Campaign ("FW Campaign");
- expresses grave concern and finds it unacceptable that in 2013, Hong Kong's per-capita domestic food waste was 0.37 kilogram ("kg") per day⁴, which was 85% higher than the 0.2 kg each of Taipei and Seoul, and emphasizes the importance of fostering an environment in Hong Kong which is conducive to creating a cultural shift on reducing food waste at source;
- expresses great dissatisfaction and disappointment that despite the ambitious vision of the Administration in managing municipal solid waste ("MSW") (including food waste) as enshrined in the "Policy Framework for the Management of Municipal Solid Waste (2005-2014)", the Environment Bureau ("ENB") and EPD had taken piecemeal actions to address the food-waste problem. It was only until 2014 when a policy paper on food waste, i.e. "A Food Waste and Yard Waste Plan for Hong Kong (2014-2022)" ("the 2014 Food Waste Plan"), was published. For the first time, a specific target was set to reduce food-waste disposal at landfills by 40% by 2022, using 2011 as

⁴ In 2014, Hong Kong's per-capita domestic food waste was 0.36 kg per day.

Reduction and recycling of food waste

the base year, and specific food-waste-reduction measures with a timeframe was promulgated;

- expresses great dissatisfaction and finds it unacceptable about EPD's laxity and unprofessional approach in the implementation of the major proposed measures⁵ set out in the 2014 Food Waste Plan for achieving the food-waste-reduction target, in particular the implementation of the OWTF project and the FW Campaign. Notwithstanding that the 2014 Food Waste Plan has been launched for only two years, it is doubtful whether EPD could effectively implement these measures to achieve the food-waste-reduction target set out in the 2014 Food Waste Plan;

Reduction in food waste

FW Campaign

- expresses serious concern and finds it unacceptable that EPD had not taken timely and proactive actions to follow up and monitor the implementation of the FW Campaign which was a key food-waste-reduction measure to meet the target of reducing 180 to 360 tonnes per day ("tpd") of food waste by 2017-2018. As a result, the participation rate of the Campaign was unsatisfactory and there were insufficient measurable data to compile useful statistics to evaluate its effectiveness, as evidenced by the following:
 - (a) as of June 2015, there were only 415 Food Wise ("FW") Charter signees and 2 759 Food Wise Hong Kong Ambassadors under the FW Campaign which was launched in May 2013;
 - (b) as of June 2015, eight of the 12 government departments that had been invited by EPD to sign the FW Charter had not signed the FW Charter, at variance with the FW Campaign objective on coordinating efforts within the Government and public institutions to lead by example in food-waste reduction; and
 - (c) out of the total 1 027 FW Charter signees' returns that should have been called for in the period from 2013 to 2015, EPD had only called for 808 returns (79%) and omitted to call for

⁵ According to paragraph 1.13 of the Audit Report, the proposed measures included implementing the Food Wise Hong Kong Campaign, the MSW charging scheme and the OWTF project, and carrying out food-waste recycling by a private operator at EcoPark. According to the 2014 Food Waste Plan, the Administration's intention was to implement a quantity-based MSW charging scheme by 2016-2017.

Reduction and recycling of food waste

219 returns (21%). In addition, only 26 returns contained measurable food-waste-reduction data;

Coordination among government departments

- expresses grave concern and finds it unacceptable that EPD has not spent sufficient efforts to coordinate and solicit support within the Government to lead by example in food-waste reduction as eight of the 12 government departments invited by EPD since 2013 had not signed the FW Charter up to June 2015. In addition, there was little progress in food-waste reduction at schools, Correctional Services Department ("CSD") institutions and Hospital Authority ("HA") hospitals. Schools and CSD institutions had insufficient measurable data to compile useful statistics to evaluate the effectiveness of the food-waste-reduction measures, as evidenced by the following:
 - (a) according to EPD's latest survey conducted in 2010 ("2010 Survey"), only 12% of students taking lunch at school took lunch through the on-site meal portioning arrangement. The survey also found that 46% of students taking lunch at school used disposable containers;
 - (b) from January 2011 to August 2015, other than the 114 schools adopting on-site meal portioning funded by the Environment and Conservation Fund ("ECF"), EPD had not conducted any survey on lunch practices of the other 1 017 (1 131 less 114) whole-day schools;
 - (c) only 20% of schools which responded in the 2010 Survey provided EPD with food-waste quantities for monitoring progress of food-waste reduction; and
 - (d) some CSD institutions and HA hospitals generated relatively high quantities of food waste. According to surveys conducted by CSD and HA respectively in response to the requests from the Audit Commission ("Audit"), the per-person-in-custody food-waste quantities of the 29 CSD institutions in August 2015 ranged from 0.02 kg to 1.61 kg per day, with an average of 0.11 kg per day, and the per-in-patient food-waste quantities of the 38 HA hospitals in July/August 2015 ranged from 0.06 kg to 0.58 kg per day, with an average of 0.31 kg per day;

Recycling of food waste

OWTF project

- expresses great dissatisfaction and finds it unacceptable that EPD had failed in its duty to implement the large-scale OWTF project (aiming to recycle 800 tpd of food waste by 2022) in a responsible and professional manner, as evidenced by the following:
 - (a) EPD's omissions and significant under-estimation of some cost components in the original project estimate of \$489 million compiled in 2010 had led to insufficient Government earmarked funding at that time to meet the project cost of OWTF Phase 1, for which the approved funding by the Finance Committee ("FC") of the Legislative Council ("LegCo") in October 2014 was as high as \$1,589.2 million;
 - (b) EPD had not included certain significant works requirements in the preliminary capital cost estimate of OWTF Phase 1 in 2010 as those requirements could have been anticipated with careful planning and foresight;
 - (c) in the paper submitted to the Panel on Environmental Affairs ("EA Panel") in November 2010 regarding the adoption of the parallel-tendering approach in OWTF Phase 1⁶, EPD had failed to explain clearly the background of the project (e.g. OWTF would be the first of its kind in Hong Kong) and the assumptions behind the project estimation of \$489 million. EA Panel members were not informed of the implications of adopting the parallel-tendering approach, such as the possibility of a significant deviation of the final project cost from the project estimation. From November 2010 to 2013, EPD had also failed to brief EA Panel of the progress of the development of OWTF Phase 1, such as the cancellation of the tender exercise in 2011 and the re-tendering of the project in 2013. EA Panel was subsequently informed of the progress of the development of OWTF Phase 1 by ENB/EPD in March 2014⁷; and

6 Please refer to the paper submitted by EPD to EA Panel in November 2010 (LC Paper No. CB(1)461/10-11(04)).

7 Please refer to the paper submitted by ENB/EPD to EA Panel in March 2014 (LC Paper No. CB(1)1074/13-14(01)).

Reduction and recycling of food waste

- (d) partly owing to the cancellation of the tender exercise in 2011 and the re-tendering of the project in 2013, the commissioning of OWTF Phase 1 would be postponed for at least four years from 2013 to 2017, and during the period a substantial quantity of food waste had been/would be disposed of at Hong Kong's precious landfills instead of being treated by the facility;

Food waste to be delivered to OWTF

- emphasizes that ENB/EPD must first develop a comprehensive plan to encourage the public and private sectors to handle their food waste in a proper manner so that adequate amount of food waste would be collected and transported to OWTF for treatment. This would provide the necessary information to facilitate LegCo's consideration of future funding applications for the other phases of OWTF;
- expresses grave concern that EPD envisaged in 2010 that of the food waste to be delivered to OWTF Phase 1, 85.6 tpd would be generated from wet markets managed by the Food and Environmental Hygiene Department ("FEHD") and 114.4 tpd would be provided by the private sector. However, according to EPD's latest estimate in December 2015, only 40 tpd of food waste would be collected and delivered from 36 wet markets managed by FEHD to OWTF Phase 1 in mid-2017;
- has yet to be convinced of the explanation by Director of Environmental Protection that she and EPD are capable of implementing an effective system for separating, collecting and transporting sufficient food waste from the commercial and industrial ("C&I") and domestic sectors to the OWTFs, in particular OWTF Phase 1, for treatment;

Food-waste recycling in public rental housing estates and private housing estates

- expresses serious concern and finds it unacceptable that despite food-waste recycling schemes in both public rental housing ("PRH") estates and private housing estates could provide valuable experience to EPD in implementing full-scale food-waste recycling schemes in future, EPD has not taken proactive actions to follow up and monitor the implementation of these schemes, leading to low participation rates of these schemes as evidenced by the following:

Reduction and recycling of food waste

- (a) from November 2012 to July 2014, only 3 198 (6.2%) of the 52 000 households, residing in 86 blocks of buildings in 14 PRH estates, invited by the Housing Department ("HD") to participate in the food-waste recycling schemes had participated in the schemes. Food-waste recycling schemes in 13 of the 14 PRH estates have ceased since mid-2014; and
 - (b) from September 2012 to June 2015, only 1 981 (4.6%) of 43 091 households residing in 16 private housing estates in receipt of the funding from ECF for implementing food-waste recycling projects had participated in the projects;
- notes that:
- (a) ENB has taken into consideration the growth in the Gross Domestic Products when setting the specific target for reducing food-waste disposal at landfills by 40% by 2022, using 2011 as the base year, in the 2014 Food Waste Plan;
 - (b) EPD will take measures to ensure that OWTF Phase 1 will commence operation by 2017 and would endeavour to take forward OWTF Phases 2 and 3 as early as practicable; and
 - (c) EPD has engaged a service contractor in November 2014 to liaise with the C&I sector, and will continue to secure support from major food-waste-generation establishments to deliver source-separated food waste to OWTF Phase 1 for treatment upon its commissioning in mid-2017. EPD will also commission a study on the food-waste collection and delivery arrangements to prepare for the operation of future OWTFs;
- urges Secretary for the Environment to:
- (a) strengthen the coordinating efforts among and supports from government departments for the initiatives on food-waste reduction. Consideration might be given to forming a high-level cross-departmental group to be chaired by the Chief Secretary for Administration to steer such coordination efforts;

Reduction and recycling of food waste

- (b) strengthen efforts to closely monitor the trend of food-waste disposal at landfills with a view to taking early corrective actions to meet the target set in the 2014 Food Waste Plan, i.e. the reduction of food-waste disposal at landfills by 40% by 2022;
 - (c) organize effective large-scale campaigns and step up publicity on food-waste reduction with a view to mobilizing the whole community to reduce food waste and fostering a cultural shift in the long run;
 - (d) closely monitor the implementation of OWTF Phases 1 to 3 to ensure that they would be commissioned on schedule without further delay;
 - (e) map out the implementation of an effective system for separating, collecting and transporting sufficient food waste from the C&I and domestic sectors to OWTFs for treatment;
 - (f) consider introducing incentives or other effective measures to encourage the transportation of food waste to OWTFs; and
 - (g) consider formulating effective measures to coordinate the handling of food waste generated from schools, CSD institutions, HA hospitals and public estates, such as by recycling them locally or transporting them to future OWTFs; and
- urges Director of Environmental Protection to:
- (a) take proactive follow-up actions and effective monitoring measures with a view to involving the whole community to participate in the FW Campaign in order to achieve the target of reducing 180 to 360 tpd of food waste by 2017-2018;
 - (b) strengthen efforts to encourage participation of households residing in PRH and private housing estates in food-waste recycling schemes, and take appropriate and timely follow-up actions to continuously improving the participation levels;
 - (c) develop an effective mechanism to collect data for evaluating and monitoring the effectiveness of the key measures for the reduction and recycling of food waste;

Reduction and recycling of food waste

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- (d) take measures to ensure that detailed design of works projects have been finalized and significant work requirements have been included in the Tender Documents prior to the tendering of works projects in future;
 - (e) take measures to implement an effective system for separating, collecting and transporting sufficient food waste from the C&I and domestic sectors to OWTFs for treatment;
 - (f) strengthen efforts to address any challenges arising from the construction of the other phases of OWTF with a view to expediting the implementation schedule as far as practicable;
 - (g) report to EA Panel on the operation of OWTF Phase 1, in particular, the collection and delivery of food waste to the related OWTF, upon its commissioning, and the progress of development of the other phases of OWTF; and
 - (h) ensure that the information provided to LegCo in the future on other phases of OWTF is accurate, up-to-date and complete, and report to FC and EA Panel in a timely manner of any significant changes to the original proposals.

Specific comments

81. The Committee:

Reduction in food waste

- expresses serious concern that disposal of large quantities of food waste at landfills had dwindled the limited and precious landfill space and generated landfill gas and leachate that exacerbated environmental problems;

FW Campaign

- expresses serious concern and finds it unacceptable that:
 - (a) as of June 2015, about two years after being invited to sign the FW Charter under the FW Campaign which was one of the

Reduction and recycling of food waste

major food-waste-reduction measures under the 2014 Food Waste Plan, eight of 12 government departments had not signed the Charter, at variance with the objective of the FW Campaign on coordinating efforts within the Government and public institutions to lead by example in food-waste reduction;

- (b) from 2013 to 2015, EPD had omitted to call for 219 (21%) of the total 1 027 returns from FW Charter signees, and only 26 returns (2.5% of 1 027 returns) had contained measurable food-waste-reduction data as requested by EPD, thus adversely affecting the evaluation of the effectiveness of the FW Campaign and the extent of achieving the projected reduction of food waste by 5% to 10% by 2017-2018, using 2011 as the base year (as promulgated in the 2014 Food Waste Plan); and
- (c) some government departments (namely the Civil Aid Service, the Fire Services Department, the Government Flying Service and the Immigration Department) which were FW Charter signees had not provided measurable food-waste-reduction data to EPD, at variance with the FW Campaign objective on coordinating efforts within the Government and public institutions to lead by example in food-waste reduction;

CSD

- expresses concern that:
 - (a) as the largest government department involving provision of meals, CSD had not conducted periodic food-waste surveys to monitor the progress of reducing food-waste generation by the 29 CSD institutions; and
 - (b) a survey conducted by CSD in August 2015 in response to Audit's request revealed that the per-person-in-custody food-waste quantities of the 29 CSD institutions ranged from 0.02 kg to 1.61 kg per day, indicating that there was room for food-waste reduction at some CSD institutions;

HA

- expresses concern that as the largest government subsidized organization involving provision of meals, a survey conducted by HA

Reduction and recycling of food waste

in July/August 2015 in response to Audit's request revealed that the per-in-patient food-waste quantities of the 38 HA hospitals ranged from 0.06 kg to 0.58 kg per day, indicating that there was room for food-waste reduction at some HA hospitals;

Food-waste reduction at schools

- expresses grave concern and finds it unacceptable that:
 - (a) from January 2011 to August 2015, other than the 114 schools adopting on-site meal portioning funded by ECF, EPD had not conducted any survey on lunch practices of the other 1 017 (1 131 less 114) whole-day schools;
 - (b) according to the 2010 Survey, some 550 000 whole-day school students taking lunch at school generated 100 tonnes of food waste and discarded 250 000 disposable lunch boxes every day which would be disposed of at landfills, and only 12% of students taking lunch at school took lunch through the on-site meal portioning arrangement (which would help reduce food waste by up to 50%) and 46% of these students used disposable containers (which would be disposed of at landfills after use);
 - (c) only 20% of schools which responded in the 2010 Survey provided EPD with food-waste quantities for monitoring progress of food-waste reduction;
 - (d) notwithstanding that EPD informed EA Panel in June 2010 that it had set targets to reduce the number of disposable lunch boxes by 20 000 per day by 2011-2012 school year and a further 40 000 per day by the 2012-2013 school year, and it would conduct surveys to ascertain the latest situation and review the above targets accordingly, up to August 2015, EPD had not conducted such surveys and review;
 - (e) despite the allocation of \$150 million to support schools to carry out conversion works and install facilities for adopting on-site meal portioning, 27 (84%) of the 32 schools approved with ECF funding for carrying out conversion works for adoption of the on-site meal portioning arrangement in or after July 2011 had not submitted to EPD the food-waste quantities both before and after

Reduction and recycling of food waste

adopting the practice, at variance with a condition of receiving the funding;

- (f) although 294 (26%) of the total 1 131 whole-day schools had signed the Green Lunch Charter from February 2010 to June 2015, ENB and the Education Bureau had not evaluated the signees' performance in practising green lunch;
 - (g) up to June 2015, four of the six new schools with construction works completed from July 2011 to October 2012 which had been installed with on-site meal portioning facilities had not adopted the on-site meal portioning practice, at variance with the Government's policy that the standard design of new schools would cater for on-site meal portioning; and
 - (h) as of June 2015, eight months after works completion to five years and one month after works completion, the accounts of 103 (98%) of the 105 projects funded by ECF for supporting on-site meal portioning had not been finalized, unnecessarily withholding excess fund which could be used to finance other qualified projects;
- notes that the Administration has agreed with Audit's recommendations in paragraphs 2.37, 2.49 and 2.88 to 2.90 of the Director of Audit's Report ("Audit Report"), and HA has agreed with those in paragraph 2.50 of the Audit Report;

Recycling of food waste

Kowloon Bay Pilot Composting Plant

- expresses grave concern that:
- (a) notwithstanding that EPD had informed the Advisory Council on the Environment and EA Panel that the Kowloon Bay Pilot Composting Plant ("the Pilot Plant") would treat up to four tpd of food waste, from August 2008 to June 2015, the average quantity of food waste treated by the Plant was only 0.89 tpd, representing only 22% of the four tpd; and

Reduction and recycling of food waste

- (b) EPD had not clearly stated in the papers submitted to EA Panel⁸ that the four tpd of food waste handled by the Pilot Plant included bulking agents and other non-food-waste materials;

OWTF Phase 1

- expresses great dissatisfaction and finds it unacceptable that:
 - (a) the cancellation in 2011 of the original tender exercise for installing OWTF Phase 1 (with a capacity of treating 200 tpd of food waste) by March 2013 and the re-tendering of the project would lead to a postponement in commissioning the facility by four years to mid-2017, resulting in a substantial quantity of food waste being disposed of at landfills instead of being treated by the facility during the four-year period;
 - (b) notwithstanding that the original project estimate of \$489 million for OWTF Phase 1 was supported by detailed cost-breakdown information, ENB/EPD informed EA Panel in March 2014 that they did not have such information; and
 - (c) OWTF Phase 1 might not be provided with sufficient food waste for treatment upon commissioning in mid-2017 because, due to resource consideration, FEHD could only provide the facility with 40 tpd of food waste to be sourced from 36 of its wet markets as estimated by FEHD, representing only 47% of the planned 85.6 tpd of food waste from FEHD's wet markets for treatment;

Food-waste recycling in PRH estates and private housing estates

- expresses serious concern and finds it unacceptable that:
 - (a) HD had only invited households residing in 86 (77%) of the 111 blocks of buildings in 14 PRH estates to participate in HD's food-waste recycling schemes implemented from November 2012 to July 2014;
 - (b) although HD's surveys found that about 66% of PRH residents indicated that they would support and participate in food-waste

⁸ Please refer to the papers submitted by EPD to EA Panel in April 2009 (LC Paper No. CB(1)1357/08-09(03)) and in March 2010 (LC Paper No. CB(1)1443/09-10(04)) respectively.

Reduction and recycling of food waste

recycling if it was implemented in their estates, from November 2012 to July 2014, only 6.2% of 52 000 households residing in 86 blocks of buildings in 14 PRH estates had participated in HD's food-waste recycling schemes;

- (c) food-waste recycling schemes in 13 of the 14 PRH estates have ceased since mid-2014, adversely affecting the opportunity of households in those PRH estates to practise food-waste recycling;
 - (d) from September 2012 to June 2015, only 1 981 (4.6%) of 43 091 households residing in 16 private housing estates in receipt of ECF funding for implementing food-waste recycling projects had participated in the projects, much lower than EPD's estimated participation rate of 10% as reported to the ECF Committee;
 - (e) while each food-waste treatment machine funded by ECF and installed in a private housing estate had a capacity to treat 100 kg of food waste a day, from September 2012 to June 2015, on average only 42.7 kg (42.7%) of food waste was collected for treatment from the estate; and
 - (f) as of June 2015, 17 (43%) of the 40 approved food-waste recycling projects at private housing estates had not commenced 13 to 24 months after approval by ECF;
- recommends that:
- (a) Secretary for the Environment and Director of Environmental Protection should endeavour to provide information requested by LegCo in future; and
 - (b) Director of Housing, Secretary for the Environment and Director of Environmental Protection should explore ways to finance food-waste recycling schemes in PRH estates;
- notes that the Administration has agreed with Audit's recommendations in paragraphs 3.13, 3.39, 3.50 and 3.67 of the Audit Report;

Way forward

- expresses concern that subject to FC's funding approval for West New Territories Landfill extension works and after completing the approved and proposed extension works, the existing three landfills would reach their capacities from 2023 to 2034;
- expresses grave concern that OWTF Phase 1 scheduled for commissioning in mid-2017 and the planned OWTF Phases 2 and 3 by 2020 and 2022 together would only help reduce disposal of 0.3 million tonnes of food waste at landfills a year, only accounting for 23% of the total food waste disposal in 2013;
- expresses grave concern that EPD had not mapped out an effective system for separating, collecting and transporting food waste from the C&I sector and the domestic sector to the OWTFs for treatment; and
- notes that the Administration has agreed with Audit's recommendations in paragraph 4.11 of the Audit Report.

Follow-up action

82. The Committee wishes to be kept informed of the progress made in implementing the various recommendations made by the Committee and Audit.