# Marine Department Environmental Report 2019

## Content

<table>
<thead>
<tr>
<th></th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>Green Management Structure of MD</td>
<td>2</td>
</tr>
<tr>
<td>C</td>
<td>Proactive Port Control</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>Efficient Marine Refuse Cleansing Services</td>
<td>6</td>
</tr>
<tr>
<td>E</td>
<td>Preparedness in Dealing with Oil Spills</td>
<td>8</td>
</tr>
<tr>
<td>F</td>
<td>Cleansing of Marine Hazardous and Noxious Substances Spillage</td>
<td>8</td>
</tr>
<tr>
<td>G</td>
<td>International Conventions and Local Legislation</td>
<td>9</td>
</tr>
<tr>
<td>H</td>
<td>Green Initiatives at Terminals, Public Cargo Working Areas and Lighthouses</td>
<td>10</td>
</tr>
<tr>
<td>I</td>
<td>Going Green at Government Dockyard</td>
<td>11</td>
</tr>
<tr>
<td>J</td>
<td>Green Housekeeping</td>
<td>14</td>
</tr>
<tr>
<td>K</td>
<td>Good Indoor Air Quality</td>
<td>19</td>
</tr>
<tr>
<td>L</td>
<td>Environmental Targets for 2020</td>
<td>20</td>
</tr>
<tr>
<td>M</td>
<td>Information and Suggestions</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Annex I A4 Paper Consumption</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Annex II Electricity Consumption</td>
<td>24</td>
</tr>
</tbody>
</table>
The Marine Department (MD) is responsible for maritime and navigational safety matters within the waters of Hong Kong. MD pledges its full support to prevention of marine pollution since 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, as an Associate Member of the International Maritime Organization, is obliged to ensure that all ships within the waters of Hong Kong comply with all applicable international standards with regard to prevention of marine pollution.

MD promotes an environmentally responsible management and contributes to a greener environment by pursuing environmental-friendly operations. The amendments to the Merchant Shipping (Prevention of Air Pollution) Regulation (Cap. 413P) came into effect in May 2019. The amended regulation reflects the latest international requirements in relation to the measures to combat climate change, and requires Hong Kong registered ocean-going vessels of 5 000 gross tonnage and above to set up a data collection system for fuel oil consumption on board.

In the third generation of MD’s Electronic Business System (eBS), starting from March 2019, we have accepted electronic certificates from ocean-going vessels in addition to physical copies of vessel certificates. A new online service was implemented to allow authorised surveyors to submit survey-related reports by means of e-submission. We shall endeavour to identify more scope for e-services to ensure a wider use of electronic communications to help save the environment.

This Environmental Report covers the environmental performance of MD in 2019 and sets out our environmental targets for 2020.
To promote an environmentally responsible management and enhance green management practice in MD, Departmental Secretary and Executive Officer (General and Committee) have been appointed as the Departmental Green Manager and the Departmental Green Executive respectively.

For all environmental protection matters at Divisional level (namely, the Planning and Services & Port Control Divisions, the Shipping & Multi-lateral Policy Divisions and the Government Fleet Division), the Assistant Directors of Marine formulate respective 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 co-ordinate and take forward the green measures.

(a) Our Environmental Goals

“We are One in Promoting Excellence in Marine Services.” MD is committed to ensuring that our services and operations are conducted in an environmental-friendly and responsible manner conducive to a cleaner port of Hong Kong.

(b) Our Environmental Work Focuses

(i) To ensure effective control on movement of dangerous goods in the waters of Hong Kong;

(ii) To improve our marine refuse collection and scavenging services;
(iii) To maintain a maritime oil pollution plan to combat oil spills;

(iv) To take prosecution actions against offences of marine littering and pollution;

(v) To implement international conventions on prevention of marine pollution and enforce relevant environmental legislation on vessels;

(vi) To employ effective management systems to achieve energy saving for operations at MD's ferry terminals, public cargo working areas and Government Dockyard;

(vii) To adopt environmental-friendly and efficient designs for facilities and work processes at Government Dockyard;

(viii) To observe the Government's green management policy in our own workplaces to ensure efficient use of natural resources and energy;

(ix) To recommend environmental-friendly seawall designs with wave-absorbing capability in the relevant development projects;

(x) To recommend conducting a proper Marine Traffic Impact Assessment for every major marine-related 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 the waters of Hong Kong, but also bring long-term benefit to the environment;

(xi) To implement plans and measures that are relevant to our operations for fulfilling the commitments to improve the air quality; and

(xii) To promote the awareness of the importance of indoor air quality (IAQ) by participating in the IAQ Certification Scheme continuously.
C | Proactive Port Control

(a) 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. Established in accordance with international requirements, the VTS system disseminates navigational information and advice to vessels to facilitate safe arrivals and departures. 14 radars are employed in the radar surveillance system to record movements of visiting vessels in the waters of Hong Kong. For energy saving, all magnetron-based radars were replaced by solid-state based radars by 2018 that utilised a lower transmission power technology.

(b) Harbour Patrol

To ensure that all the vessels navigating in Hong Kong comply with our marine legislation, MD officers perform patrol duty on board 29 patrol launches. Patrol officers will take prosecution actions against marine littering offenders. During inspections of tankers and oil barges, our officers advise the operators to strictly follow the code of practice and make sure that no illegal transfer or discharge of oil would take place in the waters of Hong Kong.
Our officers also closely monitor dilapidated vessels or wrecks to prevent any possible release of marine pollutants, such as lubricant or fuel oil residue in dilapidated vessels or wrecks. In 2019, 471 dilapidated vessels and wrecks were removed for proper disposal.

(c) Dark Smoke Emission Control

It is an offence for any vessel in the waters of Hong Kong to emit dark smoke which is as dark as, or darker than, Ringelmann Chart “Shade 2” for three minutes or more continuously at any one time. In 2019, no vessel contravened the marine legislation on dark smoke emission.

Educational leaflets with the Ringelmann Chart have been despatched to ship operators. Publicity campaigns have also been conducted to promote the importance of proper engine maintenance in reducing dark smoke emission.

(d) Dangerous Goods Control

The Dangerous Goods Unit carries out random inspections to vessels conveying dangerous goods in the waters of Hong Kong. In 2019, a total of 461 vessels were inspected. No vessel contravened the legal requirements.
**D | Efficient Marine Refuse Cleansing Services**

Floating refuse is difficult to clear because it drifts with current and wind. MD is committed to keeping the harbour clean through effective and efficient marine refuse cleansing services.

MD’s cleansing contractor has provided a fleet of about 80 vessels of various types to clean up floating refuse in the waters of Hong Kong on a daily basis (including Sundays and public holidays). The contractor also provides domestic refuse collection service to vessels in designated anchorages, berths and typhoon shelters.

Currently, refuse collection boats are stationed in major typhoon shelters including Kwan Tong, Sam Ka Tsuen, Aberdeen, Shau Kei Wan, Causeway Bay, To Kwa Wan, Yau Ma Tei, Tuen Mun, Sai Kung, Cheung Chau and Shuen Wan for collecting refuse from vessels at those typhoon shelters at least once a day.

In 2019, the total marine refuse collected amounted to 15,578 tonnes, including 11,006 tonnes of floating refuse; 2,444 tonnes of refuse from ships; and 2,128 tonnes of refuse from locally-licensed and river trade vessels. The total collected amount in 2019 roughly decreased by about 3% as compared with 16,084 tonnes of marine refuse collected in 2018.
“We are one in keeping our harbour clean”

In 2019, the Pollution Control Unit conducted 449 visits to local vessels, mariculture zones, marine works sites, yacht clubs and wholesale fish markets to publicise the message of keeping the waters of Hong Kong clean. MD issued 17 Fixed Penalty Notices to those who committed the offence in marine littering.

In 2019, MD continued to take part in the District-led Actions Scheme to address the environmental hygiene issue of different districts. MD has conducted special scavenging operations in collaboration with other government departments to improve marine hygiene conditions of Aberdeen Typhoon Shelter, Chai Wan Cargo Handling Basin, Shau Kei Wan Typhoon Shelter and the foreshore waters of Tai Po and Outlying Islands. Moreover, as a member of the Interdepartmental Working Group on Marine Environmental Management and its two Task Forces (namely, Task Force on Marine Refuse and Task Force on Emergency Response to Marine Environmental Incidents), MD will continue to enhance the Government’s efforts in marine environmental management, including the work on tackling marine refuse problem and strengthening its capability and preparedness on emergency response to marine environmental incidents.
E | Preparedness in Dealing with Oil Spills

The waters of Hong Kong are susceptible to oil spills owing to its closeness to congested waterways. MD has developed a Marine Oil Spill Response Plan to tackle oil pollution incidents. The Pollution Control Unit is on 24-hour standby and responds in situ within two hours for reported oil spillage inside harbour limits. Periodical patrols and inspections on vessels engaged in re-fuelling or transferring fuels have been carried out to remind coxswains to take precautionary measures for oil spillage. In 2019, the Pollution Control Unit responded to 126 alleged oil sighting reports, 35 of which were confirmed with oil and cleansing actions were taken subsequently.

F | Cleansing of Marine Hazardous and Noxious Substances Spillage

Two annual marine pollution response joint exercises co-ordinated by MD and EPD, code-named Oilex 2019 and the Maritime Hazardous and Noxious Substances (HNS) Exercise 2019, were held simultaneously in October 2019 off the western coast of Lamma Island to test local responses in the event of pollution caused by spillage of oil and HNS in the waters of Hong Kong.

The exercise hypothesised a scenario of a chemical, white phosphorus, leaking from containers fallen into the sea off Lamma Island. Combating the simulated HNS spill, the response teams removed the damaged containers out of the sea to Chemical Waste Treatment Centre for further disposal actions. The joint annual maritime HNS spillage response exercise reaffirmed the alertness and readiness of the Government departments under the Maritime HNS Spill Response Plan.
MD represents the Hong Kong Special Administrative Region at the International Maritime Organization (IMO), a United Nations specialised 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 International Convention for the Prevention of Pollution from Ships (known as the MARPOL Convention) including the investigation into any accidental discharge of pollutants into the sea by vessels.

In May 2019, the amendments to the Merchant Shipping (Prevention of Air Pollution) Regulation (Cap. 413P) came into effect with a view to mitigating the emission of greenhouse gases from international shipping. The amended regulation reflects the latest requirements of Annex VI to MARPOL Convention in relation to the measures to combat climate change, and requires Hong Kong registered ocean-going vessels of 5,000 gross tonnage and above to set up a data collection system for fuel oil consumption on board.¹

The Port State Control inspections check whether the vessels comply with the relevant convention provisions with respect to issues of marine safety and environmental protection. In 2019, 705 inspections on foreign ocean-going vessels were conducted in the waters of Hong Kong, of which six detentions were made due to serious contraventions with the MARPOL requirements.

H | Green Initiatives at Terminals, Public Cargo Working Areas and Lighthouses

(a) Ferry Terminals

In order to reduce energy consumption at Hong Kong-Macau Ferry Terminal (MFT) and China Ferry Terminal (CFT), a total of nine travellators fitted with motion sensors were installed.

Moreover, the first phase of the replacement project of sea water cooled chiller plant of the air-conditioning systems in MFT was completed in 2018.

The existing mosquito killer lamps in MFT and part of CFT (Phase I) were replaced by more energy efficient mosquito killer lamps in 2019.

To economise the use of air-conditioning, the indoor temperature of terminals is set at 25.5°C in line with the Government’s green policy. In addition, fluorescent tubes installed in the terminals are being replaced by LED lights progressively to minimise energy consumption.

(b) Public Cargo Working Areas (PCWAs)

The indoor temperature of Administration Building at all six PCWAs is set at 25.5°C in line with the Government’s green policy.
(c) **Aids to Navigation**

To save energy, over 90% of the aids to navigation on various bridges and piers have been changed to be fitted with longer life-span LED lanterns which will consume less electrical power. The Tathong Point light beacon was also replaced by longer life-span LED lantern in 2019.

---

## 1 | **Going Green at Government Dockyard**

The Government Dockyard on Stonecutters Island is the operational and maintenance base of all government vessels. Going green is an on-going commitment of the Government Dockyard. The following environmental measures were implemented at the Government Dockyard in 2019:

✧ **Collecting 560 waste lead batteries and 1195 used toner cartridges for recycling;**

✧ **Installing economical air compressors at all covered sheds to serve as a substitute of the high-power central compressed air system when compressed air demand is low at weekends and during public holidays;**
✧ Reducing unnecessary lamps and fluorescent tubes;

✧ Replacing old window-type and split-type air conditioners with efficient environmental non-ozone-depleting refrigerants;

✧ Replacing the instantaneous water heater with more energy efficient type with the European Union energy label A;

✧ Recovering useful parts and components from engines and equipment pending for disposal;

✧ Collecting generated chemical wastes, including lubricating oils, filters, batteries, fluoroprotein foam and fluorescent lamps, by licensed collectors;

✧ Replacing the existing lamp fittings with energy saving LED lamps at staircases at Block B and Block F. Motion sensors were installed along staircases to further reduce electricity consumption;

✧ Replacing the existing lamps and external floodlights with energy efficient LED lamps at washrooms and the refuse depot in boatyard area;
Displaying plants in offices; and

Affixing “Save Energy” stickers to lights switches to remind staff to switch lights off when not in use.

Green Fleet

(i) Green New Vessels with Environmental-Friendly Engines

Marine diesel engines installed on new vessels procured by MD will comply with the latest IMO’s regulation in reducing nitrogen oxides (NO\textsubscript{x}) emission.

To follow the Government’s green procurement policy, main and auxiliary diesel engines (over 130kW) on new government vessels comply with the most recent MARPOL regulations (i.e. the engines are IMO NO\textsubscript{x} Tier II emission types). IMO Tier II represents approximately a 20% reduction in NO\textsubscript{x} from Tier I.

In addition, MD’s new vessels will incorporate the use of hybrid power system, diesel-electric propulsion system, shore electric power and/or solar cells for lighting and ventilation so as to eliminate emission by the vessel’s own generator during the vessel’s standby.

(ii) Existing Vessels

Since 2002, MD crew have been advised to operate vessels at economically safe speed in accordance with the engine manufacturer’s recommendation. Up to 2019, nine MD vessels and 34 police diesel-driven vessels have been using B5 biodiesel in order to reduce emission of sulphur dioxide (SO\textsubscript{2}) and carbon dioxide (CO\textsubscript{2}).
We are committed to the Government's green management policy and advocate the principle of 4Rs – "Reuse, Reduce, Recycle and Replace". For instance, disposable paper cups have been replaced by reusable cups when hosting meetings. Our colleagues are also encouraged to bring their own cups to meetings. To advocate good green practice, no bottled water is distributed by our pantry service.

(a) Recyclable Materials Collection Campaign

MD’s Headquarters at Harbour Building has joined the Recyclable Materials Collection Campaign organised by the Building Management Office since early 2008 to allow paper waste, plastic bottles and aluminium cans to be collected separately at the source.

(b) “Plastic-free Takeaway, Use Reusable Tableware” Campaign

In line with the Government’s green policy, to minimise the use of disposable tableware and cultivate the habit of using reusable tableware, the catering operators in the Government Dockyard Canteen, Tuen Mun Public Cargo Working Area Canteen and New Yaumatei Public Cargo working Area Canteen have ceased distributing plastic straws and poly-foam food containers to customers since 2019.
MD is commended by the Environmental Protection Department for participating in the "Plastic-free Takeaway, Use Reusable Tableware" Campaign in 2019.

(c)  Green Information Technology (IT)

By utilising clusters of blade servers and virtualisation technology, 74 physical servers and applications supporting 38 backend systems and IT infrastructure have been transformed, resided and run within a Cloud Computing environment by December 2019.

As a total e-business solution for port formalities documents and public services, Electronic Business System (eBS) continuously evolved to save paper and travelling cost. Starting from March 2019, we have accepted electronic certificates for ocean-going vessels in addition to physical copies of vessel certificates. Another new online service was also implemented to allow authorised surveyors to submit survey-related reports by means of e-submission.
(d) E-Notices, Circulars and E-cards

In 2019, MD continued to disseminate information through the departmental intranet and departmental website to minimise the circulation of hard copies and consumption of paper. Electronic greeting cards have been sent out since 2001.

(e) Paper Saving

We endeavour to consume less paper. In 2019, MD consumed 9 615 reams of A4 recycled paper\(^2\), which registered a decrease of 10% (i.e. 1 045 reams) when compared with 2018. Detailed figures of paper consumption for the period between 2009 and 2019 are at Annex I. To reinforce staff awareness, guidelines on green management have been re-circulated to all staff at regular intervals.

An electronic filing system (known as Electronic Record-keeping System) has been rolled out since August 2019 for Batch 1 users. Looking ahead, the use of information technology helps reduce paper consumption.

(f) Energy Saving

In 2019, MD consumed 20 700 853 kWh of energy, which registered a decrease of 3% (i.e. 666 047 kWh) when compared with 2018. Detailed figures of energy consumption for the period between 2009 and 2019 are at Annex II.

\(^2\) No virgin paper (also known as woodfree paper) was consumed in 2019.
MD has participated in energy saving projects with a view to reducing energy consumption. In addition, energy wardens have been appointed since 2005 to conduct green housekeeping inspections and energy saving checks on a bi-monthly basis. In addition, Divisional Executive Officers have been tasked to perform regular checks on the completed inspection reports conducted by the energy wardens.

(g) Water Saving

Stickers were placed in prominent places such as pantries and washrooms to remind colleagues to reduce water consumption.

(h) Reducing fuel consumption

Our drivers continued to comply with the requirement to switch off idling engines and observe eco-driving practices.

(i) Carbon audit

In accordance with Environment Bureau Circular Memorandum No. 1/2017 on “Carbon Management in Government Buildings” which came into effect in April 2017, bureaux and departments are required to conduct annual carbon audits for their buildings with annual electricity consumption over 500,000 kWh.
Carbon audits were carried out at the Hong Kong-Macau Ferry Terminal, China Ferry Terminal and Government Dockyard. The greenhouse gas emissions were 6,071, 3,274 and 2,724 tonnes of CO$_2$ or equivalent respectively for Financial Year 2018-19.

(j) **Green Tips in “Scuttle Butt”**

“Ten Housekeeping Green Tips” have been regularly circulated to staff via internal emails. Green tips and news about environmental conservation are also publicised in our staff newsletter, “Scuttle Butt”, on a quarterly basis.

(k) **Earth Hour 2019 and No Air-Con Night 2019**

We support “Earth Hour 2019” organised by World Wide Fund for Nature and “No Air-con Night 2019” organised by Green Sense by relaying the event information to all staff to encourage their participation at home by turning off non-essential lighting and air-conditioners respectively.
MD has joined the Indoor Air Quality (IAQ) Certification Scheme launched by EPD to promote and commend good IAQ management practice. The following premises have been classified as “Good Class” under the IAQ Certification Scheme:

- MD Headquarters (Harbour Building)
- Government Dockyard’s Administration Building (Block A)
- Harbour Patrol Section Main Building and its Annex Building
- China Ferry Terminal
- Hong Kong-Macau Ferry Terminal
Environmental Targets for 2020

To sustain our accomplishments on environmental work, we shall continue to:

✧ do our best to prevent and fight against all forms of marine pollution, such as marine refuse, oil spills, smoke emission, etc.;

✧ encourage our staff and appeal for their support for adopting green measures and participating in green activities;

✧ convert more aids to navigation to longer life-span LED lanterns;

✧ identify business areas to be transformed into an e-service under eBS;

✧ explore new means and pay particular attention to a wider use of electronic measures to minimise the usage of paper and energy;

✧ work closely with EMSD and EPD in implementing more energy-saving projects to reduce electricity consumption and identifying renewable / alternative energy;

✧ replace those aged air-conditioning systems by adoption of the energy-saving type chillers and variable refrigerant volume (VRV) systems to reduce electricity consumption; and

✧ identify more areas in Government Dockyard which can use energy-saving lighting to reduce electricity consumption and explore the possibility for installing solar panels in available spaces to gain green energy in Government Dockyard.
To fulfil our commitments under the Clean Air Charter, we will continue to:

✧ implement energy saving measures with a view to reducing energy consumption in Government Dockyard and ferry terminals;

✧ implement the Government’s green procurement policy that main and auxiliary diesel engines (over 130 kW) on new government vessels are IMO NOx Tier II emission types;

✧ encourage user departments to adopt more solar energy for their new government vessels where possible;

✧ review vessels’ operational profile and urge all user departments to operate at the optimal conditions as far as practicable to reduce fuel consumption;

✧ work with EPD on using biofuel in government vessels; and

✧ explore with user departments who bid for government new shipbuilding projects to adopt hybrid propulsion systems and/or other green technologies, if applicable.
**Information and Suggestions**

We encourage knowledge and experience sharing with stakeholders on environmental issues. You are welcome to give us your views and suggestions by the following means:

- **Address:**  Marine Department Headquarters, 22/F, Harbour Building, 38 Pier Road, Central, Hong Kong.
- **Tel:**  2542 3711
- **Fax:**  2541 7194
- **E-mail:**  mdenquiry@mardep.gov.hk
A4 Paper Consumption - MD Offices

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Consumption (reams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>7,947</td>
</tr>
<tr>
<td>2010</td>
<td>9,038</td>
</tr>
<tr>
<td>2011</td>
<td>8,056</td>
</tr>
<tr>
<td>2012</td>
<td>8,285</td>
</tr>
<tr>
<td>2013</td>
<td>9,296</td>
</tr>
<tr>
<td>2014</td>
<td>9,545</td>
</tr>
<tr>
<td>2015</td>
<td>9,990</td>
</tr>
<tr>
<td>2016</td>
<td>10,986</td>
</tr>
<tr>
<td>2017</td>
<td>10,235</td>
</tr>
<tr>
<td>2018</td>
<td>10,660</td>
</tr>
<tr>
<td>2019</td>
<td>9,615</td>
</tr>
</tbody>
</table>
Annex II

Electricity Consumption - MD Offices

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Consumption (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>23,800,719</td>
</tr>
<tr>
<td>2010</td>
<td>22,671,480</td>
</tr>
<tr>
<td>2011</td>
<td>22,336,616</td>
</tr>
<tr>
<td>2012</td>
<td>21,723,773</td>
</tr>
<tr>
<td>2013</td>
<td>21,316,588</td>
</tr>
<tr>
<td>2014</td>
<td>21,866,410</td>
</tr>
<tr>
<td>2015</td>
<td>21,844,606</td>
</tr>
<tr>
<td>2016</td>
<td>21,704,401</td>
</tr>
<tr>
<td>2017</td>
<td>21,250,261</td>
</tr>
<tr>
<td>2018</td>
<td>21,366,900</td>
</tr>
<tr>
<td>2019</td>
<td>20,700,853</td>
</tr>
</tbody>
</table>