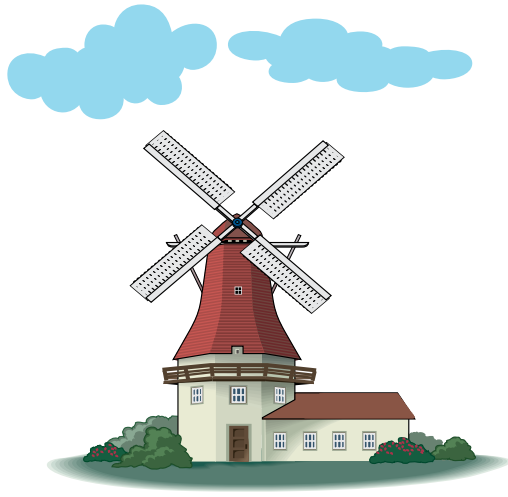




Clean Air Charter and Green Office Management

We are proactive and committed to energy saving. Various energy saving measures have been adopted to support the clean-air initiatives and to sustain green office environment.



Energy and Emission Management Team

The Energy and Emission Management (EEM) Team, set up in Highways Department in September 2007, has been providing support to the implementation of EEM programme of the department. It is responsible for the design and implementation of measures to reduce emissions and to minimize energy consumption, and for the provision of training to our staff on environmental management. The EEM Team commissioned Electrical and Mechanical Services Department (EMSD) to conduct an energy audit in 2008, covering our offices at HMTGO. Five energy management opportunities were identified:

1. Replace the remaining T8 fluorescent lamps with T5 fluorescent lamps
2. Lower the illumination level of public corridor
3. Replace existing T8 exit sign with LED sign
4. Install floor energy check meters
5. Repair broken/defective false ceiling

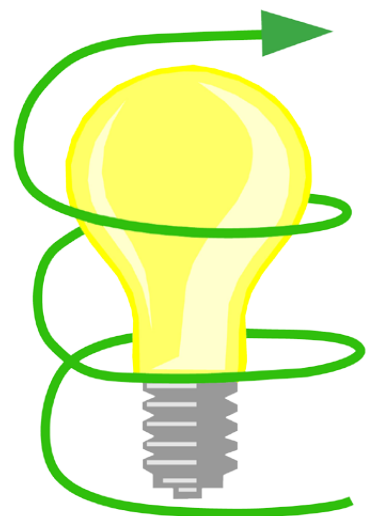
Measures and Achievements of Energy Saving

Energy Saving in Offices

In 2008, we had adopted the recommendations in the energy audit report mentioned above. One of them was to install floor energy check meters to monitor the electricity consumption of different floors in HMTGO. Having installed these meters in mid 2008, the electricity

consumption of our offices from UG/F to 6/F can be separately measured to facilitate our monitoring work. According to the data collected so far, the total energy consumption of our offices in HMTGO for the period of June to December 2008 was 2,586,879 kWh. The corresponding indirect gas emissions were 4,941 kg of sulphur dioxide (SO₂), 3,001 kg of nitrogen oxides (NO_x) and 155 kg of respirable suspended particulates (RSP).

Apart from installing floor energy check meters, we have also replaced the defective false ceilings in HMTGO to minimize the loss of air conditioning. The T8 fluorescent lamps along the public corridors will be replaced by T5 fluorescent lamps and the illumination of the public corridors will be lowered to a suitable level. Besides, the existing T8 exit signs will be replaced by LED signs to save energy. We understand that monitoring is of utmost importance in our energy saving implementation. Because of this, energy wardens have been appointed in each office and they are responsible for reminding their colleagues to comply with all green housekeeping measures in day-to-day office operations. To pave the way forward, we continue to search new and effective initiatives in office energy savings. We are now exploring the feasibility and effectiveness of installing motion detectors in cellular offices where lights will be automatically switched off once exit movement of staff is detected. Trial test will be performed shortly at the Headquarters.



Energy Saving for Public Lighting

The public lighting electricity consumption in 2008 was 136,987,358kWh. The corresponding indirect emission was 261,646 kg of SO₂, 158,905 kg of NO_x and 8,219 kg of RSP. Though there was a growth in the public lighting population, we achieved a saving of 0.2% in public lighting electricity consumption in 2008 as compared with 2007.

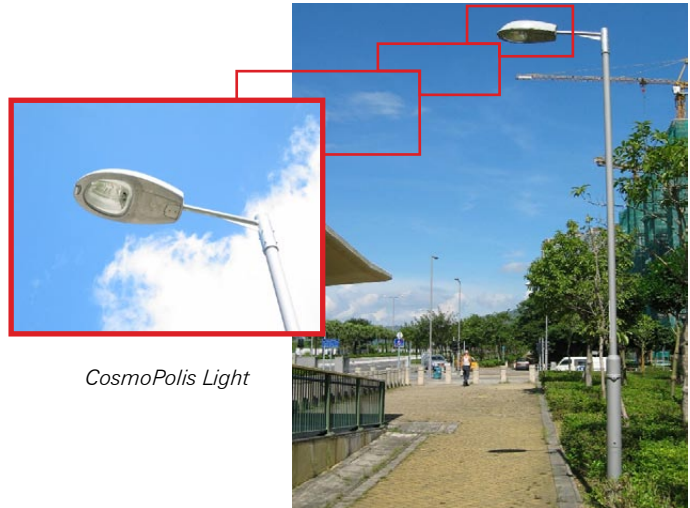
We continued implementation of energy saving measures on the public lighting system in 2008. Reduction in electricity consumption was achieved through improving the efficiency of the street lighting appliances. In 2008, 1,872 nos. of lamps and lanterns were replaced with lower wattage but higher efficiency ones, resulting in an annual saving of electricity consumption of about 304,000 kWh. We have also replaced 3,000 nos. of electromagnetic ballasts by electronic ballasts, resulting in annual saving of electricity consumption of about 287,000 kWh. In addition, we have completed our 2008 target of installing dimmable electronic ballasts at 10 nos. of footbridges, resulting in annual saving of electricity consumption of about 36,000kWh. The total annual saving of electricity consumption achieved by these three energy saving measures amounted to 627,000kWh.



Dimmable electronic ballast

To continue our efforts in reducing energy consumption for public lighting, we will replace electromagnetic ballasts by electronic ballasts for 3,000 nos. of public road lights and 10 nos. of footbridges in 2009.

One of our new initiatives on energy saving for public lighting is to evaluate the applicability of cosmopolis lamps for public lighting. Cosmopolis lamp is a new lamp type with better colour rendering properties and slightly better efficiency than the high pressure sodium lamp (HPS) currently used. We plan to conduct the trial schemes in 2009 to evaluate the applicability of cosmopolis lamps for public lighting.



CosmoPolis Light

The technology of LED lights has been developing rapidly in recent years. In order to evaluate the actual performance of LED luminaries, we appointed a university in Hong Kong to conduct laboratory tests on LED lights. Preliminary results revealed that LED lights still could not compete with HPS for general road light application due to lower luminous efficacy and reliability in outdoor conditions. Nevertheless, we will continue keeping abreast of the development of LED light technology for local public lighting application.

Energy Saving in Works Projects

We promulgate adoption of energy saving equipment in our works projects. For instance, for the Tuen Mun Road reconstruction and improvement project, electrical appliances with energy saving labels under the Energy Efficiency Labeling Scheme will be used. Quality Powered Mechanical Equipment (QPME), which are notably quieter, environmentally friendly and efficient,

have been adopted by the contractor of our maintenance term contract 11/HY/2007. We have included requirement of using QPME in our new maintenance term contract 08/HY/2008 which commenced recently.

We have assessed the applicability of potential energy efficient systems for the Central-Wan Chai Bypass and the Island Eastern Corridor Link Projects in the Projects' Energy Efficiency Reports. We will include the specification for "Using electrical appliances with energy saving labels" in the contract tender document of these Projects.



Where applicable, we shall adopt renewable energy technologies in our new capital works projects. We shall install a solar energy system and wind energy system at the engineer's site accommodation of the Tuen Mun Road reconstruction and improvement project. We shall consider using photovoltaic technology for an irrigation system in a noise barrier retrofitting project on Fanling Highway.



Measures and Achievements of Pollutant Emission Reduction

Reducing the Use of Volatile Organic Compounds

For new works contracts awarded since 2008, our contractors have to use paints with low/ no volatile organic compounds (VOC). The use of such paints will help reduce pollutant emissions. We will use paints with low or no VOC for repainting the soffits of the suspended slabs inside the immersed tubes of the Cross Harbour Tunnel. We shall also encourage our maintenance term contractors to use more water-based paints for painting of concrete structures.

Reducing the emission of gas exhaust of vehicles

The department has 37 departmental vehicles, all fueled by petrol.

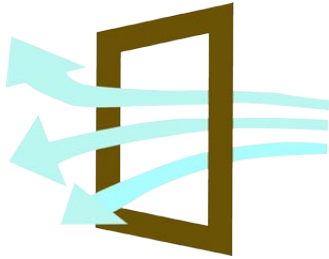
There were several measures taken to help reducing gas exhaust from our vehicle fleet. Guidelines were issued to our motor drivers, reminding them to switch off the vehicles whilst waiting so as to reduce the emission of exhausted gases and to achieve fuel saving. Our motor drivers would be updated with information concerning eco-driving from time to time.

The related emission of NO_x in 2008 was 389 kg, representing a decrease of 3.95 % when compared with the emission of 405 kg of NO_x in 2007. In 2009, with the replacement of 17 vehicles by environmentally friendly ones, the emission of gas exhaust from our vehicle fleet is expected to be further reduced.

Apart from government vehicles, we also encouraged our contractors to provide environmentally friendly contract vehicles for the use of our officers responsible for construction contracts. We specified in contract documents that the contract vehicles should be equipped with engines propelled by hybrid of petrol-electricity, or any other non-fossil fuels as far as practicable.

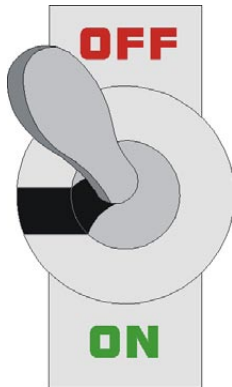
Green Office Management

To sustain a green office environment, we have followed the 3-R principles "Reduce, Reuse and Recycle" in our day-to-day office management. Our Green Committee was first formed in 1994 to develop, implement and monitor green office practices. We endeavour to provide a green office environment and adopt various green measures in housekeeping to economise the use of natural resources. The main features of the green measures are summarised as follows:



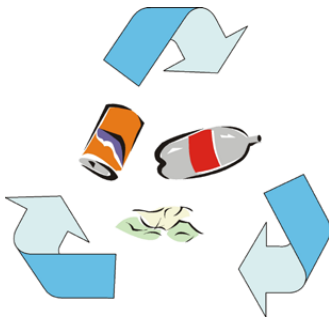
Indoor Air Quality Certification

- The indoor air quality of HMTGO has fully complied with the Good Class of the Indoor Air Quality Objectives.



Energy Saving

- Appoint Energy Wardens in every office/division to monitor the usage of light and to keep the lumination level to acceptable minimum level
- Review the lumination level arising from the change of room use
- Maintain air-conditioning not lower than 25.5°C
- Switch off lights during lunch or when staff are away for long hours
- Switch off computer equipment and electric appliances when not in use
- Encourage the use of staircase for inter-floor traffic
- Use timer water taps in toilets
- Monitor the electricity consumption of different floors by individual meters installed on each floor of HMTGO

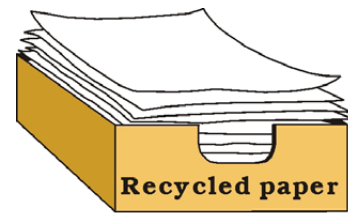


Waste Collection for Recycling

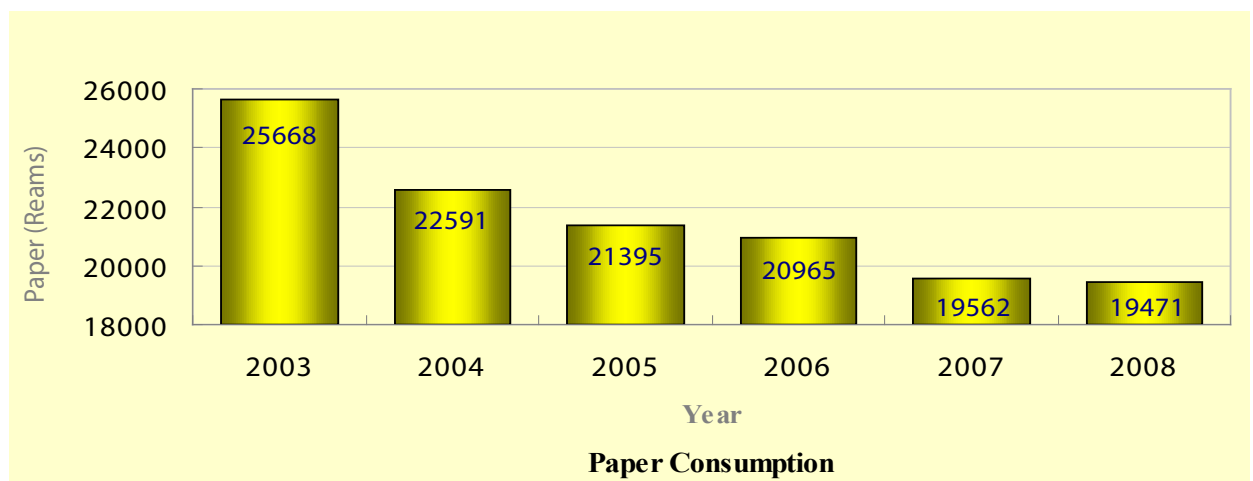
- Put up green boxes to collect reusable envelopes and paper
- Collect computer printer toners and ink cartridges for refilling and recycling
- Put up recycling boxes to collect paper, used CD, plastic bottles and aluminum cans for recycling

Paper Saving

- Minimise photocopying paper consumption
- Use both sides of paper for printing and photocopying
- Use blank side of used paper for drafting/photocopying for internal document/correspondences/fax documents
- Use electronic means extensively for communication (for instance, use electronic files and keep the use of hard copies to minimum)
- Reuse envelopes and file covers
- Encourage the use of recycled paper



We continue promulgating the above measures on paper saving over the years. With the concerted efforts of our staff, we have further achieved a saving of 0.46% in paper consumption in 2008 when compared with 2007.



To maintain the impetus of green measures in housekeeping, we conduct annual environmental audits in all 14 offices located in different premises. The objectives of conducting annual environmental audits are:

- to assess compliance with the green housekeeping guidelines;
- to identify non-compliance and recommend remedial actions;
- to promote good environmental management; and
- to increase staff awareness of green management and occupational safety and health initiatives.

