

# Marine Department Environmental Report 2010

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## ***(A) Director's Message***

The Marine Department (MD) is responsible for maritime and navigational safety matters within the waters of Hong Kong. MD pledges its full support to marine pollution prevention as marine environmental protection

is important not only in its own right but also in enhancing Hong Kong's role as one of the major ports in the world.

Hong Kong, an Associate Member of the International Maritime Organization, is obliged to ensure that all ships within Hong Kong waters comply with all applicable international standards with regard to marine pollution prevention.

In 2010, MD continued to make strides to promote an environmentally responsible management and contribute to a greener environment by pursuing environmentally friendly operations. One of the milestones was the enhancement on the use of electronic submission of applications via the MD's Electronic Business System (Phase 2) which was launched in April 2008. In 2010, two services, namely the Application for the Hong Kong Licence and the Application for Dispensation of certain safety requirements, have been transformed into e-service whereas the service about the Application for Carriage Permit and Removal Permit relating to Transport of Dangerous Goods has been identified for transformation into e-service. We shall endeavour to identify other scopes for e-service to ensure a wider use of electronic communications to help save the environment.

Another notable achievement was the reduction in the electricity consumption of 2010 by 4.7% when compared to that of the previous year. The electricity consumed in 2010 is the lowest consumption since 2002. This reflects that the various measures taken by the Department with an ultimate goal to reduce the electricity consumption of MD have come to fruition.

To show the Department's support for the Clean Air Charter and our commitment to improve the air quality, we have continued to make sustainable efforts in reducing the emission of the government fleet and monitoring closely the exhaust gas emitted from the vessels.

I am pleased to see many of our green initiatives have achieved good results and are well received by our staff and the marine industry. I take this opportunity to thank my staff members for their efforts in 2010. MD undertakes to continue working hand in hand with the community to

support the clean-air initiatives and also a greener Hong Kong.

Roger Tupper, JP  
Director of Marine

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### ***(B) Responsibilities and Organizational Structure***

In this report, we will focus on the key areas we worked in 2010 to help improve the environment and the direct environmental impact of our day-to-day departmental activities.

This report is primarily intended for Hong Kong citizens, our various business partners, other government departments, our own staff and other local and international maritime organizations.

#### Overview of the Department

MD, headed by the Director of Marine, is responsible for all navigational matters in Hong Kong and the safety standards of all classes and types of vessels. Our mission is "We are one in promoting excellence in marine services".

Staffed by well-qualified and experienced professional and technical officers, we provide a wide spectrum of services which can be broadly classified into five areas, each of which is headed by an Assistant Director:

- Government Fleet
- Multi-lateral Policy
- Planning and Services
- Port Control
- Shipping

The Administration Branch in the Department's Headquarters provides administrative support services, human resource management, and finance and accounting support to the operational divisions.

Our Headquarters are located at Harbour Building, 38 Pier Road, Central. Other major venues include the Government Dockyard at Stonecutters Island, the HK-Macau Ferry Terminal at Sheung Wan, the China Ferry Terminal at Tsim Sha Tsui and eight Public Cargo Working Areas in scattered locations.

### Green Management Structure

To promote an environmentally responsible management and enhance green management practice in MD, the Departmental Secretary and the Executive Officer (Committee and General) have been appointed as the Green Manager and the Green Executive respectively.

For all environmental protection matters at a divisional level, the respective Assistant Directors formulate their own green objectives, targets and measures based on the nature of their business. Divisional Environmental Protection Representatives at the senior professional level have been appointed to take up the role of coordinator in related matters. For example, these representatives will co-ordinate and prepare divisional inputs for compiling the annual departmental Environmental Report.

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### ***(C) Environmental Goal***

To promote excellence in marine services, we are committed to ensuring that our services and operations are conducted in an environmentally friendly and responsible manner conducive to a cleaner port of Hong Kong.

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#### ***(D) Work Focuses***

Our environmental work focuses on the following areas:

- (i) ensuring effective control on movement of dangerous goods in Hong Kong waters;
- (ii) improving our refuse collection and scavenging services;
- (iii) maintaining a world class maritime oil pollution plan to combat oil spills;
- (iv) stepping up prosecutions against offences of marine littering and pollution;
- (v) recommending environmentally friendly seawall designs with wave-absorbing capability in the relevant development projects;
- (vi) implementing international conventions on marine pollution prevention and enforcing relevant environmental legislation on vessels;
- (vii) employing effective management systems to achieve energy savings for operations at the Department's ferry terminals, public cargo working areas and the Government Dockyard;
- (viii) adopting environmentally friendly and efficient designs for facilities and work processes in the Government Dockyard;
- (ix) observing the Government's Green Management Policy in our own workplaces to ensure efficient use of natural resources and energy;
- (x) recommending a proper Marine Traffic Impact Assessment be conducted for every major development project to adequately address all potential marine impacts at each stage of the project implementation. This will not only ensure marine traffic safety in Hong Kong waters but also bring long-term benefit to the environment; and

- (xi) implementing plans and measures that are relevant to our operations for fulfilling the commitments under the Clean Air Charter.

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### ***(E) Environmental Performance in 2010***

The measures and performance relevant to environmental protection in 2010 are as follows:

#### **(a) Proactive Port Control**

##### Vessel Traffic Services (VTS)

One of the objectives of the Hong Kong Vessel Traffic Services is to protect the marine environment from being polluted by oil or chemicals as a result of marine accidents. The services are provided by our Vessel Traffic Centre (VTC), which monitors the movement of vessels within Hong Kong waters round the clock through an advance vessel traffic surveillance system. It provides real-time traffic monitoring by displaying traffic images on an electronic chart display (ECDIS) system. It enables full assessment on the overall traffic situation in the area so that appropriate navigational information or advice can be given to navigators to assist onboard decision in taking timely and substantial actions to avoid collision or grounding. In Kwai Chung Container Terminal Basin, the busy vessel traffic is closely monitored by a marine traffic control station, which further enhances the efficiency of marine traffic management.





### **The Vessel Traffic Centre located inside the Hong Kong- Macau Ferry Terminal**

#### Harbour Patrol

MD officers perform patrol duty onboard 25 patrol launches to ensure that vessels navigating in Hong Kong waters are in compliance with marine legislations including marine littering. Patrol officers regularly take prosecution actions against littering offenders. In 2010, we issued a total of 42 Fixed Penalty Notices to persons who had committed the offence of marine littering.

MD officers frequently inspect tankers and oil barges to ensure that they station or operate at designated areas. During inspections, our officers would advise the operators to strictly follow the code of practice and make sure no illegal transfer or discharge of oil would take place in Hong Kong waters. Under the Shipping and Port Control Ordinance (Cap. 313) and the Merchant Shipping (Local Vessels) Ordinance (Cap. 548), the owner and master/coxswain of the vessel or any person who discharges oil from a vessel commits an offence.

In addition, our officers keep a close surveillance for any dilapidated

vessels or wrecks during their normal patrol to prevent any possible release of harmful substances, such as lubrication/fuel oil residue in dilapidated vessels or wrecks, which would cause damage to the environment. In 2010, 105 dilapidated vessels and wrecks were removed for proper disposal.

### Smoke Emission Control

In 2010, our officers launched a series of operations around Hong Kong waters to monitor smoke emission from vessels. The smoke emission is measured by the shade levels of the Ringelmann Chart. A total of 54 advisory letters and 3 warning letters were issued to the owners and masters/coxswains according to the shade level of smoke their vessels emitted. They were required to take remedial actions in order to improve the vessels' smoke emission. We also initiated a prosecution against a vessel for having emitted smoke causing nuisance and the master was convicted and fined \$2,500 in court.

In addition, we widely dispatched educational leaflets to the floating community to promote the importance of proper engine maintenance in reducing smoke emission.

### Dangerous Goods Control

The carriage of dangerous goods at sea is governed by the Dangerous Goods (Shipping) Regulations (Cap. 295C) and the Merchant Shipping (Safety) (Dangerous Goods and Marine Pollutants) Regulation (Cap. 413H). The Dangerous Goods Unit carries out random inspections to vessels conveying dangerous goods in Hong Kong waters. In 2010, a total of 350 vessels were inspected.

Fireworks are delivered on a bi-weekly basis to the Hong Kong Disneyland by sea. Our staff regularly carry out inspections to the vessels delivering Class 1 dangerous goods (fireworks) to the Hong Kong Disneyland to ensure the safety of the vessels and personnel involved as well as to preserve the marine environment.



## **(b) Efficient Marine Refuse Cleansing Services**

Floating refuse, being the most visible evidence of pollution in the harbour, is difficult to clear because it drifts with current and wind. MD is determined to keep the harbour clean by engaging effective and efficient marine refuse cleansing services.

Over the past few years, a significant volume of floating refuse which originated from land sources was carried onto Hong Kong waters as a result of the prolonged torrential rains. However, the drier weather of 2010 as well as the drought in the Pearl River areas have resulted in a decline in the volume of floating refuse collected. The total volume of marine refuse scavenged and collected in 2010 amounted to 15,788 tonnes. This represented a decrease of 2.5% compared with that in the previous year.

### Contracting out Marine Refuse Cleansing Services

As a continual effort to improve the overall efficiency and effectiveness of its marine cleansing services, MD had embarked upon reformed outsourcing arrangements for the provision of marine refuse and oil pollution cleansing services since July 2005. Under the reformed outsourcing arrangements, the fragmented contracts for marine refuse cleansing and scavenging services have been consolidated into only 3 contracts of longer duration, i.e. 5 years plus 1 year optional, and performance-based specifications are adopted for monitoring the service quality of the contractors. The working patterns have also been revamped and a fleet of about 70 contractors' vessels is mobilized to maintain the cleanliness of Hong Kong waters during the daylight hours. The overall performance of the contractor, which is measured both by the level of cleanliness and by response time, has been improved after the introduction of the reformed outsourcing arrangements.

With a view to providing better value-for-money and higher quality services to the community, MD and the Efficiency Unit jointly conducted a review of the existing outsourcing arrangements in 2009 to identify areas for improvement. Certain improvement measures, including combining the two existing marine refuse collection and

cleansing services contracts for more efficient contract administration and deployment of resources; and introducing an indexation mechanism to link service charges to fuel price with a view to obtaining the required services at a more stable and competitive price amidst volatile fuel cost, will be implemented in the next outsourcing contract to be tendered in 2011.

In addition to routine cleansing activities, we have contributed our efforts in the following areas:

- ✧ stepping up marine littering patrols;
- ✧ strengthening public education;
- ✧ enhancing publicity programme, and
- ✧ conducting intensive cleansing programme for identified areas.

In collaboration with both the public and the private sector organizations, promotional activities have been regularly carried out with a view to improving the cleanliness of Hong Kong waters. In the fight against human swine flu, MD has stepped up the routine cleansing on our Marine Refuse Collection Points by deploying heated and pressurized water jet washers, as well as scavenging floating refuse at the littoral areas by an additional task force for a period of 12 months. The task was successfully accomplished in July 2010. A total of about 360 tonnes of refuse was collected at the littoral foreshore areas.

To improve our service further, MD is working with its contractor to study and develop suitable scavenging technologies to clean trapped floating refuse from congested and shallow sea areas that are difficult to access.

### **(c) Preparedness in Dealing with Oil Spills**

Hong Kong waters are susceptible to oil spill damage, owing to its closeness to congested waterways. Oil spills can play havoc on our maritime environment and economy. Oil spills from ships can be

easily washed ashore causing irreparable environmental damage. In this regard, we have developed an effective Maritime Oil Spill Response Plan to co-ordinate both the public and the private resources and talents to tackle oil pollution incidents in Hong Kong waters. The Pollution Control Unit (PCU) of the Department is on 24-hour standby and its target is to respond on site within two hours of reported oil spillage inside harbour limits. This pledge was 100% achieved in 2010.

Staff members to be tasked to the control of marine oil spills are trained and regularly refreshed to the International Maritime Organization oil spill response standards and competency levels. In addition to providing regular oil pollution training to the staff, MD holds a large-scale oil pollution combating exercise every year to exercise the on-the-field coordination of efforts from government departments and the oil industry under the Marine Oil Spill Response Plan. In the 2010 annual oil pollution combating exercise, the maritime administrations of Guangdong, Shenzhen and Macao were also invited to participate in the exercise in order to test the inter-governmental cooperation for handling oil spill in the Pearl River Estuary under the Regional co-operation mechanism.



**Annual Anti-Oil Pollution Exercise 2010**

#### **(d) Cleansing of Marine Hazardous and Noxious Substances Spillage**

Marine Hazardous and Noxious Substances (HNS) is defined as any substance other than oil which, if introduced into the marine environment, is likely to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

As required by the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS Protocol), a contingency plan, known as the Maritime Hazardous and Noxious Substances Spill Response Plan (MHNSSRP) for handling maritime HNS spill incidents in the Hong Kong waters is being developed. Under the plan, the MD PCU will be responsible for cleaning up the floating residue of the spilt HNS after it has been confirmed to be safe for handling. The cleansing service for HNS spill will be outsourced to the private sector to form part of outsourcing marine cleansing contract.

#### **(e) International Conventions and Local Legislation**

MD represents the Hong Kong Special Administrative Region (HKSAR) at the International Maritime Organization (IMO), a United Nation specialized agency responsible for safety and security of international shipping as well as prevention of pollution of the environment from ships.

The HKSAR is committed to implementing the MARPOL 73/78 (The International Convention on the Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978 thereto), which is the principal international convention to prevent or minimize pollution to the environment due to ship operations. The Convention has six Annexes aiming to address pollution to the environment in respect of (i) oil; (ii) noxious liquid substances; (iii) packaged form harmful substances; (iv) sewage; (v) garbage and (vi) emissions into the atmosphere. All the Annexes are applicable to Hong Kong ships wherever they are and to all ships whilst they are in Hong Kong

waters.

The International Convention on the Control of Harmful Anti-fouling Systems on Ships has come into force globally since 17 September 2008. This Convention prohibits the use of harmful organotins in anti-fouling paints on ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems. At present, the use of organotin-based paints is already put under tight control in Hong Kong but local legislation is being prepared to enforce this new Convention for application in the HKSAR. MD is also participating in the development work at IMO concerning management of ballast water and ship recycling to minimize their impact to the environment.

### Port State Control

The Port State Control (PSC) Section carries out inspections on about 15% of foreign ocean going ships entering Hong Kong waters each year under our commitment with the Tokyo Memorandum of Understanding.

The PSC inspections help prevent sub-standard ships from proceeding to sea by securing their compliance with the relevant convention provisions in safeguarding the safety of crew, passengers and ships, and prevention of pollution.

In 2010, 731 foreign ships entering Hong Kong waters were inspected, out of which 20 deficiencies related to pollution prevention were found and 1 ship was detained due to serious contraventions with MARPOL requirements.

## **(f) Green Initiatives at Terminals, Public Cargo Working Areas and Lighthouses**

### Terminals

Energy saving is the focus of the environmental initiatives being pursued at the HK-Macau Ferry Terminal and the China Ferry

Terminal. A structured energy saving plan has been introduced to cut down energy consumption in the two terminals through reducing unnecessary lighting and scheduling the operations of escalators and travellers on a need basis. Green measures adopted in 2010 included replacement of deteriorated and inefficient components of the air-conditioning systems and replacing the lightings with energy saving bulbs and tubes in the two terminals. In compliance with a service-wide green initiative of the Government, the indoor temperature of both terminals has been set at 25.5°C.

In addition, reflective cellulose layers were laminated on the glass curtain-walls along the fly-over bridges in the HK-Macau Ferry Terminal as a heat insulation agent with a view to reducing the demand for air-conditioning supply and power consumption.

#### Public Cargo Working Areas (PCWAs)

To lower power consumption, floodlights at PCWAs were adjusted and reduced to suit actual needs during and beyond operating hours. E-communication was encouraged and enhanced by introducing the use of Lotus Notes in all PCWAs.

#### Lighthouses

The power supply of North Lei Yue Mun Light and Fan Lau Light has been successfully converted from mains electricity to solar power in 2010. To continue the green initiative, more Aids to Navigation such as Black Point Light would be converted to solar power in the coming years.

The combined wind-solar power supply system for the Cape D'Aguilar lighthouse has been put on trial since November 2006. This system was found stable and effective and has replaced the electricity supply to the lighthouse.

### **(g) Going Green at Government Dockyard**

The Government Fleet Division (GFD) is responsible for the overall management of government vessels. The GFD's main activities



include operating its fleet, providing marine transport services for MD's other offices and other government departments, performing new vessels procurement and maintenance of government vessels. The Government Dockyard (GD) at Stonecutters Island is the GFD's operational base mainly for its own fleet and maintenance base of all government vessels. The projected expenditure on the management of the government fleet in 2010/11 is about \$391 million. In 2010, the government fleet was made up of 766 government vessels of different classes, types and sizes.

Going green is the long-term commitment of the GFD. Over the past years, many initiatives have been developed and adopted for the operations of the GD. They appear in the yards, in the offices, to its people, on new ships and in maintenance operations.



**Green Plantation at Open Space in GD**

## Green Workplace

With a view to preserving the ecological environment in the GD basin, the following environmental measures have been implemented in the GD in 2010:

- (i) Further development of the GD's greenery by increasing plantation to improve the air quality and reduce the heat island effect;
- (ii) Replacement of Administration Building (Block A) lighting with LED energy saving light;



**LED lighting in Administration Building of GD**

- (iii) Adoption of proximity and photovoltaic controlled lighting in public area;



**Proximity switch in the Administration Building pantry**

- (iv) Recovery of the useful parts and components from disposed engines and equipment for re-use; and
- (v) Fitting of water saving devices to the taps in the washrooms and pantries to save about 15-20% of water consumption.

### Green Fleet

- (i) Green New Vessels

Starting from as early as 2000, some new government vessels have already been delivered with environmentally friendly diesel engines (over 130kW). Since 2001, all new vessels procured are ensured to

comply with all applicable regulations relating to environmental protection and oil pollution prevention, including the installation of environmentally friendly engines, energy-efficient equipment, maintenance-free batteries, and the application of environmentally friendly paints and refrigerants. In 2010, MD took delivery of a new tug boat “Marine 32” with solar powered electrical appliances and lightings. The electricity is generated by solar panel (photovoltaics) to give power to electrical appliances and lightings when the boat is in stand-by mode.

#### (ii) Existing Vessels

Since 2002, our crew have been advised to operate GFD’s vessels at safe speed below the maximum while en-route to routine operational duties with a view to reducing fuel oil consumption and emission. Our records show that the fuel consumption has been reduced gradually over the years as a result of our continuous efforts.

### **(h) E-Communication with Customers**

Phase 2 of the Electronic Business System (eBS) was launched on 28 April 2008 to provide a total e-business solution for port formalities documents and public services. The eBS not only saves the shipping community’s resources and operating costs involved in preparing paper applications and submitting the applications in person, but also contributes to paper saving and therefore a greener environment. To further enhance the use of electronic submission of applications, two services, namely the Application for the Hong Kong Licence and the Application for Dispensation of certain safety requirements, have been transformed into e-service in 2010. A system feature has also been implemented in 2010 to generate the invoices for the annual tonnage fee automatically and issue them by emails. Another new service about the Application for Carriage Permit and Removal Permit relating to Transport of Dangerous Goods has been identified in 2010 for transformation into e-service. Business areas that have the potential of transforming into an e-service within the eBS framework would continue to be identified.

In November 2010, 4 sessions of seminars have been organized to encourage the shipping community to use the e-services of eBS. A total of 236 representatives from shipping companies have attended the seminars and provided views on eBS for further improvement.

### **(i) In-house Green Programmes**

We are committed to the Government's Green Management Policy in our daily operations at the offices to ensure efficient use of natural resources and energy. We follow and advocate the principle of "Reduce, Reuse, Recycle and Replace" in the consumption of materials.

#### E-Notices and Circulars

In 2010, MD continued to reap the benefits of the Wide Area Network by disseminating information among staff members through the Departmental Portal, Intranet and departmental website and minimizing the circulation of hardcopies. With the aid of the advanced email systems, email has become the primary means of communication in MD's daily operation.

#### Green IT

In order to adopt a green computing strategy, MD has established an environmentally friendly IT workplace leverage on the Cloud Computing infrastructure in 2009. By utilizing clusters of blade servers and virtualization technology, more than 50 physical servers and applications supporting 12 backend systems and IT infrastructure have been transformed, resided and then run within a Cloud Computing environment by December 2010. Following the setting up of the Cloud Computing platform, the number of physical servers has been greatly reduced, thereby reducing the office space for accommodating the servers and decreasing the electricity consumption and heat dissipation.

#### Paper and Energy Savings

Reduction of paper and energy consumption continued to be two of the key green measures monitored by the Green Housekeeping



Working Group. In 2010, with the implementation of various energy saving measures, we succeeded in reducing the electricity consumption by 4.7% when compared to that of the previous year. However, consumption of A4 paper has increased by 13.7% (1,091 reams) when compared with 2009 due to the increased activities of MD. One of the main contributing factors is the enactment of the Bunker Oil Pollution (Liability and Compensation) Ordinance on 22 January 2010. MD now has to process applications for Bunker Convention Certificates for all cargo ships flying the Hong Kong flag (around 1,500 ships in 2010) causing more paper use. Detailed paper and energy consumption figures for the period between 2002 and 2010 are provided at [Annexes I](#) and [II](#).

### Use of Recycled Paper

We continued to appeal to our staff to use more recycled paper instead of virgin paper. In 2010, nearly 93% of the A4 paper used by MD was recycled paper when compared to 90% in 2009.

### Disposal of Empty Toners/Inkjet Cartridges for Printers

All empty toners and inkjet cartridges of computer printers are now collected for re-cycling through public auctions. A total of 1,224 empty toners and cartridges have been collected for re-cycling in 2010.

### E-Christmas Card

MD has been sending out electronic greeting cards since 2001 to reduce paper consumption.

### Source Separation Scheme

MD's Headquarters at Harbour Building has joined the Source Separation Scheme organized by the Building Management Office in early 2008 to allow paper wastes, plastic bottles and aluminum cans to be collected separately at source.

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## ***(F) Performance under Clean Air Charter***

The HKSAR Government endorsed the Clean Air Charter (the Charter) in 2006, an initiative led by the business sector aiming to engage the whole community to improve air quality. As a signatory, the Government is committed to implementing appropriate measures to control, monitor and report air emissions from all sources, including vehicles and vessels, and to reduce energy consumption related to its activities. MD, which is responsible for providing government fleet services for other government departments, has taken various initiatives to achieve the targets regarding vessels emission under the Charter. Hereunder is a summary on the actions we have taken in 2010.

### **(a) Management Commitments and Environmental Targets**

The Government Fleet and Dockyard Environment Management System Committee (GFDEMSC) was set up in July 2007 to establish, manage and implement green measures to reduce air emission, in particular from the government-run vessels.

With an aim to reducing air emission, the following objectives and targets were set and annually reviewed by GFDEMSC:

- reduce the total electricity consumption in the offices by 5% or more from 2009-10 to 2013-14 (using 2007-08 as the baseline);
- maintain good indoor air quality in the offices and working environment;
- procure more environmentally friendly vessels when placing orders for new vessels or replacement of existing vessels;
- use ultra low sulphur fuel for vessels/vehicles available in the market. It is the Government's policy since 2001 to use ultra low sulphur diesel fuel oil for all its vessels with a view to reducing the sulphur dioxide emission in the engine exhaust;
- replace older engines on existing vessels by environmentally friendly models; and
- ensure that the GD and government fleet operations and

facilities meet the international emission standard and all legal requirements in Hong Kong by adopting the prevailing best practice.

## **(b) Achievements in 2010**

The GD and government fleet operations have observed and complied with all the applicable local and international ordinances/regulations related to emissions.

In 2010, the following achievements have been accomplished:-

- green plantation areas in the GD were increased and new trees were planted to absorb carbon dioxide;
- we took delivery of 6 new vessels (excluding small boats with engine power less than 130kW) all installed with low-NO<sub>x</sub> engines, maintenance-free batteries and environmentally friendly refrigerants;
- procurement policy has been set to phase out diesel main engines and generator engines (over 130kW) of pre-Marpol Annex VI requirements installed on government vessels and replace with Marpol compliance types in phases. Approximately 52% of the engines concerned have complied with the requirements when compared to 41% in 2009;
- for the 36 government vessels under our purview, about 1,375,316 litres of ultra-low sulphur diesel and 47,879 litres of unleaded ultra-low sulphur petrol have been consumed. The corresponding emissions of NO<sub>x</sub>, RSP and SO<sub>2</sub> were about 70,681, 2,828 and 121 kg respectively for 2010;
- the total amount of electricity consumed by different MD workplaces was 22.7 GWh which was about 4.7% less than the electricity consumed in 2009 due to the implementation of various energy saving measures. The corresponding indirect emission of SO<sub>2</sub>, NO<sub>x</sub> and RSP were 9,541, 14,568 and 594 respectively;

- the GD's Administration Building (Block A) continued to be classified as "Good Class" under the Indoor Air Quality Certification Scheme;
- the overhauled engines (over 130kW) have been tested on full load on the upgraded dynamometer and the new flue gas analyzer to ensure the exhaust emission within the acceptable limits; and
- all flood lights in 6 covered boat sheds and Block J workshops high bay were replaced with induction lights to reduce electricity consumption by about 50%.

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### ***(G) Environmental Targets for 2011***

To make our service and workplace environmentally friendly and responsible as well as to protect the natural resources of the world, we WILL:

- continue to strive our best to prevent and fight against all forms of marine pollution, such as marine refuse, oil spill, smoke emission etc.;
- continue to encourage our staff and appeal for their greater support for adopting more green measures and participating more in green activities initiated by MD or the community;
- continue to convert more Aids to Navigation to solar power;
- continue to identify business areas to be transformed into an e-service under the eBS;

- continue to explore new means and pay particular attention to a wider use of electronic measures to minimize the usage of paper and energy; and
- continue to work closely with the Electrical and Mechanical Services Department and the Environmental Protection Department in implementing more energy-saving projects to reduce electricity consumption and identifying renewable/alternative energy.

Furthermore, to fulfil our commitments under the Clean Air Charter, we WILL:

- install green roof at Administration Building and further improve greenery in the GD by phases;
- continue to implement energy saving measures with an aim to reducing energy consumption by 0.5% or more in the GD;
- continue to replace main and auxiliary diesel engines (over 130 kW) of pre-Marpol Annex VI requirements installed on government vessels by compliance types;
- continue to test the overhauled main and auxiliary diesel engines (over 130 kW) installed on government vessels and delivered after 2001 to ensure their exhaust emission are within the acceptable limits;
- continue to work with the Environmental Protection Department to explore a suitable selective catalytic converter for trials on the government vessels;
- continue to seek funding to install photovoltaic system to generate electricity for the Guard House and the Administration Building and solar water heating system for the Fleet Operation Building in the GD;
- continue to encourage user departments to use solar energy for their new government vessels where possible;

- continue to trial run the real time remote monitoring of vessels' engine revolutions per minute (rpm) to ensure that vessels are operated in more fuel-efficient conditions;
- continue to review vessels' operational profile and urge all user departments to operate at the optimal conditions as far as practicable to reduce fuel consumption;
- continue to explore the feasibility of installing a simple food waste conversion system in the GD's canteen, i.e. use a chemical / enzymatic process to convert food residues into the environmental fertilizer for the green plantations in the GD;
- continue to explore the use of bio-fuel in the government vessels;
- appeal to bidders who bid for government new shipbuilding projects to propose selective catalytic reduction (SCR) emission control if applicable in order to remove NOx gases and reduce CO from the engine exhaust; and
- appeal to bidders who bid for government new shipbuilding projects to propose hybrid propulsion systems if applicable for certain ship types.

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### ***(H) Information and Suggestions***

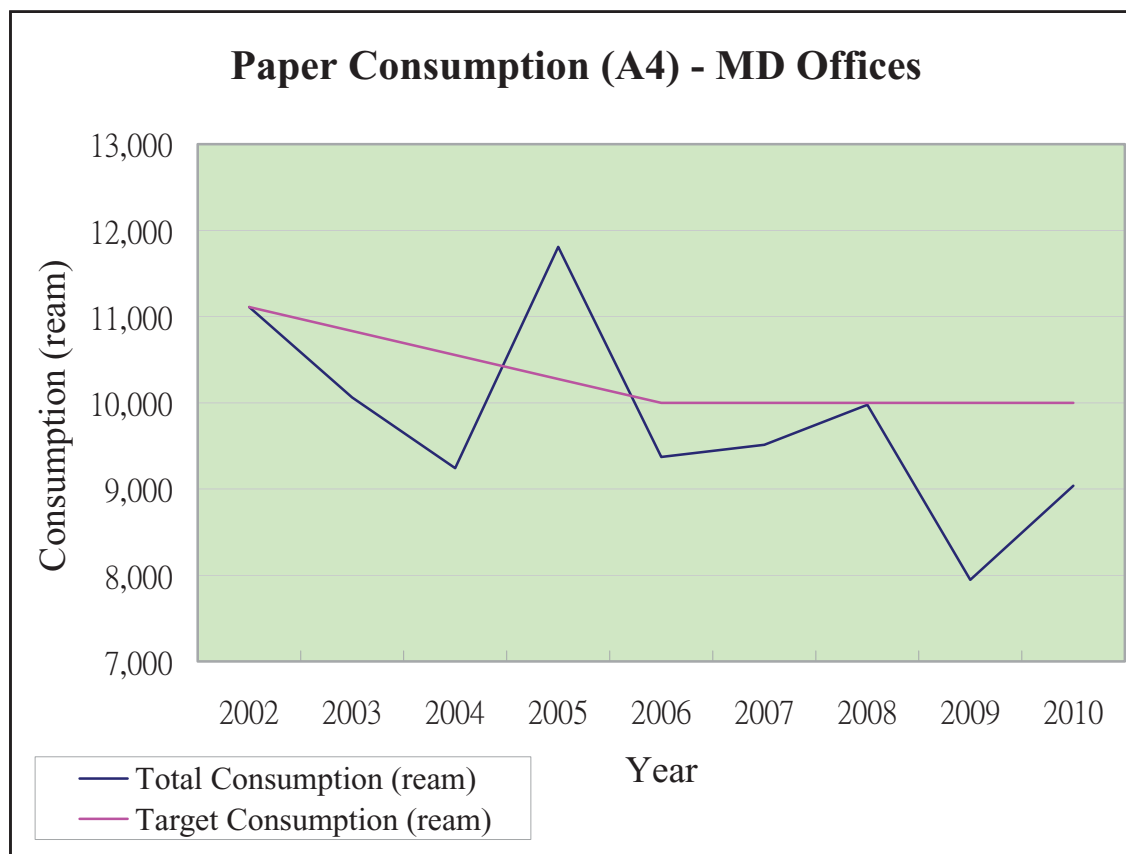
We encourage knowledge and experience sharing with the relevant stakeholders and aim to raise awareness on environmental issues. If

you have any enquiries or suggestions, please write to our Green Manager (Departmental Secretary) at Marine Department, 22/F, Harbour Building, 38 Pier Road, Hong Kong. You may also get in touch with us by e-mail at [mdenquiry@mardep.gov.hk](mailto:mdenquiry@mardep.gov.hk) or by fax on [2541 7194](tel:25417194).

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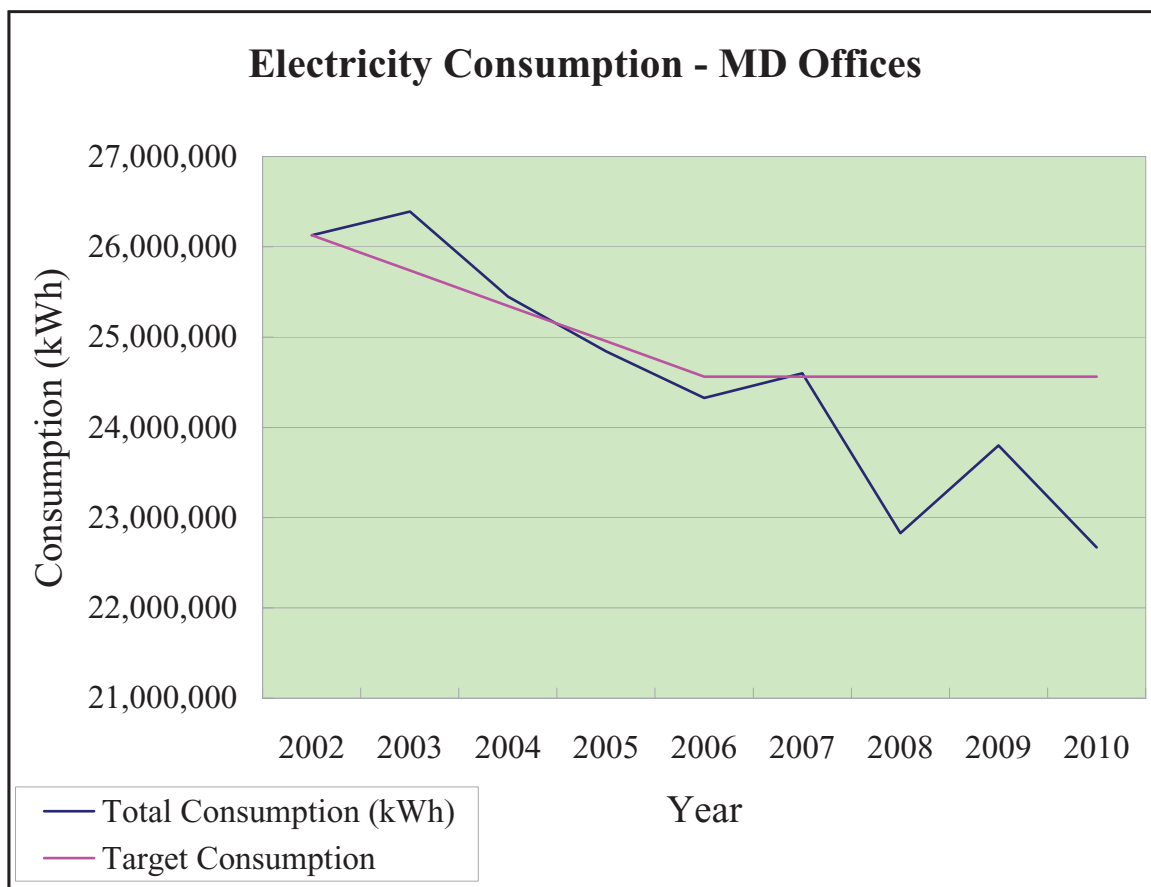


## Annex I



Year	Total Consumption (ream)	Target Consumption (ream)	Target	+/- % (compared to 2002)
2002	11,110	11,110	-	-
2003	10,062	10,832	-2.5%	-9.4%
2004	9,242	10,555	-5.0%	-16.8%
2005	11,809	10,277	-7.5%	6.3%
2006	9,371	9,999	-10.0%	-15.7%
2007	9,511	9,999	-10.0%	-14.4%
2008	9,975	9,999	-10.0%	-10.2%
2009	7,947	9,999	-10.0%	-28.5%
2010	9,038	9,999	-10.0%	-18.6%

## Annex II



Year	Total Consumption (kWh)	Target Consumption (kWh)	Target	+/- % (compared to 2002)
2002	26,129,757	26,129,757	-	-
2003	26,389,731	25,737,811	-1.5%	1.0%
2004	25,445,750	25,345,864	-3.0%	-2.6%
2005	24,839,533	24,953,918	-4.5%	-4.9%
2006	24,326,296	24,561,972	-6.0%	-6.9%
2007	24,599,278	24,561,972	-6.0%	-5.9%
2008	22,829,650	24,561,972	-6.0%	-12.6%
2009	23,800,719	24,561,972	-6.0%	-8.9%
2010	22,671,480	24,561,972	-6.0%	-13.2%