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27 November 2018

Clerk to Public Works Sub-committee of the Legislative Council
Legislative Council Secretariat
Legislative Council Complex
1 Legislative Council Road
Central, Hong Kong
(Attn: Ms Doris LO)

Dear Ms LO,

Public Works Sub-committee of the Legislative Council
Organic Resources Recovery Centre Phase 2 – Supplementary Information

The supplementary information requested by Hon HUI Chi-fung in his letter of 22 November 2018 to the Public Works Sub-committee of the Legislative Council is provided below.

(1) The Government has mentioned on different occasions that it intended to adopt the proposal put forward in “A Food Waste and Yard Waste Plan for Hong Kong 2014-2022” to build a network of 5 to 6 Organic Resources Recovery Centres (ORRCs) for the treatment of Hong Kong’s food waste. Please inform us of the details of the remaining ORRCs, including the timetable for completion of the such ORRCs, estimated food waste treatment capacity of each phase of the ORRCs, estimated expenditure involved and technologies intended to be used by the ORRCs.

According to “A Food Waste and Yard Waste Plan for Hong Kong 2014-2022” published in 2014, the Government will develop a network of five to six Organic Resources Recovery Centres (ORRCs) in phases.

The ORRC Phase 1 (O • PARK1) in Siu Ho Wan, Lantau Island commenced operation in July 2018 with a daily food waste treatment capacity of 200 tonnes. During the initial stage of operation, the quantity of food waste feed has to be increased in a steady manner so as to ensure that there is

sufficient time for the proliferation of bacteria used for the degradation of food waste in the anaerobic digesters. At present, O • PARK1 is treating 110 to 120 tonnes of food waste per day. We expect the quantity of food waste being treated will build up steadily with the growth of the micro-organisms and the improvement of the digestion conditions.

As for the ORRC Phase 2 (ORRC2) located in Sha Ling, North District, the work for preliminary design and parallel tendering has been completed. We will sign a contract with the successful contractor soon after the funding of this project is approved by the Legislative Council so that construction work can commence immediately. The ORRC2 is expected to be completed for operation in 2021 with a food waste treatment capacity of 300 tonnes per day.

Both O • PARK1 and ORRC2 adopt anaerobic digestion technology to convert food waste to methane through biodegradation by anaerobic bacteria, thus turning waste into energy. The digestate produced from anaerobic digestion will be converted into high quality compost by the aerobic bacteria through composting process.

The design and construction cost of O • PARK1 is \$1,589.2 million in money-of-the-day (MOD) prices in 2014; and its annual recurrent expenditure is estimated to be \$72.4 million, which mainly covers the operation costs and staff expenses of the facility. The design and construction cost of the ORRC2 is estimated to be \$2,453 million in MOD prices in 2018; and its annual recurrent expenditure is estimated to be \$107.92 million, which mainly covers the operation costs and staff expenses of the facility.

The site selected for the ORRC Phase 3 (ORRC3) is in Shek Kong, Yuen Long, and the designed capacity of ORRC3 is 300 tonnes of food waste per day. The environmental impact assessment and engineering feasibility study have commenced this year. In the feasibility study, a detailed technical analysis will be conducted, and reference will be made to the treatment technology adopted in O • PARK1 and the ORRC2 and the current development in technology application in international arena. The energy output and the marketability of products generated by various treatment technologies will also be examined so as to select the most suitable treatment technology for the ORRC3. This may not be the technology currently adopted by O • PARK1 and the ORRC2, and the estimated cost cannot be provided at the moment. We expect the engineering feasibility study to be completed in 2021, the tendering of the works contract to be conducted in 2022, and the construction works to be started in 2023 so that the facility can come into operation in 2026. Once the programme details are available, we will report to the Panel on Environmental Affairs, and then submit funding applications to the Public Works Sub-committee and the Finance Committee.

The Government will continue to identify land for developing the remaining ORRCs, and no concrete timetable for development can be provided for the time being.

(2) Please provide the details of the implementation of the “Food Waste/Sewage Sludge Anaerobic Co-digestion” Trial Scheme (Trial Scheme) by the Government at the Tai Po Sewage Treatment Works (STW) and the Sha Tin STW, including the anticipated food waste treatment capacity of the two STWs, the expenditure involved, and the schedule for expanding the Trial Scheme to cover other suitable STW.

It is mentioned in the Chief Executive’s 2018 Policy Agenda that the Government will examine the expansion of the overall capacity on food waste treatment by applying the “food waste/sewage sludge anaerobic co-digestion” technology at existing and future STW.

The Environmental Protection Department (EPD) and the Drainage Services Department have jointly launched the Trial Scheme at the Tai Po STW. Food waste pre-treatment facilities will be constructed. The pre-treated food waste will then be delivered to the existing sewage sludge anaerobic digestion system at the Tai Po STW for anaerobic co-digestion so as to test on the technical requirements for conducting “food waste/sewage sludge anaerobic co-digestion” using the anaerobic digestion system at STW. The facilities are expected to commence operation in mid-2019, treating about 50 tonnes per day of food waste from the commercial and industry sectors in the district. The Trial Scheme will provide information and experience on food waste and sewage sludge anaerobic co-digestion, which serve to confirm the technical feasibility and installation requirements for food waste and sewage sludge anaerobic co-digestion.

The Government awarded the Design-Build, plus 6-year Operation Contract for this scheme in November 2017. The contract sum was \$82.75 million (in MOD prices).

The Government is also planning to expand the Trial Scheme to cover the Sha Tin STW. The facilities for this Trial Scheme are scheduled to be completed and commenced operation in 2021/22. As this project is still in the initial planning stage, the related estimated cost is not available.

The Trial Scheme not only boosts Hong Kong’s overall capacity on food waste treatment, it also increases the production of biogas at STW. The biogas produced is converted into electricity and heat to supplement the STW’s

internal energy consumption, thereby raising cost effectiveness and reducing the electricity consumption and carbon emissions of the STW.

We will also consolidate the experience of the two Trial Schemes, and then apply this technology to other suitable STWs. Development in this aspect can speed up the upgrading of our overall capacity on food waste treatment and enable us to provide domestic food waste collection services for more residents.

3) *Please provide the Government's work plan to implement food waste recycling in the community, including the details of the projects that have been implemented or will commence in the future, and the cost involved. In addition, if the relevant projects involve the installation of food waste composters, what are the food waste treatment capacity of these composters and the outlets of the products?*

The food waste recycling projects that have been implemented in the community by the Government are as follows:

Funding Scheme for Food Waste Recycling Projects in Housing Estates

Since July 2011, the Government has launched the "Funding Scheme for Food Waste Recycling Projects in Housing Estates" (Funding Scheme) through the Environment and Conservation Fund (ECF) to fund participating housing estates to install on-site food waste treatment facilities, organise the two-year food waste collection and recycling project as well as relevant education activities on food waste reduction. The Funding Scheme aims to encourage the residents to participate in food waste separation and avoid producing food waste mainly through education and promotion activities. By participating in the activities, the residents will learn waste reduction at source and food waste separation. They will also convert the unavoidable food waste into compost using the on-site food waste treatment facilities and use it for landscaping in their housing estates.

As of October 2018, the ECF has granted \$36 million to fund 34 private housing estates for the implementation of the Funding Scheme and about 4 200 households have registered and participated. The total quantity of food waste recovered by the food waste composters is nearly 2 000 tonnes. The relevant education and promotion activities have also disseminated the waste reduction message to a total of 78 000 households in the housing estates. Housing estates which are interested in joining the Funding Scheme can contact the ECF to apply for the funding.

Food Waste Recycling Partnership Scheme

Since 2010, the EPD has been taking forward the “Food Waste Recycling Partnership Scheme” (the Partnership Scheme) with relevant commercial and industrial (C&I) organisations to promote good food waste management to the C&I sectors. Under the Partnership Scheme, the EPD collaborates with District Councils and non-profit-making organisations to hold “Food Waste Reduction Activities” which last for 3 to 6 months in various shopping malls in different districts on a roving basis, with a view to enhancing public participation and promoting C&I sectors to reduce food waste at source. Regarding the above food waste recycling scheme, the quantity of food waste recovered has reached nearly 4 000 tonnes.

Pilot Programme on Provision of Small Food Waste Composters at Schools

The Government has been encouraging and funding tertiary institutions and schools through the ECF to purchase food waste composters for on-site treatment of food waste and conversion of food waste into compost. To further promote the “Food Wise” culture on campus, the Government rolled out the Pilot Programme on Provision of Small Food Waste Composters at Schools (the Pilot Programme) in 2018 to provide around 90 primary and secondary schools with small food waste composters, education kits and information for educative activities, with the aim of assisting primary and secondary schools to cultivate the “Food Wise” culture among teachers and students, and demonstrating the recycling of food waste to produce compost for use in planting on campus.

Pilot Scheme on Food Waste Collection

As set out in the Chief Executive’s 2018 Policy Agenda, a pilot scheme will be introduced to examine the feasibility of implementing government-run food waste collection services in the long run. Subject to the operation and the actual amount of food waste treated in O • PARK1 and the facilities for food waste/sewage sludge anaerobic co-digestion in Tai Po, we will consider allocating part of the treatment capacity of these two facilities to collect and treat the domestic food waste for free in the second half of 2019, in addition to the food waste collected from the C&I sectors, free of transportation fee and treatment fee. In this regard, food waste from housing estates with experience in source separation and recycling food waste will be accorded a higher priority.

At the same time, the Government has commenced a study on implementing territory-wide separation and collection of domestic and C&I food waste. A collection plan and the required ancillary facilities will be formulated based on the actual local situation to cater for the needs for making future arrangement for large-scale collection and transportation of food waste

from domestic and C&I sectors to the relevant treatment facilities. The study will be completed in 2019.

To facilitate the above study, the Government is preparing for another trial scheme to make use of the Sha Tin STW for conducting “food waste/sewage sludge anaerobic co-digestion”, and to collect domestic food waste. The pilot scheme is scheduled to commence in 2021/22, under which 50 tonnes of food waste will be collected and treated each day. Through conducting domestic food waste separation at source, and the collection and recycling of domestic food waste in Sha Tin District, the operational requirements and the required ancillary facilities can be determined. Members of the public will also be taught how to prevent mixing food waste with other household waste when conducting food waste separation at source so that they will be ready for the large-scale collection of domestic food waste in the future. On the other hand, subject to the funding approval by the Legislative Council, the ORRC2 in Sha Ling of the North District is expected to commence operation in 2021 and 300 tonnes of food waste can be treated each day. Subject to the demand and the operation of the ORRC2, we will allocate part of the treatment capacity of the ORRC2 to collect and treat domestic food waste from the nearby districts.

Yours sincerely,



(Samuel H.K. CHUI)
for Director of Environmental Protection