Chapter 15

The Environment

The government's priorities in enhancing the quality of the environment include improving air quality, implementing a waste-to-resources and waste-to-energy management strategy, improving harbour water quality, promoting energy efficiency and conservation, and combating climate change

Hong Kong, with only 1,106 square kilometres of land, is home to some seven million people. More than 500 sq km of land is designated as protected areas, including country parks, special areas and conservation zones. But the city is also one of the world's largest trading economies. Inevitably, the heavy concentration of people and activities in a small area strains the environment, including the air quality. The impact of air pollution in the Pearl River Delta region also needs to be addressed.

Environmental protection is a major priority of the Hong Kong Special Administrative Region (HKSAR) Government. Improving air quality and the water quality of Victoria Harbour, managing municipal solid waste better through sustainable use of resources, promoting energy efficiency and strengthening regional cooperation are important for improving the quality of life and are government priorities.

Government spending on the environment in 2019-20 was budgeted at $22 billion, or about 3.4 per cent of total public expenditure.

The Environmental Protection Department (EPD), under the Environment Bureau, has overall responsibility for protecting the environment, including nature conservation. It executes environmental policies; vets environmental planning and assessment studies; enforces and reviews environmental laws; plans and develops facilities for waste disposal; promotes environmental management, auditing and reporting; and raises environmental awareness in the community.

The bureau's Energy Division oversees Hong Kong's energy policy to provide reliable supplies of energy at reasonable prices and promote their economical and safe use while minimising the environmental impact of energy usage and production.

The Sustainable Development Division promotes sustainable development in the government and the community. All bureaus and departments must conduct sustainability assessments of their major initiatives and present the implications to the Policy Committee and Executive Council.

This division also renders secretariat support to the Council for Sustainable Development, which is appointed by the Chief Executive to promote sustainable development in Hong Kong. It also administers the Sustainable Development Fund, which provides grants for projects that enhance public awareness of sustainable development and encourage sustainable practices. Since 2003, 74 projects have been approved and 67 of those completed, involving grants totalling about $76 million.

The EPD works with the government-appointed Environmental Campaign Committee to encourage the public's contribution to a better environment through campaigns and community programmes. The department's environmental resource and education centres provide the public with easy access to environmental information. The government's Environment and Conservation Fund promotes behavioural and lifestyle changes by supporting educational, research and other projects by non-profit-making organisations about the environment and conservation.

Cross-boundary Cooperation

Hong Kong works with Guangdong and Macao on environmental matters. The HKSAR and Guangdong governments have been implementing various measures to meet the 2020 reduction targets for regional air pollutant emissions. Both governments are considering post-2020 reduction targets and concentration levels, and collaborating on forecasting air quality.

The Guangdong-Hong Kong-Macao Pearl River Delta Regional Air Quality Monitoring Network comprises 23 air monitoring stations. Results from the network showed substantial reductions in most pollutants in recent years. From 2010 to 2019, the average annual concentrations of sulphur dioxide (SO_2), nitrogen dioxide (NO_2) and respirable suspended particulates (RSP) decreased 70 per cent, 23 per cent and 29 per cent respectively. The concentration of fine suspended particulates (FSP) has decreased 14 per cent since the pollutant was first monitored in 2015. The ozone level increased 22 per cent over the past 10 years, indicating regional photochemical pollution must be reduced.

The Cleaner Production Partnership Programme helps Hong Kong-owned factories in Hong Kong and Guangdong adopt cleaner production technologies and practices. The programme has been extended for five years up to March 2025.

Hong Kong and Shenzhen are implementing joint action programmes to protect the quality of adjoining waters. The water quality in Deep Bay has shown noticeable improvement, while that in Mirs Bay has remained consistently good. Hong Kong and Guangdong are also pursuing a joint water quality management plan to protect the water quality of the Pearl River Estuary.

Physical Characteristics, Flora and Fauna

Topography, Geology and Landforms

Hong Kong's natural terrain is characterised by rugged uplands flanked by steep slopes. The highest point is Tai Mo Shan (957 metres above Principal Datum) in the central New Territories, and the lowest point (66 metres below Principal Datum) is in Lo Chau Mun (the Beaufort Channel) to the north of Po Toi Island. The mountains are predominantly formed of volcanic rocks, whereas the lower hills and low-lying areas are generally underlain by granite or sedimentary rocks. A layer of soft, weathered rock covers the bedrock in most places, slope debris mantles the natural hillsides, and alluvium fills many of the valleys. Offshore, the seabed is covered with marine mud, with sand sheets occurring near the coast and in channels.

The oldest exposed rocks in Hong Kong were deposited as river sediments about 400 million years ago. Between 360 and 300 million years ago, the region was occasionally inundated by a shallow sea, during which limestones (now marble) and siltstones accumulated. From 170 to 140 million years ago, violent eruptions from several volcanic centres deposited thick ash layers. At deeper levels, molten magma intruded and slowly crystallised to form granite. Volcanism ended with a colossal eruption from the High Island Supervolcano centred in southeastern Hong Kong. Layered rocks on the island of Ping Chau are younger sediments, laid down in a lake on the edge of a desert about 50 million years ago. During the last 2.6 million years, several major glaciations occurred, causing successive lowering of the global sea level. Widespread river floodplains surrounded Hong Kong, and were later covered by marine mud when the sea level rose during interglacial periods.

Despite its small size, Hong Kong has a great variety of coastal landforms, including sea cliffs, sea caves, sea arches, geos, tombolos, wave-cut platforms, sea stacks, notches and blowholes.

The Civil Engineering and Development Department's Hong Kong Geological Survey Section has produced a series of fifteen 1:20,000-scale geological maps and six accompanying geological memoirs. In addition, two summary memoirs and a set of 1:100,000-scale geological and thematic maps in Chinese and English, covering various aspects of Hong Kong's geology, have been published. Geological information is available on the department's website.

Flora

Hong Kong is situated near the northern boundary of the distribution of tropical southeast Asian flora, sharing similar species and structure with the flora of Guangdong. Despite its small size, Hong Kong has a rich flora with about 3,300 species of vascular plants, of which 2,100 are native to the city.

The major types of vegetation cover comprise woodland, shrubland and grassland. Remnants of the original forest cover can still be found in steep ravines or behind traditional villages in rural areas. They have survived as a result of their location in precipitous topography and the moist micro-climate, or because they are protected for cultural reasons.

Continual afforestation efforts coupled with conservation measures have been made by the government. Besides greening and beautifying the countryside, woodlands are important habitats for wildlife and are essential to protect water catchments from soil erosion.

Fauna

Terrestrial

The climate and physical environment provide a wide range of habitats and support for a rich and varied fauna that includes over 550 species of birds, 55 species of terrestrial mammals, 25 species of amphibians, 90 species of reptiles, 193 species of freshwater fish, 245 species of butterflies and 128 species of dragonflies.

Among the rich terrestrial biodiversity, some species, such as the Bogadek's burrowing lizard, have been recorded only in Hong Kong. The territory is also home to a number of globally threatened species, such as the three-banded box turtle, yellow-breasted bunting, short-legged toad, Chinese pangolin and Chinese tiger dragonfly.

The Mai Po Marshes form one of the most important wildlife conservation sites in Hong Kong. Together with the Inner Deep Bay area, the Mai Po Marshes area is listed as a 'Wetland of International Importance' under the Ramsar Convention. About 1,500 hectares of inter-tidal mudflats, fish ponds, marshes, reed beds and mangroves provide a rich habitat for migratory and resident birds, particularly waterbirds. Around 400 species of birds have been observed in this area. About 50 species are considered globally threatened or near threatened, including the black-faced spoonbill, Baer's pochard, Nordmann's greenshank and spoon-billed sandpiper. The Agriculture, Fisheries and Conservation Department implements a wetland conservation and management plan to conserve the ecological value of the area.

Traditional *fung shui* woods near old villages and temples and secondary forests provide important habitats for many woodland birds. Warblers, flycatchers, robins, thrushes, bulbuls and tits are among the birds that have been sighted.

Areas around the Kowloon reservoirs are inhabited by monkeys descended from individuals released there in the early 20th century. These monkeys include the rhesus macaque and hybrids of the rhesus macaque and long-tailed macaque. Some have migrated to the forested areas of Shing Mun Reservoir and Tai Po Kau. The feeding of monkeys is prohibited, to make them forage for natural food in the countryside.

Other mammals that are very common in the countryside include the red muntjac and Eurasian wild pig, while the leopard cat, small-toothed ferret badger and masked palm civet are less commonly seen. Cave-dwelling bats such as the Pomona leaf-nosed bat and Chinese horseshoe bat are found in caves and water tunnels, while the short-nosed fruit bat likes roosting under the Chinese fan palm. Sightings of rare species, such as the Eurasian otter and crab-eating mongoose, are reported occasionally.

The territory is home to 115 species of amphibians and reptiles, of which the Hong Kong cascade frog, Hong Kong newt, Romer's tree frog and Burmese python are protected under the Wild Animals Protection Ordinance. Most of the 53 species of snakes are non-venomous, and

reports of people being bitten by highly venomous snakes are rare. Among the five species of sea turtles recorded in Hong Kong waters, only the green turtle is known to be breeding locally.

Marine

Hong Kong's subtropical marine environment supports species found in both tropical and temperate climates. Local waters contain a wide diversity of fish, crustaceans, molluscs and other marine life, of which many are of fisheries significance. Situated on the eastern bank of the Pearl River Estuary, Hong Kong receives fresh water from the river, especially in its western waters. The waters on the eastern side, on the other hand, are little influenced by the Pearl River outflow and are predominantly oceanic in nature. This unusual hydrography contributes to the high diversity of marine life.

Despite being close to the northern geographic limit for their growth, Hong Kong supports 84 species of hard corals. This diversity is quite rich by international standards. A variety of marine fish also breeds in local waters. Typical of the eastern waters is the red pargo, one of several sea bream varieties whose fry are abundant along the shore of Mirs Bay in early spring.

Two marine mammal species can be found throughout the year. The Indo-Pacific humpback dolphin, also known as the Chinese white dolphin, is the better known of the two. It prefers an estuarine environment and inhabits the western waters, while the Indo-Pacific finless porpoise lives in the eastern and southern parts, where the waters are predominantly oceanic.

The government's Marine Parks programme is important in protecting and conserving sites of special ecological and conservation value. In addition, artificial reefs are deployed in suitable waters to improve inshore fishery resources and biodiversity.

Protected Areas

About 40 per cent of Hong Kong's total land area is designated as country parks and special areas for conservation and recreation. There are 24 country parks and 22 special areas covering 44,312 hectares of scenic hills, woodlands, reservoirs, islands, indented coastlines, marshes and uplands. They are carefully protected for nature conservation, education and scientific studies.

Management responsibilities include the protection of woodland and vegetation against hill fire, control of development, tree planting, litter collection, the provision of educational and recreational facilities, and the promotion of a better understanding of the countryside.

There are six marine parks and one marine reserve covering about 4,000 hectares of scenic coastal areas, seascapes and important biological habitats. The marine reserve is dedicated to conservation, education and scientific studies. Fishing in marine parks is regulated through a permit system and totally banned in the marine reserve. Publicity and educational activities are organised for students and other members of the public.

Besides designating protected areas, the government identifies and conserves sites of special scientific interest (SSSI), such as areas with special geological features and natural habitats of rare plants or animals, by exercising strict land use planning and development controls. Sixty-seven sites are listed on the SSSI Register.

Conservation and Biodiversity

Legislation and Conservation

The Director of Agriculture, Fisheries and Conservation, who is also the Country and Marine Parks Authority, oversees the conservation of terrestrial and marine ecological resources and the enforcement of legislation on nature conservation issues.

The Forests and Countryside Ordinance provides for the general protection of trees and vegetation. Its subsidiary Forestry Regulations control the selling and possession of certain rare and attractive indigenous plants to deter illegal collection. These include camellias, magnolias, orchids, azaleas and the Chinese New Year flower.

The Wild Animals Protection Ordinance prohibits the wilful disturbance, hunting, possession and sale or export of protected wild animals found in Hong Kong. It also restricts entry into three important wildlife habitats designated as restricted areas: the Mai Po Marshes, the Yim Tso Ha Egretry and the green turtle nesting beach at Sham Wan on Lamma Island.

The Protection of Endangered Species of Animals and Plants Ordinance controls the import, export, re-export, introduction from the sea or possession of endangered species to prevent their over-exploitation.

The Country Parks Ordinance provides for the designation, control and management of country parks and special areas for nature conservation, education and scientific research purposes. Country parks may be used for compatible recreation and tourism purposes.

The Marine Parks Ordinance provides for the designation, protection and management of marine parks and marine reserves for nature conservation, education and scientific research purposes. It allows recreational activities such as swimming and diving in marine parks.

The Fisheries Protection Ordinance provides for the regulation of fishing practices and the prevention of destructive fishing activities, such as those involving the use of explosives or toxic substances to catch fish.

The Genetically Modified Organisms (Control of Release) Ordinance controls the release into the environment, and the import and export, of genetically modified organisms (GMOs). It aims to protect the local biological diversity from possible adverse impacts arising from GMOs intended for release into the environment, such as farming or field trials.

United Nations Convention on Biological Diversity

The UN Convention on Biological Diversity, which covers Hong Kong, aims to conserve biodiversity, ensure the sustainable use of its components, and ensure the fair and equitable sharing of benefits deriving from the use of genetic resources. The government is implementing the Hong Kong Biodiversity Strategy and Action Plan (2016-21) based on the convention's objectives and principles, taking into account local circumstances. The plan steps up conservation efforts and supports Hong Kong's sustainable development.

The Cartagena Protocol on Biosafety, adopted under the convention, seeks to ensure the safe handling, transport and use of GMOs that may affect biodiversity adversely. Hong Kong implements the protocol through enforcing the Genetically Modified Organisms (Control of Release) Ordinance.

Countryside Conservation

The scope of the Countryside Conservation Funding Scheme, launched by the EPD's Countryside Conservation Office (CCO) in 2019 to provide funding support to non-profit-making organisations for implementing conservation and revitalisation projects in remote countryside, was expanded in May to include, for instance, natural environment and habitats, non-graded built heritage, and cultural and historic assets. By year end, the fund had approved 10 projects with total funding of over $60 million.

To support eco-tourism, better serve visitors and help revitalise desolate villages, the CCO works with relevant bureaus and departments in developing appropriate licensing requirements and procedural guidelines designed especially for guesthouses and catering businesses in countryside areas, reflecting the special nature and restrictions of rural settings.

Climate

Hong Kong has a subtropical climate. January and February are cloudier with cold spells, while March and April are milder and humid with fog. From May to August, it is hot and humid with occasional heavy rain and thunderstorms. Tropical cyclones usually occur between June and October, bringing high winds, heavy rain and sometimes storm surges. November and December are generally fine and dry with pleasantly cool weather, and may on occasion be relatively cold at night and in the early morning.

The Year's Weather

It was the second warmest year in Hong Kong since records began in 1884, with an annual mean temperature of 24.4 degrees Celsius, 1.1 degrees above normal. The mean temperature of 29.6 degrees from June to August was the highest on record, as was the yearly total of 47 days with daily maximum temperatures of 33 degrees or more and 50 days with minimum temperatures of 28 degrees or more. The total annual rainfall of 2,395mm remained near normal.

Five tropical cyclones affected the territory in 2020, with the highest tropical cyclone warning issued being the Increasing Gale or Storm Signal No 9 during the passage of Typhoon Higos.

Climate Change

Carbon Neutrality

In formulating a long-term decarbonisation strategy in line with the goals of the Paris Agreement, the government will take into account the Council for Sustainable Development's recommendations in its report submitted to the government in November that Hong Kong should progressively reduce its carbon emissions to net zero by 2050.

Hong Kong cooperates internationally on climate action. It is a member of the C40 Cities Climate Leadership Group and sits on the group's Steering Committee.

The EPD provides nine guidebooks, covering different types of premises, for carbon audits in the public and private sectors. Bureaus and departments conduct carbon audits on major government buildings and publish the results. The EPD operates a Carbon Footprint Repository to encourage regular carbon auditing in the private sector. More than 80 listed companies share their carbon management experiences and practices on the repository's website. The government also works with Hong Kong Exchanges and Clearing Limited to promote carbon audits among listed companies.

Energy

Electricity

The Hongkong Electric Company Limited (HK Electric) supplies electricity to Hong Kong Island and the neighbouring islands of Ap Lei Chau and Lamma. CLP Power Hong Kong Limited (CLP Power) supplies Kowloon and the New Territories, including Lantau and several other outlying islands. The electricity supply to consumers is 50 hertz alternating current, while the voltage is 220 volts single-phase and 380 volts three-phase.

Both power companies are investor-owned. The government monitors them through mutually agreed Scheme of Control Agreements, with the current ones signed in 2017. These require the companies to seek the government's approval for certain aspects of their development plans, including projected basic tariff levels, to ensure the continued supply of reliable, safe and efficient electricity at reasonable prices. The agreements do not give the companies any exclusive rights to supply electricity. They are not franchises, nor do they define a supply area for either company or exclude newcomers to the market. The companies receive a return on their average net fixed assets at the permitted rate of return specified in the agreements.

HK Electric has a total installed capacity of 3,637 megawatts at its Lamma Power Station. CLP Power receives its electricity supply from the Castle Peak Power Company Limited's power stations at Black Point (3,175MW), Castle Peak (4,108MW) and Penny's Bay (300MW).

Each company owns its respective transmission and distribution systems. The two transmission systems are connected by a cross-harbour link, which provides emergency backup and some sharing of generating capacity reserves between the two systems. The link has a total capacity of 720 megavoltamperes.

CLP Power's transmission system is also connected to the Guangdong electricity network which allows electricity exports and imports to and from the province. The company imports about 70 per cent of the power generated by the Daya Bay nuclear power station, which has two 984MW pressurised water reactors. In addition, from 2014 to 2023 it imports on a temporary basis another 10 per cent of Daya Bay's electricity.

The Central People's Government, in a memorandum of understanding signed between the HKSAR Government and the National Energy Administration in 2008, supported the extension

of nuclear electricity supply from the Daya Bay station to Hong Kong for another 20 years from 7 May 2014.

CLP Power also has the right to use up to half of the 1,200MW capacity of the Guangzhou Pumped Storage Power Station phase 1 at Conghua. It stores off-peak electricity from Castle Peak Power's stations and the Daya Bay station in the Conghua plant, which generates hydroelectricity to meet Hong Kong's demand during peak periods.

Regulations under the Electricity Ordinance govern the registration of electrical contractors and workers and competent persons, safety of electrical wiring, supply of safe household electrical products and protection of electricity supply lines from third-party damage.

Other Fuels

Town gas and liquefied petroleum gas (LPG) are the main types of fuel gas used for domestic, commercial and industrial purposes. Hong Kong has 2.3 million gas customers in the domestic, commercial and industrial sectors, of which town gas and LPG respectively accounted for 89 and 11 per cent of the total fuel gas sold in these sectors in terms of heating values in 2020.

Town gas is manufactured at plants in Tai Po and Ma Tau Kok, which have daily throughput capacities of about 10 million and 2.6 million cubic metres respectively. It is channelled to customers via a pipe network of about 3,700km.

LPG is imported into Hong Kong mainly by sea and stored at five terminals in Tsing Yi before being distributed to customers, including 70 auto-LPG filling stations.

Natural gas is imported from the Mainland via submarine pipelines to Black Point Power Station and Lamma Power Station for electricity generation, and to the Tai Po plant, and onward from Tai Po to the Ma Tau Kok plant via underground pipelines, for the production of town gas. Separately, CLP Power draws natural gas from the Mainland's Second West-East Natural Gas Pipeline through the submarine Hong Kong Branch Line facilities.

Energy Saving

Energy consumption is related closely to greenhouse gas emissions. Improving energy efficiency helps combat global climate change. End users consumed 288,305 terajoules in 2018, with the commercial, transport, residential and industrial sectors taking up 44, 30, 21 and 4 per cent respectively.

The bureau's Energy Saving Plan for Hong Kong's Built Environment 2015~25+ sets a target of reducing energy intensity by 40 per cent by 2025, and outlines the policy, strategies, targets and key actions to achieve that target. By end-2020, the city had lowered its energy intensity by more than 30 per cent. The bureau will continue to work with the built environment sector to promote energy-saving measures.

The Electrical and Mechanical Services Department's Energy Efficiency Office promotes efficient use of energy through legislation and public education. Its Mandatory Energy Efficiency Labelling Scheme requires prescribed products to bear energy labels informing consumers of

the products' energy efficiency performance. New energy efficiency grading standards for air conditioners, dehumidifiers and compact fluorescent lamps took effect in December. After a 12-month transitional period, these products must bear energy labels with the new grading standards.

The E&M InnoPortal, launched in June 2018, promotes energy-related innovation and technology. It lists the service needs of various government departments, public organisations and the trade. Universities and start-ups can propose solutions to meet these service needs. At year end, the portal had collected more than 330 service needs and more than 660 suggested solutions. More than 110 field trials have started, with 16 of these related to energy efficiency and renewable energy.

The buildings now served by the government's district cooling system at the Kai Tak Development (being completed in phases to provide chilled water to non-domestic developments for air-conditioning) include the Kai Tak Cruise Terminal, Trade and Industry Tower, Hong Kong Children's Hospital, schools and shopping centres. The government plans to construct district cooling systems at Tung Chung New Town Extension and Kwu Tung North. When fully completed, the systems at these three districts will reduce total annual electricity consumption by 211 million kilowatt-hours, equivalent to a carbon reduction of 147,000 tonnes, compared with air-cooled air-conditioning systems.

Renewable Energy

The Paris Agreement highlights the need for wider promotion of renewable energy. In Hong Kong, new schools and educational buildings are subject to the government's target for providing renewable energy. Existing government buildings undergoing major renovation must incorporate renewable energy technology where technically and financially practicable.

To encourage the private sector to develop renewable energy, the government and the two power companies provide a Feed-in Tariff (FiT) scheme, enabling owners of private renewable energy systems to connect them to the power grid. Between 2018 and September 2020 the two power companies approved over 10,200 FiT applications. The government's Solar Harvest helps eligible schools and non-governmental welfare organisations install solar energy generation systems by funding the capital installation cost. By year end, over 350 applications had been received.

Both power companies use renewable energy. HK Electric operates an 800kW wind turbine on Lamma and a 1MW thin film solar energy generation system at Lamma Power Station, while CLP Power runs a 200kW renewable-energy generation system of solar energy generation panels and wind turbines on Town Island in Sai Kung.

Energy-efficient Buildings

Buildings account for about 90 per cent of the electricity consumed, so promoting their efficient use of energy is paramount to reducing greenhouse gas emissions. The Building Energy Code under the Buildings Energy Efficiency Ordinance stipulates the minimum energy efficiency standards for major installations, including air conditioning, electrical installations, lighting, lifts and escalators. The ordinance also requires commercial buildings to conduct

energy audits every 10 years. By end-2028, the enforcement of the ordinance is expected to bring about total energy savings of some 27 billion kWh from new and existing buildings, equivalent to the total annual electricity use of about 5.8 million households and a reduction in carbon dioxide emissions of about 19 million tonnes.

Having successfully met its earlier 5 per cent target for 2015-16 to 2019-20, the government aims to save 6 per cent of energy used by government buildings and infrastructure from 2020-21 to 2024-25 under operating conditions comparable to 2018-19. For private buildings, the capital cost of buying renewable-energy installations and building energy-efficient installations is tax deductible. From the 2018-19 year of assessment, the tax deduction can be claimed in full in one year, instead of spread over five years as previously.

Retro-commissioning is a cost-effective and useful means of saving energy in existing buildings. The Electrical and Mechanical Services Department organises seminars to help building owners and relevant trades carry out retro-commissioning. Starting from 2019, $215 million has been earmarked to retro-commission over 200 major government buildings to raise their energy efficiency, with about 40 undergoing retro-commissioning in 2020.

Under the current Scheme of Control Agreements, the power companies will promote energy efficiency and conservation. Each company manages its own energy-efficiency fund to support the retrofitting and retro-commissioning of private buildings.

Hong Kong chairs the Asia-Pacific Economic Cooperation Expert Group on Energy Efficiency and Conservation and hosted its meetings in 2020.

Pollution Prevention

Air Pollution

In 2020, the ambient concentrations of major air pollutants broadly complied with the government's air quality objectives. The EPD has put forward legislative amendments to tighten the objectives and aims to complete the legislative process in 2021.

Between 2009 and 2018, emissions of SO_2, nitrogen oxides (NO_X), RSP and volatile organic compounds dropped by between 29 per cent and 74 per cent. From 2011 to 2020, ambient concentrations of RSP, fine suspended particulates, NO_2 and SO_2 dropped 44 per cent, 55 per cent, 38 per cent and 62 per cent respectively, while roadside concentrations of the same fell 48 per cent, 50 per cent, 43 per cent and 58 per cent respectively. Ambient ozone concentration increased 27 per cent, indicating that the regional photochemical smog problem remains challenging. The EPD will collaborate with the Guangdong and Macao governments on a three-year joint regional ozone study to tackle the problem.

Land Transport

Vehicle emissions are the major source of roadside air pollution. The government's policy is to apply the most stringent motor vehicle fuel and emission standards practicable.

Nearly all taxis and about 80 per cent of public light buses run on LPG. About 79,000 pre-Euro IV diesel commercial vehicles were phased out under a scheme which ended in June, and a similar scheme was launched in October to progressively phase out some 40,000 Euro IV diesel commercial vehicles by 2027.

Controls are in place to curb excessive smoke from diesel vehicles and excessive emissions from petrol and LPG vehicles due to poor maintenance. During the year, 735 diesel vehicles with excessive smoke were reported and 2,655 petrol and LPG vehicles with excessive emissions were identified by roadside remote sensors. Such vehicles must pass a chassis dynamometer emission test at a test centre within 12 days to prove the emission problem has been rectified.

In August, the government extended until 31 March 2024 the waiver of first registration tax on electric commercial vehicles, motorcycles and tricycles. The tax concession for electric private cars is capped at $97,500, but a higher concession of up to $250,000 is granted to people who scrap and de-register an eligible old private car and then first register a new electric car under the One-for-One Replacement Scheme. In 2020, the number of electric vehicles increased 32.6 per cent year on year to 18,530, including government and special-purpose vehicles, while 3,351 public chargers were available for public use, including 643 quick and 1,456 medium chargers. To encourage people to switch to electric vehicles, the government introduced in October a $2 billion EV-charging at Home Subsidy Scheme for installation of charging facilities in car parks of existing private residential buildings, intended to cover about 60,000 parking spaces in three years.

In 2020, the government injected an additional $800 million into the New Energy Transport Fund to support the wider trial and use of new energy transport technologies.

To promote mass transit systems that are pollution-free at the street level, the government gives priority to rail over road and encourages innovation.

Marine Transport

Marine vessels are a major air pollutant emission source in Hong Kong. The government caps the sulphur content in locally supplied marine light diesel at 0.05 per cent. From 2019, the government has required all vessels in Hong Kong waters to use compliant fuel, such as fuel with sulphur content not exceeding 0.5 per cent and liquefied natural gas.

Power Generation

Power plants are a major source of local emissions. The government tightens statutory emission caps on the power sector progressively and encourages the power companies to use cleaner fuel. In 2019, the emission caps of three key air pollutants, SO_2, NO_X and RSP, from the power sector in 2024 and beyond were further reduced by 69 per cent to 87 per cent compared with 2010 levels.

Indoor Air Quality

The government's voluntary certification scheme for offices and public places encourages participating property owners and management companies to enhance indoor air quality at their premises.

Ozone Layer Protection

The Montreal Protocol for controlling substances that deplete the ozone layer applies to Hong Kong. The Ozone Layer Protection Ordinance prohibits the manufacture of these substances and their import for local consumption. The import of hydrochlorofluorocarbons for local consumption has been banned since 1 January, except a small amount permitted for servicing of refrigeration and air-conditioning equipment up to 2029.

Non-road Mobile Machinery

Non-road mobile machinery newly supplied for use in Hong Kong are required to meet statutory emission requirements, namely the Euro Stage IIIA emission standard for machines such as crawler cranes, air compressors and excavators. Starting from 1 January 2019, the statutory emission standards for newly approved non-road vehicles have been tightened in phases to Euro VI, which is in line with the emission standards for newly registered road vehicles. All machinery to be used in specified activities or locations, such as Hong Kong International Airport, container terminals and construction sites, must bear EPD-issued labels.

Noise Pollution

Road Traffic Noise

To mitigate the impact of traffic noise on residents, proponents of development projects are required to assess traffic noise impact when planning new roads and residential developments, provide direct mitigation measures such as noise barriers and low-noise road surfacing for new roads, and adopt innovative noise mitigation designs such as acoustic balconies and windows. All newly registered vehicles must comply with internationally recognised noise standards. As regards existing roads, the government installs noise barriers and lays low-noise road surfacing materials, with 121 road sections enhanced through these efforts as at end-2020.

Railway Noise

In planning new railway projects, the MTR Corporation Limited must comply with a statutory environmental impact assessment. The department will request the company to make improvements if the noise emitted from existing railways exceeds the standards.

Aircraft Noise

The impact of aircraft noise on residents in the vicinity of flight paths at the airport is within planning standards, notwithstanding concerns about nuisance from aircraft noise during evenings and early mornings. The government will continue to explore practicable mitigation measures.

Construction Noise

The department issues construction noise permits to control noise from general construction works between 7pm and 7am and at all times on public holidays. Strict criteria under these permits restrict the use of equipment and the conduct of noisy manual activities in built-up areas. Percussive piling is prohibited at night and on public holidays, and requires a permit during the day on non-public holidays. The use of noisy diesel, steam and pneumatic piling hammers is generally banned, while hand-held percussive breakers and air compressors used in

construction must meet strict noise standards and be issued with noise emission labels. Apart from these legal controls, the department also promotes quiet construction equipment and techniques to the construction industry.

Noise from Industrial or Commercial Activities

The department serves noise abatement notices requiring the owners or occupants of premises causing excessive noise from industrial or commercial activities to tone down within a given period.

Waste Management

Waste Statistics

Over the past five years, the municipal solid waste dumped at landfills has increased 9 per cent, while the mid-year population has grown 3 per cent. Between 2015 and 2019, municipal solid waste totalling 3.71 million to 4.17 million tonnes annually was dumped, translating into a daily per capita disposal rate of between 1.39kg and 1.53kg. The rate in 2019 was 1.47kg. About 60 per cent of 4.04 million tonnes dumped at landfills in 2019 was domestic waste, with the remainder being commercial and industrial waste. Food waste accounted for 30 per cent of the total municipal solid waste in 2019.

During the same five-year period, overall construction waste disposed of at landfills has dropped by 6 per cent. Overall construction waste of 1.44 million to 1.62 million tonnes was dumped annually.

Waste Reduction

In line with the Hong Kong Blueprint for Sustainable Use of Resources 2013-22, the government implements policies and legislation to reduce waste at source, undertakes targeted citywide waste reduction campaigns to raise awareness and encourage community participation, and enhances waste-related infrastructure.

At the heart of Hong Kong's overall waste reduction strategy, municipal solid waste charging will provide the necessary incentives to encourage the public to reduce waste at source and practise clean recycling, and thereby reduce overall waste disposal. The Legislative Council continued to scrutinise the bill in 2020.

From the 2019-20 financial year, the government provided additional recurrent funds for waste reduction and recycling. Once municipal solid waste charging is implemented, annual funding will increase to between $800 million and $1 billion.

The Food Waste and Yard Waste Plan for Hong Kong 2014-22 maps out a comprehensive strategy, targets, policies and action plans to manage food waste and yard waste. The government has four strategies to reduce the disposal of food waste in landfills by 40 per cent by 2022: reduction at source, reuse and donation, recyclable collection, and waste-to-energy conversion.

The Programme on Source Separation of Waste covers over 80 per cent of the Hong Kong population. Residents can contribute recyclable items to waste separation facilities close to their homes and workplaces.

Various producer responsibility schemes have been introduced by the government to reduce waste at source and develop a circular economy, including the Plastic Shopping Bag Charging Scheme and schemes for waste electrical and electronic equipment (WEEE) and glass beverage containers. In 2020, over 23,000 tonnes of WEEE were treated and recycled. In preparation for a new scheme for plastic beverage containers, in 2020 the government introduced reverse vending machines on a pilot basis for one year to assess their application in Hong Kong.

From 2020, the government has set aside an annual recurrent sum of not less than $300 million to support local waste paper recycling. During the year, the EPD extended waste paper collection and recycling services to the whole of Hong Kong. About 40,000 to 80,000 tonnes of local waste paper are processed every month.

From January, the EPD introduced the Plastic Recycling Pilot Scheme progressively in three districts to collect waste plastics for processing into recycled raw materials or products to be supplied for export or the local market.

Waste Recycling

The government supports the recycling industry and educates the public to reduce and separate waste at sources, so as to improve the quality of the recyclables collected and to streamline the subsequent treatment process.

Community participation is encouraged through district-based education and recycling support. The community recycling network promotes waste reduction and recycling, and provides local collection points for recyclables of low commercial value. In 2020, a ninth recycling station began operations.

The network also includes 22 recycling stores and over 100 mobile collection points. In September, the EPD launched a technical trial of a pilot Smart Recycling System on the network. Green Outreach, which provides on-site assistance and support on recycling to property management companies and residents, extended its coverage from three pilot districts to other districts.

Between 2015 and 2019, an annual average of 45 per cent of paper and 91 per cent of metal in municipal solid waste was recovered. The annual average recovery rate of plastics was 11 per cent.

During the same period, an average of 79 per cent of solid waste, including municipal solid waste and overall construction waste, was recovered each year, working out to an annual average of 21 million tonnes recovered. This annual average was 3 per cent lower than the 22 million tonnes recovered between 2010 and 2014.

EcoPark

More than 90 per cent of recyclable municipal solid waste is exported for recycling every year, with plastics, paper and metals contributing about 95 per cent of the recovered waste. The 20-hectare EcoPark in Tuen Mun promotes development of the recycling industry by providing long-term land at affordable rents so as to encourage investment in advanced technologies and value-added recycling processes. Twelve lots are leased to private recyclers to recycle cooking oil, scrap metal, wood, WEEE, plastics, construction materials, glass, rubber tyres, food, batteries and paper.

Recycling Fund

A $1 billion Recycling Fund, launched in 2015 to promote recovery and recycling, provides subsidies for the recycling industry to upgrade its operational capabilities and efficiency. By 31 December, a total of 1,500 projects had been approved, involving total funding of about $570 million.

Waste Treatment and Disposal

Refuse Transfer Stations

Municipal solid waste is collected and delivered to refuse transfer stations by refuse collection vehicles, packed into containers and then taken to landfills in bulk by sea or land. A network of seven refuse transfer stations handled about 3.15 million tonnes of such waste in 2019, delivering about 78 per cent of municipal solid waste to landfills.

Landfills

Three large strategic landfills are operated to high environmental standards in the New Territories to serve as the final repositories for the city's considerable amount of residual solid waste. With the South East New Territories Landfill accepting only construction waste since 2016, all municipal solid waste is disposed of at the other two landfills.

All three landfills need to be extended to maintain an uninterrupted waste disposal service to the public. Once extended, they will meet Hong Kong's needs up to the 2030s.

Hong Kong has 13 restored landfills. The government promotes the development of recreational facilities and innovative uses at the restored landfills, some of which have been developed for public use.

Planned Infrastructure

Hong Kong needs state-of-the-art, cost-effective facilities to deal with the large volume of non-recyclable waste and reduce the amount that requires landfill disposal. The first Integrated Waste Management Facility, being built on an artificial island near Shek Kwu Chau, will adopt advanced incineration as its core technology to cut waste volumes by 90 per cent and turn waste into energy so as to cut greenhouse gas emission. Once operational in 2025, it will be able to treat 3,000 tonnes of municipal solid waste daily.

The city also plans to build a network of five or six organic resource recovery centres that will use biological technology to turn food waste separated at source into useful resources such as

biogas, with compost/organic fertiliser as a by-product. The first such facility opened in North Lantau in 2018 and by December 2020 it had treated 82,000 tonnes of food waste, and produced 2,300 tonnes of compost and 2,600,000 kWh of electricity. Construction of the second facility began in 2019. When completed, the two facilities will be able to treat 500 tonnes of food waste each day. The government is also exploring the use of existing sewage treatment plants for the anaerobic co-digestion of food waste and sewage sludge to increase the food waste treatment capacity. It launched the first trial scheme in 2019 at the Tai Po Sewage Treatment Works, which can process about 50 tonnes of food waste a day.

The government is also developing a yard waste recycling centre in Tuen Mun. Once operational in 2021, it will be able to treat 60 tonnes of yard waste a day.

These high-tech facilities do not eliminate the need for waste reduction at source or for landfills to hold residual waste.

Chemical, Clinical and Special Waste

All chemical and clinical waste producers are required to pack, label and store their chemical and clinical waste properly before disposal at licensed treatment facilities. A trip ticket system tracks the waste movement from its origin to the final disposal point. The Chemical Waste Treatment Centre on Tsing Yi Island, operated by a government contractor, treated a daily average of 33.8 tonnes of chemical waste and 11 tonnes of clinical waste in 2020. Waste producers using its services pay part of the treatment cost.

The government's policy is to return low-level radioactive waste to the original suppliers if possible, hence only some of the waste is transferred for long-term storage to the Low-level Radioactive Waste Storage Facility at Siu A Chau, an uninhabited island southwest of Lantau. This facility is purpose-built to meet stringent international standards for the safe storage of low-level radioactive waste.

T•Park, a sludge treatment facility in Tuen Mun, employs an advanced treatment process to treat up to 2,000 tonnes per day of sewage sludge generated from sewage treatment. It has waste-to-energy facilities to convert the incineration heat to electricity and export the surplus electricity generated to the public power grid. The plant treated 378,428 tonnes of sewage sludge and exported 2.8 million kWh of electricity in 2020. Its premises, ingeniously designed for environmental education and recreation, have attracted over 270,000 visitors since its opening in 2016.

Construction Waste

A disposal charging scheme provides economic incentives to reduce construction waste, recover and reuse inert materials, and reduce their disposal at landfills. An annual average of 20.8 million tonnes of overall construction waste was generated from 2015 to 2019. The reuse rate was 92 per cent in 2019, having remained above 90 per cent in recent years.

Marine and Shoreline Refuse

Marine refuse within Hong Kong waters is cleared by the Marine Department, which deploys about 80 vessels to scavenge for floating refuse and collect domestic refuse from vessels in the

anchorages and typhoon shelters. In 2020, it collected nearly 10,600 tonnes of marine refuse and 4,570 tonnes of domestic refuse from vessels.

Shoreline refuse is cleared by the Agriculture, Fisheries and Conservation Department; the Food and Environmental Hygiene Department; the Leisure and Cultural Services Department; and other government bodies.

The Inter-departmental Working Group on Marine Environmental Management coordinates the efforts of different departments in handling marine refuse and marine environmental incidents. In addition, the government leverages community efforts to protect the marine environment through the Clean Shorelines Liaison Platform.

Hong Kong cooperates with Guangdong through a trial notification and alert system on marine refuse. Notifications on any potential surge of marine refuse in Hong Kong, the Pearl River Estuary and its neighbouring waters are issued by the Hong Kong-Guangdong Marine Environmental Management Special Panel to facilitate follow-up action.

Livestock Waste

The Waste Disposal Ordinance bans the keeping of livestock in new towns and environmentally sensitive areas. Where they are allowed, livestock farms must have proper waste treatment systems. The government provides a free livestock waste collection service, which collected 25,246 tonnes of waste in 2020.

Sewage Treatment and Disposal

The public sewerage system covers the entire urban area and serves over 93 per cent of the whole population. It collects about 2.9 million cubic metres of waste water daily, 96 per cent of which receives chemical or higher levels of treatment before being discharged. The government plans to spend about $23 billion over the next five years on public sewerage infrastructure projects, including sewerage provision to rural villages.

Victoria Harbour and Harbour Area Treatment Scheme

Under the Harbour Area Treatment Scheme, all sewage from both sides of Victoria Harbour is intercepted and conveyed through a network of deep tunnels to the Stonecutters Island Sewage Treatment Works for chemical treatment and disinfection before discharge. This has improved the overall water quality in the harbour significantly. The government is implementing more measures to alleviate pollution caused by the discharge of residual pollutants through the storm water systems. These measures include rectifying misconnected sewers, installing dry-weather flow interceptors in some storm water culverts and rehabilitating ageing sewers.

Sewage Disposal in Rural Areas

As at end-2020, more than 14,000 village houses were connected to public sewers. Eligible households can apply for loan and grant schemes to help them connect their buildings to the public sewers.

Sewage Charges

Under the Sewage Services Ordinance, all water users who discharge their sewage into public sewers pay a sewage charge of $2.92 per cubic metre of water supplied. Twenty-seven trades and industries whose effluent strength exceeds that of domestic sewage pay a trade effluent surcharge reflecting the additional cost of treating their stronger effluent. These charges are used to recover the operation and maintenance costs of sewage collection, treatment and disposal facilities, whose construction is government-funded.

Water Quality

The water quality of Victoria Harbour has improved markedly under the Harbour Area Treatment Scheme. In 2020, the harbour's overall compliance with the statutory water quality objectives was 90 per cent.

By controlling pollution at source, river water quality has also improved. During the year, 82 per cent of the river monitoring stations were categorised as 'good' or 'excellent', while 7 per cent belonged to the 'bad' or 'very bad' categories.

Bathing Beaches

A well-established methodology is applied to monitor water quality at bathing beaches. The pollution level is measured in terms of *Escherichia coli*, the bacterium that can indicate the presence of sewage. All gazetted beaches meet the statutory bacteriological water quality objective for bathing.

Beach water quality ranking	Geometric mean of *E coli* count per 100ml of beach water during bathing season	Cases of minor health risk per 1,000 swimmers	Number of beaches in 2020
Good	Up to 24	Undetectable	24
Fair	25 to 180	10 or less	17
Poor	181 to 610	11 to 15	0
Very Poor	More than 610	More than 15	0

Gradings of the water quality at all open public beaches are available through the EPD's website, hotline and weekly press releases.

Legislation and Environmental Protection

Ten ordinances address environmental protection: the Waste Disposal Ordinance, Water Pollution Control Ordinance, Air Pollution Control Ordinance, Noise Control Ordinance, Ozone Layer Protection Ordinance, Dumping at Sea Ordinance, Environmental Impact Assessment

Ordinance, Hazardous Chemicals Control Ordinance, Product Eco-responsibility Ordinance and Motor Vehicle Idling (Fixed Penalty) Ordinance.

The EPD works with the construction, catering, vehicle repair and property management sectors and other trades to promote good practices and compliance with environmental regulations. Its Compliance Assistance Centre responds to enquiries from businesses on environmental compliance, pollution prevention and environmental management. Departmental inspectors conduct site visits to enforce controls on air, noise, waste and water pollution and to deal with complaints about pollution, resulting in 606 convictions and $3.31 million in fines in 2020.

Environmental Monitoring and Auditing

Major development projects undergo environmental monitoring and auditing to validate assumptions made during the planning stage and to monitor the effectiveness of mitigation measures, so as to ensure every project meets the environmental performance promised in its environmental impact assessment. These projects are required under their environmental permits to publish the monitoring data and auditing results on dedicated websites or the Environmental Impact Assessment Ordinance website. In 2020, the department handled 103 monitoring and auditing programmes.

Meteorological and Geophysical Services

The Hong Kong Observatory provides meteorological, climatological, radiation monitoring, oceanographic, geophysical, time and astronomical services.

Weather Forecasting and Information Services

The Observatory provides weather information through a variety of channels, including social media, its website and mobile application 'MyObservatory', and the Dial-a-Weather telephone service. It produces regular weather television programmes and an educational series, *Cool Met Stuff*, for free for Hong Kong's major TV networks and other media. As at year end, there were around 230,000 and 36,000 followers for its Facebook and Instagram accounts respectively, and its website and MyObservatory had 158 billion page views in 2020.

The Observatory launched a trial Chatbot service 'Dr Tin' on MyObservatory, and on its website and Facebook page, and added more information to MyObservatory on 'Earth Weather', aviation weather, tide and storm track. In December, MyObservatory won in the 'Public weather forecasts and information – information content' category and earned an honourable mention in the 'Specialised apps award – weather warnings' category at the first World Meteorological Organisation (WMO) International Weather Apps Awards.

To enhance its forecast services on high-impact weather, the Observatory enlarged the forecast area of tropical cyclone track probability forecast, and provided more information on severe thunderstorms and their associated impacts, such as violent gusts. It also launched the Hong Kong Hiking Trail Weather Service webpage to provide hourly weather forecasts up to seven days ahead for Hong Kong's main hiking trails.

The Observatory issues weather forecasts and warnings, and offers professional advice to government departments and the aviation, shipping, engineering and other sectors. For instance, it provides aviation weather services to the airport and the Hong Kong Flight Information Region, offers flight crew the latest inflight weather information through its 'MyFlightWx' mobile application, and issues forecasts of wind, weather, waves and swells for the marine community and container terminals. Warnings are issued when tropical cyclones cause storm surges. The Observatory continued to deploy drifting buoys in the South China Sea and western North Pacific to obtain more weather data over the sea surface, and launched the first balloon-borne radiosonde to measure upper-air water vapour profile.

Climate Services and Studies

The Observatory provides government departments and those involved in areas such as disaster prevention, risk reduction and public health with climatological information and predictions, including updates of phenomena such as El Niño and La Niña, an annual outlook on rainfall and the number of tropical cyclones affecting Hong Kong, and forecasts of seasonal temperature and rainfall. It also conducts research on past trends and future projections of temperature, rainfall, sea level and extreme weather in Hong Kong and provides the latest climate change information and scientific input to government departments in support of initiatives to combat climate change.

Radiation Monitoring and Assessment

The Observatory monitors ambient radiation levels in Hong Kong and measures the amount of radioactivity in environmental samples, enhancing its monitoring and assessment capabilities through collaboration with Mainland and international counterparts. In the unlikely event of a nuclear incident, the Observatory would step up its radiation monitoring activities, work with other government departments to provide decision makers with an assessment of radiological consequences and advise on actions to take. Information on radiation levels and the latest developments would be provided to the public through various channels. In 2020, replacement of the automatic gamma spectrometry system at Ping Chau and refurbishment of the Monitoring and Assessment Centre were completed to enhance operational efficiency.

Geophysical Services

The Observatory monitors earthquakes and tsunamis in the vicinity of Hong Kong and round the world. It provides earthquake information and tsunami warnings through its website, the media and social media, as well as via SMS and email for registered users. The Observatory recorded three locally felt earthquake tremors, with the most received relating to an earthquake of magnitude 3.4, which occurred on 5 January near Zhuhai.

Astronomical Services

The Observatory provides information about astronomical phenomena such as solar and lunar eclipses. It publishes astronomical almanacs, which contain the traditional Chinese calendar as well as astronomical and geophysical information. The Observatory conducted a joint webcast of the partial solar eclipse on 21 June with the Hong Kong Space Museum, the Ho Koon Nature Education cum Astronomical Centre and the Po Leung Kuk Ngan Po Ling College, attracting over 900,000 users through the Observatory's Facebook page and YouTube channel.

Time Services

As Hong Kong's official timekeeper, the Observatory maintains a time standard that is accurate to within one-hundred-millionth of a second per day and contributes to the determination of Coordinated Universal Time by the International Bureau of Weights and Measures. Users can check the time through an online network time service, web clock, Dial-a-Weather and radio stations. The Observatory's internet time service drew a record high of more than 43 billion visits in 2020.

Cooperation with other Meteorological Services

In 2020, the Observatory hosted online the 52nd session of the UN Economic and Social Commission for Asia and the Pacific/WMO Typhoon Committee, which discussed ways to reduce casualties and damage caused by tropical cyclones.

The Observatory, as a Regional Specialised Meteorological Centre for Nowcasting designated by the WMO, shared its in-house developed nowcasting system, Swirls, with overseas weather services to help develop and enhance forecasts and warnings of rainstorms and high-impact weather. In collaboration with the WMO, the Observatory added five more official UN languages to the International Cloud Atlas website.

Public Education and Engagement

The Observatory promotes public awareness of hazardous weather, climate change and radiation. During the year, it organised public online courses on weather observation, launched a virtual tour of the Observatory and made available 100 quiz worksheets on the Hong Kong Education City's online Resources Depository to facilitate students' learning amid the pandemic. The Observatory also produced an additional television weather programme on Sunday morning.

The Observatory conducts school and online talks on climate change and radiation, and publishes the latest research findings on climate change and extreme weather on its website. Activities during the year included the launch of a webpage and a music video on the impact of climate change. The Observatory continued to engage students and young people through various outreach events in its 'Science in Public Service' campaign and Community Weather Information Network, including public scientific talks and workshops on community weather stations.

Some of the more than 13,600 'Friends of the Observatory' help support public education events organised by the Observatory.

Government Laboratory

The Government Laboratory supports the enforcement of environmental protection legislation and implementation of environmental programmes by providing analytical and advisory services. It conducts tests on environmental samples to furnish these programmes with the necessary data. The laboratory also offers analytical services for chemicals regulated under the Stockholm Convention on Persistent Organic Pollutants.

Websites

Agriculture, Fisheries and Conservation Department: www.afcd.gov.hk
Civil Engineering and Development Department: www.cedd.gov.hk
Council for Sustainable Development: www.enb.gov.hk/en/susdev/council/index.htm
Electrical and Mechanical Services Department: www.emsd.gov.hk
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Hong Kong Observatory *Cool Met Stuff* channel: url.hko.hk/cms
MyObservatory mobile application: www.hko.gov.hk/en/myobservatory.htm
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