

## LCQ15: Handling of food waste

Following is a question by the Hon Chan Hak-kan and a written reply by the Secretary for the Environment, Mr Wong Kam-sing, in the Legislative Council today (January 16):

Question:

The Government is implementing, through the use of existing sewage treatment facilities for food waste/sewage sludge anaerobic co-digestion, the Food Waste/Sewage Sludge Anaerobic Co-digestion Trial Scheme (the Trial Scheme), as an additional part of the network of the Organic Resources Recovery Centre (ORRC) to help raise Hong Kong's food waste treatment capability. To this end, the Government is constructing food waste pre-treatment facilities at the Shuen Wan Leachate Pre-treatment Works at Tai Po, which are expected to provide a maximum of 50 tonnes of pre-treated food waste per day to the sewage sludge anaerobic digestion system at the Tai Po Sewage Treatment Works for anaerobic co-digestion. The works concerned commenced in December 2017 and the facilities concerned are scheduled for commissioning this year. Regarding the handling of food waste, will the Government inform this Council:

- (1) as the report Monitoring of Solid Waste in Hong Kong pointed out that the daily quantity of food waste disposed of at landfills was some 3 662 tonnes in 2017, representing a year-on-year increase of 1.7 per cent, and the quantity of recyclable food waste recovered accounted for only 0.8 per cent of the total quantity of food waste, whether the Government will introduce further measures to reduce the quantity of food waste landfilled and increase the recycling rate of food waste;
- (2) whether it has estimated the treatment capacity of food waste recycling facilities and its percentage in the total quantity of food waste, in each of the coming five years;
- (3) of the concerns raised by Tai Po District Council on the Trial Scheme and the Government's response to them;
- (4) of the quantity of sewage sludge and other waste expected to be generated under the Trial Scheme and the methods of their disposal;
- (5) as the food waste to be treated under the Trial Scheme will mainly come from the food factories in Tai Po Industrial Estate and other commercial and industrial establishments in the district, whether the Government will consider collecting food waste also from the housing estates in the district for treatment under the Trial Scheme; if so, of the details; if not, the reasons for that;
- (6) of the number of sewage treatment works in Hong Kong that can carry out food waste/sewage sludge anaerobic co-digestion, and the total daily quantity

of food waste that can be treated by them;

(7) of the implementation situation of the Food Waste Recycling Projects in Housing Estates in each of the past three years, including the number of housing estates funded and the average daily quantity of food waste recycled; whether it will promote the project to housing estates which have not yet participated in the project; if so, of the details; if not, the reasons for that; and

(8) of (i) the output of electricity generated from the treatment of sewage sludge and (ii) the amount received from the sale of electricity (if any) to power companies by ORRC and the sludge treatment facility T·PARK, in each of the years since their establishment?

Reply:

President,

In February 2014, the Environment Bureau unveiled "A Food Waste & Yard Waste Plan for Hong Kong 2014-2022" (the Plan), which maps out four strategies to tackle food waste, namely reduction at source, reuse and donation, recyclable collection, and turning food waste into energy. An important element under the Plan is to build a network of Organic Resources Recovery Centres (ORRCs) which recycle unavoidable food waste into renewable energy and useful materials by advanced technology. Phase 1 of the ORRC (O·PARK1) is situated in Siu Ho Wan of North Lantau with a food waste treatment capacity of 200 tonnes per day, and has been operating since July 1, 2018. The Environmental Protection Department (EPD) is currently seeking funding approval from the Legislative Council for detailed planning and construction works for Phase 2 of the ORRC (ORRC2) which will be located in Sha Ling of the North District. If the funding is approved and the contract is awarded before mid-2019, ORRC2 is expected to be commissioned in 2022, with a daily treatment capacity of 300 tonnes of food waste. Besides, the engineering feasibility study and the Environmental Impact Assessment of Phase 3 of the ORRC (ORRC3) in Shek Kong of Yuen Long are underway. The ORRC3 is expected to be commissioned in 2026 with a daily treatment capacity of 300 tonnes of food waste. The EPD will continue to identify sites for developing the remaining phases of the ORRCs.

My reply to the question raised by the Hon Chan Hak-kan is as follows:

(1) To expedite the enhancement of the overall food waste treatment capability in Hong Kong, the EPD is working with the Drainage Services Department (DSD) to examine the use of existing and future sewage treatment works (STW) to implement the Food Waste/Sewage Sludge Anaerobic Co-digestion Trial Scheme (the Trial Scheme) to confirm the feasibility of this technology in local application. The first Trial Scheme will use the anaerobic digestion tanks in Tai Po STW and build the food waste pre-treatment facilities near the STW. The facilities will be completed for operation in the first half of 2019 and can process about 50 tonnes of food waste per day. The Government will extend the Trial Scheme to cover the Sha Tin STW for commissioning in

2022 with a similar daily food waste treatment capacity of about 50 tonnes.

In her 2018 Policy Agenda, the Chief Executive mentioned that a pilot scheme will be introduced to examine the feasibility of implementing government-run free food waste collection services in the long run. Subject to the operational performance and actual treatment capability of the O-PARK1 and the Trial Scheme at Tai Po STW, we are planning to implement the pilot scheme in late 2019 to provide free collection services (covering both transportation and treatment) for some commercial and industrial (C&I) sources. We will also make use of part of the treatment capacity of the above two facilities to provide free collection and treatment services for food waste from certain households. Priority will be given to housing estates with experience in food waste separation and collection. Meanwhile, the Government has commenced a study on territory-wide separation and collection of food waste from household and C&I sources. Based on actual local circumstances, the study will work out collection proposals and the ancillary facilities needed for large-scale collection of food waste from household and C&I sources as well as its delivery to the processing facilities in future. The study will be completed in 2019. We will use the Trial Scheme in Sha Tin STW to test the operational and facilitation requirements for the separation, collection and recycling of domestic food waste in the housing estates in Sha Tin. After the commissioning of ORRC2, we will also allocate part of the treatment capacity for a pilot scheme to treat the domestic food waste collected from some nearby residential developments.

Reducing food waste at source will remain to be the focus of future work. We will continue to implement the Food Wise Hong Kong Campaign and conduct publicity and education work, including Announcement in the Public Interest on reducing food waste at radio and television channels, "Big Waster" posters, leaflets and slogans, roving exhibitions, the Food Wise talks, the "Food Wise Hong Kong Campaign" website, the "Big Waster" Facebook, the education materials for reducing food waste and the Food Waste Reduction Good Practice Guides, etc. We will continue to collaborate with the C&I sector to implement the "Food Wise Charter" and the "Food Wise Eateries Scheme" to enhance the public's understanding and participation in the "Food Wise, Waste Reduction" culture and food waste separation and recycling.

The EPD will also continue to support non-government organisations in implementing the food recovery project through the Environment and Conservation Fund (ECF). The surplus food which is still edible or will expire soon is collected from wet markets, retail shops and food wholesalers and donated to the needy in the community to achieve the goal of reducing food waste and caring for society. As of December 2018, the ECF has approved about \$68 million for 37 surplus food recovery projects. It is anticipated that about 6 900 tonnes of surplus food will be recovered and more than 8.9 million headcounts will benefit.

(2) With the successive commencement of O-PARK1, ORRC2 and the Trial Scheme in Tai Po and Sha Tin, the total treatment capacity of food waste recycling facilities will gradually increase. Taking the daily quantity of food waste landfilled in 2017 (i.e. about 3 662 tonnes) as a benchmark and assuming that

the daily food waste disposal for the coming five years (2019-2023) will be similar to the quantity in 2017 and the food waste recycling facilities under construction and planning can be commissioned as scheduled, we estimate that the maximum treatment capacity of food waste recycling facilities and its percentage in the total quantity of food waste in each of the coming five years are as follows:

Year	Annual Maximum Total Treatment Capacity of Food Waste Recycling Facilities (Note 1) (% in the Total Quantity of Food Waste)
2019	About 90 000 tonnes (7%) (Note 2)
2020	About 90 000 tonnes (7%)
2021	About 90 000 tonnes (7%)
2022	About 220 000 tonnes (16%) (Note 2)
2023	About 220 000 tonnes (16%) (Note 2)

Note 1: If the food waste recycling facilities under construction and planning can be commissioned as scheduled, Food waste recycling facilities in operation between 2019 and 2023 include the O-PARK1 (commissioned in July 2018), the Trial Scheme in Tai Po (commissioning within the first half of 2019), the Trial Scheme in Sha Tin (commissioning in 2022) and the ORRC2 (commissioning in 2022).

Note 2: In these years, the O-PARK1 and ORRC2 are still in the start-up stage. Since the treatment capacity of the ORRCs during the start-up period will depend on the growth of the anaerobic bacteria, it will take about one year from the date of the commissioning of the facility to reach the designed food waste treatment capacity. Hence, the two ORRCs may not be able to reach the maximum total capacity in these years.

(3) On July 13, 2016, the EPD consulted the Environment, Housing and Works Committee of Tai Po District Council on the Trial Scheme at Tai Po STW. Members were more concerned about the following issues: (i) whether the emissions released during the treatment of food waste would have any impacts on the environment and health of those living in the vicinity; (ii) what indicator would be adopted to assess the effectiveness of the Trial Scheme; and (iii) whether the Trial Scheme would be extended to cover residential areas. The EPD's respective responses to these concerns were: (i) No noxious gas would be emitted during the treatment process of food waste/sewage sludge. Regarding the potential odour issue, the EPD would implement on-site monitoring and corresponding measures to control pollution. Such measures would include enclosing all potential odour sources; adopting negative pressure design to avoid odour escape; and installing deodourisers, ventilation systems, etc.; (ii) The biogas generated would serve as an indicator, where the difference between sewage sludge anaerobic digestion process and food waste/sewage sludge anaerobic co-digestion in relation to the levels of biogas generated would be compared. The greater the difference, the more effective the food waste/sewage sludge anaerobic co-digestion

technology; and (iii) The Trial Scheme aimed to confirm the feasibility of food waste/sewage sludge anaerobic co-digestion technology which would provide the basis for our formulation of medium to long-term development roadmaps and action plans.

(4) According to the consultant's assessment, the Trial Scheme will only generate small amount of impurities separated from pre-treated food waste for landfill disposal. In accordance with the existing arrangement for handling sewage sludge in STW, the sewage sludge treated by the food waste/sewage sludge anaerobic co-digestion process will be delivered, after dewatering, to the T-PARK in Tuen Mun for treatment so as to turn waste into energy.

(5) As a component of the Trial Scheme, the operation of food waste pre-treatment facilities needs to synchronise with the progress of the Trial Scheme so as to test the mixing ratio of food waste and sewage sludge as well as various operational parameters. During the initial period of operation, we will mainly use the food waste collected from food factories in the vicinity for the trial in order to test and adjust the mixing ratio of food waste and sewage sludge and other operational parameters. As mentioned above, the Chief Executive set out in her 2018 Policy Agenda that a pilot scheme would be introduced to examine the feasibility of implementing government-run free food waste collection services in the long run. Subject to the operation and trial outcome of the Trial Scheme in the Tai Po STW, we will use part of the treatment capacity to collect and treat some food waste from the household for free.

(6) As mentioned in the above paragraph, in addition to the Tai Po STW, we will extend the Trial Scheme to cover the Sha Tin STW for commissioning in 2022 with a daily food waste treatment capacity of about 50 tonnes. If the trial is successful, the EPD and the DSD will examine further expansion of the food waste treatment capacity of the Tai Po STW and apply the technology in other STWs where the sewage sludge anaerobic digestion facilities are or will be available, for example, Yuen Long and Hung Shui Kiu STWs. The total food waste treatment capacity of these STWs will be examined further.

(7) The "Food Waste Recycling Projects in Housing Estates" Funding Scheme has been implemented since July 2011 through the ECF. A sum of \$60 million has been earmarked to support private housing estates to install on-site food waste treatment facilities and organise relevant educational and promotional activities to encourage residents' participation in food waste recycling, with a view to enhancing their awareness of food waste reduction, as well as source separation and recycling of food waste. The EPD has offered help-desk service for the aforesaid projects to provide technical support for interested housing estates. Briefings have also been held for the owners' corporation and property management companies of these housing estates to brief them on the technical information and application procedures, and share with them the experience in food waste recycling. The implementation status of the "Food Waste Recycling Projects in Housing Estates" Funding Scheme in the past three years is summarised as follows:

Year	Number of Housing Estates Funded (Note 3)	Total Quantity of Food Waste Recycled (Note 4) (tonnes)
2015-16	20	292
2016-17	24	469
2017-18	23	508

Note 3: Including new and extension projects approved in that year, as well as those approved in earlier years but were still in operation.

Note 4: The figures do not necessarily represent the amount of food waste collected in the approved projects for that year. Since the housing estates had to make preparations after approval of the projects, such as recruiting staff and arranging tenders for the rental of composters, food waste recovery activities might not be commenced in the same year. Moreover, the recipient housing estates had to carry on food waste recovery activities for 24 months, and the projects approved in earlier years would continue to recover food waste after commissioning. Hence, the relevant figures include those projects approved in earlier years and were still in operation.

(8) The O-PARK1 has started receiving food waste from C&I sources since July 1, 2018 and the testing of its equipment is underway. To ensure that the efficiency and continuity of electricity supply in the Siu Ho Wan area will not be affected by the electricity supply system of the O-PARK1, the electricity generation equipment used in the O-PARK1 is of high standard and has to pass through various stringent tests before its formal connection to the power grid for sale of surplus electricity. We are conducting final-stage testing for completion in the first half of this year. Upon completion of all electricity transmission tests, we expect that the O-PARK1 can export a maximum of about 14 million kWh of surplus electricity to the power grid each year.

As for the sludge treatment facility T-PARK, the annual electricity generation and the offtake price of the surplus electricity since its operation (i.e. from April 2015 to December 2018) are summarised in the table below.

Year	Total Electricity Generation (GWh)	Surplus Electricity Exported to Public Power Grid (GWh)	Offtake Price of the Surplus Electricity (\$)
2015 (April to December)	28.93	1.46	320,000
2016	49.61	2.22	410,000
2017	47.48	2.45	650,000
2018	46.01	2.46	690,000 (Note 5)

Note 5: The 2018 offtake price is a provisional figure and the actual proceeds may be adjusted after the financial year end closed.