Islands District Council
Paper No. IDC 118/2013

Comprehensive Waste Management Blueprint 2013-2022

Purpose

This paper aims to present the "Hong Kong: Blueprint for Sustainable Use of Resources 2013-2022" ("the Blueprint") and the latest progress of the project for developing the Integrated Waste Management Facilities ("IWMF") Phase 1 on an artificial island near Shek Kwu Chau ("SKC").

Background

2. The Environmental Protection Department presented the details and progress of the IWMF to the Islands District Council in April 2008, November 2010, March 2011 and February 2012. The Islands District Council established a Working Group on the development of the IWMF near SKC ("the Working Group") on 20 February 2012 to follow up the discussion of the District Council on the project and to examine the overall planning of the district for improvement. The Working Group held two meetings on 15 March 2012 and 26 November 2013, during which we explained in detail overall waste management strategy and measures, the IWMF site selection process, the incineration technology and its impact on health and environment. The Blueprint was presented to the Working Group on 26 November 2013. As requested by the Working Group, a site visit to the incinerator in Macao was arranged on 7 December 2013. We would continue to consult the Working Group to follow up on the development of the IWMF project.

Comprehensive Waste Management Strategy for the Coming 10 years

3. To tackle the challenges brought by the imminent waste problems, the Environment Bureau announced the Blueprint on 20 May 2013 that sets out a comprehensive strategy with targets, policies and action plans on waste management for the coming 10 years. The Blueprint proposes an aggressive target to reduce the per capita disposal rate of municipal solid waste ("MSW") by 40% by 2022. To achieve this target, the Blueprint suggests the implementation of policies and actions in multiple areas and levels. Five important action items are summarised as follows:

(I) MSW Charging

4. Waste Charging is an effective waste management measure based on the polluter-pays principle. The Government intends to drive behavioural change to reduce waste at source through policies and legislations on a quantity-based MSW charging system. The Council for Sustainable Development ("the Council") launched a public engagement process on 25 September 2013. The process adopted a bottom-up and stakeholder-led approach to gauge the community's views on how best to implement a quantity-based MSW charging in Hong Kong and to strengthen publicity and education on reducing waste at source. The Council issued an Invitation for Response document entitled "Waste Reduction by Waste Charging · How to Implement?" as a discussion framework to provide information and initiate public dialogue. The public engagement process of the Council will run for four months until 24 January 2014. Views and responses collected during the process will be studied and analysed by the Council in preparing a report with recommendations to the Government.

(II) Food Wise Hong Kong Campaign

5. On 3 December 2012, the Government announced the setting up of the Food Wise Hong Kong Steering Committee which is tasked with formulating and overseeing the implementation strategies of the Food Wise Hong Kong Campaign. The Campaign aims to promote public awareness of food waste problems in Hong Kong and co-ordinate efforts within the Government and public institutions to lead by example in food waste reduction. The objectives of the Steering Committee also include instilling behavioural change at the individual and household levels to help reduce food waste generation in daily life, drawing up and promoting good practices of food waste reduction at commercial and industrial establishments, and encouraging food donation to charitable organizations from establishments with surplus food. The Food Wise Hong Kong Campaign was launched in May this year. A host of activities are being implemented, including the public education programmes through the media such as television and the radio, the publication of good practices, roving exhibitions and community activities, the setting up of a dedicated website, and workshops on food waste reduction for different sectors.

(III) Steering Committee to Promote the Sustainable Development of the Recycling Industry

6. In response to the Blueprint that proposes further reductions in local waste disposal rate, the government established the Steering Committee to Promote the

Sustainable Development of the Recycling Industry so as to step up concerted efforts in reducing waste at source and promoting the development of the recycling industry. As the operation of the recycling industry involves different areas of work, the Chief Secretary for Administration, Mrs Carrie Lam, chairs the Steering Committee for coordinating works amongst relevant bureaux and departments. The Steering Committee's terms of reference include reviewing the current local situation of recyclable collection and disposal, and the related policies and support measures, as well as identifying possible proactive approaches to support the recycling industry such as the setting up of a "Recycling Fund" to improve the recycling network in the community. In addition, the Steering Committee will explore means to foster community support to recycling through public education and community engagement programmes. The Steering Committee will also promote related technological research as well as training and development of the recycling industry's workforce.

(IV) Waste-to-energy facility

7. There are major inadequacies in Hong Kong's existing waste infrastructure. To fill the gaps, the Blueprint sets out that we should develop adequate infrastructure that mainly involves waste-to-energy facilities such as the Organic Waste Treatment Facility ("OWTF") and IWMF as soon as possible. The first waste-to-energy sludge treatment facility in Hong Kong will be completed soon. The construction work of OWTF Phase 1, the first local food waste treatment plant, is expected to commence in 2014. We are also planning to develop the OWTF Phase 2. For the proposed IWMF Phase I, through the use of advanced technology, it will substantially reduce the volume of waste to the landfill and recover energy from waste.

(V) Landfill Extension

8. Landfills are an indispensable and ultimate part of the waste management chain everywhere in the world, and the same applies to Hong Kong. No matter how hard we work to reduce waste, there will still be inert materials, non-recyclables, construction waste and post-treatment residues that need to be disposed of. Landfills in Hong Kong adopt very high standards of design and stringent control measures to prevent odors, landfill gases and leachate from causing nuisance to the surrounding environment. Landfill gas has the potential for use by vehicles, household and commercial establishments. Such use will not only reduce greenhouse gas emissions in Hong Kong, but also enhance the overall standard of technology and waste management in Hong Kong.

Latest Progress of the IWMF

Proposed Site

9. Taking into account the EIA results of the IWMF and having considered the spatial distribution of our waste management facilities, environmental factors and transport efficiency, the Government has chosen the artificial island near SKC as the site for the first IWMF. The major reasons are:

(a) The proposed choice ensures a more balanced spatial distribution of waste facilities. For the Western New Territories, there is WENT Landfill and the proposed WENT Landfill extension. There is also a Sludge Treatment Facility with a capacity of 2 000 tpd under construction at the Tsang Tsui Ash Lagoon (TTAL). For the North New Territories, there is NENT Landfill and the proposed landfill extension. For the East New Territories, there is SENT Landfill and proposed landfill extension. For the urban area, we have a network of Refuse Transfer stations, including two at both ends of Hong Kong Island. The Chemical Waste Treatment Centre is situated in Tsing Yi. The development of the IWMF at the southern tip of Hong Kong will present a more balanced spatial distribution of facilities;

(b) The artificial island near SKC is closer to the Island East, Island West and West Kowloon refuse transfer stations, the catchment area for the IWMF, when compared with the site at TTAL. The sea route for delivering solid waste from these stations to the artificial island near SKC is shorter by one fourth when compared with the route to TTAL. This routing will not cause significant impact on the marine traffic in the area. Consequently the transport of MSW to the island will help reduce the current transport of MSW to the WENT Landfill, hence reducing marine traffic in the busy Ma Wan Channel;

(c) The SKC site is far away from the densely populated areas. It is located at about 3.5 to 5 km from Cheung Chau, which is not in the direction of prevailing wind (northeasterly wind towards southwest in the sea). The IWMF will have advanced incineration technology and air cleansing systems on site to further minimize impact caused by gas emission on ambient air quality and, hence, the residents nearby; and

(d) The IWMF and its on-site educational and community facilities under planning would bring considerable economic benefits to the nearby islands (especially Cheung Chau). Apart from more jobs and enhanced ferry services, the

development will also bring in streams of workers and visitors that will, in turn, generate other economic activities and benefits. During the construction and operation of the IWMF, there will be about 3 000 workers working on the island and in the surrounding waters during the peak construction period. When it commences operation, there will be about 200 workers working every day in the facility. The community facilities such as the heated pool and education centre in the IWMF can benefit the residents of Cheung Chau. Visitors and workers of the IWMF will also bring business opportunities to Cheung Chau and benefit the catering industry.

Technology Selection for IWMF

10. After detailed studies, we selected advanced moving-grate incineration as the core waste treatment technology for the IWMF. We have been keeping track of the latest development of waste treatment technologies and reviewing technologies suitable for the IWMF in recent years. From 2008 to 2009, we conducted a detailed review on a variety of thermal waste treatment technologies, which showed that moving-grate incineration is the mainstream advanced technology adopted worldwide for the treatment of MSW. This technology has merits in terms of environmental performance, technological soundness, reliability, operation adaptability in waste treatment as well as cost-effectiveness. Therefore, it is most suitable for the first modern IWMF in Hong Kong. Findings of the review was reported to the Advisory Council on the Environment (ref: ACE Paper 22/2009) and gained its support. According to the latest information we obtained on the development of waste treatment technologies, which includes the "White Paper on Alternative Waste Conversion Technologies" published by the International Solid Waste Association (ISWA) in January 2013 as well as the International Conference on Solid Waste – Innovation in Technology and Management held in Hong Kong in early May 2013, the moving-grate incineration technology remains to be the mainstream MSW treatment technology. It is also the only technology which is capable of treating mixed MSW reliably at a scale up to 3 000 tonnes per day. It is a mature mainstream technology with substantial proven track record and is still widely adopted by well-developed countries in Europe and Asia for their new or extension facilities (see Table 1).

Table 1. Moving-grate incineration plants that are commissioned recently or will commence operation soon

Name	**Location**	**Design Capacity (in tpd)**	**Year in-service**
Greater Manchester Energy-from-Waste Plant	Greater Manchester region, UK	2 050	First quarter of 2014 (Phase I)
Senoko Waste-to-Energy Plant	Tuas , Singapore	2 400	2012
Integrated Domestic Solid Waste Management Centre	Qatar	2 300	2011
Baviro Waste to Energy (WtE) Plant	Roosendaal, Netherlands	800	2011
Lakeside Energy from Waste (EfW) facility	Colnbrook, UK	1 120	2010
Riverside Resource Recovery EfW Facility	Belvedere, UK	1 800	2011
Roskilde WtE Facility	Roskilde, Denmark	960	Second half of 2013
Nanjing Jiangnan Domestic Waste-to-Electricity Plant	Nanjing, China	2 000	2014
Suzhou Waste-to-Electricity Plant Phase III	Suzhou, China	1 500	2013
Jinan Metropolitan Domestic Waste-to-Electricity Plant	Jinan, China	2 000	2011

Health impacts on residents

11. Waste-to-energy is a well-developed technology. Emission standards with the EU standards being the most stringent has been developed internationally to control the emissions so as to ensure that the waste-to-energy facility will not cause adverse impacts to the health of residents and the environment during operation. The IWMF will adopt the modern 3T moving-grate incineration technology (i.e. operating at a high temperature above 850℃, with high turbulence and allowing residence time of at least 2 seconds for flue gas) to destroy the organic pollutants completely. In addition, advanced multiple air pollution control systems will be installed, including

scrubbers to remove acidic gas, activated carbon powder injection system to absorb heavy metals and dioxin, baghouse filters to remove particulates, and selective catalytic reactor system to remove nitrogen oxides. The flue gas will also be closely monitored. We will set up a highly transparent system to provide the public with the monitoring data to ensure compliance of the IWMF emissions with the Hong Kong and EU standards or more stringent standard for human health protection. In fact, according to the IWMF EIA findings on human health impact assessment, the potential risk level of carcinogenic compound emissions from the IWMF is lower than the screening level adopted by the U.S. Environmental Protection Agency, and the accumulated acute non-carcinogenic health effects of the IWMF will be negligible. These findings have been independently reviewed and confirmed by the Department of Health. According to the overseas data released from a consultancy study in UK in February 2012, the dioxin and furan emissions of the UK local waste-to-energy facilities for the whole year only accounted for 2.4% of the overall emissions, which was lower than that of fireworks (3%), fire/open burning(41%), crematorium (5%) and metal manufacturing(17%).

Way Forward

12. We will consult the Working Group on the detailed design of the IWMF. We hope that the design, including that of the environmental education center and related visitor facilities would meet local and public demand, and its architectural and landscape design would blend into the surrounding green and natural environment to make it a welcome facility to the public.

13. Regarding the judicial review against the EIA and the outline zoning plan related to the IWMF, the Court of First Instance ruled in favor of the Government in July this year. We plan to submit the project details and funding application to the Legislative Council Panel on Environmental Affairs, Public Works Subcommittee and the Finance Committee in the first quarter next year. In respect of the preparation work for the project, we are drafting the prequalification and tender documents with a view to carrying out the prequalification in the second half of 2014. In accordance with the requirements of the ACE and the environmental permits, we will also commence a study on marine park in 2014 to develop the detailed requirements of marine park. We will pay close attention to each step of the preparation work and expedite all the necessary actions so that the IWMF can be commissioned as early as possible.

Environmental Bureau
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