

# **Powering Hong Kong by Sustainable Lighting**

## **– Research Report on Lighting System in Hong Kong**

### **Executive Summary**

The Professional Commons  
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**I. Background**

- 1. Government’s Approach to the Development of Sustainable Lighting - Castle in the Air:** In the 2008-09 Policy Address, the Chief Executive has committed that, “to promote the use of more energy-efficient lighting products, we will study the need to restrict the sale of incandescent light bulbs”. Despite the fact that the Policy Address has already been published for months, neither the Environment Bureau nor the Environmental Protection Department has any indication on how to advance the respective proposal.
- 2. Global Trend on Banning of Incandescent Light Bulbs:** In view of the high energy consumption of incandescent light bulbs and its damaging effects of greenhouse gases to the environment, several governments overseas have regarded banning the sale of the light bulbs as a strategic measure for raising energy efficiency.
- 3. Incandescent Light Bulbs do not Complement with Environmental and Economic Principles:** Incandescent light bulbs are widely used across the territories. However, the market share of Energy Efficiency Light Bulbs (hereafter “EELBs”) is only 20% of the total. Should each of the approximately 2.2 million of households in Hong Kong replaces five incandescent light bulbs, and take account that of 12 watts per EELB, and a daily use of six hours, as each of the incandescent light bulbs last three years on average, a total of HK\$3.09 billion of electricity bills could be saved, and a reduction of 2 205 000 of carbon dioxide emissions could be made during that three year period.
- 4. Two Types of Energy Saving Lamps: More Environmentally Friendly and Not So Environmentally Friendly:** Although EELBs will perform better in reduction of electricity consumption, those powered by electronic ballast (hereafter electronic EELBs) are more damaging to the environment. As most of the electronic EELBs, which contains mercury and toxic materials, would be treated as regular waste only, individual citizens might face health hazards, and the surrounding environment be poisoned too. Even worse, most of the electronic EELBs would still be disposed in the landfills without treatment. Therefore, those

powered by electronic ballasts (hereafter the electronic EELBs) are relatively not so environmentally friendly. Comparatively speaking, there are no toxic electronic components in the electromagnetic EELBs, and the detachable EELBs could maximize the lifespan of each components. Hence, they are more environmentally friendly.

5. **Inadequate Capacity for Processing the EELBs:** Part of the waste light bulbs and florescent tubes are sent to the Chemical Waste Treatment Centre (CWTC) in Tsing Yi for special treatment. The Centre has a capacity of processing merely 800 000 EELBs at present, but is definitely incapable of handling every used EELBs in Hong Kong.
6. **Lack of Coordination in Lighting Policy within the Government:** Many government departments are still using 43 000 incandescent light bulbs, and of which 28 000 could be replaced by EELBs.
7. **Disincentives of Those who Share Social Responsibility:** The “Producer Eco-responsibility Ordinance” has not been applied to EELBs and the Government does not impose mandatory recycling of light bulbs. Companies and institutions which voluntarily submit the light bulbs to the Government for the special treatment would have to pay a treatment fee amounts to HK\$1,027 per tonne.
8. **Energy Efficiency Labels are not Comprehensive Labels:** The existing energy efficient labels can reflect the life cycle efficiency only, but failed to cover information regarding environmental efficiency.

## II. Policy Proposals

### A. Principles of “Sustainable Lighting”

1. Hong Kong should put in place a comprehensive “sustainable lighting system”, and the specifications are as follows:
  - Systematically analyze the life cycle of light bulbs, and to formulate respective measures to tackle problems arising from different life stages of the light bulbs in accordance with the three principles of energy efficiency, reduction of waste from the source, and recyclability. The issues which shall be tackled include: the materials in the manufacturing of light bulbs, the means of production, the collection process, the recycling process, the responsibilities between the producers

and the consumers...etc.

- It is the right moment to ban the sale of incandescent lights decisively, after years of environmental education;
- Promoting the more environmentally friendly EELBs, which would facilitate the reduction of waste from the source, and those which reduce greenhouse gas emissions;
- Short term measures should be introduced before the banning of the sale of incandescent light bulbs to help improve environmental qualities in Hong Kong in the near term;
- Not only the energy consumption when the light bulb is lighted up should be considered when calculating the energy efficiency of a light bulb, it should cover the total energy consumption of the light bulb throughout its life cycle. That includes the energy consumption during the production process, extra air conditioning costs as a result when the light bulbs are heated up, and the energy consumed during the collection and recycling process;
- The Government should have the foresight to avoid creating a large amount of electronic rubbish from the electronic EELBs. Both policy measures and governmental actions should be employed to promote environmentally more friendly products;
- The existing legal and regulatory structure should be put into better use, and the Producer Responsibility Scheme should be promoted further, ensure the producers, suppliers and consumers to share the responsibilities on the environmentally friendly production, reduction, collection and recycling systems through the Producer Responsibility Scheme.
- To revise the current energy saving labels through the three principles of energy efficiency, reduction of waste from the source and recyclability.

## **B. Specific Measures**

### **1. Short-term Measures**

- 1.1 Use More Environmentally-friendly EELBs in Government Premises:** The Government should replace all replaceable 28 000 incandescent light bulbs in government premises with more environmentally friendly EELBs during the next fiscal year.
- 1.2 Subsidize the Citizens to Change Light Bulbs:** The Government should provide every adult population a coupon amounts to HK\$200 on changing the light bulbs to EELBs.

## **2. Medium and Long-term Measures**

**2.1 Banning of the sale of incandescent light bulbs** (including halogen lamps) through legislative means, as well as to formulate an action plan.

### **2.2 Replacement of Low Energy Efficient Lighting Devices with Those Follows the Sustainable Lighting System:**

- It should be up to the general public and market mechanism to decide which replacement lighting device should be used in the future;
- The Government should adopt a green procurement policy specifically in the development of territorial wide lighting system. By doing so, it might help create a more favourable environment for scientific research and market development for the more environmentally friendly EELBs.

### **2.3 Inclusion of EELBs in the Regulation of “Producer Eco-responsibility Ordinance”:**

- Collect a levy from the manufacturers/suppliers under which the more the light bulbs are made from environmental friendly materials or easier for recycling, the less the levy shall be; they could also be used to cover the cost of recycling;
- Introduce a deposit-refund system;
- Implementing a collection scheme demanding the manufacturers or importers to provide direct collection services.

**2.4 Establishing a Territorial Wide Collection System:** Greater importance should be attached to the environmental and health hazards arising from the mercury present in the EELBs. The Government should launch a territorial wide collection system, through the implementation of a deposit-refund system and a collection scheme. We also recommend the Government to expand the network of collection boxes for the collection of EELBs used for recycling, and call for the general public to put the EELBs in those collection boxes.

**2.5 Expanding the Recycling and Processing Capacity of EELBs:** The Government should gradually increase the capacity of mercury recycling of the Chemical Waste Treatment Centre in Tsing Yi in order to proactively prepare for the coming of the “EELB age”. It would be of equal importance to improve the processing and recycling capability electronic and metal components of EELBs.

**2.6 A Comprehensive Eco-labeling System:** The new label should facilitate an easier recognition of the environmental efficiency of EELBs. It should reflect factors such as lifespan, raw materials used, energy efficiency, amount of toxic materials, and the level of energy consumption during the production process.

### **3. Supporting and Transitional Arrangements**

**3.1 Against the Fake and Poor Quality EELBs:** The Customs and Excise Department and the Electrical and Mechanical Services Department should strengthen their inspection exercises.

**3.2 Consumer Education:** The Government shall strengthen the public education on the appropriate means to use an EELB, and to educate the electrician on the correct means to install light fixtures fitting the EELBs to avoid the shortening of the lifespan due to overheating.

**3.3 Problem Identification in the Early Stage:** There might be adaptability problems in some sectors in switching to the EELBs. It would be important for the Government to investigate, and solutions to be mapped out as soon as possible.

**3.4 Exemption Clauses:** It would be advisable for the Government to explore with relevant sectors in the near future on the areas in which the uses of incandescent light bulbs (for example: Special lighting effects). Exemption clauses should also be included in the legislation.

**3.5 Voluntary Eco-label for Electronic Products:** The Government should take reference of the concerned measures in the European Union, and to promote a voluntary “eco-label award scheme” as a transitional measure. In the long run, it should consider the applicability of the EU directives (RoHS and WEEE) regarding the regulation of electronic waste and the disposal of used electronic goods.

**3.6 Solving the Problem of the Lack of “bayonet” cap:** In view of the shortage of EELBs that can fit on bayonet cap in the market, we are proposing that the Government explore the feasibility with the light bulb sector to increase the supply of the light bulbs of bayonet cap in order to extend the usage of EELBs to domestic households..

**3.7 Comparing the Pros and Cons of Electronic EELBs and Electromagnetic**

**EELBs:** The Government should compare the performance of these two types of light bulbs as soon as possible. It is worthwhile to consider a wider application of detachable EELBs in which different components of the light bulb could be separated from each other, as its components can be used for the fullest extent. Such design should be adopted whether the EELBs are driven by electronic or magnetic ballasts. For the maximization of the results in waste reduction, the Government should study the feasibilities for the promotion of detachable light bulbs.

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