TPB Paper No. 8742
For consideration of
the Town Planning Board
on 25 February 2011

Update on the Progress of the key initiatives in the "Policy Framework for the Management of Municipal Solid Waste (2005 – 2014)

PURPOSE

This paper sets out the Administration's strategies and its updated action plan to tackle the imminent waste problem in Hong Kong and invites Members' views on the subject.

INTRODUCTION

2. The three existing landfills will exhaust their capacity in the next few years. To ensure solid waste can continue to be handled properly without causing environmental problems, the Administration will –

(a) revise upward the municipal solid waste (MSW) recovery target to 55% by 2015 by stepping up publicity and promotional efforts on waste reduction and recycling;

(b) expedite legislative proposals to introduce new Producer Responsibility Scheme (PRS) and extend current PRS to encourage waste reduction;

(c) engage the public in continued discussions on possible options to introduce MSW charging as a direct economic disincentive to reduce waste at source; and

(d) seek funding approval from the Finance Committee of the Legislative Council (LegCo) in early 2012 so that advanced waste treatment facilities and extension to existing landfills will be commissioned in time to ensure solid waste can continue to be properly managed in an environmentally acceptable manner.

BACKGROUND

Imminent Waste Management Problem

3. Hong Kong now relies principally on landfills to treat its waste. The remaining capacities of the three landfills will be exhausted in 2014, 2016 and 2018 (see **Annex A**).

4. At present, about 13 300 tonnes of waste are disposed of at landfills every day. The main trunk of them are 9 000 tonnes of MSW, the amount that remains from our daily generation of 18 000 tonnes after 49% of them are recovered for recycling. The following table summarizes the waste disposal figures:

Types of Waste Disposed at Landfills

Waste	**Volume (Daily)**
Municipal solid waste	9,000 tonnes *(including 3,300 tonnes of food waste)*
Construction waste	3,200 tonnes
Sludge	900 tonnes
Other waste	200 tonnes
Total:	**13,300 tonnes**

5. Development of waste treatment facilities requires long lead time of at least two years for landfills and substantially more for incinerators or other advanced treatment facilities after funding approval is confirmed to cater for selection of contractors and contract arrangement, site works and construction. Prior to seeking funding approval, various statutory environmental, planning approvals are necessary. Under advance planning are the development of an integrated waste management facility (IWMF) with a capacity of sorting and incinerating 3 000 tonnes of MSW daily, two organic waste treatment facilities (OWTF) with total capacity of bio-degrading 500 tonnes of food/ organic waste daily, and extension of the three landfills. These projects have all along been taken forward on individual project basis. However the LegCo's rejection of using

5 hectare (ha) of land in the Clear Water Bay Country Park land for the extension of the South East New Territories (SENT) landfill calls for a critical review of the strategy in the planning of the waste treatment facilities.

6. We face an imminent waste management problem and need to confirm on the development of advanced waste management facilities as soon as possible, otherwise there will be no suitable disposal facilities to handle the waste we generate by 2018. If funding approval to extend the SENT landfill is not available in early 2012, all of the 5 000 tonnes of waste disposed of at it daily will have to be diverted to other two landfills. The environmental impact assessment (EIA) and engineering study of an IWMF with incineration as core technology is near completion. Based on the result of the EIA, we need to settle on a viable option as the site for Hong Kong's first IWMF and engage the relevant stakeholders, including the district council concerned, on the site selection. We need to act in time, taking into account the lead time required for project planning and preparation, as well as the relevant statutory and administrative requirements. Hong Kong will not be able to uphold the high standard of environmental hygiene that the local and international community expects of a world city if there is no timely and adequate provision of appropriate waste treatment and disposal facilities.

THE ACTION PLAN

7. We have reviewed the action agenda outlined in the "Policy Framework for the Management of Municipal Solid Waste (2005-2014)" (the Policy Framework) published in 2005 against the latest development and we consider that the three-pronged strategy of waste avoidance and minimization; reuse, recovery and recycling; and bulk waste treatment and disposal should be reaffirmed for taking forward our waste management strategy. A complete and comprehensive strategy for the management of MSW is outlined below.

Waste Reduction and Recycling

8. A crucial, on-going piece of our waste strategy is to reduce waste at source. Since the Government published the Policy Framework in 2005, we now achieve 49% MSW recovery rate which is not low by international standards (see comparison at **Annex B**) and overshoots the target laid down in the 2005 Policy Framework (of 45% by 2009 and 50% by 2014). We will introduce a series of complementary measures

involving government departments, the estate management trades, the restaurant operators, the public organizations, green groups and social services groups in efforts to broaden the participation in waste reduction and recycling. Some of the ideas being explored are as follows:

- expansion of the programme on Source Separation of Waste and operate waste recycling activities, for example in public markets, to facilitate collection of recyclables from the community with a view to instilling behavioural change;
- taking forward pilot projects to promote on-site waste composting at shopping malls with restaurants, hotels and other premises, and developing of funding schemes under the Environment and Conservation Fund to support the operation of on-site food waste treatment at housing estates, and
- rallying the support of all departments with close interface with the public in waste reduction programmes as far as possible so as to demonstrate a visible commitment of the Administration.

With all these efforts in place, we are prepared to enhance our work and commit to raise our target of waste recovery rate to 55% by 2015. This target is above that of other developed cities like Tokyo, London and Sydney. Our study of overseas experience shows that any further attempts to significantly raise the figure would not be possible in the absence of major economic incentives/ disincentives such as MSW charging.

9. In parallel, in line with the "Polluter Pays Principle", we need to expedite the introduction of economic and legislative incentives to encourage recycling and waste reduction. On waste reduction, we will roll out a consultation exercise in 2011 on extension of the PRS on Plastic Shopping Bags, and engagement with relevant trades on an implementation plan on a new PRS on Waste Electrical and Electronic Equipment (WEEE) following the public consultation in 2010. Part and parcel of the WEEE PRS is to ensure there will be sufficient local treatment capability and the Administration will seek to facilitate the establishment of such facility.

10. Experiences from some overseas jurisdictions have shown that a very effective economic means to reduce waste is through the introduction of MSW charging at household/enterprise levels. Our

study on the overseas experiences also shows that effectiveness of the charging scheme would hinge largely on the implementation of associated measures in waste collection and the delegating of sufficient powers to waste collectors. For example, waste collectors in some jurisdictions are given the power to refuse taking waste if their content is in doubt. Due to the unique city fabric of Hong Kong and the way our municipal waste is being collected, the implementation of MSW charging would pose significant implementation challenges.

11. Nevertheless, we need to engage the public in a discussion of the objectives of implementing MSW charging for waste reduction, the principles and practicalities of various MSW charging options, such that the process can both be educational and promotional on waste reduction as well as fostering a better understanding of the implications and the demand on behavioural changes to support an effective implementation of an MSW charging system. In line with the PRS, the future model of MSW charging should be formulated with an objective for waste reduction. A broad framework on the principles and pros and cons of MSW charging options will be presented for public engagement in 2011. We will also seek to explore various means of introducing incentives to reduce waste in parallel with disincentives for producing waste.

The Package of Waste Treatment and Disposal Facilities to Deal with the Local Waste

12. The use of modern incineration technology can significantly reduce the size of the waste treated to about 10% of the original volume. The residue from incineration is mainly dry ashes that will cause little nuisance in the process of disposal. Another advantage of modern incineration facilities is that electricity could be generated from the incineration process, thus turning waste into resource. Worldwide, modern incineration plants are operated to high pollution control standards with the emission of pollutants (such as dioxin) kept at safe levels.

13. **Annex C** shows the projected situation assuming the projects under planning, which include the first IWMF with the capacity to treat 3 000 tonnes per day (to be sited in Tuen Mun or near Shek Kwu Chau) and two OWTF (at Siu Ho Wan and Sha Ling), get through all necessary approvals for commissioning before or by 2018. It is obvious that there is still a huge volume of waste left to be tackled (estimated to be over 8 400 tonnes per day) by disposal at landfills. Having regard to the volume of waste that we generate today, we consider there may be a need

for one further IWMF of the capacity of 3 000 tonnes of MSW per day and some more OWTF in addition to what are under planning despite the stepping up of waste recycling and reduction efforts. We would launch a site search for this purpose while looking into the potential of private sector projects that can provide the waste treatment services.

14. In this connection, the engineering and EIA studies on IWMF at an artificial island near Shek Kwu Chau and Tsang Tsui in Tuen Mun will be completed in early 2011. As mentioned in paragraph 6 above, we will make careful assessment, engage the relevant stakeholders (including the district council concerned) on the site selection and settle on a viable option as the site for the first IWMF.

15. In order to cater for the long-term needs of Hong Kong, we will take account of progress and effectiveness in waste reduction measures as well as other possible options on waste treatment e.g. private sector participation or the outcomes of the site search, to consider plans for further development of IWMF, including a second IWMF as mentioned in paragraph 13.

16. As regards food waste, Hong Kong currently produces about 3 300 tonnes of food waste per day, of which about 960 tonnes are generated from the commercial and industrial (C&I) sectors that can be more easily separated at source for collection. Hence, in our planning of the development of two OWTFs (with daily treatment capacity of 200 and 300 tonnes respectively) in Siu Ho Wan in North Lantau and Sha Ling in the North District, we have concurrently formed a partnership programme with key food waste generators in the C&I sector with a view to setting up the delivery and collection protocol so that their food waste generated can be delivered for treatment at OWTFs when commissioned. In addition, as mentioned in paragraph 8, setting up of on-site food waste treatment facilities at markets, shopping malls, food production factories and housing estates are being explored.

17. On and off, there are suggestions from the private sector for Government to use (i.e. fund) their alternative waste treatment facilities or technologies which are purported to being cheaper and faster to implement. We will examine the feasibility of engaging private sector participation in our future waste treatment plans.

SENT Landfill Extension

18. As indicated above, even with the new waste reduction and

recovery measures as well as modern incineration facilities, we still need landfills to cater for unavoidable and non-recyclable waste, non-combustible waste and incineration ashes. In all overseas cities where incineration is used as the core waste treatment technology, landfills are required though their lifespan is much longer as the volume of the ashes thus disposed of is much smaller as compared with the waste before incineration. The projected fill-up dates for SENT, North East New Territories (NENT) and West New Territories (WENT) landfills are 2014, 2016 and 2018 respectively. Yet projected residual waste requiring landfill disposal (after taking account of the planned one IWMF and two OWTFs before or by 2018) is over 8 400 tonnes per day (see **Annex C**). It clearly indicates that we need to include landfill extension as part of our waste treatment package.

19. The capacity of the existing SENT landfill will be exhausted by 2014. We originally proposed to extend the lifespan of the SENT landfill by six years (to 2020) by, inter alia, extending 20.6 ha which comprises taking up some 15.6 ha of the adjoining TKO Area 137 and encroaching into five ha of the Clear Water Bay Country Park. This proposal will create an estimated capacity of 17 million m^3 for the extended landfill. We understand that the community has expressed concern on our originally proposed extension. Nevertheless, we consider it essential to seek extension of the SENT landfill albeit on a smaller scale. It is because the SENT landfill is the territory's single largest disposal outlet for construction waste. Some 2 350 tonnes of construction waste are being disposed of in the SENT landfill each day, which account for 73% of the overall construction waste disposed of each day in the three landfills. We also need to account for possible rise in the demand for construction waste disposal with the implementation of infrastructure projects. In the remaining area of TKO Area 137, there are a cluster of facilities for receiving waste from excavation, construction and demolition works, which include a construction waste sorting facility (to sort out inert fill materials for later beneficial reuse) and a public fill bank (to stockpile the fill materials). The SENT landfill is conveniently located to these facilities so that it receives the bulk of construction waste which cannot be reused. It is important to retain the SENT landfill extension to maximize the synergy with the sorting facility and the public fill bank. In addition, from the overall waste management strategy, as the first IWMF will not be commissioned until 2016 or 2018, it is critical to maintain the capacity of the landfills for depositing of waste in the meantime.

20. The key complaint against the SENT landfill extension is the

odour problem. While we have implemented many measures to avoid odour problem, the proximity of residential buildings to the SENT landfill has posed a unique challenge to us. To address the odour issue, we will invoke the Waste Disposal (Designated Waste Disposal Facility) Regulation of the Waste Disposal Ordinance so that the SENT landfill would be used for disposal of construction waste only, from an appropriate date in future when the sludge treatment facility is commissioned in late 2013 and the MSW collection trades are given sufficient advance notice for diversion arrangements. This measure should remove the community's concern on odour.

21. On the assumption of waste diversion starting the latest from early 2014, it is possible to scale down the SENT landfill extension into TKO Area 137 to 13 ha which may allow the lifespan of the SENT landfill to last until around 2020 to allow for tying over with the planning of new permanent construction waste transfer facility in South-East New Territories so that construction waste in this region could be sorted and bulk transferred to the other landfills. The requirement of 13 ha of TKO Area 137 is worked out on the basis of the landfill space needed to receive the estimated volume of construction waste having regard to the current disposal figures in the SENT landfill. Given site and technical constraints, any further reduction in extension of land area will highly unlikely be able to provide sufficient landfill capacity to meet the expected demand. An illustration on the SENT landfill life between 2014 and 2020 is given in **Annex D**. We will continue with the current town planning process to re-zone land in TKO Area 137 for landfill use.

Way Forward

22. The package of initiatives in reducing waste at source, which we have presented above, would help Hong Kong move towards higher MSW recovery target. The introduction of modern facilities would help properly manage our daily waste generation, and the extension of landfills should be incorporated as an indispensable element of our waste strategy. We also plan to present our funding applications for the first IWMF, the first OWTF and the extension of the three existing landfills as a package to the LegCo in early 2012 so that an overall picture on the provision of essential waste treatment facilities to tackle the urgent waste problem can be presented and clarified as soon as possible. An action timetable for the programme is set out at **Annex E**.

OTHER OPTIONS

23. To maintain status quo is not an option. While we will strive to promote waste reduction and recovery of MSW with our best endeavours, as in many advanced economies such as Japan, Singapore and European Union, waste incineration is a commonly adopted waste disposal strategies to substantially reduce the volume of unavoidable waste. But even that, landfill is still needed as the final repository for the remaining incineration ash and other non-recyclable and non-combustible waste.

ADVICE SOUGHT

24. Members are invited to comment on the Administration's strategies and its updated action plan to tackle the waste problem in Hong Kong as set out in paragraphs 7 to 22 above.

Environment Bureau/Environmental Protection Department
February 2011

Annex A

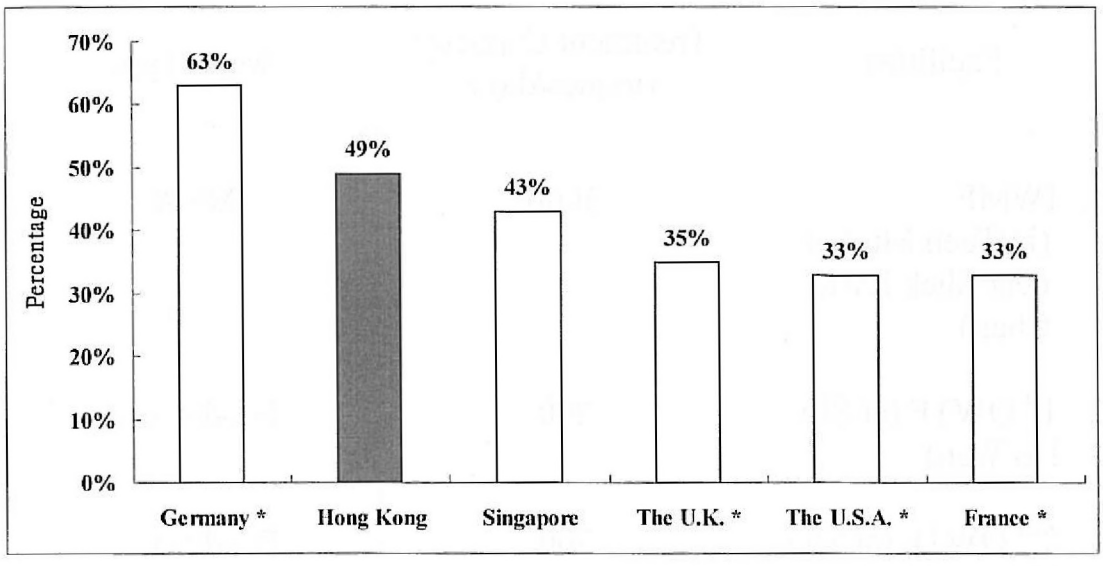
Remaining Capacities of Existing Landfills (Without Extensions)

	Current Daily Intake	Design Filling Capacity	Remaining Filling Capacity (as of end 2009)	Anticipated Year of Exhaustion
	(tonnes / day) (MSW, construction waste, others)	(million cubic metres)	(million cubic metres)	(Note 1)
SENT Landfill	5,000 (including 2,200 MSW; 2,350 construction waste; 450 others)	43	11	2014
NENT Landfill	2,400 (including 1,800 MSW; 400 construction waste; 200 others)	35	20	2016
WENT Landfill	5,900 (including 5,000 MSW; 450 construction waste; 450 others)	61	36	2018
Total	13,300 (including 9,000 MSW; 3,200 construction waste; 1,100 others)	139	67	

Note 1 The estimated year of exhaustion of landfill space has built in a small allowance to cater for possible waste growth due to population growth, increases in economic activities and major development projects having regard to historical trend and economic forecasts.

Annex B

Comparison between the MSW Recovery Rate in Hong Kong and Other Selected Jurisdictions (2009)



* Figures of 2008

Annex C

Residual Waste Requiring Landfill Disposal by Completion of first IWMF

[A] Waste Treatment Facilities Commissioned on the basis of current planning :

Facilities	Treatment Capacity (tonnes/day)	Waste Type
1. IWMF (in Tuen Mun or near Shek Kwu Chau)	3000	MSW
2. 1st OWTF (at Siu Ho Wan)	200	Food waste
3. 2nd OWTF (at Sha Ling)	300	Food waste
4. Sludge Treatment Facilities (Contract awarded for commissioning in 2013)	Up to ~2000	Sludge
Total	Up to ~5500	

[B] Estimated net waste generated for disposal per day taking into account the enhanced recycling rates of MSW to 55% by 2015 and assuming no growth in waste generation despite increases in population, GDP and other economic activities :

Tonnes Per Day			
Construction Waste (non-combustible)	Net MSW after recycling (can be incinerated)	Sludge (can be incinerated)	Special Waste (non-combustible)
~3200	~8000 *[calculation: 9000/51%*45%]*	~1500 – 2000	~200
	Total	Non-combustible Combustible	(~3400) (~10000)

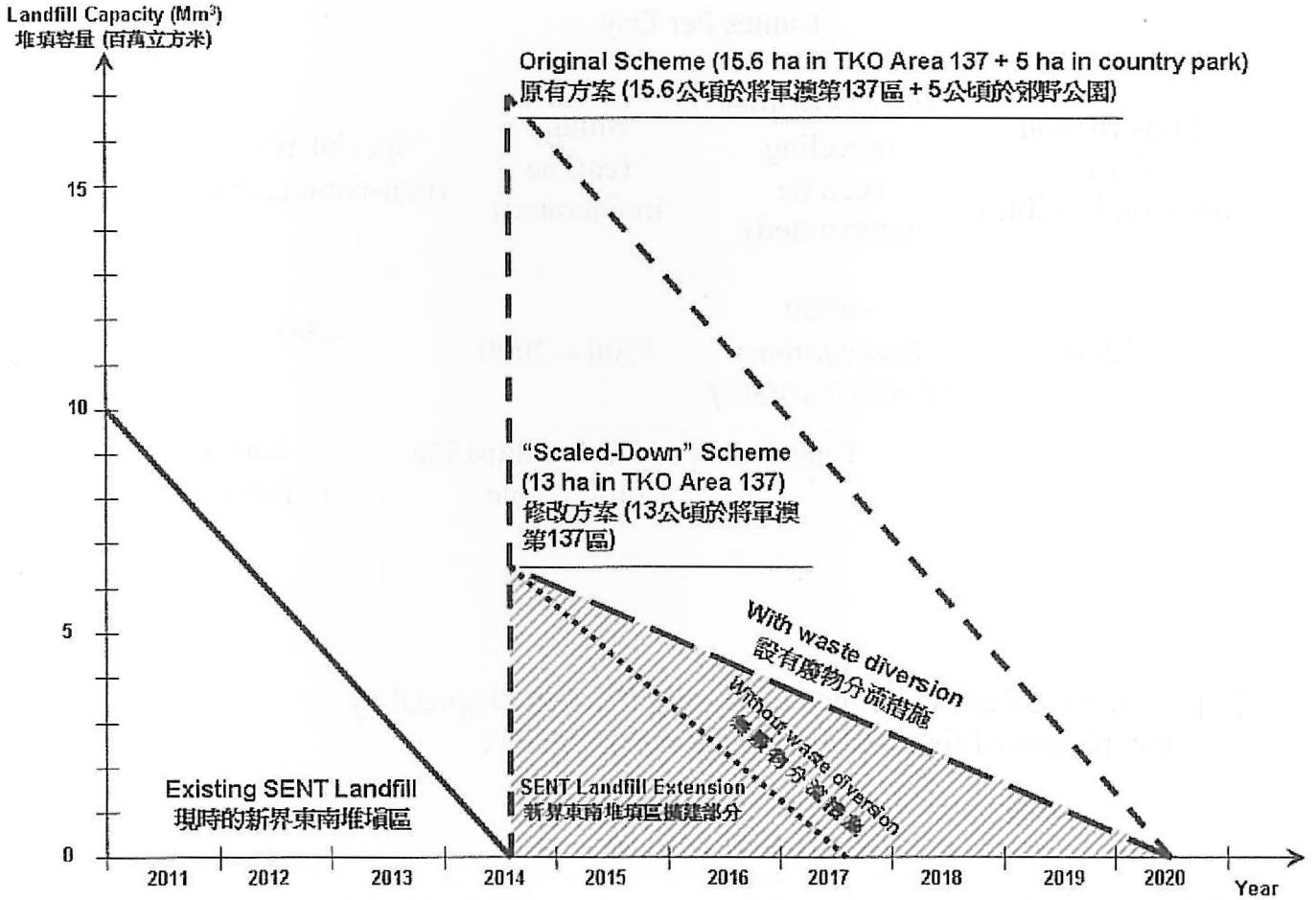
[C] Estimated Residual Waste Requiring Landfill Disposal by completion of first IWMF and the two OWTFs :

Tonnes Per Day		
Construction Waste + Special Waste	Remaining MSW not incinerated	Residual Ashes after incineration (Note 1)
~3200 + 200	~4500 *[calculation: 8000-3000-200-300]*	~500
	Total	~8400 or more

Note 1 : For the purpose of estimating landfill capacity, incineration of MSW and sludge is planned to achieve 90% volume reduction.

Annex D

Life of SENT Landfill and Extension Schemes



Life of SENT Landfill and extension schemes
新界東南堆填區及擴建部分方案的壽命

Annex E

Action Timetable for the Planning of Waste Treatment Facilities and Waste Reduction Initiatives

	2011	2012	Beyond 2013
(I) Waste Management Facilities			
(a) Integrated Waste Management Facility Phase I	i) Public consultation of Environmental Impact Assessment (EIA) reports and necessary legislative procedures(2011 Q2) ii) Pre-qualification of works (2011 Q4)	Seek funding from LegCo Finance Committee/Public Works Sub-committee (early 2012)	Commission facility (estimated in 2016 or 2018)
(b) Organic Waste Treatment Facility Phase I	Invite tenders	Seek funding from LegCo Finance Committee/Public Works Sub-committee (early 2012)	Commission facility (estimated in 2014)
(c) Organic Waste Treatment Facility Phase II	EIA study commences	EIA study completes	Commission facility (estimated in 2016-17)
(d) North East New Territories landfill extension	Seek approval from ExCo for land resumption/grave relocation (2011 Q4)	Seek funding from LegCo Finance Committee/Public Works Sub-committee (early 2012)	Commission facility (estimated in 2015-16)
(e) South East New Territories landfill extension	Completion of land rezoning	Seek funding from LegCo Finance Committee/Public Works Sub-committee (early 2012)	Commission facility (estimated in 2014)

	2011	2012	Beyond 2013
(f) West New Territories landfill extension		Seek funding from LegCo Finance Committee/Public Works Sub-committee (for part upgrade to commission consultancy study on contract and tender preparation) (early 2012)	Commission facility (estimated in 2018)
(II) Waste Reduction initiatives			
(a) Producer Responsibility Scheme			
- Plastic Shopping Bags next phase	i) LegCo and public consultation (2011 Q1) ii) Report back to LegCo EA Panel (2011 Q4)		Target submission of Amendment Bill to LegCo (2012-13)
- Waste Electrical and Electronic Equipment	i) Report back to LegCo EA Panel on implementation proposal (2011 Q2) ii) discussion with trade on detailed implementation plan (2011 Q3)		Target submission of Amendment Bill to LegCo (2012-13)
(b) Municipal Solid Waste charging	Public engagement (2011 Q3)	Report to LegCo on recommended way forward for MSW charging (2012)	