For information on
20 April 2012

LEGISLATIVE COUNCIL PANEL ON ENVIRONMENTAL AFFAIRS

"REDUCE, RECYCLE AND PROPER WASTE MANAGEMENT"

1. PURPOSE

1.1 At the meeting of 26 March 2012, we submitted a paper (cf. LegCo Paper No. **CB(1)1369/11-12(01)**, hereinafter referred to as "the March paper") to –

(a) update the LegCo Panel on Environmental Affairs on the progress of waste reduction and recycling initiatives under the action agenda for solid waste management in Hong Kong; and

(b) seek Members' support to our proposals for upgrading **5177DR** (i.e. Integrated Waste Management Facilities (IWMF) Phase 1), **5163DR** (i.e. Northeast New Territories (NENT) Landfill Extension), **5164DR** (i.e. Southeast New Territories (SENT) Landfill Extension) and part of **5165DR** (i.e. West New Territories (WENT) Landfill Extension) to Category A.

We set out in this note for Members' reference our response to the views from deputations received at the meeting and provide supplementary information as requested by some Members.

2. VIEWS FROM DEPUTATIONS

2.1 Over 100 organizations and individuals attended the Panel meeting on 26 March 2012. Our responses to their comments, broadly grouped into three areas, are set out below –

(a) *Hong Kong's Waste Management Strategy.* With views expressed by Members in late 2010, we have explained to the LegCo and the community in January 2011, the three-pronged approach of waste management strategy including (i) strengthened actions to reduce wastes at source and to promote

waste recycling, (ii) introduction of modern technologies to upgrade our waste treatment capability, and (iii) timely extension of landfills, is necessary for effective tackling of our waste problem. This approach is in line with the experience of sustainable waste management of many other modern cities in the world.

(b) *Odour Problem of the SENT Landfill.* We have closely monitored and implemented a wide range of measures to address odour complaints related to SENT Landfill. A series of enhanced control measures have been implemented since 2008. At an additional capital cost of about $80 million, these measures include minimising the active waste tipping area, covering the tipping area with soil and then Posi-Shell Cover (a cement-based material) at end of the daily waste reception process, covering the non-active tipping areas with impermeable synthetic liners or Posi-Shell Cover, installing additional landfill gas extraction wells, pipes and flaring units to collect and treat landfill gas, setting up deodourisers, etc. Moreover, electronic odour detection systems (i.e. electronic nose) have been installed for close monitoring of any odour issues. Upon commissioning of the Sludge Treatment Facility (STF) in 2013, odourous sewage sludge would no longer be landfilled. Furthermore, under our current proposal, the SENT Landfill Extension will be designated to receive odourless construction waste only. The planned extension, if materialized, could fully address community's concern on the odour problem.

(c) *Technology and Site Selection for IWMF Phase 1*. The current proposal of adopting the advanced moving grate incineration technology is the outcome of a detailed technology review process – see section 4.1.1.2 of the March paper. The moving grate incineration technology has been well proven as a mainstream waste treatment technology which has been used in over 900 MSW treatment facilities in over 20 countries with more than 100 years operational experience. The technology has been popular worldwide for its environmental performance, technological soundness, reliability, operation adaptability in waste treatment and cost effectiveness. It is also an evolving technology that can meet the increasingly stringent prevailing environmental standards. The justifications for site selection have been set out in section

4.1.1.3.5 of the March paper.

3. MODERN WASTE TREATMENT FACILITIES STILL NEEDED EVEN WITH MSW CHARGING IN PLACE

3.1 At the meeting of 26 March 2012, we advised this Panel that by 2018, assuming zero growth in waste generation and an MSW recovery rate at 55%, there would still be ***about 8,500 tonnes*** of solid waste (comprising municipal solid waste (MSW), construction waste and other wastes) to be landfilled on a daily basis even after the implementation of producer responsibility schemes and the commissioning of the modern waste treatment facilities. In other words, without IWMF Phase 1 which would have a 3000-tpd capacity, the waste burden on our landfills could be as much as 11,500 tpd of which about 8,000 tpd is MSW.

3.2 Progressive implementation of other waste reduction initiatives could further lessen our waste burden. It is for this reason that we launched the public consultation on MSW charging which was just completed on 10 April 2012. We are now reviewing the feedback received during the public consultation. The experience of Taipei City and Seoul has demonstrated the substantial potential waste reduction benefits that could be achieved through successful charging. In both cities, several years of intensive preparation preceded full implementation of waste charging. We note that waste disposal dropped by 30%[1] in the initial period after putting in place a quantity-based charging system. We shall continue to engage the community in discussing a feasible model for Hong Kong's waste reduction strategies based on the analysis of the consultation result. Notwithstanding the substantial waste reduction benefits that it could potentially bring about, MSW charging alone could not provide an adequate solution for our waste problem: even after translating the magnitude of reduction in Taipei City and Seoul in the Hong Kong context, if IMWF Phase 1 is not commissioned as planned, there would still be ***about 9,000 tonnes***[2] of waste to be landfilled by 2018 every day. This reinforces our message at the meeting on 26 March 2012 that no modern city in the world could resolve its waste problem solely through waste reduction and recovery. Taking

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1 Figure for reduction in domestic waste disposal; we assume that the same magnitude of reduction could be achieved for commercial and industrial waste.

2 Waste reduction achieved in Taipei City and Seoul has grown over time after the implementation of MSW charging to say 60% cumulative in 10 years. Even if we take this factor into account as well, our waste burden would still be about 7,000 tpd in the long term.

Taipei City as an example, while their waste disposal rate has reduced significantly upon the implementation of a quantity-based charging system and complementary measures about 10 years ago, it still operates three incinerators with a total capacity of 4,200 tonnes per day (tpd) in Taipei City area. With increasing waste recovery rate, Taiwan has reinforced that incineration would be their primary measure in waste treatment, supplemented by landfilling. At present there are a total of 24 waste-to-energy incineration facilities over Taiwan, serving a population of 23 million.

3.3 As such, while we proceed with various waste reduction initiatives, we still have to take urgent action to ensure timely development of proper waste treatment facilities, which is exacerbated by the exhaustion of the three existing landfills in 2014, 2016 and 2018. LegCo's funding approval for various facilities and landfill extensions is needed for the necessary project planning and implementation procedures to commence in time. Depending on the complexity and scale of the facilities concerned, lead time of **two to seven years** (e.g. up to seven years for IWMF Phase 1) is involved for undergoing the due procedures for the selection of competent contractors in open, competitive and fair process, as well as for the detailed project design, construction and commissioning. All these waste treatment projects should be pursued as a package and be considered now; and any delay would seriously impact on the ability of Hong Kong to handle waste and maintain its environmental hygiene expected of an international city.

4. SUPPLEMENTARY INFORMATION RELATING TO THE FOUR FUNDING APPLICATIONS

4.1 5177DR: IWMF Phase 1

4.1.1 Project Cost

4.1.1.1 Members would like to have clarifications on the estimated cost of $11.38 billion in September 2011 prices (or $14.96 billion in money-of-the-day prices) with reference to the details of the proposed IWMF Phase 1. The latest project estimate has taken into account detailed project design, including measures to achieve the highest environmental performance and health standards. At a more detailed level, it has taken into account and reflected –

(a) the findings and recommendations of the latest engineering

and EIA studies, which commenced in late 2008 and only substantially completed in early 2012, as well as the latest market prices of such facilities, having regard to the recent quotations received;

(b) the state-of-the-art, advanced and proven environmental control systems and additional green features incorporated in the project to achieve high environmental performance and reliable and safe operation, including -

(i) advanced flue gas treatment system to meet the most stringent international standards (ie the European Union emission standards), together with sufficient stand-by flue gas treatment system to ensure reliable and effective operation of the air cleansing system. With the additional measure to reduce nitrogen dioxide using selective catalytic reduction system, the environmental performance of the proposed IWMF would be better than the European Union emission standards;

(ii) modern desalination plant to provide a sustainable potable water supply for use in the plant and for SKC;

(iii) advanced wastewater treatment plant to recycle wastewater for reuse in the plant and irrigation;

(iv) comprehensive landscaping to achieve vertical and horizontal greening in all buildings and for blending with the environment;

(v) Environmental Education Centre to showcase state-of-the-art technology and environmental protection measures;

(vi) state-of-the-art waste-to-energy system to harness the renewable energy and reduce greenhouse gas emission from power generation; and

(vii) comprehensive environmental monitoring and environmental and safety management;

(c) the substantial increase in construction tender prices and

building material prices in recent years. For instance, over the period from 2003/04 to 2011, the Building Works Tender Price Index has increased by 100%. The price of steel, the major materials for the incinerator building and furnaces of the IWMF Phase 1, has increased significantly by 150% to 250% over the period from 2002-03 to 2008-2011 as indicated from the cost of material index; and

(d) the cost of building the facility on an artificial island involving reclamation works, berths and seawall construction, sub-marine cables, resulting in an additional cost of about $2.4 billion.

4.1.1.2 The estimated project cost of the IWMF Phase 1 near SKC is comparable to other waste-to-energy plants of similar scale, technology level and treatment capacity overseas meeting the European Union standards, such as the one in Amsterdam which has a treatment capacity of 2,400 tpd (one-fifth less than the proposed IMWF Phase I) and cost about $9 billion (in 2011 prices).

4.1.1.3 The IWMF will meet the most stringent international standards with additional measures and safeguards incorporated so as to ensure that the health of nearby residents would not be adversely affected and high environmental performance can be achieved. Specific measures that could address concerns about air pollution and human health impacts include –

(a) Advanced air pollution control system will be installed to ensure that emissions from the IWMF stacks will meet the European Union standard for MSW incinerators, which is the most stringent standard in force internationally. Details of the standard are given at Annex A.

(b) A transparent system will be set up to provide the public with emission monitoring data (mostly real time) of the IWMF. In fact, according to the human health impact assessment in the EIA, the cancer risk is within the screening level adopted by the United States Environmental Protection Agency, and the cumulative acute non-carcinogenic health impacts arising from the IWMF are insignificant. These findings have been reviewed and agreed independently by the Department of Health.

4.1.1.4 The location plan and information relating to of IWMF Phase 1 are at Annex B.

4.1.2 District Consultation

4.1.2.1 As we mentioned in section 4.1.3.3 of the March paper, we further consulted the Islands District Council (IsDC) on 20 February 2012, after the earlier consultation with the former IsDC on 21 February 2011. As stated in section 4.1.3 of the March paper, we have been engaging the local community and concerned stakeholders, and over 50 meetings and briefings have been conducted since February 2011 to explain the project and address their concerns. In addition, a dedicated Working Group under the IsDC with senior representatives from Environment Bureau (ENB), Environmental Protection Department (EPD), Home Affairs Department (HAD) etc. has also been formed to facilitate communications and to follow up on the discussions at the IsDC on the project and to review the overall planning of district facilities to improve the environment of the district. The first Working Group meeting was held on 15 March 2012 and we will continue to work with all concerned Departments to support the work of the Working Group.

4.1.3 Addressing Local Needs for Betterment

4.1.3.1 It is common internationally to include community facilities in incinerator project to serve the community. Using the STF under construction as an example, we have incorporated into the design an environmental education centre and community facilities such as heated dipping pool, promenade and a woodland garden after consultation with Tuen Mun District Council (TMDC). We will continue to engage the IsDC on the provision of similar facilities in the IWMF Phase I.

4.1.3.2 The dedicated Working Group under IsDC will serve as a platform for gauging views from the local community for the planning of IWMF. We intend to engage the Working Group in developing an architectural and landscaping design for IWMF so as to blend into the surrounding natural and green environment. The IWMF will also include an environmental education centre and related visitor facilities showcasing waste management, ecological protection works, waste-to-energy and wastewater reuse technology. Furthermore, the ferry services set up between the IWMF and Cheung Chau during the construction and operation of the IWMF, together with the education centre and recreational and leisure facilities within the IWMF site will benefit the public in particular residents of Cheung Chau and other

outlying islands. The state-of-the-art facilities will help boost local tourism and related businesses.

4.2 5163DR: NENT Landfill Extension

4.2.1 Addressing Local Needs for Betterment

4.2.1.1 As explained in section 4.2.3 of the March paper, we have maintained a continuous public involvement approach with all relevant parties since the inception of the project in 2004. As the proposed NENT Landfill Extension site is located between Ta Kwu Ling (TKL) and Sha Tau Kok (STK), the Ta Kwu Ling District Rural Committee (TKLDRC) and the Sha Tau Kok District Rural Committee (STKDRC) are the key stakeholders. The North District Office and EPD have set up a Working Group with representatives from the two rural committees in early 2009 to provide a forum for stakeholders to express views and to map out betterment programmes for the nearby community. A total of nine meetings have been held so far with the latest one held on 8 March 2012. The discussions at the Working Group have been satisfactory with most of the requests from the local community successfully met and resolved or being considered. For instance, we have been taking forward improvement to local facilities such as community hall, reading and activity room as well as village offices. Tree and shrub planting to the affected areas are being conducted to enhance the local environment. We will continue to maintain close liaison with the North District Council (NDC), local community and other relevant stakeholders via the Working Group platform as regards the NENT Landfill Extension project.

4.2.2 District Consultation

4.2.2.1 In a recent consultation with the NDC on 9 June 2011 regarding Hong Kong's latest waste management strategy and the action plan, including the implementation of the NENT Landfill Extension project, the NDC members were generally supportive of the waste management strategy, without any motion against the NENT Landfill Extension.

4.3 5164DR: SENT Landfill Extension

4.3.1 Addressing Local Concerns on Odour

4.3.1.1 As outlined above, to address local concerns on odour, we have been implementing a wide range of mitigation measures in the

existing landfill operation and would continue to improve the operation upon its extension. As regards the proposed SENT landfill extension, we have already taken on board Sai Kung District Council (SKDC) and local residents' sentiments, through significantly reducing the scale of the landfill extension, addressing fully the local community's concern about odour nuisance by putting in place a series of enhanced odour control measures at the existing landfill, and accepting only construction waste at the landfill extension. The odour caused by putrescible waste and sludge would be abated when the extension is commissioned. By then, the environmental and traffic impacts would also be significantly reduced, thus addressing the concerns of the local residents. For more details of the environmental control measures to mitigate the potential impacts caused by the landfill extension, please refer to section 4.3.4 of the March paper. We would continue to address the concerns of the local community and we intend to set up an environmental monitoring system and audit programme so as to ensure the effectiveness of the proposed mitigation measures.

4.3.2 District Consultation

4.3.2.1 We consulted SKDC on the revised proposal on SENT landfill extension on 3 May 2011. The meeting did not carry any motion against the proposal. We will continue to report to the SKDC on progress made in abating odour nuisance from the existing landfill and in the planning for the extension proposal. We would take on board any measures proposed by the Council in the operation of the extension as far as possible.

4.4 5165DR: WENT Landfill Extension

4.4.1 District Consultation

4.4.1.1 As explained in section 4.4.3 of the March paper, we have maintained a continuous public involvement approach with all relevant parties since the inception of the project in 2004. To address TMDC members' concern, ENB took the lead and set up the Tuen Mun Development Liaison Working Group in 2009, with inter-departmental representatives from ENB, Development Bureau, Transport and Housing Bureau, Food and Health Bureau, HAD and TMDC members, to look into strategic matters relating to the long-term development of the district. Eight meetings have been held since March 2009, with the most recent one being held in August 2011 to follow up with TMDC members' proposals and to report on the progress and development of the action

items. The work of this Liaison Working Group is continuing upon the formation of the new TMDC in 2012. We will continue to maintain close liaison with TMDC, the local community and other relevant stakeholders in taking forward the project.

5. Advice Sought

5.1 Members are invited to support our proposals for upgrading **5177DR, 5163DR, 5164DR** and **part of 5165DR** to Category A. Subject to Members' advice, we plan to submit our proposals for consideration by the LegCo PWSC in May 2012 with a view to seeking the FC's approval in June 2012.

Environment Bureau/Environmental Protection Department
April 2012

Annex A

European Union's Emission Limits in the Waste Incineration Directive

Air Pollutant	(mg/m^3)	
	Daily	**Half– Hourly**
Particulates	10	30
Organic Compounds	10	20
Hydrogen Chloride (HCl)	10	60
Hydrogen Fluoride (HF)	1	4
Sulphur Dioxide (SO_2)	50	200
Carbon Monoxide (CO)	50	100
Nitrogen Oxides (NO_X) as Nitrogen Dioxide (NO_2) (Note)	200	400
Mercury	0.05	-
Total Cadmium & Thallium	0.05	-
Total Heavy Metals	0.5	-
Dioxins & Furans (in mg I-TEQ m^{-3})	$1x10^{-7}$	-

Note: With the additional measure to reduce nitrogen dioxide using selective catalytic reduction system, the proposed IWMF could further reduce nitrogen dioxide emissions to 100 mg/ m^3 (daily) and 200 mg/ m^3 (half-hourly).

Annex B

Figure 1 - Location Plan for the IWMF Phase 1

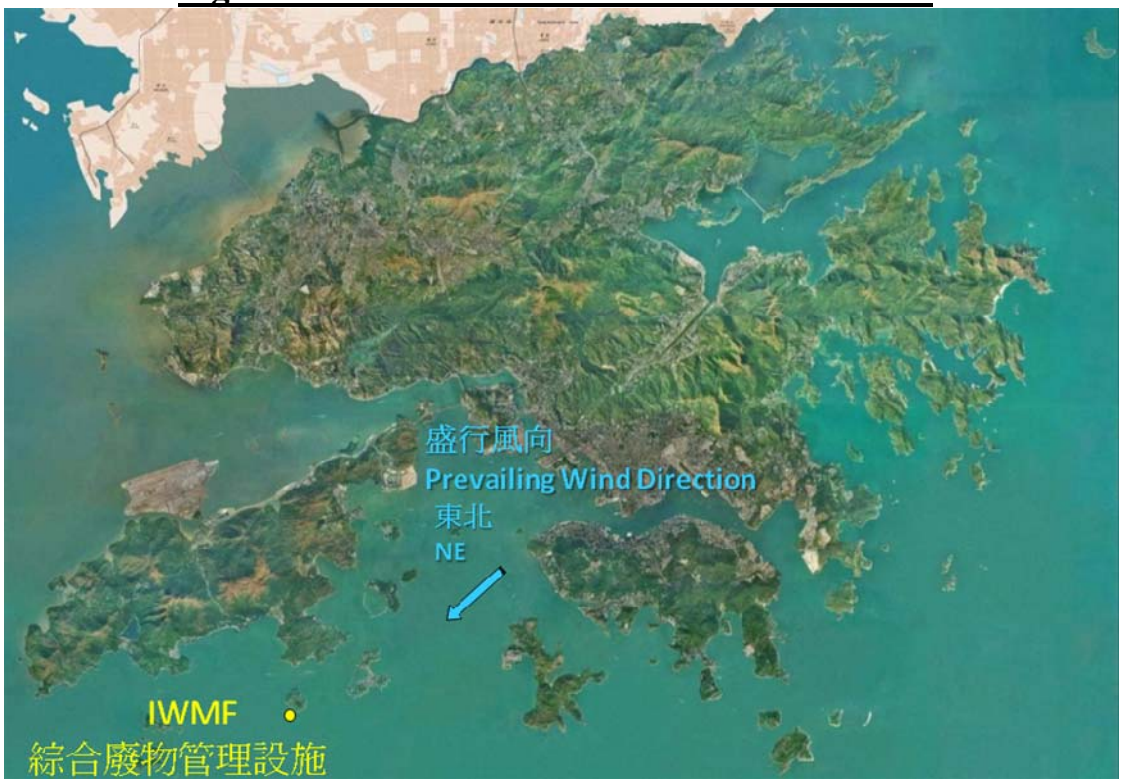

Figure 2 - Information Relating to the IWMF Phase 1