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(Fax No.: 2869 6794)

13 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 Gary FAN Kwok-wai in his letter of 9 November 2018 to the Chairman of the Public Works Sub-committee of the Legislative Council is attached below.

(1) It is stated in the discussion paper that the daily food waste treatment capacity of the Organic Resources Recovery Centre (ORRC) will be 300 tonnes, and the ORRC will also produce nearly 10,000 tonnes of compost by-products annually. Some of them will be reserved for use by government departments, farmers and members of the public for free. In this connection, how will the Environment Bureau ensure that the food sources of such food waste do not contain genetically modified (GM) ingredients? If such food waste is derived from food sources which contain GM ingredients, the crops and plants where fertilizers containing GM ingredients have been applied will also be affected, thereby affecting the whole ecosystem.

Whether the food sources of the food waste contain GM ingredients or not will not affect the quality of the compost produced by the ORRC. This is

mainly because during the process of anaerobic digestion (in the absence of oxygen), the organic pollutants of the food waste, including proteins, carbohydrates and greases, will first be decomposed by bacteria into fatty acids and amino acids, which will then be broken down into volatile fatty acids, and will finally be converted to methane. During the subsequent composting process, the digestate is further broken down under aerobic condition at a higher temperature at 55°C. Although we cannot guarantee that the food waste collected will not contain any GM food, proteins and fats in general will be decomposed by anaerobic and aerobic bacteria, and therefore the compost produced should not have any impacts on the environment. Meanwhile, a study[1] showed that a proper composting process could effectively treat and break down GM organisms and their genes.

(2) It is also mentioned in the discussion paper that the ORRC Phase 2 (ORRC2) can produce around 30,000 cubic metres of biogas, a form of renewable energy, on a daily basis. Providing electricity and heat for its own facilities will consume about 9000 cubic metres of biogas daily. The surplus biogas can be converted to about 5 million cubic metres of bio-methane or 24 million kilowatt-hours of electricity annually. In this connection, would the Administration provide the amount of energy required for the above energy transformation process and the details? Is it possible that the amount of energy required is greater than the amount of renewable energy produced?

Biogas is produced during the anaerobic digestion of food waste at the ORRC. Since no oxygen is required, the energy consumed during the process is relatively low. Biogas contains very high chemical energy which can be converted into a considerable amount of electricity and heat to meet the needs of the facilities of the whole ORRC. No extra/external energy is therefore required in the entire waste-to-energy process at the ORRC2. Furthermore, the surplus biogas can be converted to about 5 million cubic metres of bio-methane or 24 million kilowatt-hours of electricity annually (approximate to the electricity consumption for 5 000 three-person households in one year).

(3) As mentioned in the discussion paper, upon the commissioning of the ORRC2, it is expected that there will be about 70 round trips of food waste collection vehicles between the ORRC2 and various collection points on a daily basis. In this connection, would the Government provide the details of the estimated transportation cost?

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[1] Singh A, Billingsley K, and Ward O. (2006) Composting: A Potentially Safe Process for Disposal of Genetically Modified Organisms. Critical Reviews in Biotechnology. 2006 Jan-Mar; 26(1):1-16

Upon the commissioning of the ORRC2 in Sha Ling of the North District, food waste will be mainly collected from districts such as Sheung Shui, Fanling, Yuen Long and Sha Tin in the same mode as that of O • PARK1, under which food waste is separated at source by the commercial and industrial sectors before being transported by registered food waste collectors to the ORRC for treatment. The current funding application for the ORRC2 does not include the relevant collection and transportation costs. As the transportation cost is affected by travel distance and other factors, such information is not available at present.

Yours sincerely,

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