

Hong Kong Observatory

Sustainability Report for Fiscal Year 2017/18





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1 Director's Message

The financial year 2017/18 has been both a challenging and fruitful one for the Hong Kong Observatory (HKO). This report details the performance and efforts of HKO in respect of sustainability during the year.

In 2017/18, our weather services continued to maintain its high quality to meet with public demand. The number of visitors to the HKO website and the “My Observatory” mobile application reached 160 billion. The successful ISO accreditation of Automatic Wind Measurement Services for the operation of Tropical Cyclone Warning Services, and Radiation and Upper-air Meteorological Measurement Services also boosted our confidence in providing professional weather services to our citizens.



There were also a number of historical developments during the year. First, our Headquarters (HQ) has received WMO's recognition as a centennial observing station, which is one of the first few observing stations in Asia that gained such international status. The year 2017 also marked the centenary of the numbered typhoon system with the refurbished Cheung Chau Meteorological Station returning to public's sight. Hong Kong was hit by Typhoon Hato the same year, one of the fiercest in recent years. Nevertheless, I was relieved to see that the losses and damages to Hong Kong due to Hato were minimized. I am very grateful to my colleagues, both past and present, for their dedicated efforts in providing professional meteorological services, without which the achievements above could not have been materialized.

Apart from excellence in service development, HKO is determined to spare no effort in pursuing green causes to combat against climate change. We strive to foster a green culture within our offices and also cultivate an environmental-friendly attitude with stakeholders. Encouragingly, with the implementation of various housekeeping measures and optimization, the electricity consumption in 2017/18 was reduced by 3.3% when comparing with that of 2013/2014 after normalization. As regards the indoor air quality, HKO HQ was again categorized as “Good Class” under the Indoor Air Quality Certification Scheme, while the Terminal Doppler Weather Radar Station at Brothers Point, with its state-of-the-art greenery design, continued to be rated as “Excellent Class”. Furthermore, the launch of electronic application “MyFlightWx”, aiming to replace traditional paper-based meteorological flight documentation, also helped contribute to the



reduction of paper consumption by aviation service providers, benefiting society as a whole. Lastly, we were very pleased that our green efforts had been recognized by the Environmental Campaign Committee with the award of Merits under the 2017 Hong Kong Awards for Environmental Excellence.

During the year, HKO continued to engage the public through different ways and means, including the annual Open Day, exhibitions, talks and lectures, to enhance interaction with the community we serve. The year 2017/18 also marked a milestone for our public communication, as we have launched our own facebook and instagram pages. We are grateful for the warm support from the public on our social media platforms, which would give a strong impetus to us for providing our services at the next higher level.

Building a better society through innovation in science and dedication in services has always been a core vision of HKO, and we shall make every effort to enhance our performance and boost sustainability in the years ahead. Readers are welcome to provide comments and feedbacks to help us identify ways for further improvement.

C M SHUN

Director of the Hong Kong Observatory



2 About the Department

HKO, established in 1883, is a government department responsible for monitoring and forecasting weather, as well as issuing warnings on weather-related hazards. HKO also monitors and assesses radiation levels in Hong Kong, and provides other climate and geophysical services to meet the needs of the public and the shipping, aviation, industrial and engineering sectors. Its governance is of international standard and is one of the leading meteorological organizations in the world.

HKO has four manned offices, with their locations as follows:-

- (a) HKO Headquarters at 134A, Nathan Road, Tsim Sha Tsui;
- (b) Miramar Tower Office at Units 2304-09, 23/F, Mira Place Tower A at Tsim Sha Tsui;
- (c) King's Park Meteorological Station at Yau Ma Tei; and
- (d) Airport Meteorological Office at Chek Lap Kok.

Besides, five radar stations are operated at Tai Mo Shan, Tate's Cairn, Brothers Point, Tai Lam Chung and Siu Ho Wan. As at 31 March 2018, HKO operated a total of 195 weather stations including automatic weather stations, rain-gauges, anemometers and tide stations.

The revised estimate of HKO in 2017/18 was \$291.8 million, which was wholly deployed for operational expenses in the financial year.

2.1 Staff Establishment

HKO had an approved establishment of 315 as at 31 March 2018, with details as shown below:

Grade	Establishment
Directorate	5
Scientific Officer Grade	59
Experimental Officer Grade	52
Radar Specialist Mechanic Grade	25
Scientific Assistant Grade	96
General Grades	55
Common Grades	23
Total	315



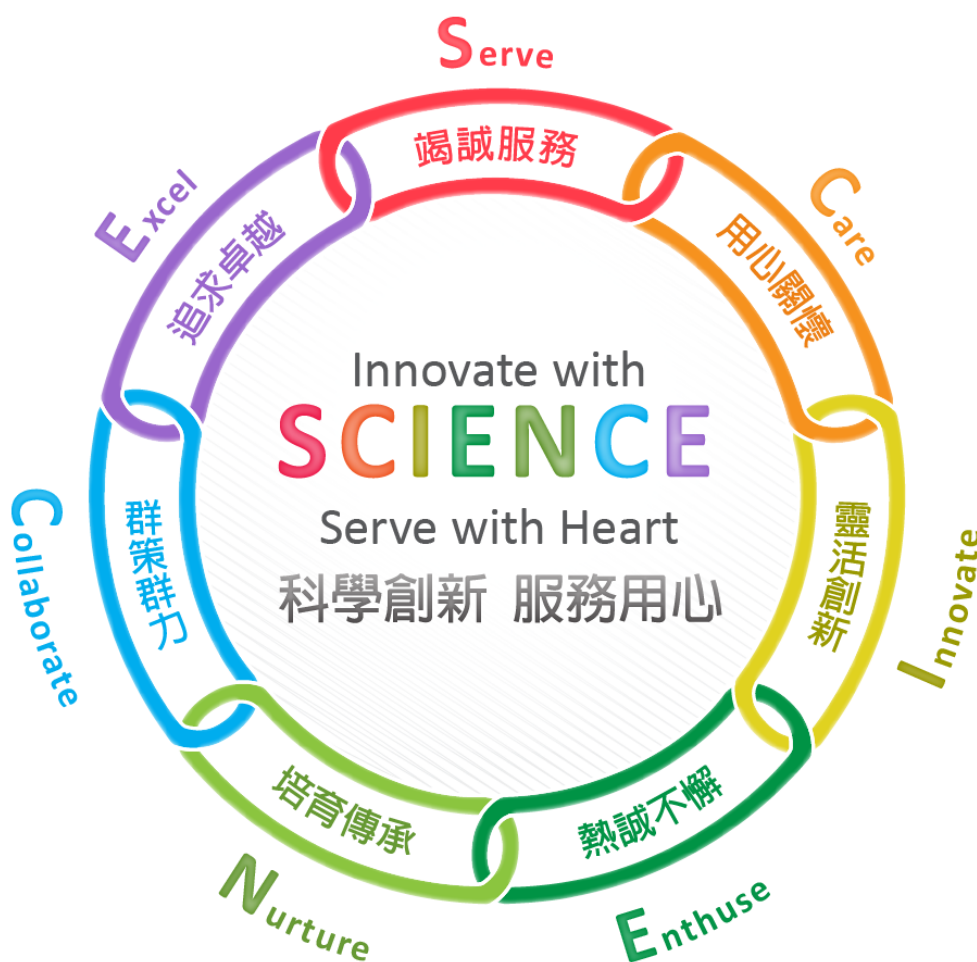
2.2 Vision, Mission and Values

Vision

Be a model of excellence in protecting lives and building together a better society through science.

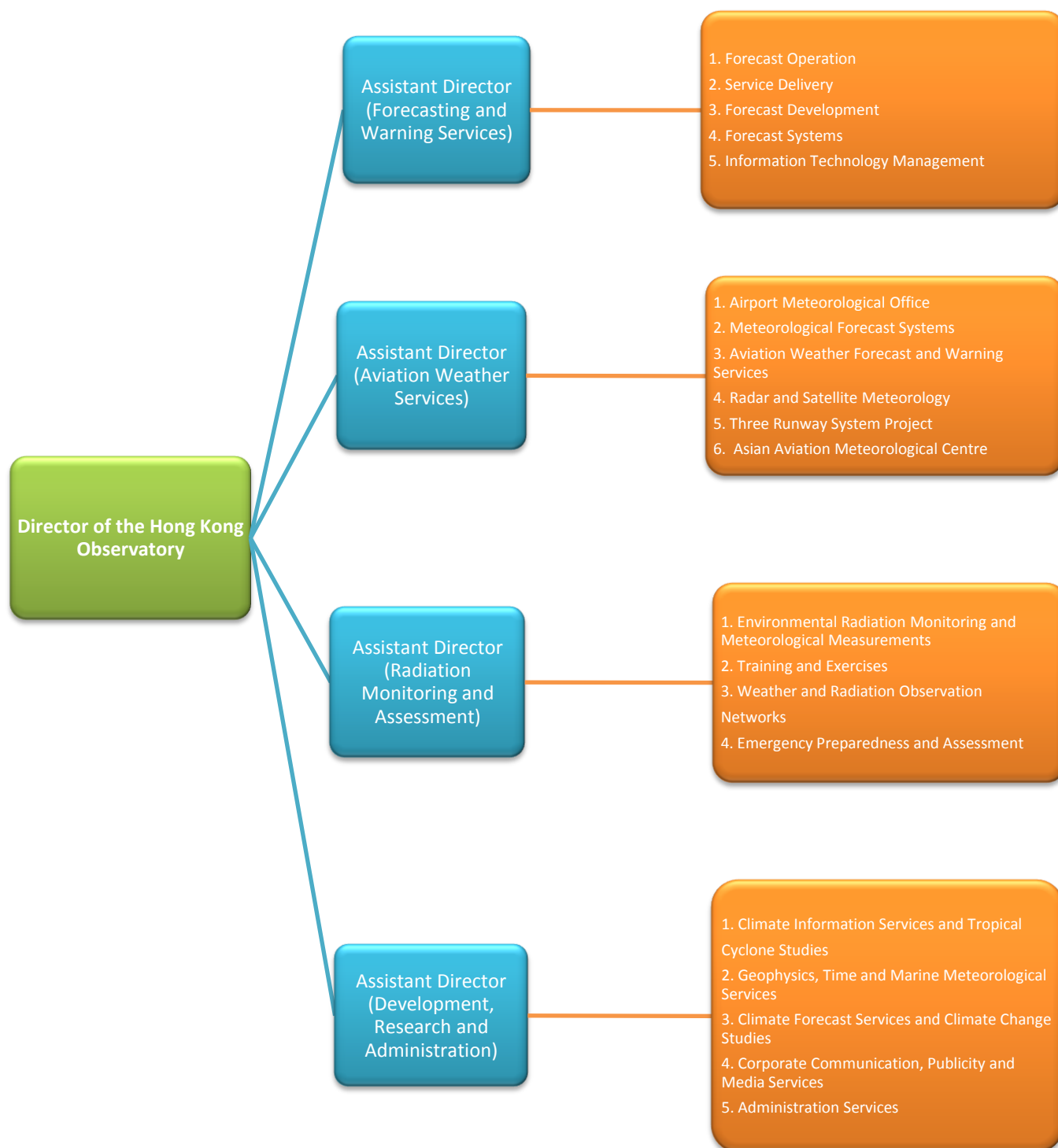
Mission

To provide people-oriented quality services in meteorology and related fields, and to enhance the society's capability in natural disaster prevention and response, through science, innovation and partnership.





2.3 Governance Structure (as at 31 March 2018)





3 About the Report

When compiling the report, we have made reference to internationally and locally recognized reporting guidelines, namely, Global Reporting Initiative (GRI) G4 Guidelines and Hong Kong Exchanges and Clearing Limited's Environmental, Social and Governance Reporting Guide.

This report is prepared annually to meet the needs of:-

- the general public receiving HKO information via traditional media, social media, telephone, mobile devices or by browsing HKO website;
- all Government Bureaux and Departments;
- visitors to HKO; and
- other users of HKO services including those from the aviation, shipping, business, industry, education, engineering, public utility and tourism sectors.

This report is divided into three main parts as follows:-

- the first part (section 4) highlights the activities and initiatives of the Department during the year;
- the second part (section 5) introduces the environmental policies adopted by the Department and its achievement in support of sustainable development during the year; and
- the third part (section 6) presents the work done by HKO in the community, such as on the aspects of public education and communication.



4 Activities and Initiatives

4.1 5-year Strategic Plan

To keep pace with a fast-changing society and an increasingly challenging environment, HKO has formulated a 5-year Strategic Plan that sets out directions for development thrusts for the period 2017 – 2021. The working priorities are outlined as follows:-

- Public weather services — to provide impact and risk-based public weather services with the Multi-Hazard Early Warning System;
- Aviation weather services — to provide excellent aviation weather services at the regional and global levels;
- Diversified climate services — to develop innovative climate services with the concept of "MET+" and support the climate change strategy of Adaptation, Resilience and Mitigation (ARM);
- Public education and communication — to enhance public engagement through new media and channels;
- Big Data — to mainstream Big Data for service development;
- Research and development — to continue research and innovation in a multitude of areas, including new instruments, high impact weather, service provision, and emergency response; and
- Resource management and training — to strengthen resource management of the department and promote diversified training.

4.2 ISO Accreditation

In pursuit of quality management as advocated by the World Meteorological Organization (WMO), HKO has successfully acquired the ISO 9001:2015 certification in 2017/18 for the provision of Automatic Wind Measurement Services for the operation of Tropical Cyclone Warning Services and Radiation and Upper-air Meteorological Measurement Services.



Fig 1: The Director of the Hong Kong Observatory (DHKO), Mr Shun Chi-ming (middle), and Assistant Director, Mr Tsui Kit-chi (right), receiving the ISO 9001:2015 certificates from the Senior Manager of the Global Products and Services Development of SGS Hong Kong, Mr Chris Yau (left), at the presentation ceremony on 31 January 2018.

4.3 Staff Training and Development

Training and development are crucial to the assurance of professional, technical and core competency in support of the long-term sustainable development of HKO towards the vision of being a model of excellence in protecting lives and building a better society through science. To this end, HKO draws up its Departmental Training and Development Plan every year and promulgates to all staff the objectives, policies, specific training and development plans and opportunities for the year ahead.

In 2017/18, HKO has provided training to staff to cope with the fast evolving global trends including the rise of social media, machine learning, Internet of Things technologies and intelligent crowdsourcing for big data analytics. Courses organized in 2017/18 are highlighted as follows: -



Date	Training
24 to 27 Apr 2017	Advanced Communication, Live Presentation and Social Media Training Programme
26 Apr 2017	Seminar for New Recruits – Smart Regulation and Business Facilitation
27 Apr 2017	Big Data and Smart City
8 & 13 Sep 2017	ISO 9001:2015 Internal Auditor Training
24 Jan to 9 Feb 2018	Innovative Leadership Programme
12 Mar 2018	Sharing Session on the Use of Big Data Analytics Platform
20 Mar 2018	Crisis Communication Training Workshop for Senior Management and Senior Staff

In 2017/18, the total number of training man-days was 2,537, and the average number of training man-days per post was 7.8. The decrease, as compared with the previous year of 2016/17, was mainly due to the decrease in new recruits and hence the induction training attended.

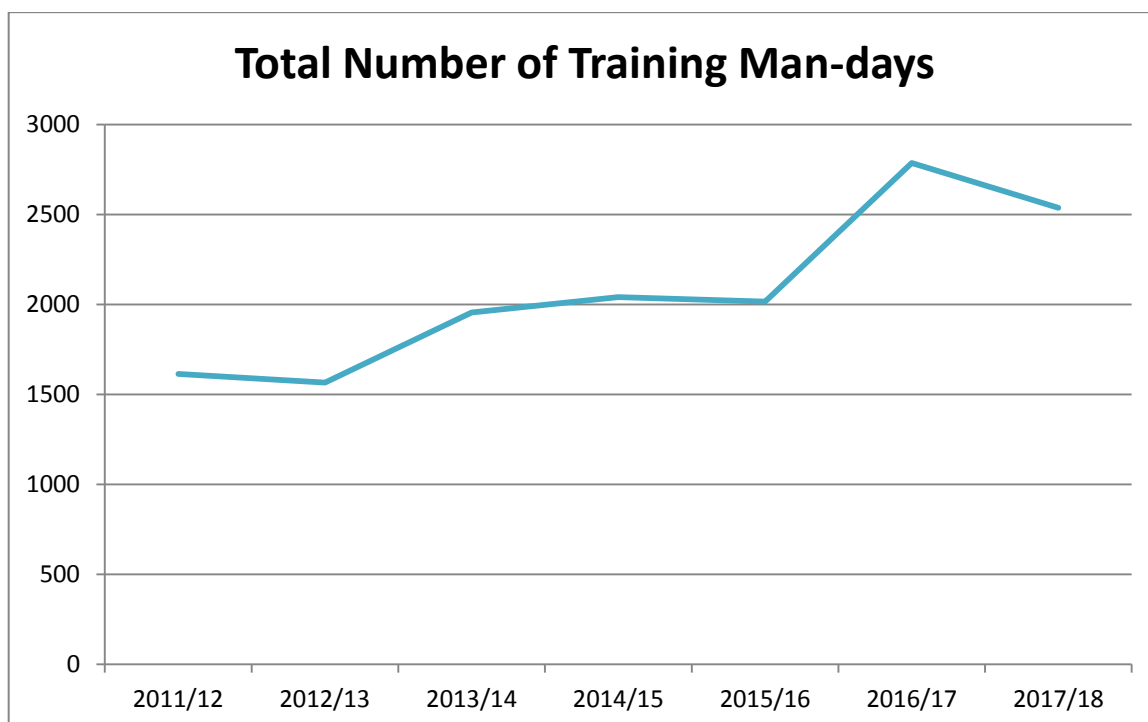


Fig 2: Total Number of Training Man-days from 2011/12 to 2017/18

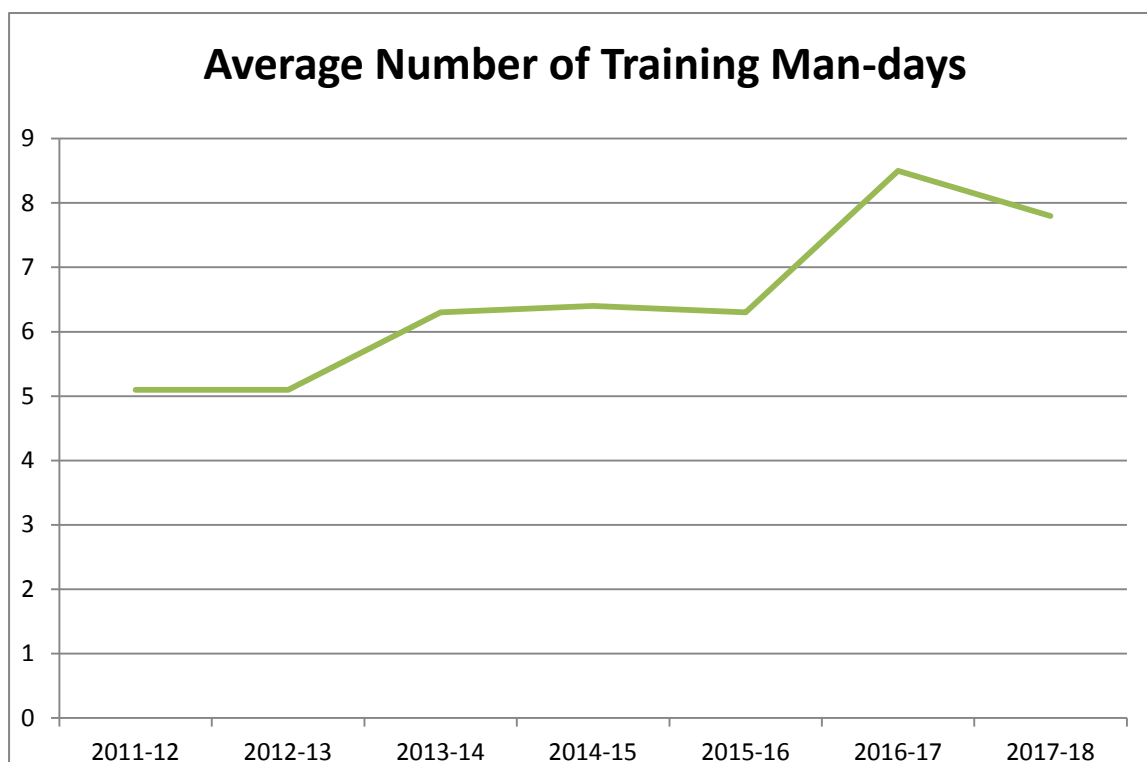


Fig 3: Average Number of Training Man-days from 2011/12 to 2017/18

A voluntary mentorship programme has also been implemented since 2014 to facilitate the transfer of skills and knowledge and to nurture a learning culture within the Department. The programme currently covers three technical areas, namely: (i) weather observation, (ii) information technology, and (iii) instrumentation. Staff are encouraged to join the programme as mentors or mentees according to their needs and interests.

To preserve and manage the vast amount of knowledge acquired, a number of knowledge management measures have been put in place, which include:-

- (a) a Sharing Databank to facilitate the gathering and sharing of resources and materials under different subject areas;
- (b) a revamped Cyber Learning Centre to facilitate the management of continuous self-learning by colleagues, including in-house training course materials as well as online training modules from other meteorological centres or training institutions; and
- (c) regular Technical Forum and Management Forum to facilitate the sharing of knowledge among colleagues.



HKO's effort in staff training and development was recognized by the Employee Retraining Board and a "Manpower Developer Award" was given to us first in May 2016. We also successfully renewed the recognition in 2018, demonstrating our commitments in five human resources areas, namely, "Leading a Learning Culture", "Resources Planning", "Training and Development System", "Performance Management", and "Corporate Social Responsibility in Manpower Development".



Fig 4: Certificate of Manpower Developer awarded to the Hong Kong Observatory

4.4 Occupational Safety and Health

HKO attaches great importance to the assurance of Occupational Safety and Health (OSH) for its staff. HKO regularly nominates staff to attend OSH courses organized by relevant Government Bureaux and Departments, such as the "General Training Course on OSH" organized by the Civil Service Bureau (CSB).

HKO also contributes to the promotion of OSH among civil servants by organizing training courses on radiation protection. We also support the OSH Seminars organized by CSB to promote the use of general weather information as an important reference for undertaking outdoor work.



In 2017/18, HKO continued to encourage staff to attend courses organized by various Bureaux and Departments including CSB and the Labour Department (LD), e.g. “Mandatory Basic Safety Training Course for Construction Industry”, “Shipboard Cargo Handling Basic Safety Training” and “Occupational Safety Management System”. HKO also invited representative from LD to our HQ in February 2018 to deliver a talk on OSH including working under extreme hot conditions and intensive manual labour. Besides, circulation of online materials on OSH was persistently made to raise staff awareness as well.

4.5 Highlights of Key Initiatives 2017/18

HKO is responsible for three main programme areas, namely weather services, radiation monitoring and assessment, and time standard and geophysical services.

(a) Weather Services

HKO provides weather services to deliver in a timely manner short to medium range weather forecasts and warnings. In support of such services, it operates a range of weather monitoring equipment, including a territory-wide network of automatic weather stations for measuring wind, pressure, temperature, humidity and rainfall, a network of cameras and visibility meters for providing real-time weather photos and visibility reading, a lightning location network for detecting lightning, two Doppler weather radars for detecting the intensity and movement of rain areas, as well as a network of sensors and equipment in the vicinity of the Hong Kong International Airport, including Terminal Doppler weather radars and lidars, for monitoring wind shear and turbulence in support of airport operation. HKO also exchanges real-time data with other meteorological centres worldwide and receives cloud imageries from a variety of weather satellites.

In 2017/18, HKO fulfilled its performance pledge of issuing at least one bulletin every hour of the day, disseminating 99 % of the bulletins within ten minutes after each hour, and attained a forecast accuracy (as verified by objective means) of 92%. The total number of page views of HKO website and mobile weather application continued to reflect the high demand from public on the weather services provided by the Observatory, reaching the all-time-high figure of 167 billion in 2017.

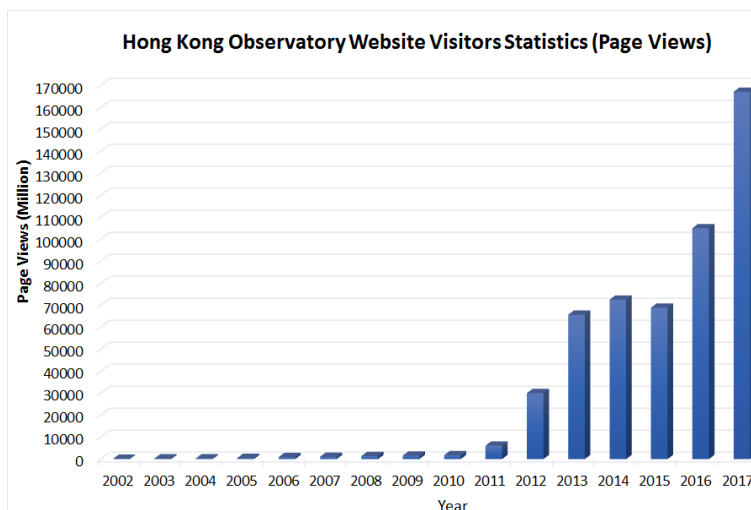
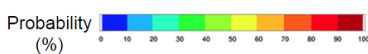
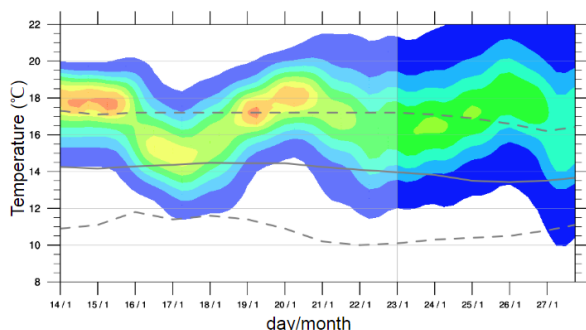


Fig 5: The total number of page views of HKO website and mobile weather application “MyObservatory” reached around 160 billion in 2017.

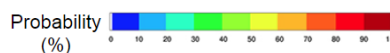
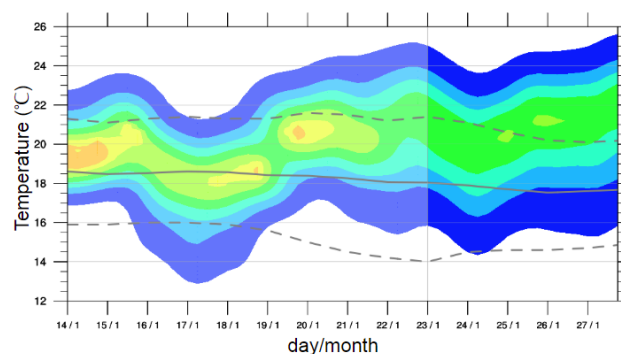
During the year, HKO further extended the scope of its service. One of the key initiatives was the launch of trial “Extended Outlook” forecast service. It provided probability forecasts of daily minimum and maximum temperatures for the next 14 days, enabling the public to further keep track of the temperature trend.

Probability Forecast of Minimum Temperature



- Solid line —: Climatological Mean
- Dotted lines - - - -: 85th (upper) and 15th (lower) percentiles of climatological distribution

Probability Forecast of Maximum Temperature



- Solid line —: Climatological Mean
- Dotted lines - - - -: 85th (upper) and 15th (lower) percentiles of climatological distribution

Fig 6: Time series probability forecast of maximum and minimum temperature.

Besides, HKO stepped up its effort in social media platform by launching its facebook and instagram pages on 23 March 2018, in order to enhance the communication with public. The facebook page has received overwhelming public support, already attracting more than 120,000 followers by the end of 2018, which was recognized as the fastest growing facebook page in Asia.



Fig 7: The facebook and instagram pages of HKO

In 2017/18, HKO also maintained a close surveillance of the weather at and around the Hong Kong International Airport (HKIA) and provided the aviation community with the weather information required for its operations. Special briefing service was provided to the Airport Authority Hong Kong for the evacuation of construction vessels from the Three-Runway System (3RS) project work area during the approach of tropical cyclones. Hong Kong’s fleet of automatic aircraft observation further expanded to 38 aircraft.

In tandem with the celebration of the 80th anniversary of aviation meteorological services in Hong Kong, the Observatory soft launched in December 2017 “MyFlightWx”, an electronic flight bag mobile application to provide flight crews with the latest weather information, replacing traditional paper-based meteorological flight documentation. Being the first of its kind, the application enabled flight crew to download data updates and keep abreast of the latest weather conditions during a flight on an aircraft equipped with wifi.



Fig 8: The General Manager Operations of Cathay Pacific Airways, Mr Mark Hoey (left), and DHKO (right), demonstrated the use of “MyFlightWx” in a Flight Simulator.

Furthermore, HKO continued to keep up its efforts in fostering wider international cooperation. For example, HKO signed a Memorandum of Understanding (MOU) on cooperation with the Thai Meteorological Department in September 2017 to strengthen meteorological collaboration between the two places, in areas including windshear detection, thunderstorm nowcasting, and coordination in the issuance of significant weather warnings for aviation, and the training of meteorological personnel.



Fig 9: DHKO (second to the left) is pictured with the Director-General of the Thai Meteorological Department, Mr Wanchai Sakudomchai (second to the right), at the signing ceremony of the MOU.

(b) Radiation Monitoring and Assessment

HKO provides information on local environmental radiation levels and effects and advises the Government on counter-measures that may be necessary during nuclear emergencies.

In the unlikely event of a nuclear emergency at the nuclear power stations in Guangdong, HKO will immediately step up radiation monitoring, assess the radiological consequences and provide technical advice to the Government regarding the appropriate protective actions to take.

In 2017/18, all radiation monitoring and assessment work in this programme was carried out satisfactorily. All equipment was maintained in a state of readiness, highlighted by the successful annual surveillance audits under ISO 9001:2008 for the radiation laboratory and the ambient gamma radiation level measurement service. Also, new radiation and monitoring and assessment facilities, in particular the second radiological survey vehicle, an online gamma spectroscopic analyzer network and a mobile version of the emergency radiation data management system, were put in use for enhancing emergency preparedness and response capability.

It was noteworthy that HKO participated in the government-wide Daya Bay Contingency Plan exercise in December 2017.



Fig 10: HKO colleagues operating the Monitoring and Assessment Centre in response to a simulated nuclear incident in December 2017.



Fig 11: A new radiological survey vehicle, in addition to the existing one, has been deployed into service since mid June 2017.



(c) Time Standard, Climate and Geophysical Services

HKO maintains the Hong Kong time standard, provides time signals for the public and contributes to the International Bureau of Weights and Measures for the determination of the universal standard time. It monitors earthquakes and the sea level and releases related information to the public, including the operation of the tsunami warning system. It provides geophysical, oceanographic, astronomical and climatological information to meet the requirements for town planning, engineering design and environmental impact assessments. It also keeps abreast of research and development on international issues such as global climate change and advises the public and government departments on the likely implications.

In 2017/18, HKO had successfully obtained the accreditation from the World Meteorological Organization in recognizing HKO HQ as a “Centennial Observing Station” for long-term climate monitoring. Long-term meteorological observations, in particular those from observing stations that provide continuous data for 100 years or more, are crucial for documenting and analyzing long-term variations of the Earth’s climate on multi-decadal and centennial timescales, thereby providing useful input to the development of climate research and services.



Fig 12: Mr Yung Wai-hung, Philip, the then Permanent Secretary for Commerce and Economic Development (Commerce, Industry and Tourism), officiated the plaque unveiling ceremony with DHKO in March 2018, on the occasion of HKO HQ being recognized by WMO as a “Centennial Observing Station”.

Apart from the above, HKO continued to dedicate its efforts in raising public awareness on the adverse impact of climate change, in which we collaborated with the Radio Television of Hong Kong to produce and broadcast a 13-episode series of live radio programme “Climate Watcher”. Other means of education, including school talks and educational videos, continued to convey the importance of taking actions to combat climate change.

5 Environmental Performance

5.1 Environmental Policy

HKO has put in place a departmental environmental policy that meets the guidelines issued by the Environmental Protection Department and other government departments, such as the Electrical and Mechanical Services Department and the Architectural Services Department. Moreover, we are committed to the Clean Air Charter, which aims at making sustained improvement to the air quality by introducing clean and energy-efficient measures in daily operation; and the Green Bottle Charter, which seeks to minimize the use of plastic bottles within the department. We strive to improve the environment by:

- conserving bio-diversity and preserving natural habitat within HKO Headquarters (HKO HQ) and its outstations;
- developing a culture of environmental conservation among staff;
- adopting the best practices in green housekeeping;
- complying with the requirements of relevant environmental protection ordinances; and
- promoting public awareness of environmental issues.



Fig 13: HKO was awarded the Certificate of Merit under the 2017 Hong Kong Awards for Environmental Excellence in recognition of its continual and dedicated efforts in protecting the environment.



5.2 Green Management System

HKO has set up the following committee/working group to formulate, monitor and implement environmental policy at HKO:

(a) Working Group on Energy and Environment

The Working Group on Energy and Environment, established in 2006, aims to collect and implement green ideas from staff and promote green awareness among all levels in HKO. It is chaired by the Assistant Director (Development, Research and Administration), with staff from different grades/ranks as members.

Examples of some new measures and staff suggestions implemented during 2017/18:-

- Replacing all traditional light tubes at the lift lobbies at our Centenary Building to LED ones; and
- Developing a computer application of pop-up window which reminds colleagues to "think before print".

(b) Buildings, Grounds and Accommodation Committee

The Buildings, Grounds and Accommodation Committee, chaired by the Assistant Director (Development, Research and Administration), evaluates the utilization of space and all major civil and building services works carried out at HKO premises and grounds to minimize the impact on the environment. Members include the Departmental Secretary, who is also the Green Manager of HKO, and four Senior Scientific Officers from their respective branches.

5.3 Environmental Measures

HKO has adopted multi-pronged environmental measures to support and implement the government's green initiatives and to promote low carbon living style and energy conservation awareness among staff.

(a) Car Free Day 2017

To reduce carbon emission from vehicles, staff are encouraged to use environmental-friendly means to travel to work. In this regard, a Car Free Policy is adopted at HKO to encourage colleagues to designate at least one working day per week as a Car Free Day.

In 2017/18, we also supported the initiative by Friends of the Earth and designated 22 September 2017 as our departmental “Car Free Day 2017”.

(b) No Air Con Night 2017

The increasing use of air-conditioners is widely regarded as one of the culprits behind global warming and climate change. To help alleviate global warming and promote energy conservation, HKO participated in the “No Air Con Night 2017” organized by Green Sense and suspended the use of non-critical air-conditioners for one night on 29 September 2017.



Fig 14: Appreciation certificate awarded to HKO for its participation in “No Air Con Night 2017”.

(c) “Planting Day”

HKO organized the annual Planting Day on 29 April 2017. Around 30-strong HKO colleagues and their family members joined the event and participated in the planting of seedlings.



Fig 15: HKO Planting Day 2017

(d) Waste Check Charter

HKO has won the Waste Check Promotional Partner Award (Class of Good) and the Waste Check Commitment Award under the Waste Check Charter, organized by the Environmental Protection Department and the Hong Kong Productivity Council (HKPC), in mid-2017.

During the Charter period, HKO honored its pledge to submit the data on waste disposal and waste recovery regularly. Our efforts were recognized with a Waste Check Commitment Award. In addition, the Observatory was also presented with the Waste Check Promotional Partner Awards (Class of Good), in recognition of its efforts in holding waste reduction publicity and educational activities.



Fig 16: The Waste Check Commitment Award (right) and Waste Check Promotional Partner Award – Class of Good (left) won by HKO.

(e) Preservation of bio-diversity



Fig 17: Lawn outside 1883 Building of HKO HQ



Fig 18: Mini-forest at HKO HQ

Apart from its historical and operational values, the woodland at HKO HQ also serves as a natural shelter for local birds. It is one of the few remaining semi-natural woodlands in Kowloon. Avian species like Spotted Dove, Chinese Bulbul, Crested Bulbul, Magpie Robin, Black-necked Starling and White-eye are inhabitants of the HKO woodland. The woodland is also of paramount importance as it serves as a stopover for migrating birds. Some birds, including Brown Flycatcher, Blackbird and Grey-backed Thrush, even stay for the whole winter.



Fig 19: Crested Bulbul resting in the mini-forest of HKO HQ.

HKO cherishes the bio-diversity of its site and works hard to preserve the natural habitat of the trees and vegetation at HKO HQ. Expert consultants / contractors are commissioned to help monitor and upkeep the healthy condition of the plants. Some 500-strong trees of different species can be found within the HKO compound with details as shown below (see next page):-



	English Name	Chinese Name	Scientific Name
1	Lebeck Tree	大葉合歡	<i>Albizia lebeck</i> (L.) Benth.
2	Alexandra Palm	假檳榔	<i>Archontophoenix alexandrae</i> (F. Muell.)
3	Hong Kong Orchid Tree	洋紫荊	<i>Bauhinia x blakeana</i> Dunn
4	Camel Foot Tree	宮粉羊蹄甲	<i>Bauhinia variegata</i> L.
5	Tall Bottle-brush	串錢柳	<i>Callistemon viminalis</i> G. Don
6	Horsetail Tree	木麻黃	<i>Casuarina equisetifolia</i> L.
7	Yellow Cow Wood	黃牛木	<i>Cratoxylum cochinchinense</i> (Lour.) Blume
8	Flame Tree	鳳凰木	<i>Delonix regia</i> (Boj. ex Hook.) Raf.
9	Longan	龍眼	<i>Dimocarpus longan</i> Lour.
10	Lemon-scented Gum	檸檬桉	<i>Eucalyptus citriodora</i> Hook. f.
11	Chinese Banyan	細葉榕	<i>Ficus microcarpa</i> L. f.
12	Common Red-stem	青果榕	<i>Ficus variegata</i> var. <i>chlorocarpa</i> (Benth.) King
13	Big-leaved Fig	大葉榕	<i>Ficus virens</i> var. <i>sublanceolata</i> (Miq.) Corner
14	Pond Spice	潺槁	<i>Litsea glutinosa</i> (Lour.) C.B.Rob.
15	White Champak	白蘭	<i>Michelia x alba</i> DC.
16	Chinese Red Pine	馬尾松(山松)	<i>Pinus massoniana</i> Lamb.
17	Frangipani	雞蛋花	<i>Plumeria rubra</i> L.
18	Buddhist Pine , Kusamaki	羅漢松	<i>Podocarpus macrophyllus</i> (Thunb.) D. Don
19	Wood-oil Tree	木油樹	<i>Vernicia montana</i> Lour.
20	Candlenut	石栗	<i>Aleurites molucana</i> (L.) Willd.
21	Indonesian Cinnamon	陰香	<i>Cinnamomum burmannii</i> (C.G.& T. Nees) Blume

(f) Summary of Other Green Measures

(i) Paper Consumption

- ✓ Establishing a policy of 10% cut in the stock supply of A3 and A4 papers and significantly reducing the consumption of A3 paper for printing weather charts.
- ✓ Encouraging the use of electronic means, such as email and e-Memo, for external and internal communication.
- ✓ Encouraging paperless meetings.
- ✓ Adopting duplex printing practices, minimizing photocopying, and uploading the “Guidelines on Reducing Photocopying Paper Use” onto the intranet for reference.
- ✓ Using blank side of used papers for drafting, printing, photocopying and faxing documents.
- ✓ Encouraging staff to re-use envelopes and file jackets whenever possible.
- ✓ Replacing printing of newsletters and circulars by electronic means and uploading publications on HKO website.
- ✓ Reducing the request for paper publications by other Bureaux and Departments where appropriate.

(ii) Waste Reduction and Recovery

- ✓ Recycling as the preferred option for disposal.
- ✓ Setting up shared printers to reduce the purchases of printers and toner cartridges.
- ✓ Collecting empty toners and inkjet cartridges of computer printers for recycling.
- ✓ Encouraging staff to use re-usable stationery such as refillable ball pens.
- ✓ Paper wastes, plastic bottles and aluminum cans to be collected separately at source by recycle bins.

(iii) Energy Conservation

- ✓ Using clean energy, such as solar power or wind power, to support operation of automatic weather stations and radiation monitoring stations.



Fig 20: Automatic weather station at Lai Chi Kok Park using solar power (see arrow).

- ✓ Using automatic circuit-break timers to switch off unnecessary electrical appliances after office hours.
- ✓ Using energy-saving T5 fluorescent tubes in all HKO premises to reduce energy consumption and mounting motion sensors to reduce energy wastage.
- ✓ Segregating hot and cold air flow by setting plastic screens in the high-performance computer room to enhance cooling efficiency of the air-conditioning system.
- ✓ Using auto-sensitized water taps in washrooms to reduce water consumption with flow controllers installed to reduce wastage.
- ✓ Minimizing the number of servicing lifts after normal office hours.
- ✓ Encouraging staff to use staircases instead of lifts for inter-floor traffic.
- ✓ Conducting regular inspection to ensure lights, computers and other electrical appliances in offices, conference rooms, corridors and common facilities are switched off during lunch breaks and after office hours.
- ✓ Switching off lights, air conditioners, photocopiers, computers and other electrical appliances when not in use.
- ✓ Using solar powered lighting devices.
- ✓ Setting the ambient office temperature to 25.5°C in the summer months and switching off air-conditioning system in winter wherever and whenever appropriate by using electronic control panel.
- ✓ Encouraging staff to dress more casually to reduce air-conditioning consumption where appropriate.



Fig 21: Bollard lamps at HKO HQ using solar power.

- ✓ Conducting regular checks and maintenance on the air-conditioning systems.
- ✓ Installing solar films in departmental vehicles and security guard room.



(iv) Air Quality Improvement

- ✓ Joining the IAQ Certification Scheme with “Good” class awarded in 2017 for the 1883 Building and Centenary Building at HKO HQ, and “Excellent” class awarded for Brothers Point Terminal Doppler Weather Radar Station.
- ✓ Carrying out regular maintenance and cleaning on air-conditioning systems.
- ✓ Maintaining a non-smoking environment in office premises and, designated area aside, prohibiting smoking at outdoor areas of HKO HQ.

(v) Procurement Practices

- ✓ Implementing e-Procurement system in phases to reduce the use of papers when conducting procurement activities.
- ✓ Complying with the government’s regulations and guidelines regarding green procurement.
- ✓ Encouraging suppliers to provide HKO with environmental-friendly products and stipulating green procurement specifications in tender documents, wherever appropriate.
- ✓ Utilizing environmental-friendly products, such as:
 - ✚ Photocopiers and printers capable of double-side and eco-printing
 - ✚ Automatic sensors installed in water dispensers
 - ✚ Water-saving type flush cisterns
 - ✚ High efficiency water purifiers
 - ✚ High pressure water gun for car-washing
 - ✚ High efficiency electrical appliances

(vi) Promoting Staff Awareness

- ✓ Promoting the principle of “Reduce, Reuse, Recycle and Replace” and encouraging staff to practise this 4-R principle in daily work where applicable.
- ✓ Promulgating resource saving tips regularly via emails, staff notices, circulars and posters.
- ✓ Organizing staff activities, such as Car-free Days and Light-off Days, to enhance environmental awareness.
- ✓ Operating an internal website “Green Corner” to enhance colleagues’ awareness on energy consumption, with guidelines on energy, paper and water conservation posted, as well as tips for energy saving at home and in office.
- ✓ Engaging staff in recycling programmes such as recycling of books, moon cake boxes and red packets.

5.4 Environmental Performance

(a) Envelope Consumption



Target 2.5% reduction achieved

Under the concerted effort of HKO staff, the annual cumulative envelope consumption for FY 2017/18 was 3,715 pieces, reduced by 132pcs (i.e. 3.4%), when compared with the figure in the base year FY 2013/14. The target of reducing envelope consumption by 2.5% was therefore well achieved.

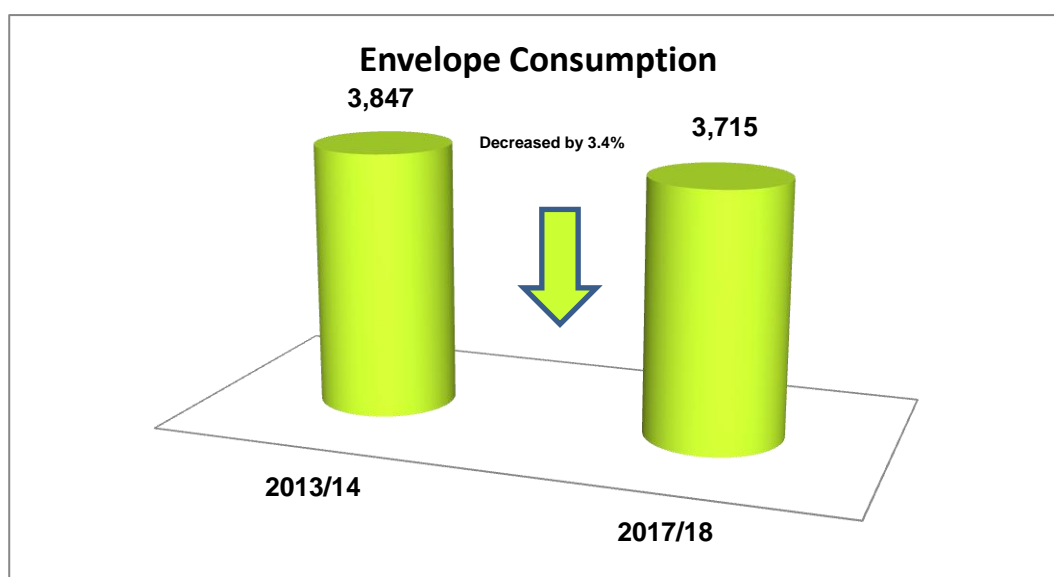


Fig 22: Envelop consumption in FY 2013/14 and 2017/18.

(b) Paper Consumption



Target 2.5% reduction achieved

As a result of various measures adopted, the annual cumulative paper consumption for FY 2017/18 was 1,434 reams, reduced by 76 reams (i.e. 5%), as compared with the baseline figure in FY2013/14. The target of reducing paper consumption by 2.5% was therefore achieved as well.

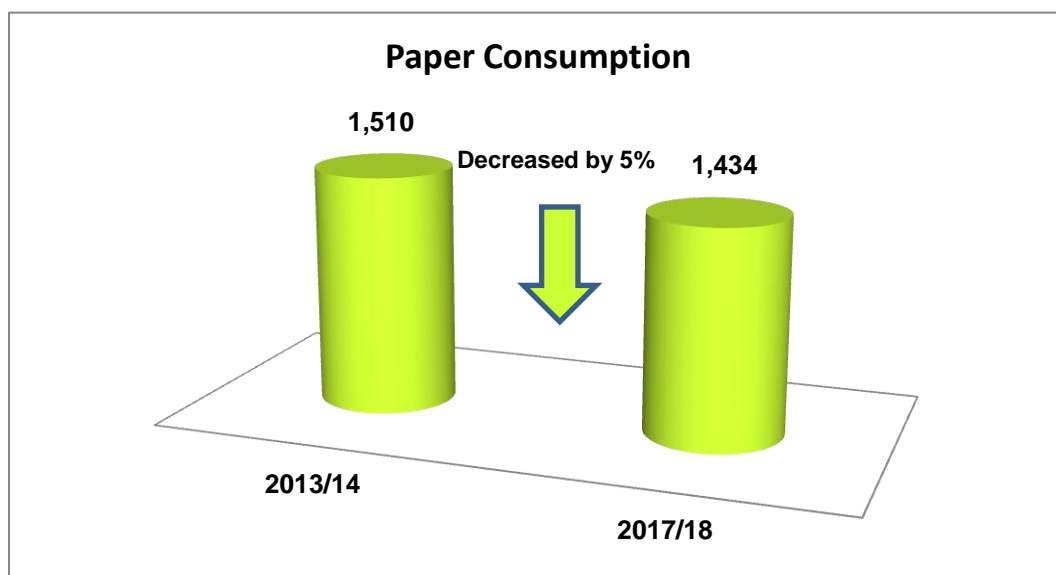


Fig 23: Paper consumption in FY 2013/14 and 2017/18.

(c) Electricity Consumption



Target 5% reduction in good progress

The annual cumulative electricity consumption for FY 2017/18, after normalized against activity changes in the intervening years, was 4,058,966 units, an decrease of 3.3% as compared with the base year FY2013/14. HKO will continue to implement various measures to conserve energy to achieve the target of 5% by FY 2019/20.

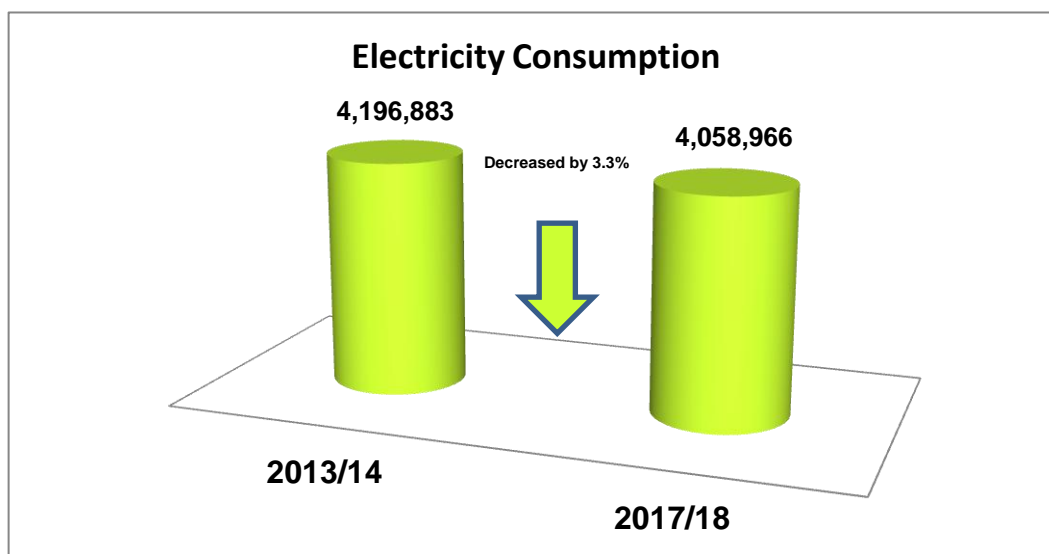








Fig 24: Electricity consumption in FY 2013/14 and 2017/18.



(d) Carbon Audit

In line with prevailing international and local practices, HKO has started to report its carbon audit results starting from FY 2016/17. The scope of carbon audit covers:

-  Fuel consumption by departmental vehicles
-  Electricity consumption at HKO HQ, King's Park Meteorological Station, Miramar Tower Office and outstations
-  Greenery at HKO HQ
-  Paper consumption
-  Freshwater processing
-  Sewage processing

The carbon emission of HKO in 2017/18 was 2,337.31 tonnes of CO₂-equivalent, a reduction by 1% when compared with that of 2016/17.

5.5 Targets for Fiscal Year 2017/18

HKO aims to achieve the following specific targets in FY 2017/18:

- 2.5% reduction in envelope consumption compared to FY 2013/14
- 2.5% reduction in paper consumption compared to FY 2013/14
- To continue to reduce annual electricity consumption with a target to achieve 5% saving by FY 2019/20 when compared with FY 2013/14¹
- To continue implementing green initiatives and other measures for conservation of bio-diversity.

¹ The 2015 Policy Address has set a target of 5% saving in the total electricity consumption of government buildings from FY 2015/16 to FY 2019/20 under comparable operating conditions, using FY 2013/14 as the baseline.

<u>Carbon Audit Report Table</u>						
Description (by source, areas, etc.)	GHG Emission by gas type (in tonnes of CO ₂ -equivalent)					
	Carbon Dioxide (CO ₂)	Methane (CH ₄)	Nitrous Oxide (N ₂ O)	Hydrofluoro-carbons (HFCs)	Perfluoro-Carbon (PFCs)	Total
Scope 1 Direct GHG Emissions						
Mobile Combustion Sources						
	48.68	0.0955	5.7376	N/A	N/A	54.52
Scope 1 GHG Emissions Total:						54.52
Scope 1 Direct GHG Removals						
Planting of Additional trees						
	1.288	N/A	N/A	N/A	N/A	1.29
Total Scope 1 GHG Removals:						1.29
Scope 2 Energy Indirect GHG Emissions (without being classified into specific gas type)						
Electricity Purchased:						2259.02
Towngas Purchased:						N/A
Total Scope 2 GHG Emissions:						2259.02
Scope 3 Other Indirect GHG Emissions						
Methane Generation at Landfill due to Disposal of Paper Waste						
	16.64	N/A	N/A	N/A	N/A	16.64
Electricity for Processing Fresh Water (without being classified into specific gas type)						3.89
Electricity for Processing Sewage (without being classified into specific gas type)						1.95
Total Scope 3 GHG Emissions						22.48
Total GHG Emissions of 2017/18:						2337.31
Total GHG Emissions of Previous Year 2016/17:						2360.05
% Change in GHG Emissions compared with Previous Year						-1.0%

6 Engagement with the Community

6.1 Outreach Activities

(a) HKO Open Day

The Open Day event is organized at the HQ in Tsim Sha Tsui for the public annually, in which information on climate change and other meteorological knowledge are shown through various displays and exhibits.

HKO Open Day 2017 was held on 25 and 26 March with around 14,000 visitors attending the event. Apart from HKO departmental staff, more than 80 volunteers from "Friends of the Observatory" served as goodwill ambassadors and offered enthusiastic support and assistance in receiving the visitors.



Fig 25: Group photo of participants at the seminar on "Understanding Clouds" and the award presentation ceremony of "Meteorological Information Technology Design Invention Competition"



Fig 26: Knowledge of climate and weather was introduced to visitors by HKO staff through an interactive approach.

(b) COWIN 2.0 and New Generation of Microclimate Station

The Observatory made its debut of new generation of Community Weather Information Network (Co-WIN 2.0) microclimate station in November 2017. The new generation of microclimate stations could provide information on air temperature, relative humidity, wind direction, wind speed, atmospheric pressure, the UV Index and more. With the enhancement of technology and mountable capability on drones, the stations were more suitable than their predecessors for operation within the city environment and convenient for deployment outdoors for collection of meteorological data. The data so collected would support urban climate studies, Big Data analytics, and smart city planning in meeting the challenges of climate change.



Fig 27: The 10th anniversary of CO-WIN was celebrated, with the debut of the new generation of microclimate station, at the opening ceremony of Zero Carbon Building's Smart-Drone Demonstration & Experience Day on 4 November 2017.

(c) Public Talks, Lectures and Exhibition

HKO continues its efforts to play an active role in promoting public awareness on various issues including weather forecasting and climate change. Talks, school visits, seminars and lectures are organized to achieve this goal.

(i) [Climate Change Exhibition on “Vanishing Glacier”](#)

A climate change exhibition on the theme "Vanishing Glaciers", jointly organized by the Jockey Club Museum of Climate Change of the Chinese University of Hong Kong, Project Pressure (a UK-based non-profit arts organization) and HKO, was held from March to June 2018. The exhibition featured photographs of various vanishing glaciers around the world to raise public awareness of climate change and its impacts. Consequent upon the fact that melting glaciers are contributing to sea level rise, the Observatory took the opportunity to present the impacts of sea level rise in Hong Kong.



Fig 28: By viewing the exhibited photos, visitors gained more knowledge on the impact of climate change on melting glaciers and, as a result, rising sea level.

(ii) [The 12th Edition of Eco Expo Asia](#)

The 12th Eco Expo Asia, organized by the Hong Kong Trade Development Council and co-organized by the Environment Bureau, was held at AsiaWorld-Expo, Hong Kong from 26 to 29 October 2017 with the theme of "Innovative Solutions for Greener Cities". HKO participated in the exhibition and presented the phenomena of global climate change and climate projections for Hong Kong, calling for actions to combat the impacts of climate change. We also delivered a talk on climate change science and exposed some climate myths at the Public Day Forum to enhance public awareness on climate change issues.

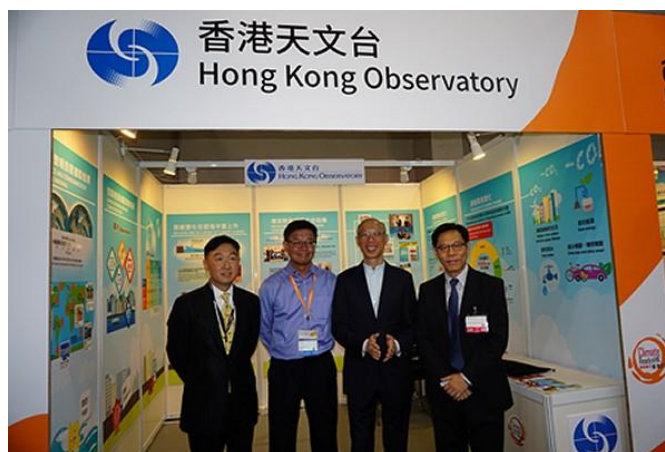


Fig 29: Mr WONG Kam-sing (2nd right), Secretary for the Environment, along with Mr Donald TONG (1st right), Permanent Secretary for the Environment and Director of Environmental Protection, and Mr Benjamin CHAU (1st left), Deputy Executive Director of the Hong Kong Trade Development Council, visited the Observatory's booth at the Eco Expo Asia.

(d) Other Outreach Activities

(i) Guided Tours in HKO HQ

Guided tours are held regularly through which members of the public can visit HKO HQ in Tsim Sha Tsui. Apart from understanding how weather forecasts are formulated and how technology is applied in the delivery of HKO services, participants can also learn more about the historical development of HKO and the ecological values of the woodland of HKO at the heart of the urban area.

(ii) Public Course on Weather Observation

The Public Course on Weather Observation, well received by the public since its launch in 2004, was successfully completed on 24 February and 3 March 2018. Around 130 participants learnt about the basic knowledge of weather observation, including the classification of clouds, weather phenomena and hazards, and the coding of weather reports, etc.

(iii) Nurturing Young Generation



Fig 30: HKO staff sharing with the youth their work and life experience.

To support the nurturing of young generation, HKO participated for the second time in a row in the meaningful project on “Career and Life Adventure Planning (CLAP) for Youth @ Jockey Club”, which is Hong Kong’s first cross-sectoral support platform that helps students and non-engaged youth navigate their futures. Some thirty secondary students and youths visited the HKO HQ in mid-April 2018. During the visit, they attended a dialogue session with different grades of the Observatory staff. They greatly appreciated the sharing with the staff members, which enhanced their understanding of the Observatory work and service culture, and most importantly, inspired them to set goals and plan for future career.

(iv) [Cloud Appreciation Workshops](#)

To encourage the elderly people to adopt a more active outdoor lifestyle and to appreciate the weather around them, HKO and the Senior Citizen Home Safety Association (SCHSA) jointly organized two Cloud Appreciation Workshops at the SCHSA and HKO HQ on 10 and 27 May 2017 respectively. The activities echoed the theme of the World Meteorological Day 2017 on “Understanding Clouds” to promote cloud observation knowledge. Responses to the events were overwhelming, with more than 120 senior citizens taking part.

At the workshops, HKO staff introduced different classifications of clouds and some observation techniques, while veteran photographers shared their experience in taking photos of clouds and other weather phenomena.



Fig 31: Mr Ng Tak-leung (Fifth from the left), the then Senior Scientific Assistant of the Hong Kong Observatory, introducing cloud observation techniques.

(v) Voluntary and Charity Activities

The HKO Volunteer Team is established to support and participate in various voluntary and charity activities. During 2017/18, the volunteer team organized various activities including fund raisings and visits to help the needy in the society and enhance the mutual understanding between different parties of the society.



Fig 32: The volunteer team visited the Christian Zheng Sheng College in July 2017, a school aiming to correct adolescents with drug addiction and other problems using life education.



Fig 33: The volunteer team provided a tour in October 2017 for the children of Camp Quality Hong Kong, an organisation aiming to provide support to children with cancer.

6.2 Staff Activities

Staff morale and well-being are indispensable keys to better governance and service provision. HKO continues to develop initiatives to maintain and enhance mutual understanding and support between the management and staff, including activities organized under the “Happy Business” programme.



Fig 34: Poster of "Happy Business"

A number of visits and activities were organized in 2017/18:-

- (i) a visit to the Fire and Ambulance Services Education Centre cum Museum managed by the Fire Services Department on 20 April 2017;
- (ii) two workshops on stress management on 9 November 2017 and 9 March 2018 respectively; and
- (iii) a visit to our Cheung Chau Meteorological Station on 8 December 2017.



Fig 35: A visit to the Fire and Ambulance Services Education Centre cum Museum on 20 April 2017.



Fig 36: A visit to our Cheung Chau Metrological Station. Its refurbishment was completed in December 2017 to commemorate the 100th anniversary of the introduction of numbered typhoon system.

Apart from the “Happy Business” programme, HKO also strives to enhance the wellness and cohesiveness of staff through various means, including:

- ✓ a Departmental Consultative Committee to serve as a platform to discuss staff related issues;
- ✓ tea gatherings between the senior management and staff were organized regularly to enhance communication and mutual understanding;



Fig 37: a tea gathering session between Management and Staff in January 2018.

- ✓ the HKO Staff Association with activities fostering work relations and a spirit of mutual assistance among members; and



Fig 38: Annual staff dinner organized by Staff Association in January 2018 to celebrate the Chinese New Year.

- ✓ “Sky Dragon”, HKO’s dragon boat team formed in 2015, participated in various dragon boat races during the year.



Fig 39: “Sky Dragon” at the Cheung Chau Dragon Boat Race for Tuen Ng Festival in May 2017.



7 Verification Statement

I have verified the information and data of the Sustainability Report 2017/18. I confirm that the data presented in the Sustainability Report 2017/18 are authentic and the methodology for the collection and analysis of data is appropriate. The report represents an accurate account of HKO's sustainability actions and performance in the fiscal year of 2017/18.

Jerry Siu
Green Manager
Hong Kong Observatory

8 Contact Information and Feedback Form

This report is available on our homepage at the following link:

http://www.hko.gov.hk/environmental/Sustainability_Report_1718_eng.pdf and at our Resource Centre at the following address:

Units 2304-2309, 23rd floor, Mira Place Tower A,
132 Nathan Road, Tsim Sha Tsui, Kowloon
Tel.: 2926 8250

If you wish to obtain further information or raise any suggestions about this report, please contact our Green Manager at telephone 2926 8207 or email to dsec@hko.gov.hk. You can also make use of the following feedback form and send it back to the Green Manager, Hong Kong Observatory, 134A, Nathan Road, Tsim Sha Tsui, Kowloon, Hong Kong, or fax it to 2311 9448, or by email to dsec@hko.gov.hk.

To: Green Manager, Hong Kong Observatory

Feedback Form on HKO Sustainability Report 2017/18

1. Do you find the Report informative? Yes No

2. Do you find the content of the Report easy to understand? Yes No

3. What other sustainability issues you would like HKO to include in the Report?

4. Which aspects of the Report need to be improved?

5. What is your overall view of the Report?

Name:

Telephone:

Email:

