

Marine Department Environmental Report 2011

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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 2011, 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 achievements 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 2011, a new service about the electronic Application for Carriage Permit and Removal Permit relating to Transport of Dangerous Goods was implemented. Furthermore, two services, namely the Application for the Free Pratique for River Trade Vessels to the Department of Health and the Application of Multiple Entry and Clearance for High Speed Passenger Craft, have been identified for transformation into e-services. 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 paper consumption of 2011 by 10.9% when compared to that of the previous year. Furthermore, the electricity consumed in 2011 registered a 1.5% decrease when compared to that of 2010 and is the lowest consumption since 2002. These reflect that the various measures taken by the Department with an ultimate goal to reduce paper and electricity consumption of MD have come to fruition.

To show MD'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 2011. MD undertakes to continue working hand in hand with the community to support the clean-air initiatives and also a greener Hong Kong.

Francis H. P. LIU, 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 2011 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 Areas¹ 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.

¹ Two of the eight Public Cargo Working Areas (PCWAs), namely Cha Kwo Ling PCWA and Kwun Tong PCWA, were closed in October 2011.

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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;

- (xi) implementing plans and measures that are relevant to our operations for fulfilling the commitments under the Clean Air Charter; and
- (xii) promoting the awareness of the importance of indoor air quality (IAQ) by continuing the participation of the IAQ Certification Scheme.

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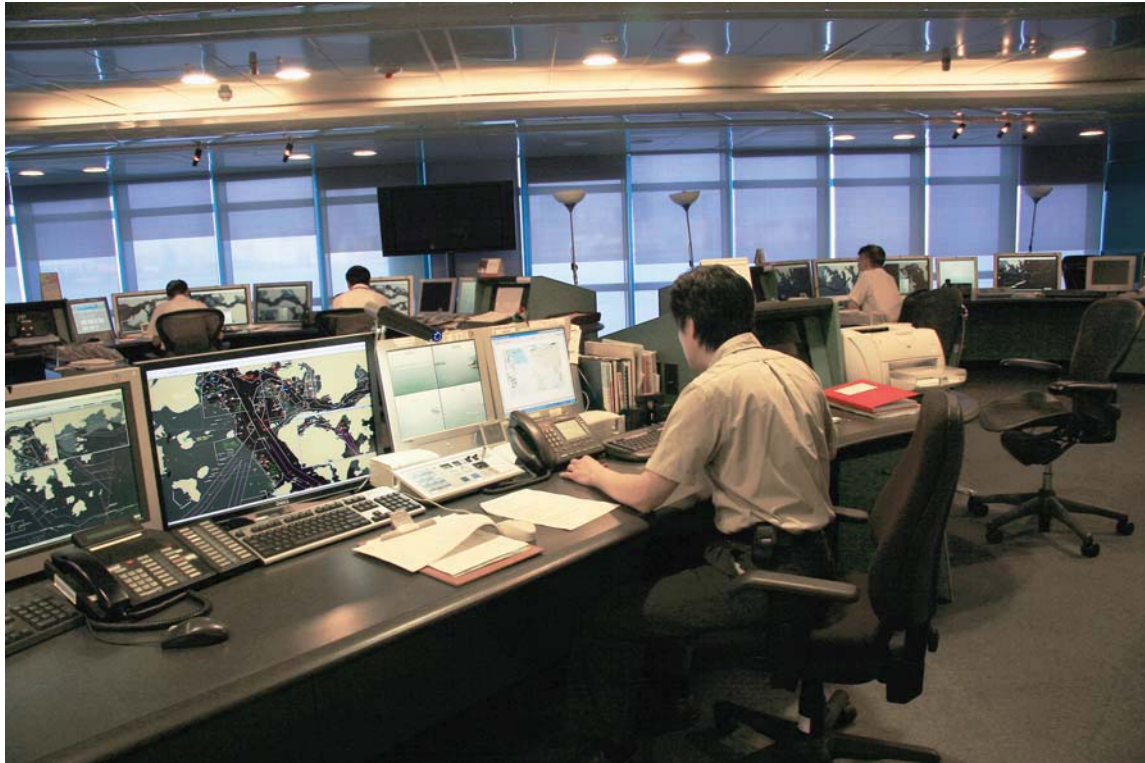
(E) Environmental Performance in 2011

The measures and performance relevant to environmental protection in 2011 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 legislation including marine littering. Patrol officers regularly take prosecution actions against littering offenders. In 2011, we issued a total of 20 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 2011, 74 dilapidated vessels and wrecks were removed for proper disposal.

Smoke Emission Control

In 2011, 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 21 advisory letters and 1 warning letter 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.

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 2011, a total of 354 vessels were inspected.

Fireworks (Class 1 dangerous goods) are delivered on a bi-weekly basis to the Hong Kong Disneyland by sea. Our staff regularly carry out inspections to the vessels undertaking such delivery to ensure the safety of the vessels and the 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 dry weather of 2011, with the lowest rainfall recorded since 1963, has resulted in a decline in the volume of floating refuse collected. The total volume of marine refuse scavenged and collected in 2011 amounted to 15,399 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 larger 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 outsourcing arrangements in 2009 to identify areas for improvement. Certain improvement measures, including combining all 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, have been implemented in the renewed outsourcing contract 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.

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 2011.

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.

MD held the 2011 annual oil spill response field exercise (code name oilex 2011) at the bay of Tai Wan To, west of Lamma Island. The exercise tested the readiness and preparedness of concerned government departments and oil companies in combating oil spills and validated individuals and teams of their key functions, knowledge, skills and capabilities.

Annual Anti-Oil Pollution Exercise 2011



(d) Cleansing of Marine Hazardous and Noxious Substances Spillage

A marine hazardous and noxious substance (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 has been 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.

In view of the similarities in technologies and methodologies for marine HNS spill cleansing and marine oil pollution cleansing, the marine HNS spill cleansing service contract is bundled with the marine oil pollution cleansing service 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) air pollution from ship.

All the Annexes are applicable to Hong Kong ships wherever they are and to all ships whilst they are in Hong Kong waters. MD keeps reviewing the local legislation related to the MARPOL Convention to ensure that it can keep abreast of the latest international requirements.

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 has also participated in the development work at the IMO concerning the formulation of the following new Conventions:

- International Convention for the Control and Management of Ships' Ballast Water and Sediments – The Convention aims to prevent the potentially devastating effects of the spread of harmful aquatic organisms carried by ships' ballast water; and
- The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships – The Convention aims at ensuring that ships, when being recycled after reaching the end of their operational lives, do not pose any unnecessary risk to human health and safety or 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 to 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 2011, 746 foreign ships entering Hong Kong waters were inspected, out of which 35 deficiencies related to pollution prevention were found and 8 ships were detained due to serious contraventions with the MARPOL requirements.

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

Terminals

Various measures have been introduced at the HK-Macau Ferry Terminal (MFT) and the China Ferry Terminal (CFT) to ensure conservation of energy, such as the installation of motion sensors in areas of less activities/security concerns to reduce unnecessary lighting. Motion sensors have also been installed for escalators and travellers at CFT and the feasibility for similar installation at MFT is under study.

The indoor temperature of both terminals are set at 25.5°C and closely monitored in compliance with Government's green policy. To better maintain the indoor temperature, the main glass doors at the pier deck of MFT and 2 glass-doors at the entrance to the escalators leading to outside areas of CFT have been fitted with auto closing device to keep them closed while not in use.

In addition, the deteriorated or inefficient components of the air-conditioning systems in the two terminals are replaced to ensure better working and energy efficiency.

Public Cargo Working Areas (PCWAs)

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

Lighthouses

The power supply of Black Point Light Beacon has been successfully converted from mains electricity to solar power in 2011. To continue with the green initiative, more Aids to Navigation such as Wong Ma

Kok Lighthouse would be converted to solar power in the coming years.

(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 as well as the maintenance base of all government vessels. The projected expenditure on the management of the government fleet in 2011/12 is about \$392 million. In 2011, the government fleet was made up of 788 government vessels of different classes, types and sizes.

Going green is the on-going commitment of the GFD. Over the 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 Workplace

With a view to preserving the ecological environment in the GD basin, the following environmental measures have been implemented in the GD in 2011:

- (i) Further development of the GD's greenery by installing green roof at the Administration Building (Block A) to improve the air quality and reduce the heat island effect;



Green Roof at the Administration Building in GD

- (ii) Replacement of the Administration Building (Block A) lighting with LED energy saving light; and



LED lighting in Administration Building of GD

- (iii) Recovery of the useful parts and components from disposed engines and equipment for re-use.

Green Fleet

(i) Green New Vessels with Environmentally Friendly Engines

New vessels procured by the Government New Construction Section (GNC) are equipped with marine diesel engines in compliance with the IMO's Tier II regulation representing a 20% reduction in NOx compared to the Tier I regulation. In addition, GNC endeavors to further reduce NOx by exploring the possibility of introducing advanced emission-control technology such as Selective Catalytic Reduction (SCR), etc. to prepare for the more stringent Tier III requirement that the IMO will implement in 2016. The IMO's Tier III requirement represents approximately an 80% reduction in NOx from Tier I and applies to vessels in Emission Control Area (ECA).

From 2012, GNC will only accept outboard engines with Three Stars Rating (or higher). The Three Stars label means an outboard engine meeting California's Air Resources Board 2008 exhaust emission standards, that is, 65% fewer emissions than the existing One Star engines.

In addition, GFD's new vessel will be designed to avoid the engine running at low load during her stay alongside or for maintenance purpose. The power for lighting and ventilation can be supplied through the shore electric power and/or solar cells even when the engine is stopped so that no harmful gases or substances will be generated.

(ii) Existing Vessels

Since 2002, our crew have been advised to operate GFD's vessels at safe economic speed in accordance with the manufacturer's recommendation while en-route to routine operational duties. GFD's vessels running at such speed can considerably reduce the fuel oil consumption and emission.

(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, a new service about the electronic Application for Carriage Permit and Removal Permit relating to Transport of Dangerous Goods has been implemented in 2011. Another two new services about Application for Free Pratique for River Trade Vessels to the Department of Health and the Application of Multiple Entry and Clearance for High Speed Passenger Craft have been identified in 2011 for transformation into e-services. Business areas that have the potential of transforming into an e-service within the eBS framework would continue to be identified. In August 2011, an on-line Satisfaction Survey on eBS had been conducted with 159 replies received from the shipping companies. The survey findings revealed that more than 96% of the respondents were satisfied / very satisfied with the services provided. The respondents had also 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 2011, 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 hard copies. 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 14 backend systems and IT infrastructure have been transformed, resided and then run within a Cloud Computing environment by December 2011. 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 2011, with the implementation of various energy saving measures, we succeeded in reducing the electricity consumption by 1.5% when compared to that of the previous year. In addition, to further reduce paper consumption due to printing of meeting documents, MD has implemented the paperless meeting solution with the use of tablets in 2011. Furthermore, the consumption of A4 paper has also registered a 10.9% decrease when compared with 2010. Detailed paper and energy consumption figures for the period between 2002 and 2011 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 2011, nearly 95% of the A4 paper used by MD was recycled paper when compared to 93% in 2010.

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 1,120

empty toners and cartridges have been collected for re-cycling in 2011.

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 2011.

(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-operated 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 2011

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

In 2011, the following achievements have been accomplished:-

- green plantation areas in the GD were increased by installing green roof at the Administration Building (Block A) to absorb carbon dioxide;
- we took delivery of 1 new vessel (excluding 6 small boats with engine power less than 130kW) installed with low-NO_x 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. In 2011, about 52% of the engines concerned complied with the requirements;
- for MD's 36 vessels , about 1,778,486 litres of ultra-low sulphur diesel and 61,990 litres of unleaded ultra-low sulphur petrol have been consumed. The corresponding emissions of NO_x, RSP and SO₂ were about 91,404, 3,656 and 156 kg respectively for 2011;
- the total amount of electricity consumed by different MD workplaces was 22.3 GWh which was about 1.5% less than the electricity consumed in 2010 due to the implementation of various energy saving measures. The corresponding indirect emission of SO₂, NO_x and RSP were 9,366, 14,272 and 669kg 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 that their exhaust emission is within the acceptable limits;
- the work for the installation of solar water heating system in the Crew Building has commenced. The project is to reduce electricity consumption; and
- with an aim of mitigating noise pollution and exhaust emission from on board generators, shore power connections have been installed on board 6 government vessels so that they can switch to shore power when staying at GD's lay-by berths.

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(G) Environmental Targets for 2012

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;
- 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; and
- complete the installation of solar water heating system at the Crew Building in the GD.

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

- install green roof at other GD buildings 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 that their exhaust emission is within the acceptable limits;
- continue to seek funding to install photovoltaic system to generate electricity for the lighting of the lighters in the GD;
- continue to encourage user departments to use solar energy for their new government vessels where possible;
- 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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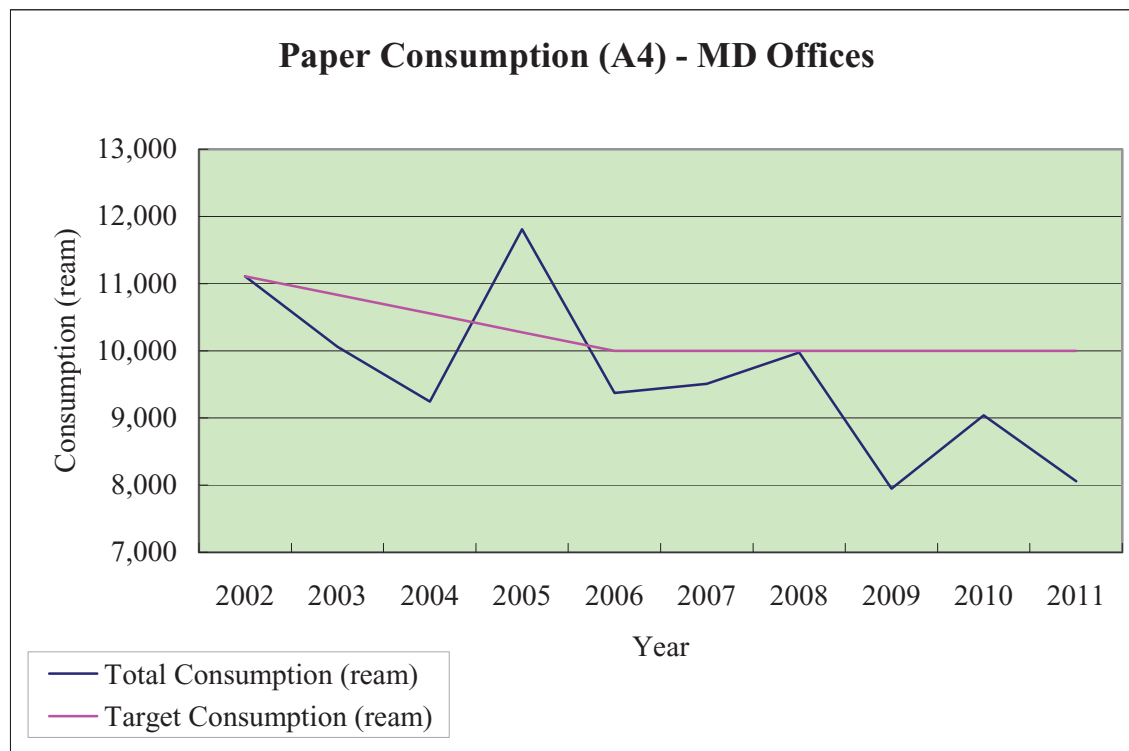


(H) Information and Suggestions

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 or by fax on 2541 7194.

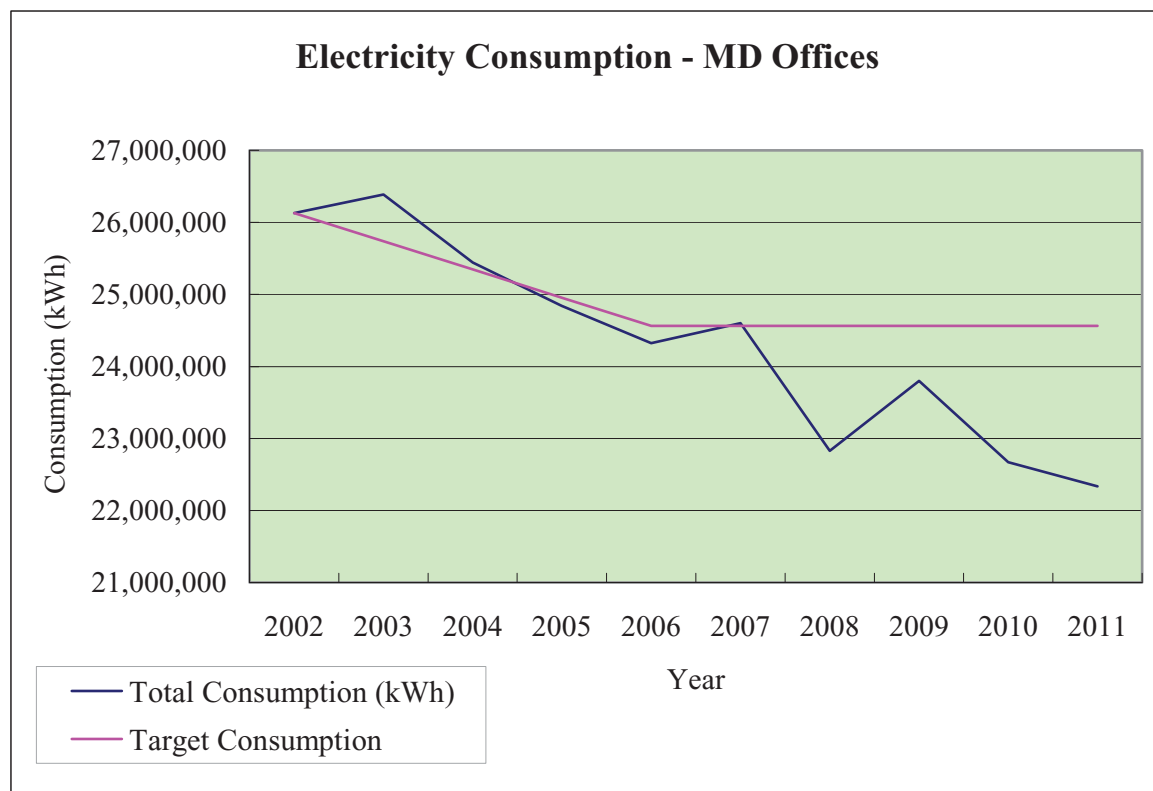
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Annex I



| 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% |
| 2011 | 8,056 | 9,999 | -10.0% | -27.5% |

Annex II



| Year | Total Consumption (kWh) | Target Consumption (kWh) | Target | +/- % (compared to 2002) |
|------|-------------------------|--------------------------|--------|--------------------------|
| 2002 | 26,129,757 | 26,129,757 | - | - |
| 2003 | 26,897,731 | 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% |
| 2011 | 22,336,616 | 24,561,972 | -6.0% | -14.5% |