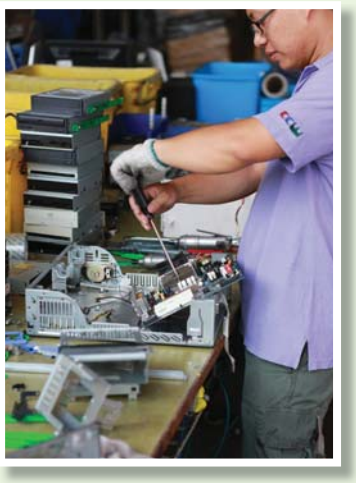
# HONG KONG
# BLUEPRINT FOR SUSTAINABLE USE OF RESOURCES
# 2013 – 2022

Environment Bureau


May 2013

# USE LESS, WASTE LESS

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# Preface

The types and quantities of waste we generate and dispose of are influenced by economic development, lifestyle and habit. As disposable income and living standard increase, consumption of goods and services correspondingly rise, as does the amount of waste we generate.

Hong Kong's daily per capita domestic waste generation rate is high when compared to cities in Asia at stages of economic development similar to ours. Since the mid-1990s, a number of leading Asian cities have achieved very good results in waste reduction. Their experience tells us that Hong Kong can do very much better if we take coordinated and simultaneous action on waste prevention, reuse, recycling, recovery, treatment and landfilling, as part of a whole resources management chain. Hong Kong has fallen behind because we have only taken some of the steps. We need to urgently fill in the gaps.

We understand what needs to be done and we are committed to taking all the necessary decisions and actions now so that we can put Hong Kong on a clear path, with targets and a timeline, towards a "Use Less, Waste Less" lifestyle. We will put substantial effort in social campaigns to mobilize our citizens to take more environmentally-sustainable actions in their daily lives. We will work with communities and districts, we will collaborate with business stakeholders, and we will encourage NGOs to develop projects as we make this transition together.

Permit me to share one of my personal beliefs. I believe a simpler life is a happier life. We can eat what we need, which can be nutritious and delicious, and not more. There are many opportunities for us to enjoy simplicity. Our homes do not need to be over-designed. We can separate recyclables so we can recover resources. We can work together in our community so that we and future generations can transform and conserve Hong Kong with sustainable and green moves.

**KS Wong**
Secretary for the Environment

May 2013

# SUMMARY OF HONG KONG BLUEPRINT FOR SUSTAINABLE USE OF RESOURCES 2013-2022

## Vision

Use less and waste less of the Earth's resources through instilling an environmentally-sustainable culture into Hong Kong people's daily life.

## Strategy

Develop a comprehensive waste management plan and promote a new social contract with the community to conserve resources and reduce waste.

## Overall Target

-40%

Reduce the Municipal Solid Waste (MSW) disposal rate by 40% on a per capita basis by 2022.

## Policy Directions

1 Government to take multiple, concurrent actions to prevent and reduce waste

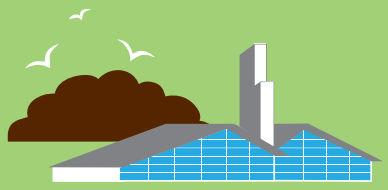
2 Make all out efforts to mobilize the community to participate

3 Fill missing gaps in Hong Kong's waste-related infrastructure

## Key Actions

Drive behavioural change through policies and legislation to reduce waste, such as MSW charging and Producer Responsibility Schemes (PRS).

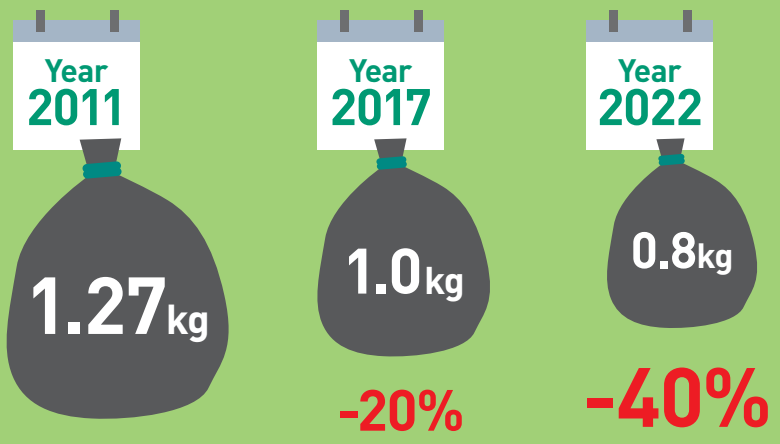
Mobilize the community through targeted campaigns, such as with food waste, glass beverage bottles collection, bring your own bag (BYOB), community green stations etc.



Invest in infrastructure, including Organic Waste Treatment Facilities (OWTFs), waste-to-energy MSW treatment, and landfill extensions.

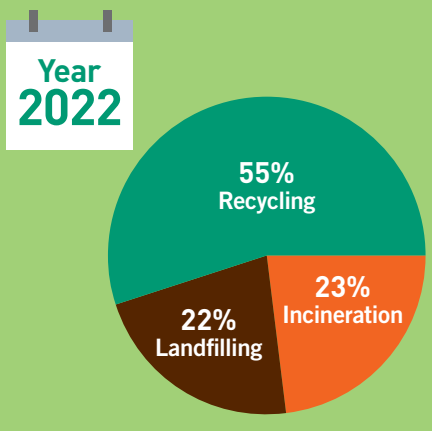
## Specific Targets

To reduce the current per capita MSW disposal rate of 1.27 kg per day to 0.8kg per day by 2022.




## Target Result

To transform the waste management structure by 2022.



# 1 Our Vision for Sustainable Use of Resources

## A New Social Contract

Our vision is to use less and waste less of the Earth's resources through instilling an environmentally-sustainable culture into Hong Kong people's daily life.

To achieve this vision, it takes no less than a new social contract between the Government and the people of Hong Kong. This blueprint proposes a mix of public and community actions.

## A "Use Less, Waste Less" Shared Value

A new social contract must be grounded in a clear and widely shared value, which we summarize simply as "Use less, Waste less".

This value is grounded in the fact that everything we consume has a hidden story – every item has an inventory of the materials and resources that have gone into producing it. For example, the act of creation, such as for a humble beverage plastic bottle, uses enormous amounts of energy, materials, water and other resources. When we throw the plastic bottle away, we forget that there had already been very large quantities of waste and emissions generated from its production and transportation including the extractive and manufacturing processes.

There is another aspect of our modern life we cannot ignore – the ethical dimension. The consumption lifestyle must be tempered to achieve sustainable development for all – including in high consuming Hong Kong. Indeed, as a community, we are generating so much waste everyday that we are no longer able to carry on like we have been. We have a waste crisis that needs urgent addressing.

The starting point of our new waste policy is to adopt a different attitude to waste in Hong Kong. Our waste stream contains a treasure trove of useful resources, much of which can be reused, recycled and recovered.

At the same time, we must reduce waste at source by cutting down on unnecessary consumption and promote source separation – especially with respect to food waste. In our businesses, we must challenge ourselves to find new ways that put less demand on resources.

## Waste Less is Everyone's Responsibility

Managing waste in any city is an intensive service that involves many activities and people. This blueprint touches upon the entire resource chain although greater emphasis is given to those aspects that must be dealt with urgently because they are the most critical. This includes the completion of a comprehensive system of waste reduction, charging, handling, treatment and disposal for Hong Kong.

To make the change, we all need to work together – Government, Business and Community. We need everyone to participate to reach the goal we have set in this plan. When we arrive there, we will have to quicken the pace and go further along the path of "Use less, Waste less".

**"This blueprint touches upon the entire resource chain although greater emphasis is given to those aspects that must be dealt with urgently because they are the most critical. This includes the completion of a comprehensive system of waste reduction, charging, handling, treatment and disposal for Hong Kong."**

# 2 | Our Challenges & Opportunities

While dealing with Hong Kong's waste challenge is a complex exercise, we have the capability to do it because we understand the problem, we can set appropriate policies, and we have the financial resources to take action. Most importantly, we have as yet the untapped potential of mobilizing the people of Hong Kong to change how they deal with waste.

Before we put forward The Action Blueprint (2013-2022) in the next chapter, we want to explain what we see as Hong Kong's major challenges and opportunities in dealing with waste.

## The Challenges

### 1. Large 'waste load'

We have a large 'waste load'. Over the years, Hong Kong people have become more, not less, wasteful. In the past 30 years, our MSW increased by nearly 80% while our population grew by 36% and our Gross Domestic Product (GDP) increased two fold. Tellingly, the daily per capita MSW rate rose from 0.97 kg to 1.27kg, so not only were there more of us throwing away waste, but we were each throwing away 30% more.

Our wasteful habits put tremendous pressure on the entire waste chain from collection to final disposal. In light of the enormous quantities of waste Hong Kong has to deal with every day, we must prevent and reduce the total amount of waste at source if we are to ease the pressure downstream.

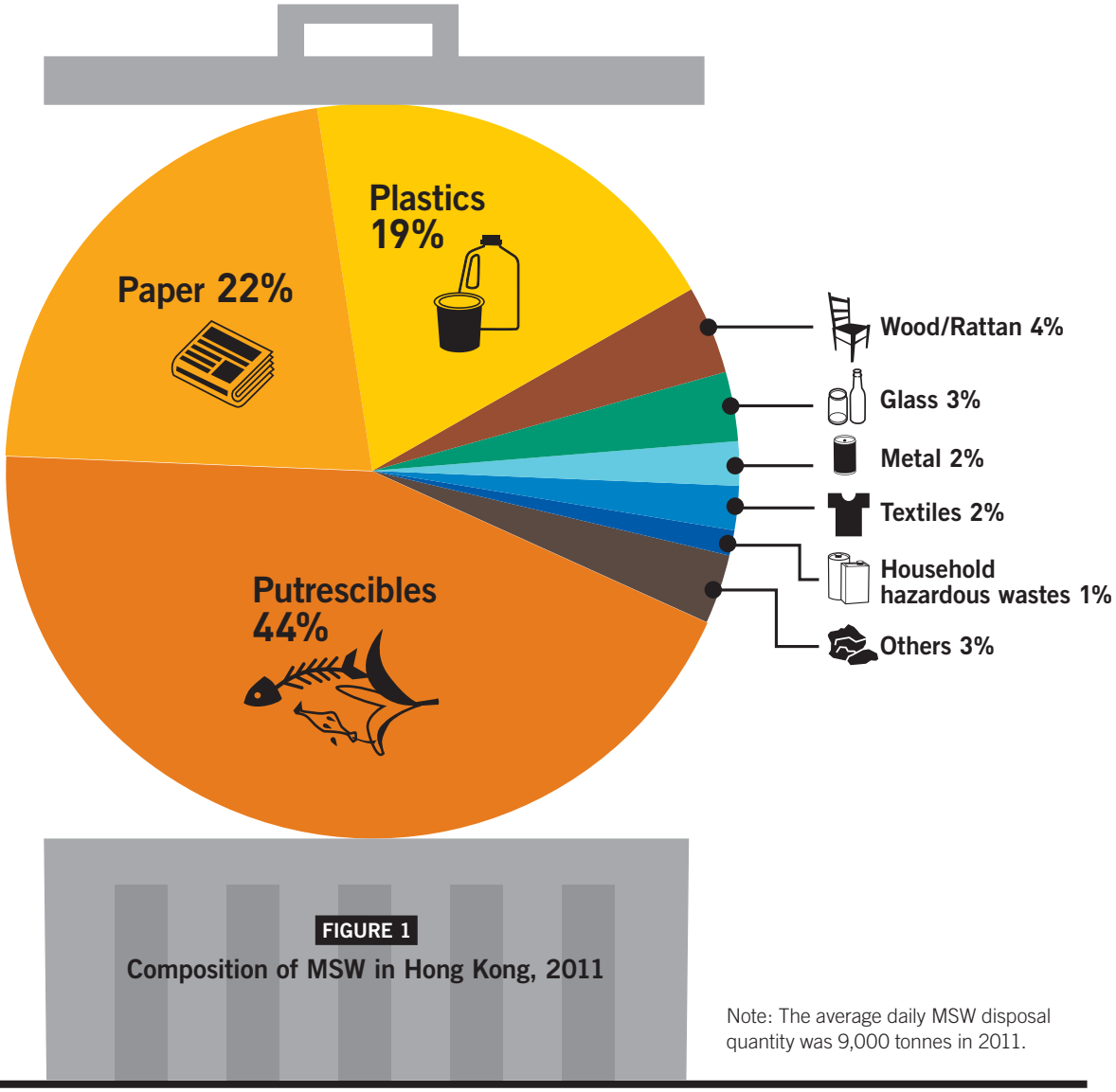



**FIGURE 1**
**Composition of MSW in Hong Kong, 2011**

Note: The average daily MSW disposal quantity was 9,000 tonnes in 2011.

### 2. Public distrust

While many improvements have been made, people question whether their efforts in waste separation are helping to increase waste recovery. There are still public concerns about a range of inadequacies with the quantities, sizes and locations of recycling bins. There are also doubts being raised about whether some waste collectors just lump everything from the recycling bins together and take them to the landfill.

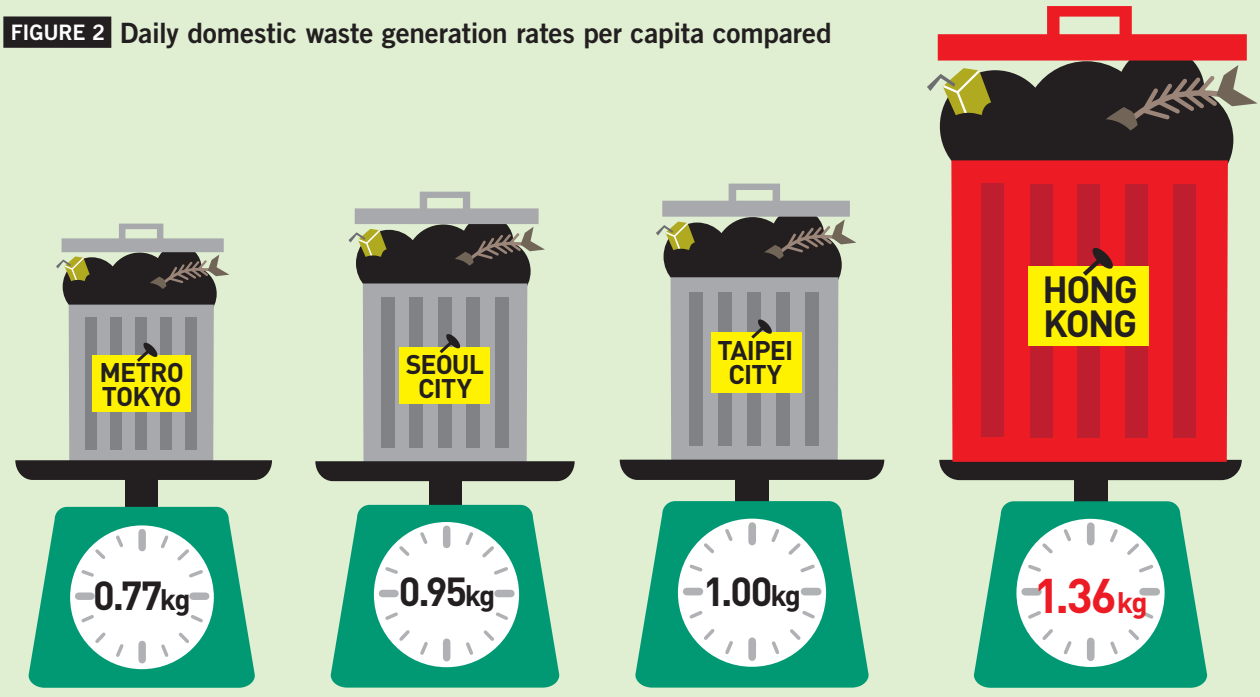
We believe Hong Kong people are willing to practice waste separation and recycling but they want better support. The lack of a comprehensive and convenient waste collection system diminishes the effort people are willing to make. We must improve the front-end of the waste chain through strengthening the waste separation of recyclables and the collection system in order to reinforce public trust.

#### Hong Kong's Waste Load Compared

Despite difficulties in making direct comparisons in the MSW disposal rates between cities because of different methods of calculation in waste quantities, the many differences in culture and habits, and different stages of industrial and commercial development, useful insights can still be gleamed from looking at cities' domestic waste generation rates.

Hong Kong has a comparatively large waste load compared to neighbouring cities at a similar level of development. Figure 2 compares Hong Kong's daily domestic waste generation rate with Seoul, Taipei City and Tokyo.

**FIGURE 2** **Daily domestic waste generation rates per capita compared**



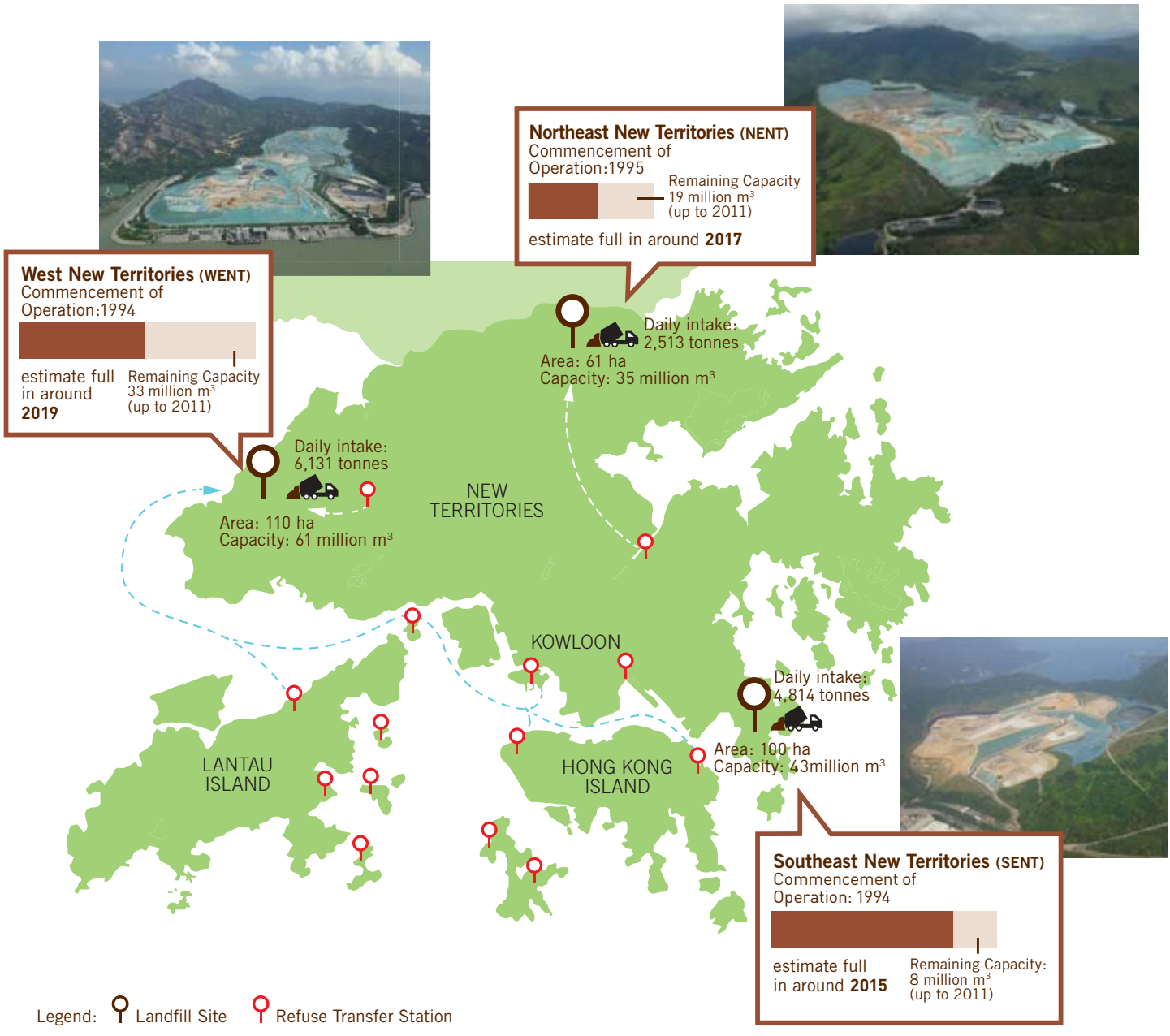

Sources: Hong Kong Environmental Protection Department; Ministry of the Environment of Japan; Taiwan environmental authority and Seoul Metropolitan Government

Note: Different places have different definitions of waste and different methods of compiling waste statistics. Hence apparently similar parameters may not be directly comparable. For example, Seoul reports its per capita municipal waste generation as 0.95 kg/day, but this only covers waste from households and small businesses, which is more similar to the domestic waste as defined in Hong Kong.

### 3. Limited capacity to absorb waste

Hong Kong is a highly urbanized city with a service economy. It is not easy to establish waste recycling industries here when land is scarce and so very costly. Nevertheless, the waste collection industry is reasonably efficient at collecting higher value wastes, such as metals, paper and second-hand electrical and electronic products, for reprocessing or reuse elsewhere. The same cannot be said of lower value recyclables, including waste plastic, waste glass and food waste, which have less commercial attraction. Commercial viability for recyclables will change when PRS and MSW charging are in place. Moreover, Hong Kong has limited space that is acceptable for waste infrastructure, especially for landfills. Thus, we must work doubly hard under many constraints to prevent and reduce waste at source, as well as treat waste (and recover energy at the same time) to reduce the quantities of waste going to landfills.

**FIGURE 3** **Geographical distribution and utilization of landfills in Hong Kong**



### Hong Kong's Landfills

Landfills are an essential and ultimate part of the waste management chain everywhere in the world. 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.

Hong Kong had operated 13 landfills which are now closed and some have already been restored for community greening and activities. Today, there are three large, modern state-of-the-art strategic landfills established in three corners of Hong Kong – North East New Territories (NENT), South East New Territories (SENT) and West New Territories (WENT). The locations were chosen in light of the development needs of various districts and transport optimization in terms of emissions and costs for waste arising from all over the city. These three landfills began operation in the 1990s and they will reach their designed capacities one-by-one by 2019 if not planned for extension.

Hong Kong's landfills are engineered to a very high standard, using impermeable lining with comprehensive leachate and landfill gas management. They are well-operated to meet high international environmental standards, including stringent control measures to prevent potential nuisance caused by odour, landfill gas and leachate. Landfill gas can be used beneficially to generate electricity and energy for site use or as a substitute for towngas. The landfills have also received about 20,000 visitors (from schools and general public) over the past five years.

Restored landfill at Jordan Valley

**4. Incomplete infrastructure**

There are both pockets of excellence and major missing elements in Hong Kong's waste infrastructure. Hong Kong's refuse collection and transfer system, landfill management, and the chemical waste treatment facility are examples of good practices. We are filling some of the gaps – a sludge treatment facility (STF) will be completed soon to deal with sewage sludge and turn waste to energy, and we plan to build Hong Kong's first Organic Waste Treatment Facility (OWTF) to deal with food waste. Before long, we will need to commit to a second OWTF, and we also need to build a sizable integrated waste management facility (IWMF) with enhanced capacity to turn waste to energy and to deal with MSW that has not been taken out of the waste stream.

A key aspect of Hong Kong's failure in waste management to date is to have relied for too long on landfills to the extent that these are filling up and need to be imminently extended. In future, landfill space must be regarded as one of the city's most precious assets – to be more prudently used as a last resort.

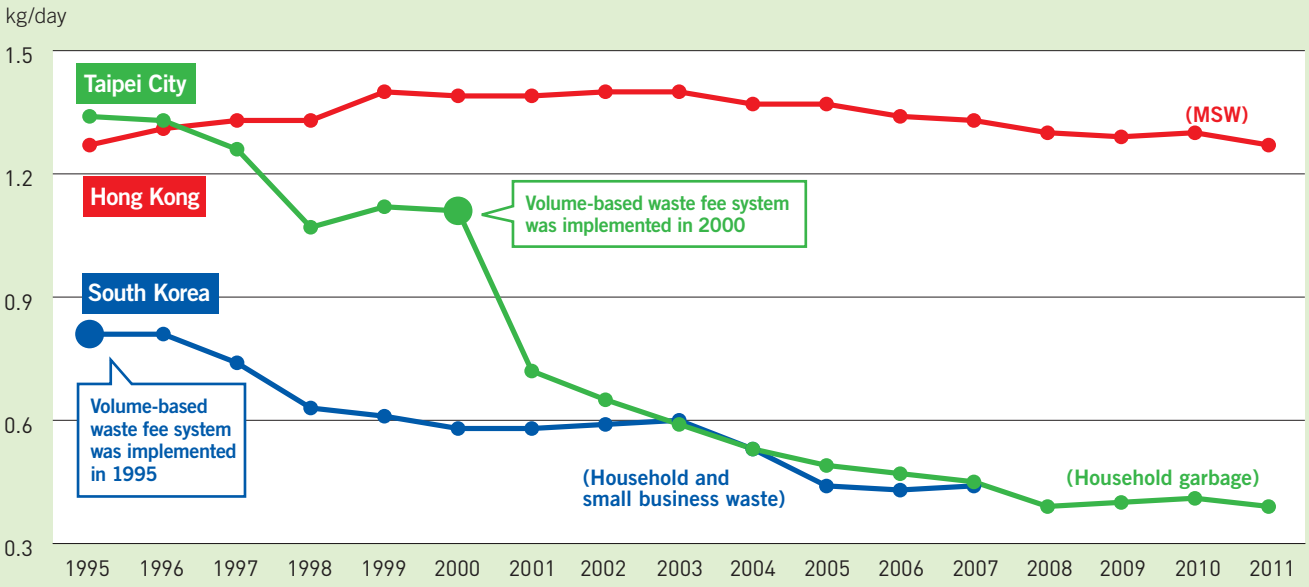
## Learning from Taipei City and South Korea

We are encouraged by the success of other places in waste reduction. Our study of successful waste reduction examples from other jurisdictions shows the different types of intervention needed and the time-scale necessary to work with the community to change behaviour.

We have looked at countries, cities and places in Asia, Europe and the US for inspiration. Taipei City and South Korea in particular offer useful lessons for Hong Kong because there are some similarities between the lifestyle of their residents and ours, and they embarked on a full waste reduction drive in the last two decades when Hong Kong should have picked up our pace to do the same. Their experience can help us to reflect on a whole range of decisions and actions Hong Kong must take now.

Figure 4 is most revealing. In 1995, Taipei City's and Hong Kong's daily per capita waste disposal rates were similar but since then, Taipei City's rate has decreased significantly. The most dramatic drop took place between 2000 and 2011 when Taipei City's per capita disposal rate of household garbage fell 65% from 1.11 kg to 0.39 kg.[1] The remaining waste from her 2 million citizens is treated by three incinerators with a daily capacity of 4,200 tonnes in total and then landfilled. In the case of South Korea as a whole, the waste disposal rate on a per capita basis dropped by 40%[2] from 1995 with the remaining waste treated by incinerators and then landfilled.[3] The capital city – Seoul, with a population of more than 10 million, has built four incinerators for treating MSW with a daily capacity of 2,850 tonnes in total.[4]

**FIGURE 4** **Waste disposal rates in Hong Kong, Taipei City and South Korea (per capita)**




Sources: Taiwan Environmental Authority; Hong Kong Environmental Protection Department; Dr. Kwang-yim Kim, Performance of Waste Management Policy in Korea -Volume-based Waste Fee System and Packaging Waste EPR, 2008, Korea Environment Institute; and Ministry of Environment of South Korea.

Note: Different places have different definitions of waste and different methods of compiling waste statistics. Hence apparently similar parameters may not be directly comparable. For example, figures for South Korea only cover waste from households and small businesses, not the whole range of MSW as defined in Hong Kong, which includes waste from all commercial and industrial entities. Thus the above chart is only for reference regarding trends.

Footnotes:
1. Department of Environmental Protection, Taipei City Government: Implementation of the "Resource Recovery and Zero Landfill" Policy in Taipei City in 2010.
2. Dr. Kwang-yim Kim, Performance of Waste Management Policy in Korea-Volume-based Waste Fee System and Packaging Waste EPR, 2008, Korea Environment Institute.
3. "The Republic of Korea Year Book 2011", Ministry of Environment of South Korea.
4. Korea Zero Waste Movement Network (KZWMN) http://www.waste21.or.kr/html/eng.asp.

The most effective means for Taipei City and South Korea to reduce waste was the combination of public education and volume-based MSW charging. Hong Kong's own experience is that waste charging works. After Hong Kong imposed charging for the disposal of construction waste, the waste loads to landfill has dropped by some 60% (see Figure 10).

At the same time, Taipei City and South Korea turned waste into energy and thereby reducing waste residues going to landfills.

Figure 5 provides a summary of the full complement of policies and measures used in Taipei City and South Korea. Success did not come overnight. It took years of sustained perseverance for the authorities and communities. Both Taipei City and South Korea had to work out how best to impose waste charging. They both adopted a volume-based charging scheme for households and commercial/industrial units.

Waste charging should be seen together with the imposition of PRSs, which apply to commercial/industrial enterprises and are based on the Polluter Pays Principle (PPP). PRSs are effective in changing the behaviour of businesses to redesign products and packaging to reduce or even eliminate waste. In Taiwan and South Korea, PRSs also helped to foster the incremental development of recycling industries and the creation of green jobs.

**FIGURE 5** **Schedule of waste policies and measures imposed in Taipei City and South Korea**

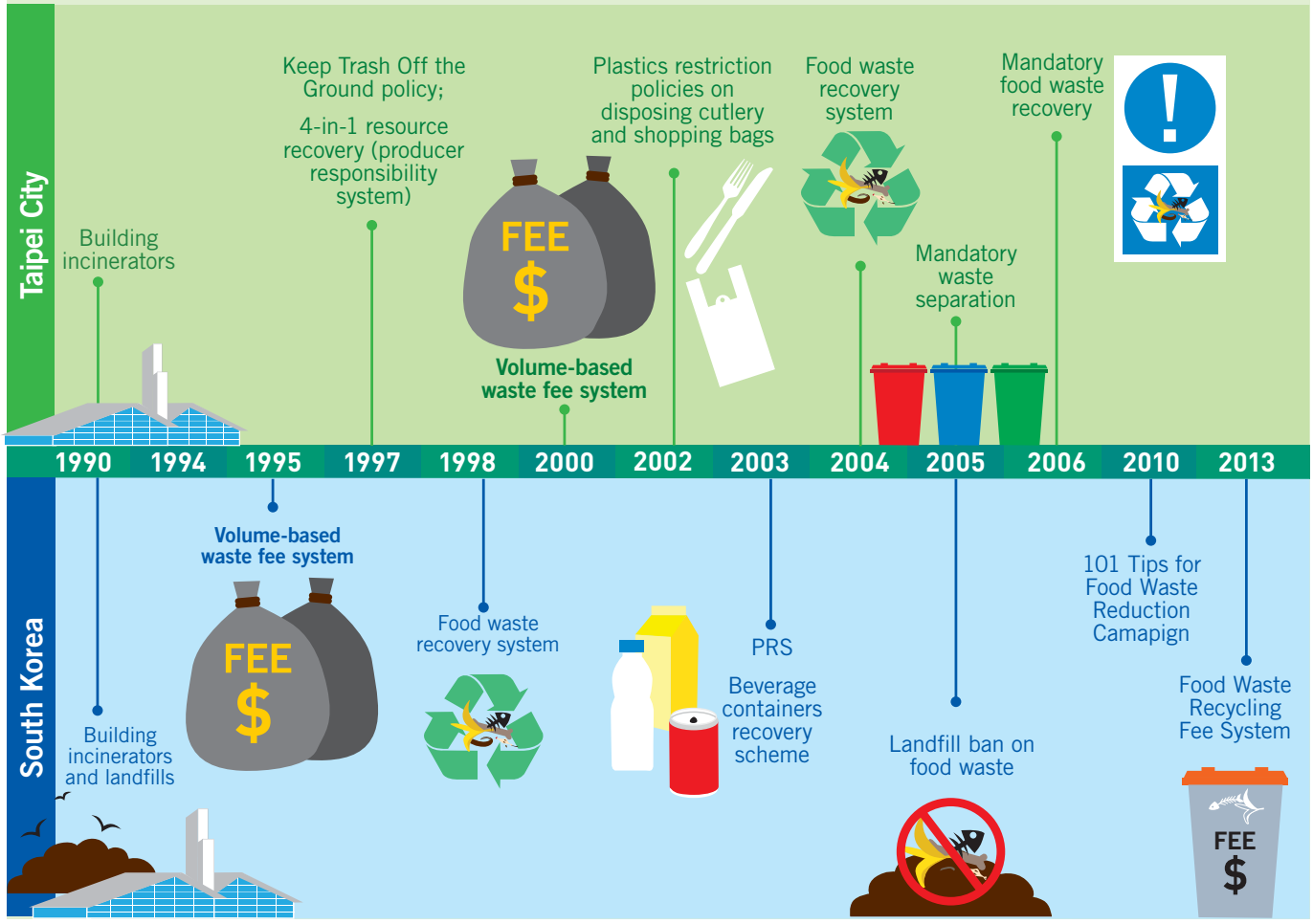
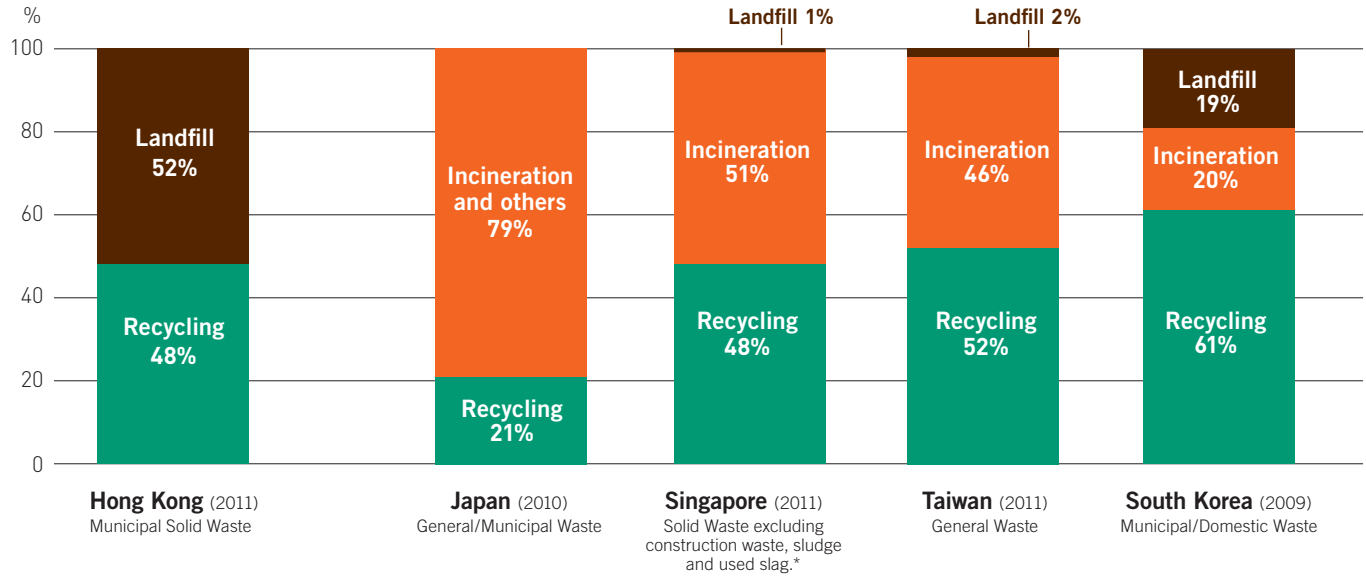


**FIGURE 6** Comparison of waste management structure with other Asia areas




* Note: The published Total Solid Waste Recycling rate is 59%. After excluding construction waste, sludge and used slag, the solid waste recycling rate is 48%.

## The Opportunities

### 1. Mobilize our people

There is an enormous untapped potential in mobilizing our community. Hong Kong people can adopt new behaviour to reduce waste. We are confident that mobilization will work in Hong Kong for two reasons: firstly, there are already many effective, self-started community activities in waste reduction and recycling; and secondly, we see strong results from other cities when their people became motivated to participate in waste reduction. Substantial reduction is possible when public policies and infrastructure provision are properly aligned.

### 2. Multiple, concurrent actions needed now

We can avert Hong Kong's waste crisis by taking multiple decisions and actions now to lay the path towards a new 'Waste Not' culture.

Different jurisdictions adopted a mix of policies and measures. Figure 6 provides a breakdown of recycled, incinerated and landfilled waste in different places. Hong Kong is unique in that up until now we have been relying on landfills for waste disposal. However, this will start to change with the commissioning of the STF and OWTFs, and also when we build an IWMF with waste-to-energy technology. The adoption of MSW charging will further help to reduce waste substantially.

Taking into account Hong Kong's challenges, opportunities and lessons from other cities, our Action Blueprint covers a wide range of activities that we must urgently embark upon to:

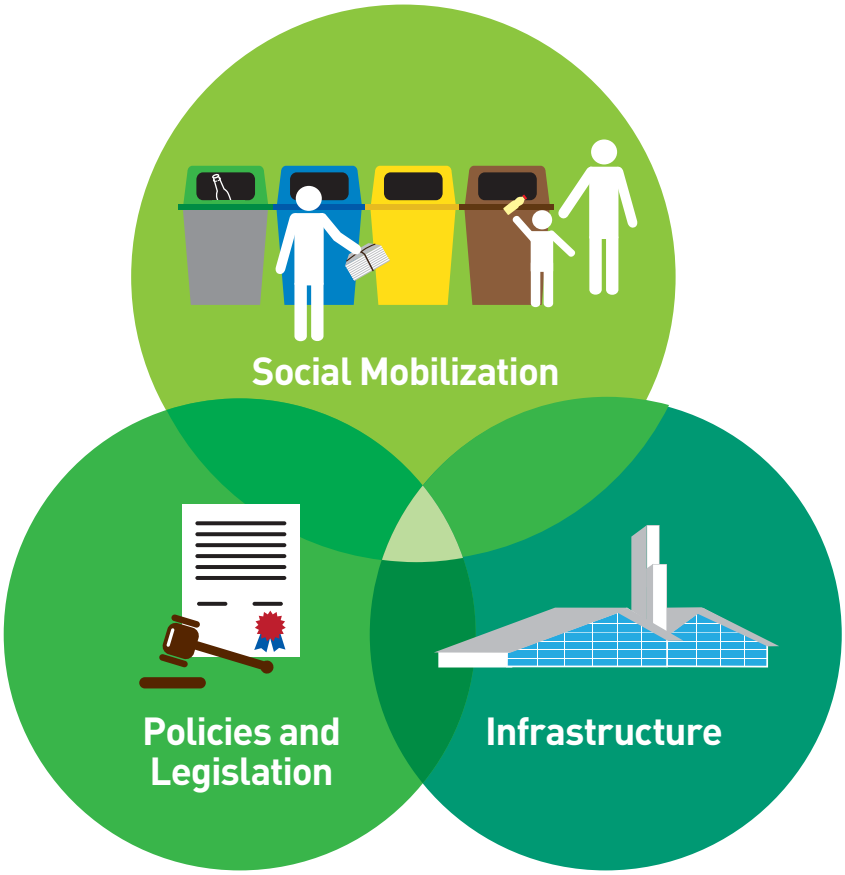
- Prevent and reduce all types of waste at source;
- Increase reuse and recycling;
- Implement MSW charging;
- Review construction waste charging;
- Expand PRS;
- Invest in infrastructure to recover energy and treat waste;
- Collaborate with stakeholders to prevent, reduce and recycle waste; and
- Promote territory-wide campaigns and mobilize the community to change behaviour.

# 3 The Action Blueprint 2013-2022

## Joined-up Action Agenda

Taking into account Hong Kong's waste challenges described in Chapter 2, our action agenda to reduce waste and relieve pressure on landfills is built upon enhanced social mobilization coupled with the right policies and legislation, as well as providing the necessary waste infrastructure to deal with different types of waste. By also taking into account past measures in waste management (see Annex), we believe Hong Kong has a solid foundation from which to advance.

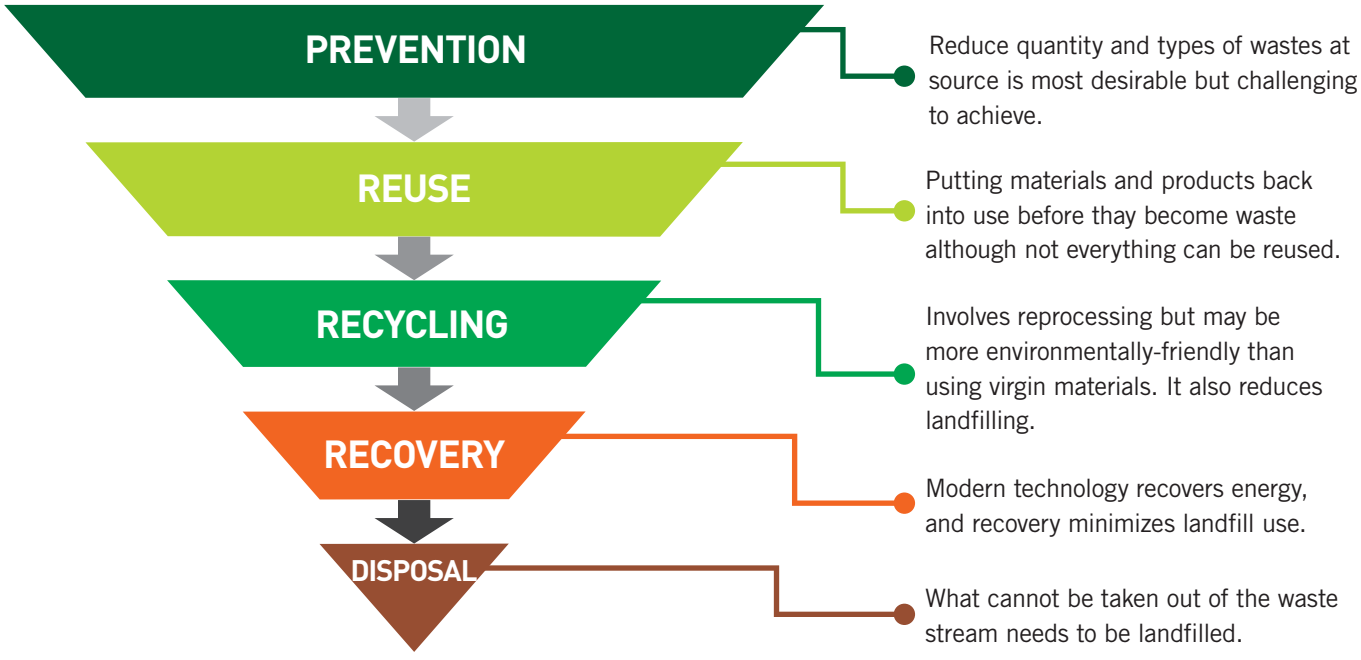
**FIGURE 7** Joined-up Action Agenda




## Principles of Waste Management

We will continue to use the internationally-accepted multi-tiered waste management hierarchy to guide our policies and measures. Figure 8 shows the hierarchy and the desirability of each of the tiers.

**FIGURE 8** Waste Management Hierarchy



## The Action Blueprint 2013-2022

Our 10-year Action Blueprint categorizes the decisions and actions we need to take using the waste management hierarchy for reference. Many of the actions are in fact interrelated.

| | | Prevention | Reuse | Recycling | Recovery | Disposal |
|---|---|---|---|---|---|---|
| **Policy Development and Legislation** | | | | | | |
| **1. Quantity-based waste charging** | | | | | | |
| 1A. MSW charging | Stakeholder engagements on charging scheme in 2013 | ■ | ■ | ■ | | |
| 1B. Construction waste charging | Review the charging scheme | ■ | ■ | ■ | | |
| **2. Producer responsibility schemes** | | | | | | |
| 2A. Plastic shopping bags | • Legislate to extend existing PRS<br>• Encourage BYOB campaigns | ■ | ■ | | | |
| 2B. Waste electrical and electronic equipment | • Public consultation completed<br>• Draft legislation as part of PRS | ■ | ■ | ■ | | |
| 2C. Glass beverage bottles | • Draft legislation subject to outcome of consultation<br>• May be extended to other glass products | ■ | ■ | ■ | | |
| 2D. Others (e.g. rubber tyres, wood, packaging materials, rechargeable batteries etc) | To assess need and consider whether they can be part of PRS | ■ | ■ | ■ | | |
| **3. Other policy incentives** | | | | | | |
| 3A. BEAM Plus | Explore how BEAM Plus (the local comprehensive environmental assessment scheme for buildings) can promote waste prevention and reduction during building construction and operation | ■ | ■ | ■ | ■ | |
| 3B. Green Procurement | Review regularly the green specifications of the products that are commonly used by Government departments on the green procurement list, and continue the promotion of green procurement policy in the Government | | | ■ | ■ | |
| **Social Mobilization** | | | | | | |
| **1. Reduction on Food Waste** | | | | | | |
| 1A. Food Wise | • The Food Wise Hong Kong Steering Committee, set-up in December 2012, is drawing up programmes to target households, businesses and schools etc. to prevent and reduce food waste<br>• Support catering and related sectors, women and other groups on their food-related reduction projects<br>• Encourage catering and related sectors to support food donation activities whenever possible | ■ | ■ | | | |
| 1B. Food Waste Recycling | • The Environment and Conservation Fund (ECF) is supporting Food Waste Recycling Projects in residential estates with $50 million earmarked<br>• The Food Waste Recycling Partnership Scheme, commenced in 2010, brings stakeholders in the commercial and industrial sectors together to reduce and recycle food waste at the Kowloon Bay pilot composting plant | ■ | ■ | ■ | ■ | |
| **2. ECF** | Support community mobilization projects | ■ | ■ | ■ | | |
| **3. Community Collaboration** | | | | | | |
| 3A. Industry stakeholders | Work with industry stakeholders to prevent and reduce waste | ■ | ■ | ■ | | |
| 3B. District Councils | Collaborate with District Councils, neighbourhoods and NGOs to extend and expand campaigns, as well as increasing the penetration rate of recycling facilities | ■ | ■ | ■ | | |

| | | Prevention | Reuse | Recycling | Recovery | Disposal |
|---|---|---|---|---|---|---|
| **Investing in Infrastructure** | | | | | | |
| **1. Recycling infrastructure** | | | | | | |
| 1A. Community Green Stations (CGS) | Government to pilot 5 CGS operated by NGOs to bring green living to communities, where waste prevention, reduction and reuse can be demonstrated and practised. We aim to commission the stations in phases starting from late 2013 with a term of three years | ■ | ■ | ■ | | |
| 1B. Public cargo working areas (PCWA) | Provide stable berthing facilities for recyclers to export recyclable materials | | | ■ | | |
| 1C. Waste separation and collection system | • Enhance the collection network and review deployment, provision and placement of recycling bins, and workers performance, as well as review any additional resources needed<br>• Study the improvement of roadside tricolour bins<br>• Consult trade on recycling facilities at public transport venues<br>• Continue on-going efforts to step up Source Separation of Waste Programme | | | ■ | | |
| **2. Recovery infrastructure** | | | | | | |
| 2A. WEEE treatment plant | Develop a WEEE treatment plant at EcoPark | | | | ■ | |
| 2B. STF | Commission the facility at end-2013 to treat all of Hong Kong's sludge generated from the Harbour Area Treatment Scheme (HATS) and regional sewage treatment works | | | | ■ | |
| 2C. OWTF | • 1st OWTF for 200 tonnes per day being tendered; expect to commission by 2016<br>• 2nd OWTF for 300 tonnes per day; expect to commission by 2017<br>• Site search for 3rd and more OWTF | | | | ■ | |
| 2D. IWMF | Secure funding (subject to outcome of judicial proceedings) | | | | ■ | |
| **3. Disposal infrastructure** | | | | | | |
| 3A. Landfill extensions | Secure funding in 2013 for extending NENT, SENT and WENT landfills | | | | | ■ |

**FIGURE 9** Timeframe for The Action Blueprint

| | 2013-2015 | 2016-2018 | 2019-2022 |
|---|---|---|---|
| **Policy Development and Legislation**  | (1A) Stakeholder engagement and law drafting for MSW charging<br>(1B) Trade consultation regarding review of construction waste charging scheme<br>(2A) Bill on Extension of PRS on plastic shopping bags<br>(2B) Bill on PRS on WEEE<br>(2C) Public consultation and law drafting for PRS on glass beverage bottles<br>(3A) Optimize the BEAM Plus scheme on waste reduction<br>(3B) Review regularly the green specifications of the products | (2D) Study on PRSs on other waste (e.g. rubber tyres, wood, packaging materials, rechargeable batteries, etc.) | |
| **Social Mobilization**  | (1A) Food Wise Hong Kong Campaign<br>(1B) Funding for small-scale food waste treatment facilities<br>(2) Injection into the ECF<br>(3A) On-going work with industry stakeholders<br>(3B) Collaboration with District Councils | (1A)(1B)(2)(3A)(3B) Review all items | |
| **Investing in Infrastructure**  | (1A) Commission CGS by phases<br>(1C) Improve the waste separation and collection system<br>(2A) Establish WEEE treatment plant.<br>(2B) Commission the STF<br>(2C) Apply for funding for the 1st OWTF & 2nd OWTF<br>(2C) Site search for 3rd and more OWTF<br>(2D) Apply for funding for IWMF<br>(3A) Apply for funding for landfill extensions | (1B) Provide stable berthing facilities for recyclers to export recyclable materials<br>(2C) Commission the 1st OWTF & 2nd OWTF | (2D) Commission the IWMF |

More about Waste in Hong Kong

## Hong Kong's waste statistics

All garbage generated at homes, schools and in public places (for instance, public buildings and from street sweeping) is called domestic waste. All the waste that comes from shops, restaurants, offices, hotels, factories and other businesses is commercial and industrial waste. The term MSW includes both domestic and commercial and industrial waste. In addition, Hong Kong generates a large amount of construction waste. We also handle special waste, such as dewatered sludge from sewage treatment plants, livestock waste, animal carcasses etc. Every year, our three landfills receive about five million tonnes (around 13,458 tonnes per day in 2011) of waste from these three categories combined.

With domestic waste, everything we discard from home is our **generation quantity**. Recyclable materials placed into recycling bins (such as used paper, plastics and metals) and sent to recycling outlets are counted as the **recovery quantity**. The remaining waste, which is mixed together in garbage bins and will end up in landfills, is the **disposal quantity**. In simple terms,

**generation quantity = recovery quantity + disposal quantity.**

It then follows that the

**recovery rate = recovery quantity/generation quantity.**

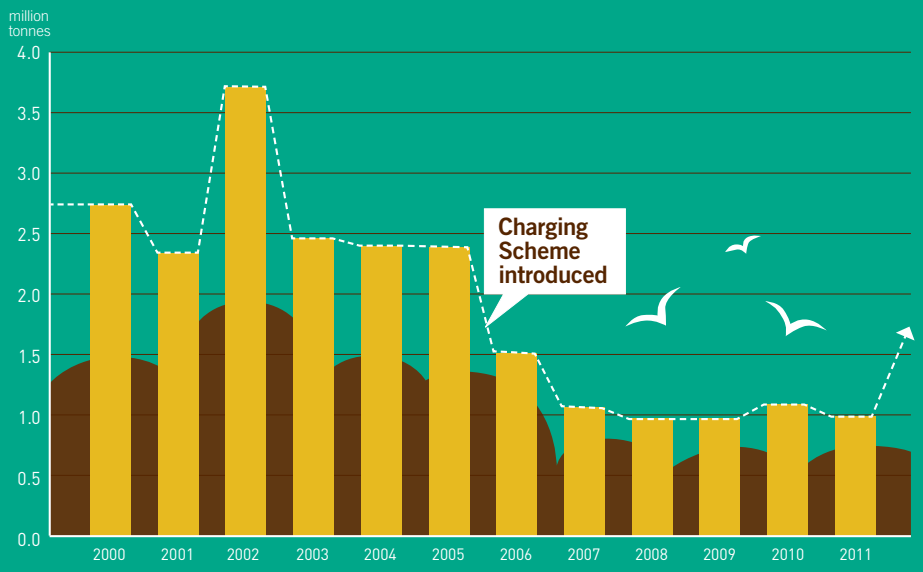
To assess how well we manage our waste, we need to measure the quantities in each of these categories either in total or on a per capita basis. How much we generate at source reflects how good we are in preventing waste (less generation is better). How much is removed for reuse and recycling reflects how good we are in turning waste back into resources (more is better). The quantity we dispose of is the combined measurement of the two, and it also reflects how good we are in conserving landfill space (less is better).

It should be noted that by simply increasing the recovery quantity or recycling rate does not necessarily mean we are managing our waste well. For instance, using bottled drinks all the time and recycling the used plastic bottles is not as good as avoiding bottled drinks in the first place. In practice, the disposal quantity is based on what is recorded at landfills and is an accurate measurement of our waste loads. Whereas how much waste we recover can only be estimated from surveys. Hence the generation quantity calculated from them is also an estimate.

## Construction Waste

Construction works in Hong Kong generate nearly 50,000 tonnes of construction waste every day. Since the implementation of the Construction Waste Disposal Charging Scheme in 2006, the trade has been incentivized to separate waste at source and Figure 10 shows the positive result. Currently, over 90% of construction waste is classified as public fill to be reused as construction materials or for reclamation. However, there is still 3,300 tonnes to dispose of each day at landfills, representing 25% of the total daily disposal.

**FIGURE 10** Reduction in construction waste in Hong Kong




## Act Now for Clean Recycling

Recycling bins are there to help us separate waste for recycling. However, a frequent problem is people stuffing the bins with other refuse, such as food waste and unfinished drinks. This makes the contents of these bins unrecyclable and the only option is to dispose of them with other refuse – and add to our landfill burden.

**Over 80% of Hong Kong residents now have recycling bins close to where they live.**

## Waste separation at source is most important

Over 80% of Hong Kong residents now have recycling bins close to where they live. People can easily separate out metal cans, plastic products, and newsprint/magazines and paper products (such as packaging) and place them in the proper bins close to their home.

In addition, to reduce food waste generation and to turn unavoidable food waste to useful resources, the ECF has earmarked $50 million to support housing estates in organizing food waste reduction educational activities as well as collecting and recycling the food waste by on-site facility to compost for landscaping reuse.

As for glass bottle recycling, we have progressively expanded the recycling network over past years and now over 120 public and private housing estates participating, covering some 880,000 people or 12% of the total population.

At the same time, various programmes under the voluntary PRSs have received support from different sectors of the community, including 1,550 housing estates covering 70% of total population, which has helped to raise public awareness on the recycling of energy saving lamps, rechargeable batteries, etc.

It does take extra time and effort to reduce, separate and recycle waste, but Hong Kong people are becoming familiar with what to do – we just need to take responsibility and participate.

## Food Waste Reduction is Achievable

About 3,600 tonnes of food waste is disposed of in Hong Kong every day, accounting for nearly 40% of all MSW disposal. A year of food waste equates to 100,000 double-decker buses by weight.

We can all help prevent and reduce food waste:

**Avoid ordering more than we can eat at restaurants and eateries.**

**Avoid buying more than we need for the home and consume food before the expiry date.**

**When preparing food, avoid providing more food than can be eaten at a meal, and make the most of all the ingredients (they may be used for several dishes and meals).**

**During meals, cherish every bite. Consume all the food on the table!**


## Green Procurement in Hong Kong

The Government has taken the lead to adopt a green procurement policy for promoting waste reduction and recycling. We have encouraged Government departments to purchase green products as far as possible and where economically rational. Green specifications have been developed for items commonly used by bureaux and departments and at present, there are 103 products on the Government's green procurement list. We have also encouraged wider use of recycled and other green materials in public works projects whenever the technical performance of the green products is proven to be satisfactory, subject to adequate market supply.

An example of green procurement is the commissioning, from January 2012, of a pilot scheme to use B5 diesel (a blend of 95% Euro V diesel and 5% biodiesel) in some Government vehicles, vessels and machinery. This pioneered the use of bio-diesel in Hong Kong and will enable wider, progressive adoption of the fuel.

We are currently reviewing the green procurement scheme to explore how to expand its scope, including placing greater emphasis on local products with recycled contents.

## Recycling trade in Hong Kong

Success in recycling depends on the costs (collection, transportation, sorting and processing), the availability of land or facilities for recycling, and the availability of buyers and markets. As such, recyclers in Hong Kong have focussed on higher value recyclables such as metals and paper for which there are export markets.

The Government has implemented a basket of initiatives to support the local recycling industry. These include promoting source separation of waste to increase the quantities of recyclables available for recyclers; developing the EcoPark to provide long term land at an affordable cost to recyclers; providing short-term tenancy sites for the same purpose; and adopting a green procurement policy within Government to increase market demand for recycled and environmental products.

More opportunities for local recycling will arise with the implementation of the PRS for glass beverage bottles, which can be reprocessed locally into various types of building materials. There will also be a mandatory PRS for Waste Electrical and Electronic Equipment (WEEE), which will likewise stimulate new recycling business. More importantly, the implementation of MSW charging will provide a much greater incentive for people and businesses to separate all kinds of waste, which will in turn provide more recyclable materials for the trade.

## Polluter Pays Principle (PPP)


The PPP articulates that the party responsible for generating pollution is responsible for paying for the damage done. It is widely adopted internationally by governments to prevent and reduce waste. PRSs are derived from this concept.

The additional costs involved in PRSs for those generating pollution gives them an incentive to prevent and reduce waste. Many cities apply PPP through PRSs and such policies as quantity-based MSW charging, with the ultimate goal of reducing waste.

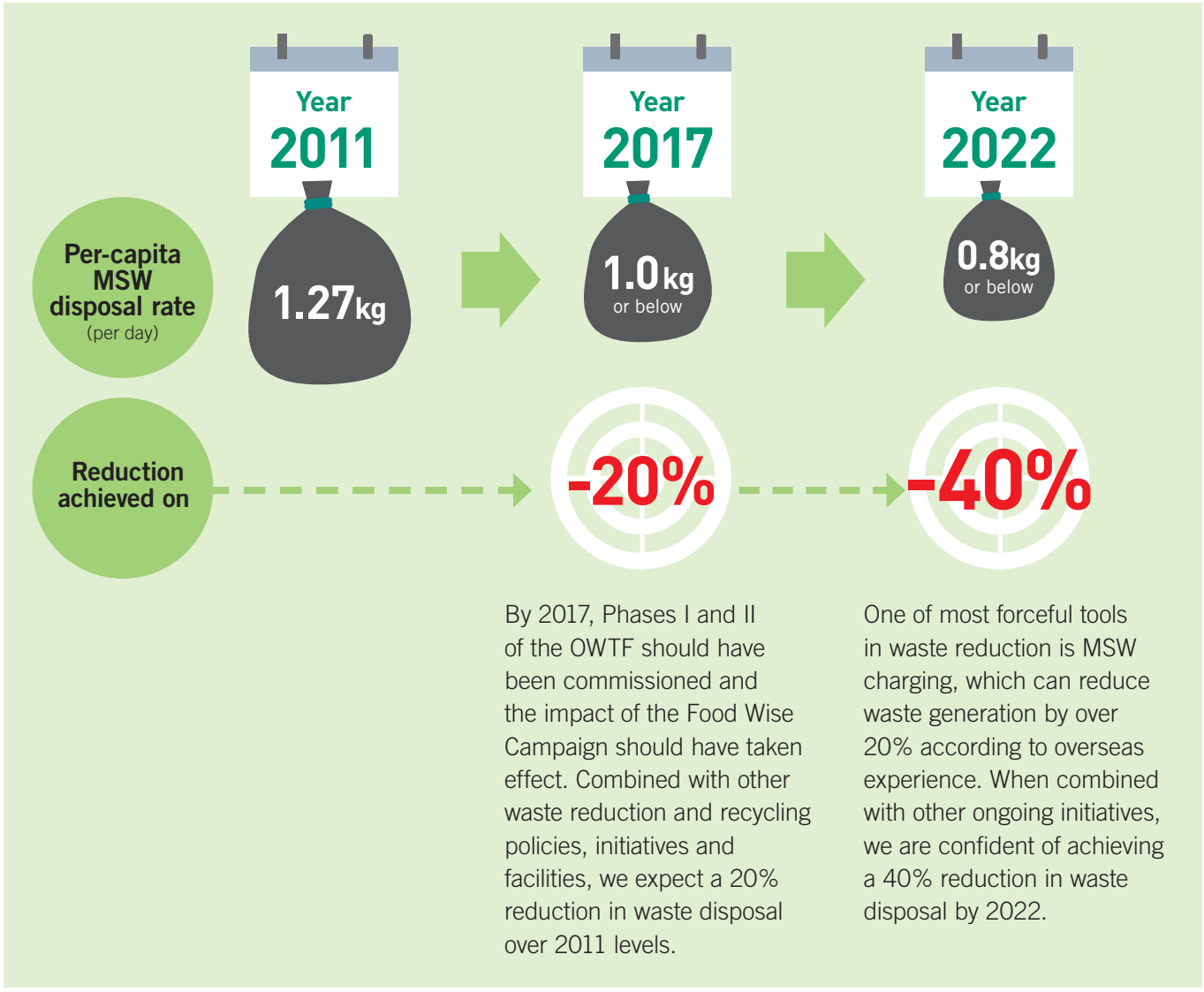
# 4 | MSW Disposal Rate Reduction Targets by 2022

The measures in our Action Blueprint will help Hong Kong to achieve a set of specific targets by 2022 to prevent and reduce MSW across the board. While Hong Kong will still have much to overcome to instill an environmentally-sustainable culture into our daily activities, we will have started to change community attitude on how we look at and deal with waste. Our citizens will have become highly mobilized to participate in waste prevention, reuse and recycling, and we will have completed or be close to completing the missing pieces of waste infrastructure, without which we cannot achieve these targets.

Our MSW reduction targets by 2017 and 2022 are as follows:

- By 2017, we will have reduced the MSW disposal rate on a per capita basis by 20% from 1.27 kg per day to 1 kg or below.
- By 2022, we will have further reduced the MSW disposal rate on a per capita basis from 1 kg to 0.8 kg or below, representing a 40% decrease from 2011.

**FIGURE 11** **MSW Disposal Rate Reduction Targets**




Note:

1. Assume waste generation per capita unchanged, hence total waste generation and disposal rise in line with population growth.
2. Based on 2011 MSW disposal of 1.27kg per person per day.

# 5 | An Evolving Waste Management Structure

## Achieving Wider Benefits

There are many other benefits that will arise from smarter waste management.

For example, residents will demand increasingly improved waste collection services that are efficient, hygienic and environmentally-sound, and that will lead to higher professionalism in the waste collection sector. Building managers will also have to make waste reduction efforts a part of their core competence, as waste separation and waste charging become a normal part of life in Hong Kong. While the recycling trade is still small here, there will be more opportunities and new jobs arising all along the waste chain from collection to disposal.

Air pollutants will also be reduced because we will be reducing the use of other resources, such as trucks and fuel to transport waste. With less waste to transport, there will be fewer journeys and less pollution emitted from them. Reducing waste quantities will also lower the level of emissions from waste treatment and landfilling, which will in turn reduce not only local air pollution but also greenhouse gases that cause global warming.

Another example of a wider benefit is that food will not be wasted to the same extent that it is today. The food and beverage sector is collaborating with NGOs in food donation programmes – a good way to reduce waste and help people in need at the same time.

Community gardening, community farming and composting are growing in popularity. Our urban residents are learning more about the food cycle while some are engaging directly in small scale agriculture using the compost produced from food waste.

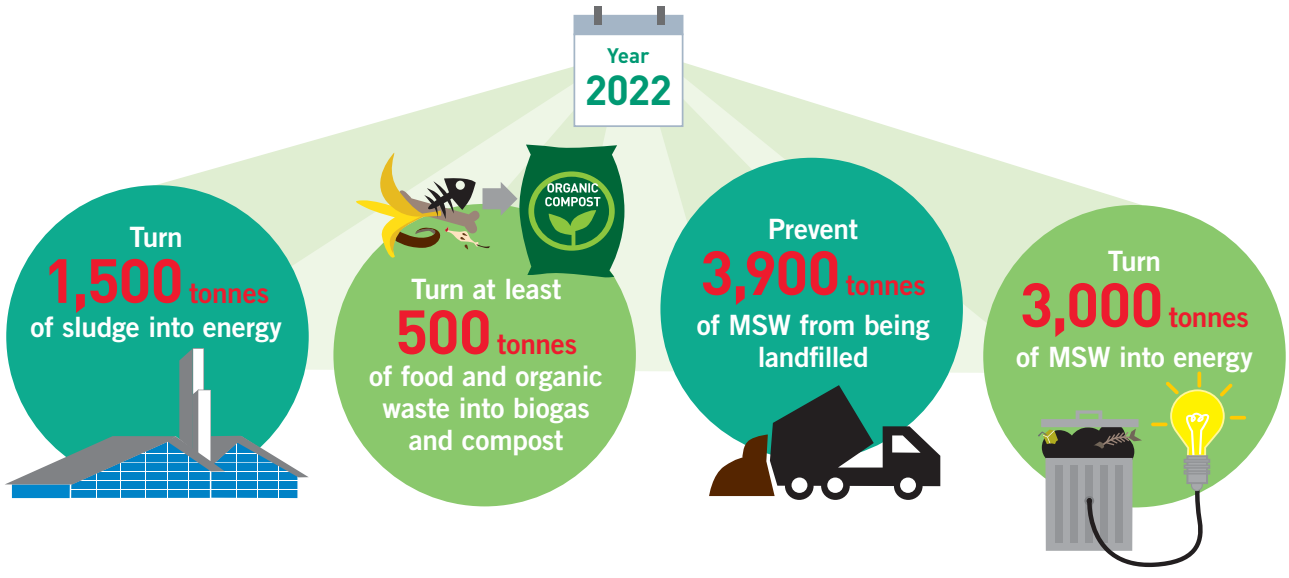
Whole neighbourhoods will be engaged in waste reduction programmes, where district leaders and councillors actively work alongside residents and businesses. Indeed, social mobilization to improve waste management has the capacity to strengthen communities – yet another win-win benefit.

Hong Kong will also adopt a variety of new waste-related technologies that generate energy. The STF, OWTFs and IWMF are all designed to produce considerable quantities of renewable energy that can be used directly to operate the facilities and the surplus energy can even be used elsewhere. Our landfill gas can also be captured for use as a source of gas for trucks or household and business use. These opportunities will not only enable a portion of Hong Kong's greenhouse gas emissions to be reduced, they will also add to Hong Kong's overall competence in technology and waste management.

## Waste-to-energy

The Action Blueprint 2013-2022 will lead to the following results as shown in Figure 12 on a per day basis:

**FIGURE 12** **Estimates of Waste Reduction and Energy Gains in 2022**



## Saving on Costs

Reducing, reusing and recycling waste can help to cut costs for all of society. Two examples can illustrate this. In the construction sector, good practice from an early stage in the planning and design process can lead to cost reductions in materials and resources. Money can be saved by increasing the reusability of materials, and savings can also be made by minimizing waste taken to landfill since there is already a charge for construction waste today. In the food sector, costs can be saved through careful planning of menus and inventories, as well as in kitchen management to reduce waste.

**FIGURE 13** Current government waste management costs


On the whole, the provision of waste services for the city is a public sector responsibility. Beyond land and construction costs, the Government's current operational costs for waste collection, transfer, treatment and landfilling amount to HK$1.4 billion per annum.

Waste prevention and reduction will also save costs for the community as a whole. While Hong Kong needs to invest in completing our waste infrastructure, by preventing and reducing waste, there will be long-term and multiple benefits for the city as a whole.

**FIGURE 14** The Distribution of Waste Management Facilities

## EcoPark

The development of the EcoPark aims to provide long-term land at affordable cost for the development of the recycling industry in Hong Kong. At present, a total of 14 lots have been leased for recycling waste cooking oil, waste metals, waste wood, WEEE, waste plastics, waste batteries, waste construction materials / waste glass, waste tyres and food waste. In 2012, about 50,000 tonnes of recyclable materials were recovered by the EcoPark tenants. In addition, a WEEE treatment facility will be developed at the EcoPark to support the future mandatory PRS. The facility is scheduled to be commissioned in 2016.

**Waste Cooking Oil Recycling Plant**

Waste cooking oil recycling plant at EcoPark, which converts waste cooking oil to biodiesel

**Waste Wood Recycling Plant**

A plant produces wood chips from waste wood, which helps to reduce further deforestation and preserve our remaining forests

**Waste Computer Equipment Dismantling Plant**

Dismantling of waste computer equipment at EcoPark into various electronic components for further processing

**Recycling Centres**

There are two resources recycling centres for waste plastics and WEEE operated by non-profit making organizations at EcoPark

**Waste Construction Materials Recycling Plant**

A plant to recycle waste construction materials and waste glass to produce recycled glass paving blocks is under construction at EcoPark

**Waste Metals Recycling Plant**

Waste metals recycling plant at EcoPark, which shreds waste metals and export the materials for the manufacturing of construction materials

## Waste Recycling and Recovery Facilities

In addition to intensifying the efforts on waste reduction and to mobilizing the community to adopt new behavior to use less, waste less, we should also invest in infrastructure on recycling and recovering resources. It is one of the important steps to implement the comprehensive waste management for Hong Kong. These four types of infrastructure will be built and make the best use of waste resources.

**Organic Waste Treatment Facilities (OWTF)**

We are planning to develop modern large-scale OWTF in phases to recycle and turn food waste into renewable energy and compost.

**Integrated Waste Management Facilities (IWMF)**

We are planning for the IWMF which will adopt modern waste-to-energy technology to substantially reduce the volume of waste and turn waste into energy.

**Community Green Stations (CGS)**

There will be five pilot Community Green Stations to enhance environmental education with a view to promoting public participation in waste reduction and recovery. Necessary logistics support will also be available.

**Sludge Treatment Facility (STF)**

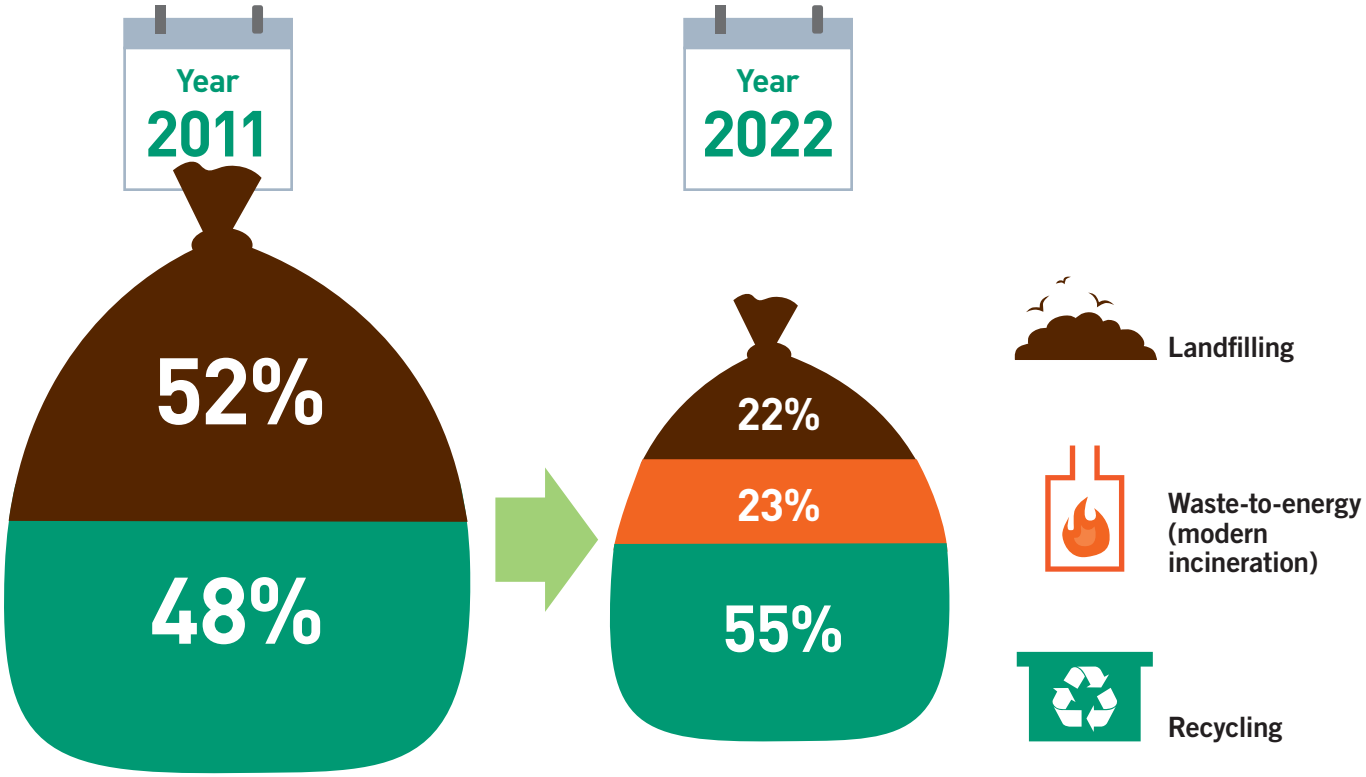
The STF adopts a high-temperature incineration process to treat sludge arising from sewage treatment works. The facility is under construction and is expected to be commissioned at the end of 2013. It will also produce energy.

## Evolution of Hong Kong's Waste Management Structure

Figure 6 in Chapter 2 provides a comparison of how different jurisdictions deal with their waste. Currently, Hong Kong's recycling rate is about 48% and our landfilling rate is 52%. This proportion will start to change with the commissioning of the STF and OWTFs, and will speed up when we build an IWMF with waste-to-energy technology.

Figure 15 shows the evolution of Hong Kong's waste management structure up until 2022, assuming the critical steps in the Action Blueprint will be implemented.

**FIGURE 15** **Evolution of Hong Kong's Waste Management Structure**




In order to achieve this transition in how Hong Kong deals with waste, we will need public support for new legislation and funding to support for the various steps in the Action Blueprint. Delays will mean this timetable will have to be stretched further into the future.

# 6 Conclusion


As the world continues to urbanize, one of the most notable by-products of the urban lifestyle has become the amount of waste generated, especially MSW. A decade ago, there were 2.9 billion urban residents in the world, who together generated about 0.64 kg of MSW per person per day. Today, there are estimated to be 3 billion urban residents generating 1.2 kg of MSW per person per day. By 2025, the World Bank estimates that there will be 4.3 billion urban residents generating 1.42 kg of MSW per person per day. During this period of time, the total quantity of MSW from urban residents will have increased from 0.68 billion tonnes to 2.2 billion tonnes per year.[5]

Hong Kong's waste story is a part of the global story. Some places, such as Taipei City and South Korea, have made sustained efforts in recent years to prevent and reduce waste with great success. Hong Kong needs to catch up with the best-in-class cities although we have a way to go. Our job is to set Hong Kong and our citizens on that path now so that by 2022, the targets we have set in the Action Blueprint can be met. This requires many decisions to be made today – not tomorrow – so that plans can be actualized expeditiously.

Do we have sufficiently ambitious waste reduction targets? We think so. We aim to reduce Hong Kong's MSW disposal rate on a per capita basis by 20%, from 1.27 kg per day to 1 kg or below by 2017, and then further down to 0.8 kg or below, representing a 40% from 2011. But we need public support to turn these numbers into reality. The Government cannot do it alone. Hence, we propose a new social contract with the community. We need the people of Hong Kong to adopt these targets as their own. The Government will work hard in social mobilization, and we will provide polices and the necessary tools to realize these targets but we need citizens to participate and change their behaviour. Let's do our part and go green for Hong Kong.

**"We aim to reduce Hong Kong's MSW disposal rate on a per capita basis by 20%, from 1.27 kg per day to 1 kg or below by 2017, and then further down to 0.8 kg or below, representing a 40% from 2011."**

Footnote:
5. Hoornweg, Daniel; Bhada-Tata, Perinaz; "What a Waste: A Global Review of Solid Waste Management", The World Bank, 2012 Jul.

# Annex

## Previous and On-going Waste Management Initiatives in Hong Kong

(Please click the blue words to read the relevant websites or documents)

| Year | Initiative |
|---|---|
| **Policies and Legislation** | |
| Since 1998 | The Government has allocated suitable sites under short term tenancy to provide land resources to the recycling trade at an affordable cost. |
| 2008 – | The Building (Refuse Storage and Material Recovery Chambers and Refuse Chutes) Regulation was amended, making it mandatory that a refuse storage and material recovery room (no smaller than 1.5m x 1.5m) be provided on every floor of new domestic buildings and the domestic part of new composite buildings, in order to provide sufficient and accessible space for source separation of waste. |
| 2009 – | The first stage of the Environmental Levy Scheme on Plastic Shopping Bags was implemented to promote the bring-your-own-bag lifestyle and counter excessive use of plastic shopping bags. |
| **Social Mobilization** | |
| 2005 – | Source Separation of Domestic Waste was launched territory-wide. It aims to provide additional waste separation facilities on each building floor or in other areas of housing estates to facilitate source separation of waste by residents and broaden the types of recyclables to be recovered, including waste paper, metals, plastics, used clothes, used computers and electrical appliances. In 2007, the Programme was further extended to commercial and industrial buildings. |
| 2010 – | The Food Waste Recycling Partnership Scheme was implemented with the commercial and industrial sectors for food waste reduction and recycling. |
| 2010 – | The EcoPark WEEE Recycling Centre was set up with funding support from the ECF, to enhance the reuse and recycling of WEEE generated in Hong Kong. |
| 2010 – | A Plastic Resources Recycling Centre at EcoPark was set up to provide recycling processing for limited quantities of locally collected plastic waste. |
| 2011 – | A Community Recycling Network was established in collaboration with frontline Government departments and various sectors in the community. The network organises regular recycling promotional activities at its 530 recycling points. The collection of materials of lower market value such as plastics and WEEE is promoted through various means such as redemption vouchers. |
| 2011 – | The ECF subsidized educational and promotional programmes for food waste reduction and source separation of waste in private residences, as well as on-site treatment that turns unavoidable able food waste into usable resources.<br><br>Pilot schemes of on-site food waste treatment were launched in Government facilities. |
| 2012 – | The District Councils were provided with funding and assistance for educational and promotional campaigns to raise public awareness regarding waste reduction and recovery. |
| **Infrastructure** | |
| Since mid 1990s | The 3 strategic landfills were established to provide environmentally sound waste disposal outlets at strategic locations of the territory. Obsolete waste facilities were phased out. |
| 1993 – | The Chemical Waste Treatment Centre at Tsing Yi was established in 1993 upon the launch of regulatory control over chemical waste. It provides high temperature incineration, physical/chemical treatment and oil/water separation processes for various types of chemical waste. It is a centralised facility for Hong Kong's chemical waste, clinical waste as well as MARPOL waste (oily water and noxious liquid substances) from local vessels and ocean-going vessels visiting Hong Kong. |
| 2007 – | The EcoPark was developed to provide the recycling trade with land for long term leasing at an affordable cost. |
| 2006 – 2008 | A pilot food waste composting plant was built in Kowloon Bay and commissioned in 2008. |
| 2008 – | The Animal Waste Composting Plant at Ngau Tam Mei, Yuen Long was built in 2008 to treat horse stable waste generated from the Olympics and Paralympics Equestrian Events. In addition to horse stable waste, the facility now also treats a small quantity of livestock waste, food waste and yard waste and the compost produced is suitable for agricultural use. |

# Abbreviation

| | |
|---|---|
| BEAM | Building Environmental Assessment Method |
| BYOB | Bring Your Own Bag |
| CGS | Community Green Station |
| ECF | Environment and Conservation Fund |
| GDP | Gross Domestic Product |
| HATS | Harbour Area Treatment Scheme |
| IWMF | Integrated Waste Management Facility |
| MSW | Municipal Solid Waste |
| NENT | Northeast New Territories Landfill |
| NGOs | Non-Governmental Organizations |
| OWTF | Organic Waste Treatment Facility |
| PCWA | Public Cargo Working Area |
| PPP | Polluter Pays Principle |
| PRS | Producer Responsibility Schemes |
| SENT | Southeast New Territories Landfill |
| STF | Sludge Treatment Facility |
| WEEE | Waste Electrical and Electronic Equipment |
| WENT | West New Territories Landfill |