

香港環境保護
ENVIRONMENT
HONG KONG

2021



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FOREWORD

BY THE SECRETARY FOR THE ENVIRONMENT



2020 was a year of tremendous challenge across the world as governments everywhere acted to control the COVID-19 pandemic. Despite the urgency of the related work, at the same time the Government of the Hong Kong Special Administrative Region continued to devote considerable effort and resources to the longer-term challenges in combating climate change and improving Hong Kong's sustainable development. In fact, we made substantial progress in our work. I would like to take this opportunity to express my heartfelt gratitude to the Council for Sustainable Development for conducting a public engagement exercise on long-term decarbonisation strategy by adopting a bottom-up and stakeholder-oriented approach to draw on collective wisdom, and submitting a report in November 2020 to assist the Government in formulating a more updated plan to combat climate change.

The most important progress in 2020 was our commitment to achieving carbon neutrality before 2050, which was announced in the Chief Executive's 2020 Policy Address. This will shape our environmental policies and programmes for years to come and mark a major

undertaking for Hong Kong to go for deep decarbonisation and put the city on a more sustainable path. Actions will be required across every sector of society by everyone, from large organisations to individual members of the public. The Government will provide the framework and guidance on the way forward, building on the past and ongoing progress.

With the implementation of various mitigation measures, Hong Kong's total carbon emissions have shown a downward trend after reaching its peak in 2014. Preliminary estimation shows that the per capita carbon emissions would be reduced from the level of 6.2 tonnes in 2014 to 4.5 tonnes in 2020.

In 2020, we successfully reached our target of halving Hong Kong's reliance on coal for electricity generation as compared with 2015. Natural gas now contributes about half of Hong Kong's electricity consumption while coal has dropped to about a quarter, with nuclear and renewable energy making up the rest. We are also opening the path to wider use of zero-carbon energy, through the Feed-in Tariff Scheme that provides incentives for the community

to invest in distributed renewable energy. As at the end of 2020, more than 11 000 applications had been approved under the Scheme.

Improving energy efficiency can help reduce greenhouse gas emissions. In 2020, we commenced a new round of review of the Building Energy Code and promoted enhanced energy saving to businesses and organisations. The Government reduced electricity consumption in government buildings by 7.8% as compared with 2015, far exceeding its target of 5% reduction for the five years ending 2019-20.

Green transport, such as electric vehicles, is also being supported through such measures as the \$2 billion EV-charging at Home Subsidy Scheme and the \$1.1 billion New Energy Transport Fund to support the development and popularisation of green innovative transport technologies. The proportion of electric private cars in newly registered private cars has further increased from 5.2% in 2015 to 12.4% in 2020, representing one out of every eight new private cars was electric. This proportion leads among every major Asian cities.

To effectively reduce Hong Kong's carbon emissions, in addition to using cleaner fuel for electricity generation, improving the energy efficiency of buildings and promoting green transport are all obvious targets. Less well-known as a source of greenhouse gases but nonetheless of pressing importance is our disposed waste. The large amount of waste disposed of daily in Hong Kong is placing immense pressure on the landfills, which in turn emits greenhouse gases, even though the three operating landfills have fully implemented measures to convert landfill gas into energy.

The Government therefore is continuing to expand the breadth of its waste reduction programmes. The community recycling network, rebranded as GREEN@COMMUNITY at the end of 2020, brings dozens of existing and newly increased community recycling facilities under one umbrella with a new image. Different schemes were launched to trial new approaches in handling recyclables, such as the pilot on smart recycling systems and a technical trial on the application of reverse vending machines (RVMs) for recycling plastic beverage bottles. To support recycling at the community level, the

Green Outreach was progressively deployed in the entire territory to help members of the public and organisations in practising source separation of waste and clean recycling. A two-year pilot programme to provide free collection and recycling service for all types of waste plastics from non-commercial and non-industrial sources was also launched. The Environmental Protection Department (EPD) also launched the territory-wide waste paper collection and recycling services for the first time to improve the quality and quantity of paper collected.

The above measures were rolled out at the same time as we continued to build additional waste treatment facilities, such as organic resources recovery centres for food waste (O-PARK), yard waste recycling centre (Y-PARK) for yard waste and a waste-to-energy facility (I-PARK) for municipal solid waste to turn waste into energy or resources.

The issue of waste also had particular resonance during the COVID-19 pandemic. With all the social restrictions people have bought more takeaway food, which often came with disposable plastic tableware. A series of

publicity campaigns was launched to promote the message of "plastic-and-disposable-free" to the public. Furthermore, we also encourage the public to use refillable containers for hand sanitizer and to properly dispose of masks. The messages advocated by these campaigns dovetailed with our overall goal of reducing waste.

To assist the recycling and waste collection industry in coping with the business difficulties caused by the COVID-19 pandemic, the EPD worked together with the industry to overcome the economic downturn and provide them with relief packages. We also launched the Green Employment Scheme to create over 600 time-limited jobs related to environmental protection, as well as subsidy programme for fresh graduates with a view to providing opportunities for them who are interested in environment-related fields to enter the industry.

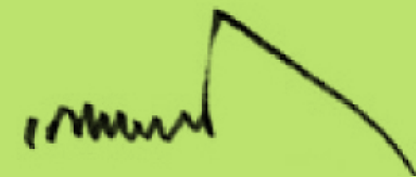
Furthermore, EPD also participated directly in the anti-epidemic work through a strategic cooperation with Drainage Services Department and the University of Hong Kong to apply a novel sewage testing technology

for monitoring the transmission of COVID-19 in the community. Starting in October 2020, regular samples were taken at 26 fixed monitoring points set up across the territory to monitor the virus. As the fourth wave of COVID-19 epidemic emerged, we adopted a more proactive approach to track some housing estates with infected clusters and subsequently identified some hidden infected cases in Choi Wan (II) Estate through sewage testing. This world's first successful application of sewage testing in tracking down COVID-19 infection cases laid the foundation for its extensive application in support of the anti-epidemic work in the future.

We continued to take forward our work on marine ecology conservation proactively during the pandemic. The Southwest Lantau Marine Park was designated in April 2020, and work on the designation of the proposed South Lantau Marine Park and North Lantau Marine Park has also commenced. After designation of these parks, the total protected sea area will increase by 150% from the original 3 400 hectares to 8 500 hectares, thus enhancing the conservation of the

marine environment.

Although 2020 has been difficult for everyone in the world, there is also a silver lining, and the crisis can even be turned into opportunities. Given the global impact of climate change, we must take timely actions together to turn Hong Kong into a liveable and sustainable city with zero carbon emissions.



Mr. WONG Kam-sing, GBS, JP
Secretary for the Environment

PERMANENT SECRETARY/ DIRECTOR'S MESSAGE

As announced by the Chief Executive in her 2020 Policy Address, Hong Kong will strive to achieve carbon neutrality by 2050. In 2020, both the Environment Bureau (ENB) and the Environmental Protection Department (EPD) made long strides towards this goal through cleaner energy development, air quality improvement, enhanced waste reduction and recycling, and close collaboration with our counterparts in the region.

On energy aspect, we have successfully reached our target of halving the ratio of Hong Kong's coal-fired electricity generation as compared with 2015. Natural gas now meets about half of Hong Kong's electricity demand while coal-fired electricity generation has dropped to about a quarter, with nuclear and renewable energy making up the rest. Hong Kong's total carbon emissions have shown a downward trend after reaching its peak in 2014. Preliminary estimation shows that the per capita carbon emissions would be reduced from the peak level

of 6.2 tonnes in 2014 to about 4.5 tonnes in 2020. This achievement puts us on course for achieving a reduction in carbon intensity of 65-70% by 2030, compared with 2005 levels, as outlined in the Hong Kong's Climate Action Plan 2030+.

Apart from adjusting the fuel mix for electricity generation, other measures have also been introduced to support the use of clean energy for electricity generation and enhance efficient use of energy. For instance, in 2020, we embarked on a review of the emission caps for power plants and continued to promote distributed renewable energy through the Feed-in Tariff Scheme. More efficient use of energy was promoted in buildings through the Building Energy Code and energy-saving pledges by businesses, building owners and managers, non-profit organisations and schools. We also secured an additional \$4.3 billion to build an additional District Cooling System to provide energy-efficient cooling

services at the Kai Tak Development, and launched the \$200 million Green Tech Fund to promote the research and development, as well as application, of decarbonisation and green technology.

Green transport, which improves roadside air quality, also has an indispensable role in reducing carbon emissions. In 2020, we expanded the scope of the New Energy Transport Fund from subsidising only trials of green innovative transport technologies to also subsidising direct procurement of products of transport technologies that have been proven to be relatively mature and suitable for local adoption. We also launched the \$2 billion EV-charging at Home Subsidy Scheme to subsidise the installation of charging facilities for electric vehicles in the carparks of existing private residential buildings. Emission standards for certain newly-registered vehicles were also tightened.

Greener energy use largely requires technical solutions and investment. However, in waste reduction, participation of all members of the public is a vital factor of success. Waste treatment accounted for 7.4% of greenhouse gas emissions in 2018 (the most recent year for figures), making it the third largest sector after electricity generation and transport. The experience of some cities that have implemented quantity-based waste charging shows that municipal solid waste (MSW) charging is an effective policy tool to drive behavioural change and reduce overall waste disposal. The implementation of MSW charging will form an integral part of our overall waste management strategy. In the meantime, we are also rolling out programmes to support people in reducing, recycling and avoiding waste.

In 2020, our efforts focused on expanding the community recycling network and revamp its image. The brand "GREEN@COMMUNITY" was launched, and took under its

umbrella 22 Recycling Stores, more than 100 Recycling Spots and 9 Recycling Stations across the territory to bring a new recycling experience to the public. Plastic waste was targeted from multiple angles, including a two-year pilot programme to provide free collection service for waste plastics from non-commercial and non-industrial sources in three different districts, a Pilot Scheme for Provision of Necessary Equipment for “Plastic-free” School Lunch for about 45 primary and secondary schools, and a technical trial on the application of reverse vending machines for collecting used plastic beverage bottles. Taken together, these initiatives will help us to reduce plastic wastes and greatly improve their recycling. In addition, EPD launched for the first time territory-wide waste paper collection and recycling services, and continued to implement programmes to reduce food waste.

We also launch the “Reduce and Recycle 2.0” Campaign to further promote the green living concept of “Save More, Recycle More”, and encourage people to make good use of the community recycling network and adopt a plastic-free lifestyle. At the same time, we continued with the ongoing development of waste treatment and disposal

facilities, which will come online within the coming five years.

A major plank in our efforts to improve the environment is our collaboration with regional and international counterparts. In line with the Basel Convention Amendment, Hong Kong will enhance control on transboundary movement of plastic waste from 2021, and we have briefed the trade associations to prepare them for the resulting changes. We also continued to work closely with our counterparts in Guangdong on air pollution and other shared environmental issues, such as establishing regional air pollution reduction targets and concentration levels for 2025 and 2030. Furthermore, we prepared to launch a new study on ozone formation mechanism to formulate more effective control measures.

Apart from major initiatives that have implications on carbon emissions, waste management and air quality, we also continued to upgrade our sewage treatment facilities and extend our sewerage network to remote villages in 2020. With more than 93% of the population being served by public sewerage, a high level of public hygiene

is maintained. The latest territory-wide water quality monitoring shows that our rivers and marine water bodies can meet the Water Quality Objectives about 90% of the time. Our relentless efforts have also led to better water quality at the gazetted beaches with all 41 of them being safe for swimming for 11 consecutive years since 2010. We will build on these achievements to strive for an even more pleasant water environment in Hong Kong.

We also endeavoured to conserve and revitalise our countryside areas. Since the launch of the Countryside Conservation Funding Scheme in October 2019, a total of 10 countryside conservation and revitalisation projects by non-profit organisations were approved, involving total funding support of about \$60 million by the end of 2020.

Overall, 2020 has been a remarkably productive year for both ENB and EPD amid the restrictions imposed to combat the COVID-19 pandemic. The Government will continue to press ahead with its environmental agenda to drive low-carbon transformation in Hong Kong and achieve a greener and more sustainable environment.



Mrs. NG KIANG Mei-nei, Millie, JP

Acting Permanent Secretary for the Environment /
Director of Environmental Protection

POLLUTION PREVENTION & CONTROL



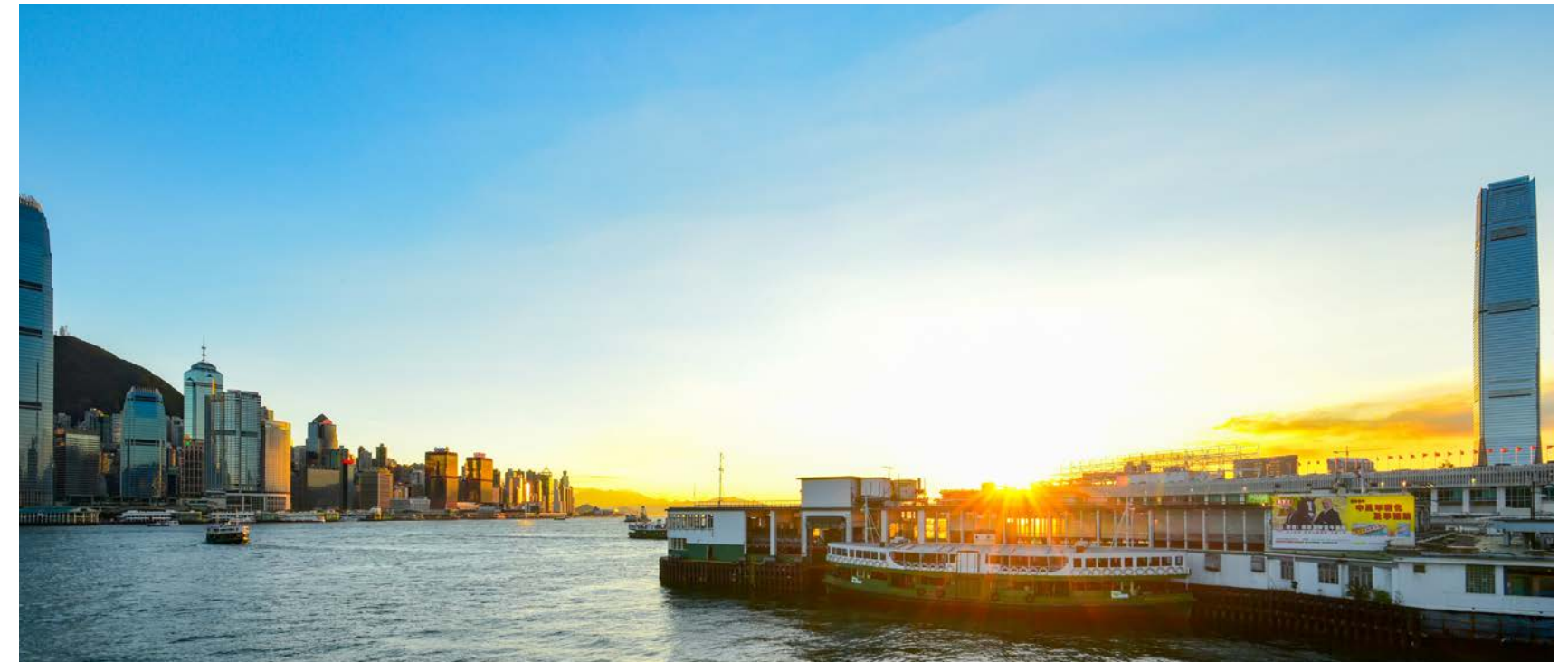
Air

Emissions Mission

The Hong Kong Government aims to achieve carbon neutrality by 2050 (see [Energy](#) chapter), a goal that is critical for addressing climate change impacts but that also benefits air quality. For years, we have been working locally and with our regional counterparts to reduce emissions and enhance air quality. In 2020, the main initiatives included promoting electric vehicles (EVs) through tax concessions, subsidising trials for new energy vehicles, preparing a pilot scheme for electric ferries, and sustaining efforts to tighten emission caps for power plants and emission standards for motor vehicles.

Highlights

- ◆ Embarked on the legislative process to update Air Quality Objectives.
- ◆ Launched an incentive-cum-regulatory programme to progressively phase out about 40 000 Euro IV diesel commercial vehicles by the end of 2027.
- ◆ Expanded the scope of the New Energy Transport Fund to subsidise not only testing but also use of green innovative transport technologies.
- ◆ Launched the \$2 billion EV-charging at Home Subsidy Scheme to subsidise the installation of EV charging-enabling infrastructure in the car parks of existing private residential buildings.
- ◆ Tightened the emission standards for newly registered motorcycles, light buses with a design weight of more than 3.5 tonnes and buses with a design weight of not more than 9 tonnes, in phases starting from October 2020.
- ◆ Embarked on a review of the Eighth Technical Memorandum to further tighten the emission caps for power plants.



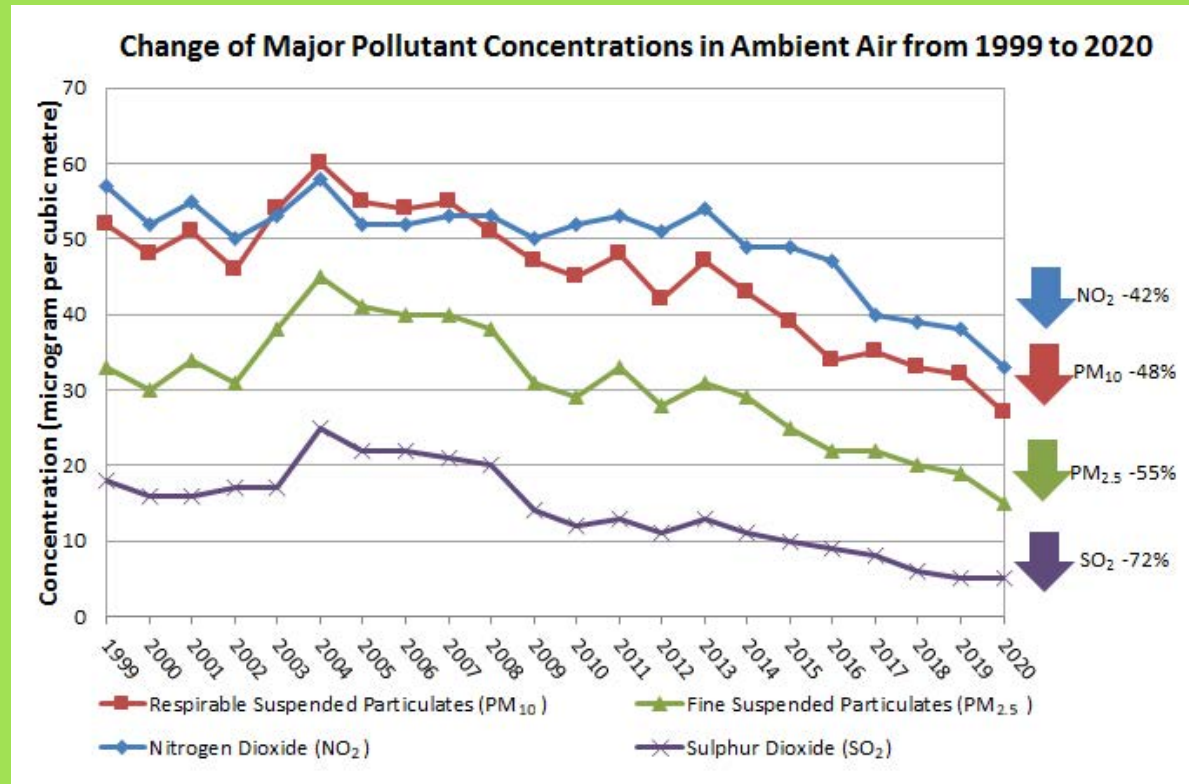
| Photo of clear sky

Air Quality

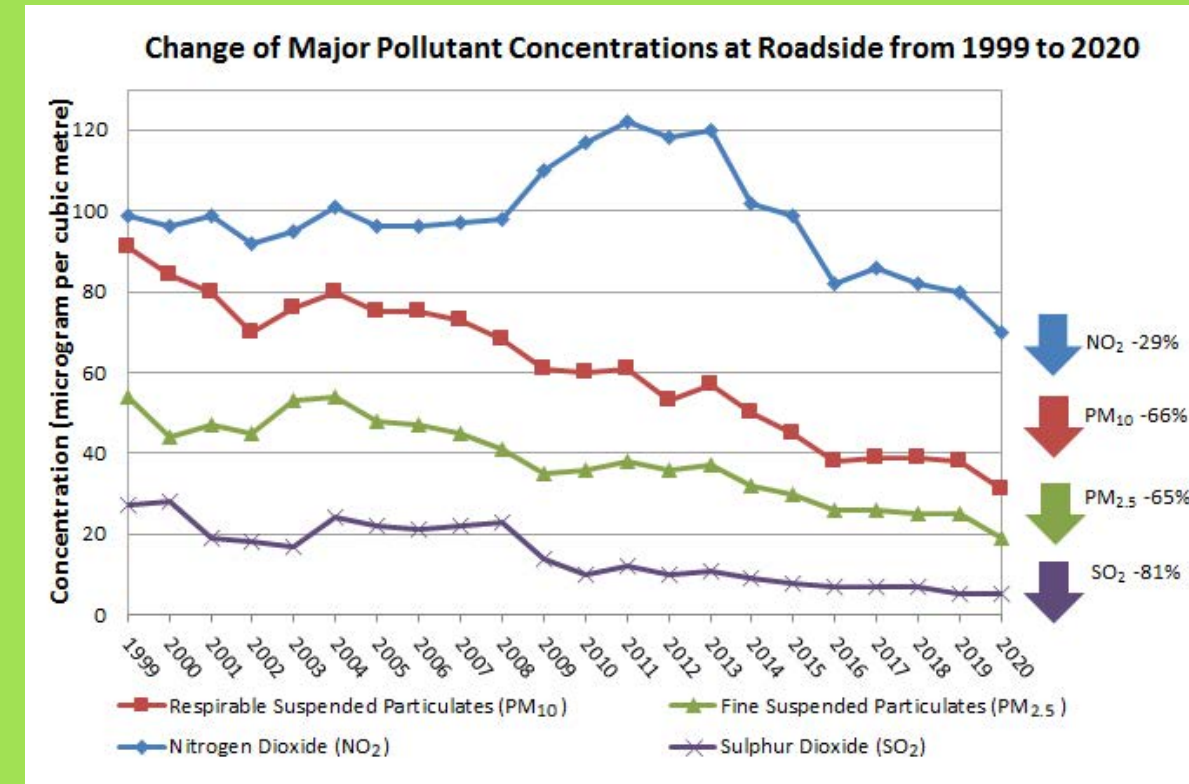
Air quality in 2020: Air quality has been steadily improving on most counts at both the local and regional levels. Locally, levels of sulphur dioxide (SO₂), nitrogen dioxide (NO₂), respirable suspended particulates (RSP) and fine suspended particulates (FSP) have fallen by 29%-81% since 1999. Regionally, readings by the Guangdong-Hong Kong-Macao Pearl River Delta Air Quality Monitoring (PRDAQM) Network show that concentrations of SO₂, NO₂ and RSP fell 43%-86% between 2006 and 2020 and those of FSP by 31% since 2015 when monitoring began.

However, we need to further reduce the concentration of roadside NO₂ as it directly impacts on pedestrians, despite already a reduction of 43% from its peak in

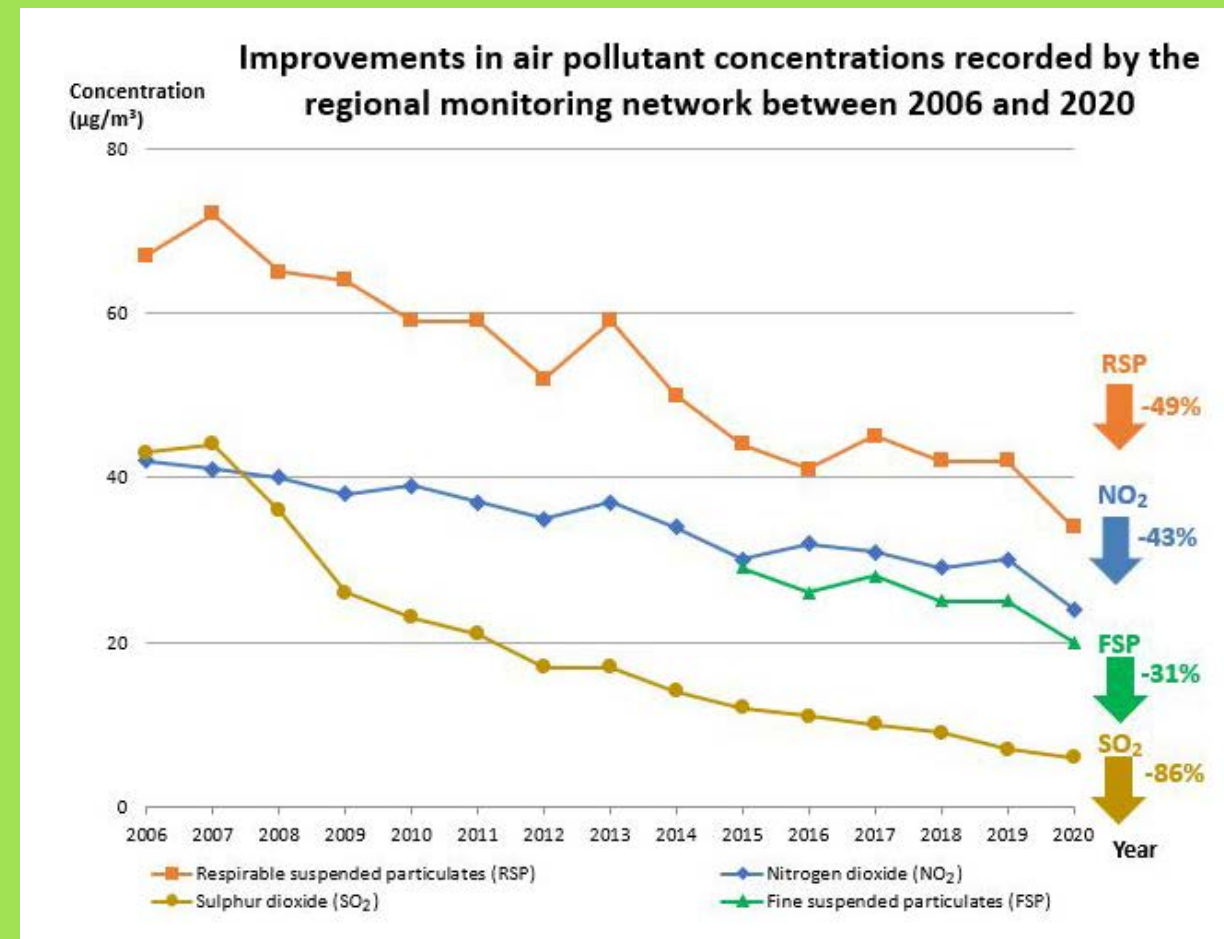
2011. On the other hand, ambient ozone (O₃) at the local and regional levels are also on a rising trend. To address these issues, the Government has been tightening emission requirements and reducing emissions from vehicles, vessels and power plants (see below), and working with Guangdong and Macao to monitor the formation, characteristics and transportation of regional O₃ (see [Climate Change and Cross-boundary and International Cooperation](#) chapter). To strengthen control over products containing volatile organic compounds (VOCs, which interact with nitrogen oxides (NO_x) under sunlight to form O₃) thus reducing their emissions, the Government has been exploring proposals to tighten the VOC content limits of regulated architectural paints and extend the control to cleaning products.



Change of Major Pollutant Concentrations in Ambient Air



Change of Major Pollutant Concentrations at Roadside



Improvements in air pollutant concentrations recorded by the regional monitoring network

Monitoring: General and roadside air quality are monitored locally. In July 2020, two new air quality monitoring stations commenced operation in Southern and North districts, bringing the total to 18. For regional air quality, the PRDAQM Network has 23 monitoring stations in Guangdong, Hong Kong and Macao and will increase the number in 2021 to start monitoring VOCs, following completion of a pilot programme in 2020.

Targets: Air Quality Objectives (AQOs) represent our targets for cleaner air and are benchmarked against the World Health Organization’s Air Quality Guidelines. Following a review on Hong Kong’s AQOs, the Government is preparing to amend legislation as at end 2020 in order to tighten the 24-hour AQO for SO₂ and the annual and 24-hour AQOs for FSP.

Hong Kong and Guangdong are also working together to formulate regional air pollutant emission reduction plans and targets for 2025 and 2030, with a view to further improving regional air quality.

Hong Kong’s Prevailing and Proposed New Air Quality Objectives (AQOs) and Interim and Ultimate Targets of the World Health Organization (WHO) Air Quality Guidelines (AQGs) as at end 2020

Pollutants	Averaging Time	WHO AQGs (µg/m ³)				No. of Exceedances Allowed in Hong Kong’s AQOs per calendar year
		Interim Target-1	Interim Target-2	Interim Target-3	Ultimate Target	
Sulphur Dioxide (SO ₂)	10 minutes	-	-	-	500	3
	24 hours	125	50	-	20	3
Respirable Suspended Particulates (RSP/PM ₁₀)	annual	70	50	30	20	Not applicable
	24 hours	150	100	75	50	9
Fine Suspended Particulates (FSP/PM _{2.5})	annual	35	25	15	10	Not applicable
	24 hours	75	50	37.5	25	9 35
Nitrogen Dioxide (NO ₂)	annual	-	-	-	40	Not applicable
	1 hour	-	-	-	200	18
Ozone (O ₃)	8 hours	160	-	-	100	9
Carbon Monoxide (CO)	1 hour	-	-	-	30 000	0
	8 hours	-	-	-	10 000	0
Lead (Pb)	annual	-	-	-	0.5	Not applicable

Notes:
 ■ Prevailing AQOs which took effect on 1 January 2014 are indicated in green cells
 ■ Proposed New AQOs and allowable number of exceedances are indicated in light green cells



New air quality monitoring stations at North District and Southern District commenced operation in July 2020

Reducing Motor Vehicle Emissions

Motor vehicles remain a major source of air pollutant emissions, particularly at roadsides. For example, more than 90% of roadside NOx emissions are produced by commercial vehicles such as goods vehicles, buses, public light buses and taxis, yet they account for only about 20% of total vehicles on the road. To reduce vehicular and their carbon emissions, the Government is promoting adoption of EVs, encouraging trials and application of green transport technologies, and tightening emission standards for conventional vehicles while phasing out the most polluting ones.

Going electric: EVs have no tailpipe emissions, hence bringing down the roadside emissions and also enhancing the air quality. The Government encourages EV adoption through granting tax concessions, expanding EV charging infrastructure, and conducting trials to test their viability for Hong Kong conditions. In 2020, the proportion of electric private cars in newly registered private cars has further increased from 5.2% in 2015 to 12.4%, representing that one out of every eight new private cars was electric.

On the tax concessions, the first registration tax (FRT) is fully waived for electric commercial vehicles, motorcycles and motor tricycles. Electric private cars are eligible for an FRT concession of \$97,500 – and if they are replacing old private cars with new electric ones, they are eligible for a

maximum concession of \$250,000 under the “One-for-One Replacement” Scheme. More than 90% of first-registered electric private cars benefited from the scheme in 2020. The Government also announced during the year that the FRT concessions, which were due to expire in 2021, would be extended to 31 March 2024.

On charging infrastructure, apart from providing gross floor area concessions to new car parks with EV charging infrastructure, the \$2 billion EV-charging at Home Subsidy Scheme was launched in October 2020 to subsidise installation of EV charging-enabling infrastructure in the car parks of existing private residential buildings. The scheme targets to cover 60 000 car parking spaces in 3 years. Response to the scheme was very positive. Over 100 applications were received by end 2020, involving more than 30 000 parking spaces. The Government has also allocated \$120 million to add about 1 000 public EV chargers in its carparks by 2022.

Green vehicle trials: The Pilot Green Transport Fund has been providing subsidies for transport operators to put green innovative transport technologies into trial since its establishment in 2011. In 2020, it was given an extra boost with an expanded scope to support the trials and direct applications of products of technologies that are proven to be relatively mature and suitable for local adoption. An additional \$800 million was injected to support that wider scope and the fund was re-named the New Energy Transport Fund.



Trial of single-deck electric bus under the New Energy Transport Fund



Trial of electric light goods vehicle under the New Energy Transport Fund



Trial of electric medium goods vehicle (tractor) under the New Energy Transport Fund



Trial of light bus under the New Energy Transport Fund

As at end 2020, 196 trial applications have been approved, involving 163 electric commercial vehicles, 103 hybrid commercial vehicles, and 9 technologies applicable to conventional buses and ferries.

Emission standards: The Government has been tightening emission standards for newly registered vehicles gradually with reference to international developments and the supply of vehicles to Hong Kong. Starting from October 2020, tighter emission standards have been adopted for newly registered motorcycles. Emission standards for newly registered light buses (with a design weight of more than 3.5 tonnes) and buses (with a design weight of not more than 9 tonnes) will also be tightened from March 2021.



| Euro IV DCV Non-Franchised Bus

To reinforce the benefits of these cleaner vehicles, older, more polluting vehicles are being phased out. Subsequent to the completion of the \$11.4 billion scheme for phasing out pre-Euro, Euro I, Euro II and Euro III diesel commercial vehicles (DCVs) in end-June 2020, the Government has mandated the retirement deadlines of Euro IV DCVs and launched an ex-gratia payment scheme, to progressively phase out about 40 000 Euro IV DCVs by end 2027. Meanwhile, a remote sensing system to monitor air pollutant emissions from petrol and liquefied petroleum gas vehicles processed about 610 000 vehicle counts in 2020 and issued emission testing notices to 2 655 vehicle owners.



| Euro IV DCV Medium Goods Vehicle



| Phasing Out Euro IV DCV Poster

Marine Emissions

Marine vessels accounted for 28% of total SO₂ emissions in 2019. To ease the problem, the sulphur content of locally supplied marine light diesel is capped at 0.05%. For ocean-going vessels (OGVs), the requirement has been to use fuel with sulphur content not exceeding 0.5% while at berth. This was tightened in January 2019 so that OGVs have to use the same low sulphur fuel at all times when they are in Hong Kong waters. Since then, the air quality in the harbour area has significantly improved. For example, the annual average concentration of SO₂ recorded in 2020 at the air quality monitoring station in Kwai Chung which is located near to the container terminals was about 25% below the level recorded in 2018.

To facilitate the use of green transport technologies in marine vessels, the Government is also preparing to launch a pilot scheme on electric ferries for in-harbour ferry routes to test their technical viability.

Power Plant Emissions

Electricity generation by power plants accounted for 47% of SO₂, 28% of NO_x and 16% of RSP in 2018 (the latest available figures). Hong Kong's two power companies are subject to technical memoranda that set out emission caps for SO₂, NO_x and RSP. The latest Eighth Technical Memorandum was under review in 2020, with a view to further tightening the caps.

In order to meet the tightening emission caps and reduce carbon emissions, the power companies have been constructing new gas-fired generating units, improving the thermal efficiency of existing gas-fired units, and exploring to generate more electricity from renewable energy (RE) (see also [Energy](#) chapter).

Looking Ahead

Proceed with the legislative process to update the AQOs and embark on the next review.

Formulate Hong Kong's first roadmap on popularisation of EVs.

Update the Clean Air Plan for Hong Kong.

Complete a review of the Eighth Technical Memorandum to further tighten the emission caps of power plants.

Prepare to launch public consultations on proposals to tighten the VOC content limits of regulated architectural paints and extend the control to cleaning products.

Prepare to launch a trial of electric public light buses and associated charging facilities in 2023.

Prepare to launch a pilot scheme of electric ferries for in-harbour ferry routes in 2023.

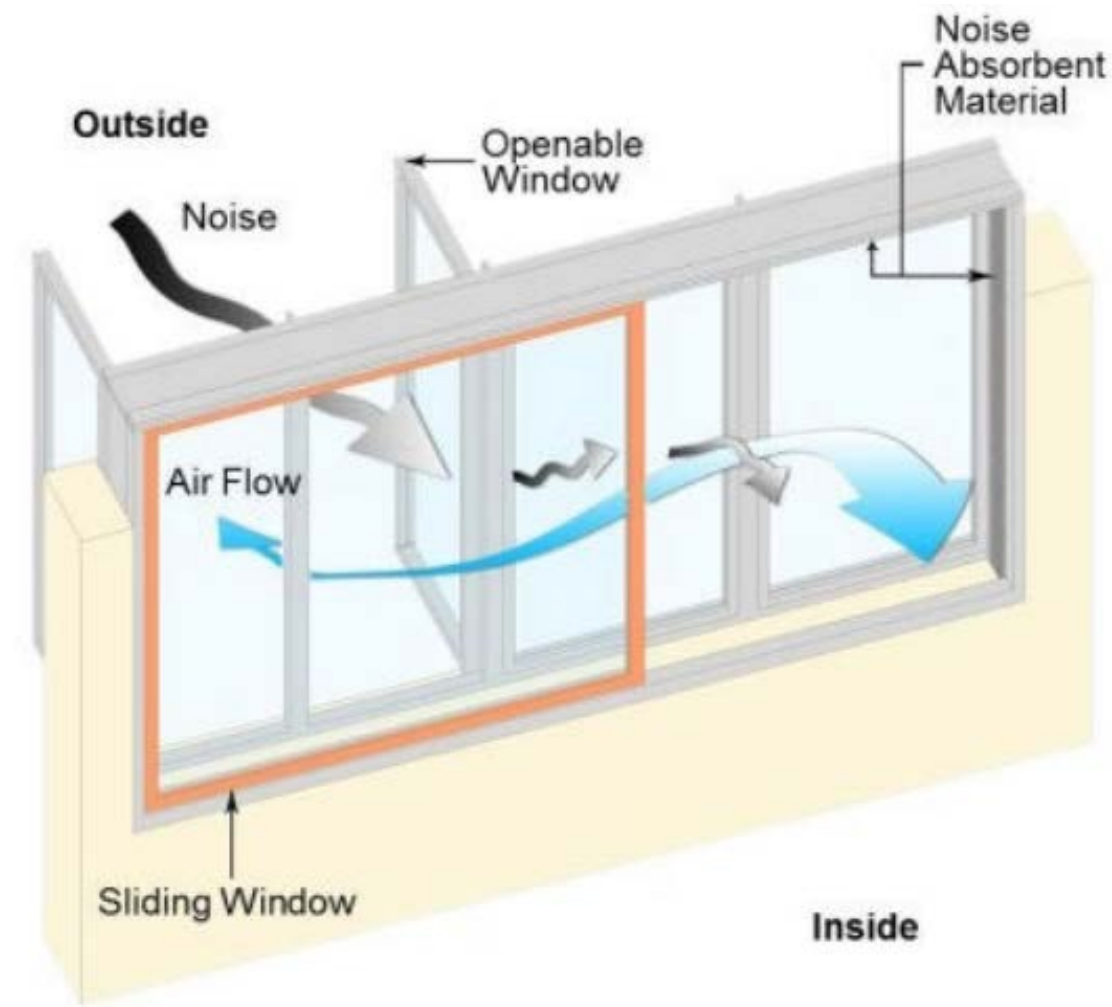
Noise

Innovation and Engagement

Environmental noise is a fact of life in a city as vibrant and densely populated as Hong Kong. Although the EPD has had good success mitigating the most problematic noise from traffic and construction work, we are still seeking ways to reduce the impacts further. We have developed an innovative window for residential flats to reduce traffic noise while maintaining ventilation. In 2020, we published a practice note for professionals on such application. We have also reached out to the trades on reducing noise from construction and renovation works.

Highlights

- ◆ Issued a professional practice note on the application of baffle-type acoustic windows in planning residential developments.
- ◆ Completed resurfacing 102 local road sections with low-noise road surfacing materials, benefiting 146 000 people.
- ◆ Completed retrofitting noise barriers at 19 road sections, benefiting 64 000 people. Noise barriers were under construction at two other road sections.



| Schematic diagram of baffle type acoustic window

Opening a Window

The increasing demand for housing in Hong Kong coupled with limited land supply means new residential developments inevitably are built close to roads. To reduce traffic noise for residents, the EPD has collaborated with the Housing Department and the Buildings Department to develop an innovative acoustic window, and issued professional guidelines to facilitate industry's application.

The acoustic window is unique in allowing for both noise reduction and ventilation. It has two layers - the outer layer is a conventional side-hung window with a push-pull opening, while the inner layer is a half-sized sliding window. By positioning the two layers properly, noise from outside can be muffled while providing natural ventilation for the flat.



| Baffle type acoustic window at Hoi Ying Estate to mitigate traffic noise from West Kowloon Highway

To evaluate the noise reduction performance of the acoustic window, the EPD conducted more than 100 noise measurements in a mock-up facility. We tested different window designs, different mock road orientations and different enhanced noise mitigation measures. The results were incorporated into a professional practice note issued in 2020 that will save the industry from having to spend time and money conducting their own tests when using the acoustic window.

The EPD also organised 10 technical seminars in 2019 and 2020 to promote the application of acoustic windows in planning new residential developments, as well as other innovative noise mitigation designs. More than 1 100 practitioners attended from the architecture, engineering, planning, acoustics, environmental consultancy, construction and other trades.

Innovation in mitigating noise is catching on in Hong Kong. As of 2020, about 130 residential developments had incorporated such designs to reduce traffic noise.

A Quieter Approach for Building and Renovating

Noise from construction sites can affect the surrounding area while noise from renovating a high-rise flat can directly impact neighbouring households as it reverberates through the building. A recent survey of 5 000 Hong Kong residents identified such domestic renovation noise as the most annoying type of construction noise, ahead of percussive piling, demolition, road maintenance and general construction noise. The EPD has completed a study to investigate solutions and is using the findings to encourage the trade and property managers to focus on quieter methods and equipment and develop house rules and other management techniques that reduce noise impacts on residents.

The study looked at overseas' experiences, new technologies and the options for stakeholder engagement. It found that early planning by builders and the establishment of house rules through community liaison had been effective in reducing noise in other places. Non-percussive technologies were also identified that can significantly reduce noise – for example, for pre-drilling and fastening, a direct fastening tool is 9 dB(A) quieter than a conventional hammer drill, while for making holes on a concrete wall, a handheld coring machine is 15 dB(A) quieter than a conventional percussive drill.



Wall chaser (bottom) performs with less noise and dust than the conventional breaker (top)

The study made several recommendations that are now being promoted by the EPD. Builders are encouraged to give early consideration to construction noise at the planning and tender stage to identify opportunities for adopting quieter construction technologies. The EPD will also explore incentive schemes for adopting quieter construction machineries, initiate training programmes for the trade, and review and monitor the effectiveness of these tools and quiet site practices.

For property managers, the EPD is collaborating with the profession to provide workshops and training that can help them tackle domestic renovation noise more effectively. Guidelines and leaflets will also be produced for promoting quiet renovation tools and effective house rules to Owners Corporations and the building management so as to minimise noise disturbance and mediate noise complaints.

Together, these measures should help meet people's aspirations for a quieter environment and reduce the annoyance from noise.

Environmental Protection Department
The Government of the Hong Kong
Special Administrative Region

Site Map A A A English 繁體版 简体版

Home Background Concrete Removal Demolition Foundation Works General Building Works Renovation Road Works Tunneling and Pipe Installation

Renovation

Interior/ partial interior renovation works at the existing building would cause noise impact to the residents at neighbouring buildings or units. Concrete/ brickworks breaking and tiles/paint removal using handheld breakers are common noisy renovation works. Sound power levels of traditional handheld breakers can generally reach 108 dB(A). Use of some smaller mechanical equipment such as mini-breaker or innovative method such as high pressure water jet for tiles/ paint removal would generate less noise during renovation works.

| Sharing of state-of-the-art quiet renovation technologies in EPD's webpage

Looking Ahead

Continue to leverage new technologies to pre-empt, minimise and resolve noise problems.

Continue to use the environmental impact assessment process to address public concerns and achieve an acceptable noise level from new infrastructure projects.

Continue to promote quiet renovation tools and encourage good building management practices to reduce noise from domestic renovation.

Water

Land-based Solutions

The quality of Hong Kong's beaches, rivers and seawater has had a remarkable turnaround over the past 20 years. With persistent effort and investment to collect and treat sewage, our waters have become mostly clean and healthy. It is a different story, however, for rubbish, which litters the shoreline and marine waters. Plastic bottles, plastic bags, and even plastic microbeads from personal care products are both unsightly and unhealthy for marine life. In 2020, measures were underway to bring this problem under control.

Highlights

- ◆ Invested \$2 billion in sewerage infrastructure, bringing the total invested since 1990 to \$59 billion.
- ◆ Launched shoreline wardenship programmes to create temporary jobs in the realm of clean shorelines.
- ◆ Consulted the trade on introducing a voluntary scheme for phasing out personal care and cosmetics products that contain plastic microbeads.
- ◆ Supported a sewage surveillance research for monitoring the spread of the COVID-19 virus and tracking down infection cases from sewerage systems.

Water Quality in 2020

All 41 gazetted beaches have fully complied with bacteriological water quality objectives for the 11th year in a row, while measurements in Victoria Harbour achieved 90% compliance. These achievements follow the investment of \$59 billion in sewerage infrastructure since 1990, including \$2 billion in 2019-20 alone.

In addition, painstaking work has been ongoing to identify and rectify misconnections of sewers and stormwater drains, install dry-weather flow interceptors, enhance public awareness, and divert sewage from village houses to public sewers and sewage treatment works. By the end of 2020, the latter had covered 14 700 houses in 258 villages.

Cleaning Our Shorelines

Refuse accumulating at shorelines often arises from complex and disparate problems that must be tackled through coordination between different departments and targeted operations. The Government has established two platforms to take on this challenge – the Interdepartmental Working Group on Marine Environmental Management, which plans special cleanup operations under the EPD's coordination, and the Clean Shoreline Liaison Platform, established in 2018 to leverage community efforts to protect the marine environment and keep shorelines clean.

The Interdepartmental Working Group conducted several operations in 2020 that resulted in many tonnes of refuse being removed from coastal sites. At Aberdeen Typhoon Shelter, for instance, about 90 bags of refuse were removed from vacant land between shipyards by the Food and Environmental Hygiene Department (FEHD) and the Lands Department (LandsD). More than 200 large fish feed bags were collected in a joint operation undertaken by the FEHD, Marine Department (MD) and Agriculture, Fisheries and Conservation Department (AFCD) at Soko Islands and a nearby fish culture zone. FEHD also coordinated with the EPD to clean up a layer of floating refuse that had accumulated in stagnant water at the back of the beach area of Shek Pai Wan on Lamma Island.



| Beaches are perfect places to escape from the hustle and bustle of the city



| EPD staff collecting water sample and conducting field measurement at a beach

The COVID-19 pandemic placed restrictions on community events, but the Clean Shoreline Liaison Platform was still able to organise a socially distanced cleanup operation in April that involved the EPD, FEHD, MD and volunteers. This was held at Kung Pui Wan on Tap Mun, a rocky beach not easily accessible by working vessels and engulfed by a rough terrain. Bags of collected refuse had to be carried by foot to a collection point, where MD vessels picked up the waste. People worked in groups of no more than four and maintained social distance, to minimise the risk of COVID-19. Despite the conditions, a total of two tonnes of refuse was collected on the day.

The Government also continued to use social media to raise people's awareness of the marine refuse problem and encourage behavioural change in order to keep our shorelines clean. This was bolstered by the recruitment of 100 shoreline wardens under the ENB's Green Employment Scheme in 2020, to help with cleanups, do marine refuse surveys and produce promotional videos. Also bringing a spotlight to the issue was the September kick-off ceremony of International Coastal Cleanup 2020 Hong Kong, which was attended by Government officials.

Tackling the marine refuse problem has a regional dimension, too. The Hong Kong-Guangdong Marine Environmental Management Special Panel has established a notification and alert mechanism for surges of water-borne refuse that was activated four times in 2020.



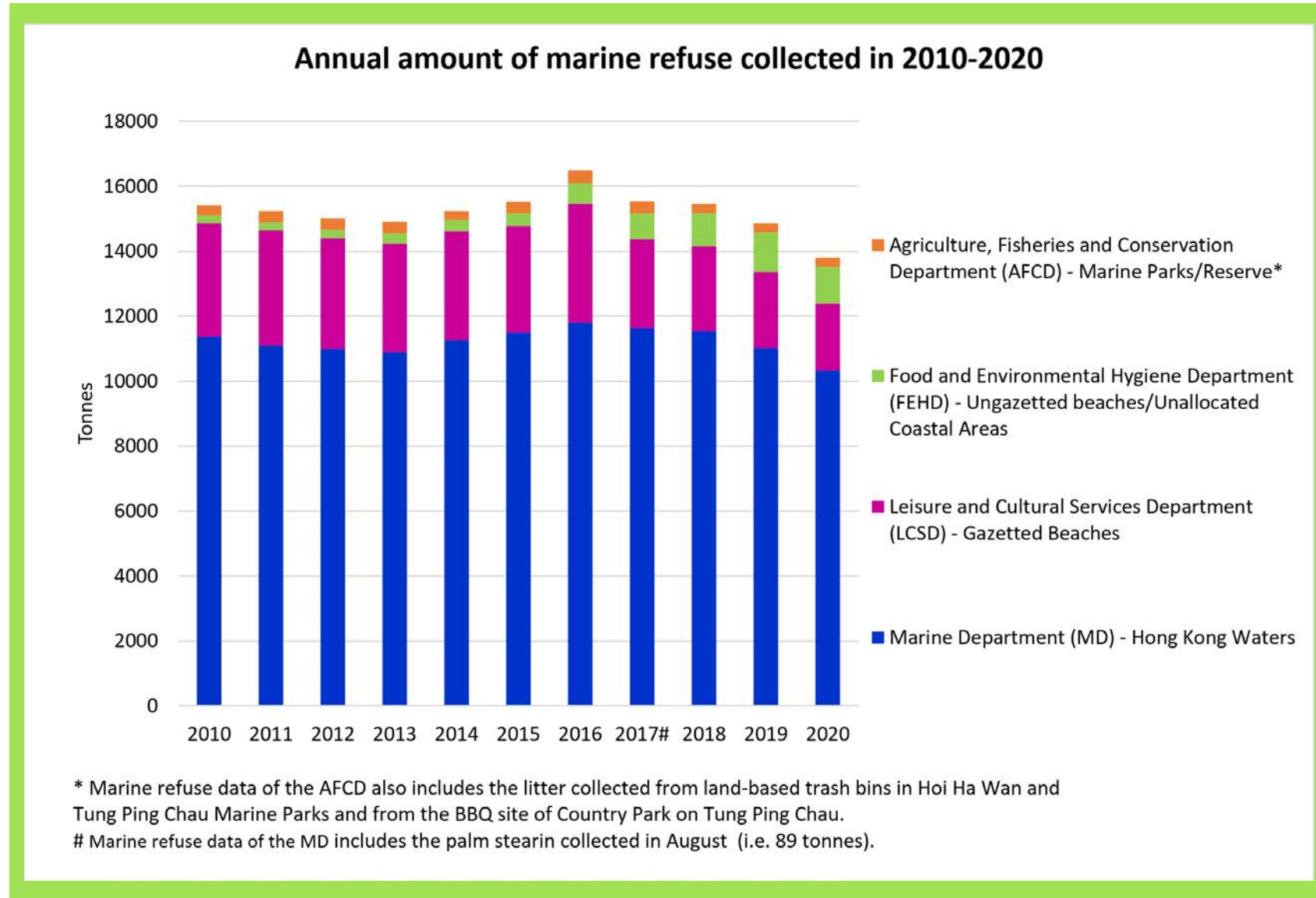
The removal of marine refuse collected during the joint cleanup operation in Tap Mun



Shoreline Wardens producing publicity video at a coastal site



The Secretary for the Environment joined the Shoreline Wardens and volunteers to conduct cleanup at Tung Lung Island

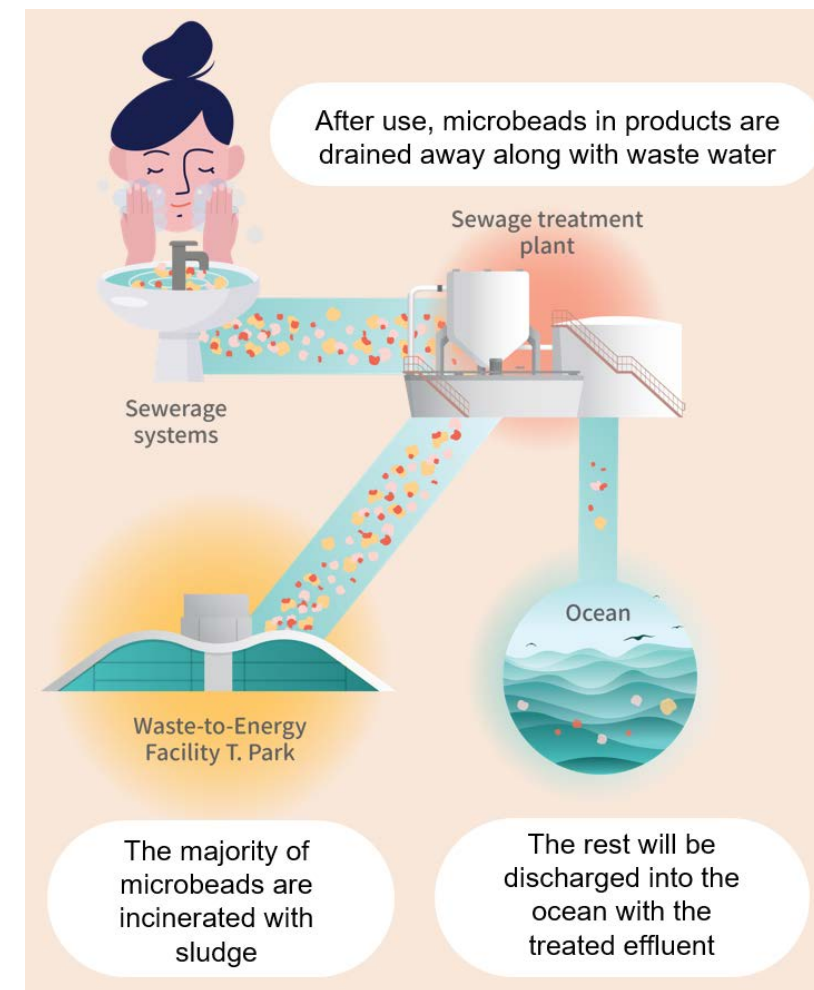


Annual amount of marine refuse collected in 2010-2020

Squeezing Out the Microbeads

Plastic microbeads are sometimes added to personal care and cosmetic products (PCCPs) for functions such as scrubbing and cleansing, but they may be a threat to the aquatic environment. Although a majority of microbeads can be removed through sewage treatment works, a portion still escapes into the marine environment, entering food chains and potentially harming marine life. Microbeads have become a global concern and a number of countries have started to introduce voluntary or regulatory programmes to phase them out at source.

The Government is keen to follow suit and has undertaken to gradually eliminate microbeads. This goal was first outlined in the Chief Executive's 2019 Policy Address Supplement. By March 2020, the EPD had completed a consultancy study reviewing international trends and strategies for controlling microbeads in PCCPs. Two paths are possible: voluntary phase-out, which has been implemented in such countries as Australia and the Netherlands, and regulatory control, seen in such places as Mainland China, the US and South Korea. Given Hong Kong imports most of its goods and a regulatory regime will take some time to implement, the Government has decided to take a voluntary approach first.



Pathway of microbeads into the marine environment

The voluntary scheme will be implemented through a "Bye Bye Microbeads" Charter in collaboration with manufacturers, importers, retailers, beauty salons, and other handlers of PCCPs to set targets and timetables for ceasing or reducing the use of microbeads in their rinse-off products. The Charter was being developed with feedback from the trade which was presented with a draft in October 2020 and given several weeks to comment.



Online kick-off ceremony of International Coastal Cleanup 2020 Hong Kong

The Government will promote the names of Charter signatories and issue a certificate and a logo sticker for them to display at their outlets. The sticker will bear a QR code which links to a website with a list of brands or product lines already under the Charter, so people can make informed choices on the spot. Participants who actively phase out microbeads in their products will be commended with awards. With the ball rolling in Hong Kong and around the world, it is hoped microbeads can soon be phased out and this threat to the marine environment can be eliminated.



EPD staff introduced the draft plan of the Charter to the trade



Assistant Director answering questions arising from the trade



The trade actively shared their views on the Charter

Sewage Surveillance for COVID-19 Virus

With the objective to develop an effective methodology for monitoring the spread of COVID-19 virus in the community, the Government in collaboration with a cross-disciplinary team of the University of Hong Kong (HKU) started a research study in July 2020, applying a novel method developed by HKU for testing the virus in samples collected from sewerage systems. EPD formed an expert team to support the research with sewerage network analysis and strategic sampling planning from its onset, together with the Drainage Services Department (DSD) arranging for sewage sampling. Starting in October 2020, regular samples were taken at 26 fixed monitoring points set up across the territory and tested for the gene segments of COVID-19 virus.

In response to the fourth wave of COVID-19 epidemic emerging in November 2020, the teams adjusted the regular monitoring plan and proceed to collect samples at some housing estates with infected clusters for analysis, hoping to provide supplementary information to complement clinical testing results in the assessment of local epidemic situation. In December 2020, the teams obtained consecutive positive results of the presence of the virus in sewage samples taken from two buildings in Choi Wan (II) Estate where there had been no confirmed case. The Government immediately ordered compulsory testing for all residents in the two buildings and located a total of 10 hidden infected cases there. This is the world's first successful case of tracking down COVID-19 infection cases through combined testing of sewage and compulsory testing on residents.



EPD and DSD locating suitable sewage sampling location

Looking Ahead

Roll out more measures to combat nearshore pollution in Victoria Harbour.

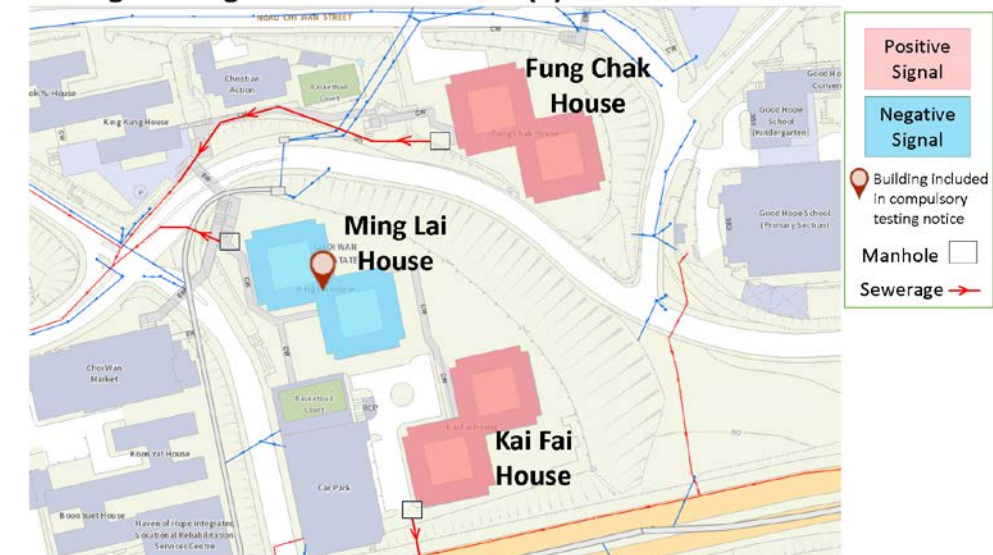
Launch a voluntary scheme to phase out microbeads in PCCPs.

Strengthen efforts and engage the public in cleaning up shorelines.

Continue to expand sewerage infrastructure to enhance territorial water quality.

Expand the sewage surveillance network and laboratory testing capacity for COVID-19 virus to cover more population of Hong Kong.

Sewage Testing Results for Choi Wan (II) Estate on 26 – 29 Dec 2020



Positive sewage testing results in buildings with no confirmed cases

Environmental Assessment and Planning

A Greener Way to Meet Housing Needs

The lack of sufficient land supply to meet housing demand in Hong Kong is a long-term problem. One of the projects that will help address the gap is the extension of Tung Chung New Town, an area with strategic resources, tourist attractions and a rich natural environment. Through careful planning and environmental impact assessment (EIA), a well-balanced project has been developed that will reclaim land in Tung Chung East using methods that protect sensitive natural areas, incorporate green features, and at the same time provide some 49 500 new residential flats.

Highlights

- ◆ Continued to adopt green features in planning new development areas to promote a green living environment.
- ◆ Continued to promote state-of-the-art construction methods that minimise environmental impacts and expedite land production.
- ◆ Vetted the environmental implications of 237 funding and policy proposals submitted to the Executive Council, Legislative Council (LegCo) and other decision-making bodies.



| Photomontage of Tung Chung East Development



| Tung Chung East Reclamation Works

Green Features for Tung Chung East Reclamation

Tung Chung New Town is an important hub with easy access to the Hong Kong International Airport, Hong Kong-Zhuhai-Macao Bridge, Mass Transit Railway (MTR) and, importantly, space for building new flats. A planned extension there will add 200 hectares of land for development, including a 130-hectare reclamation project at Tung Chung East. As with any such project, careful consideration has been given to balance an urgent need – in this case, for housing – with the need to avoid undue harm to the natural ecology and create a sustainable living environment.



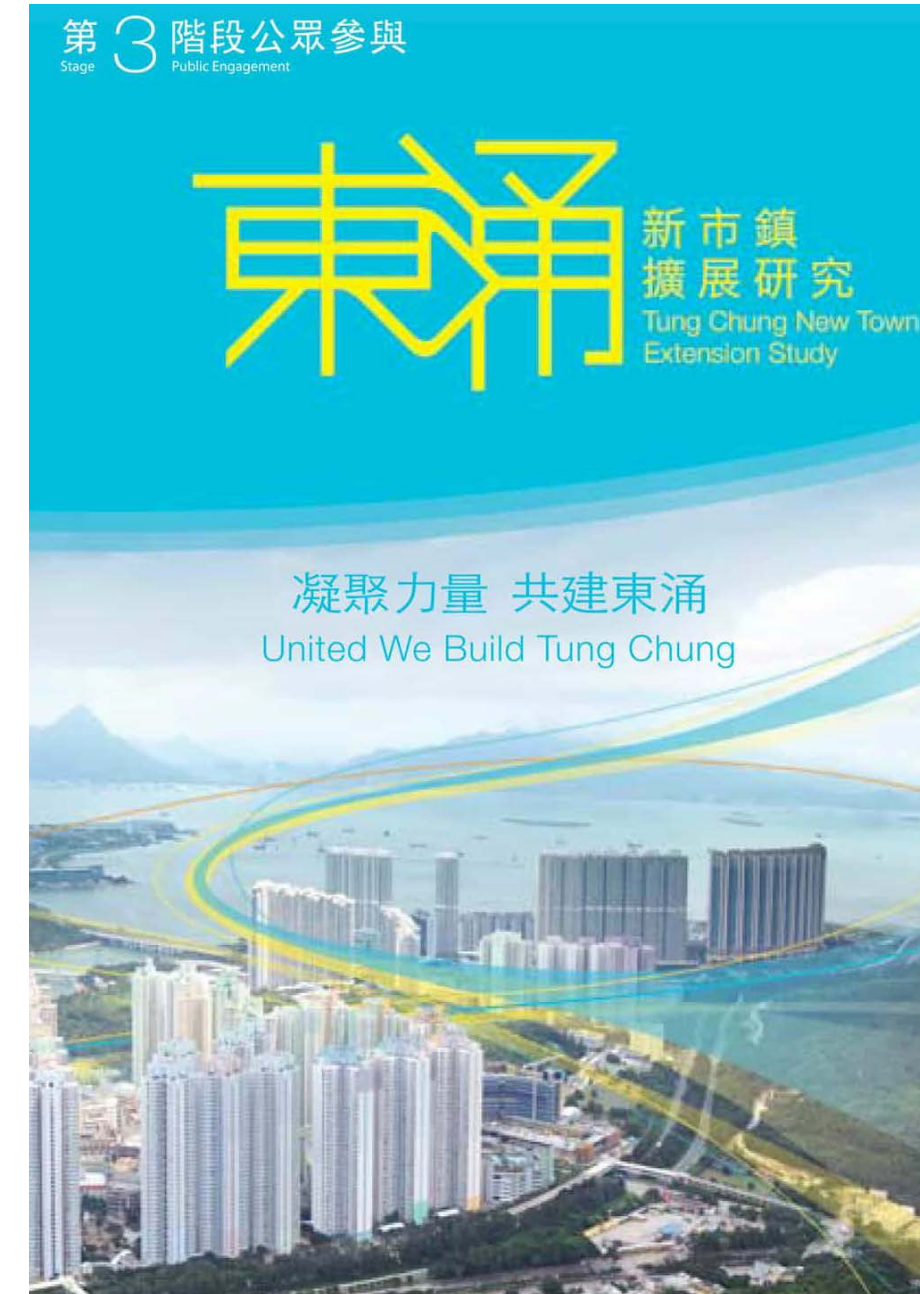
| Stage 1 Public Engagement Report

Three stages of public engagement were carried out to solicit public views on environmental goals such as protecting the Chinese white dolphins, conserving ecologically sensitive



| Stage 2 Public Engagement Report

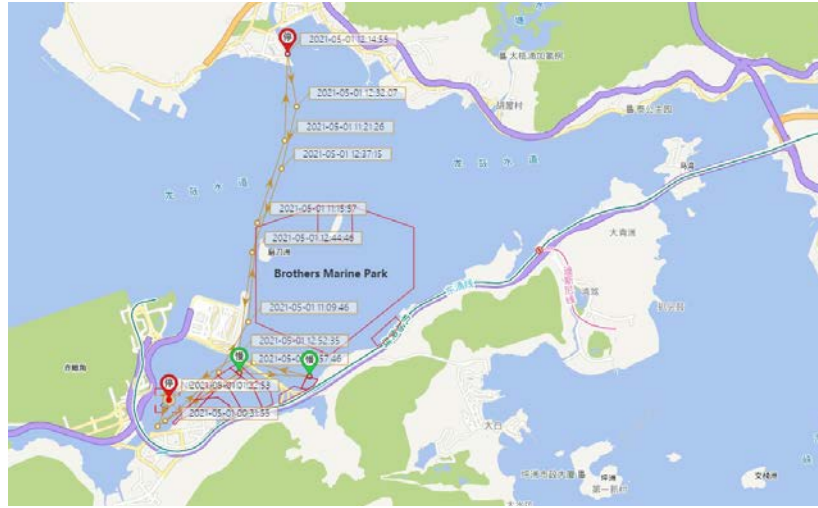
areas and maintaining healthy air quality, as well as creating a liveable space for residents. This input was incorporated into an urban design that balances the allocation of open



| Stage 3 Public Engagement Report

space with community facilities and environmental protection measures.

The unmitigated reclamation would have had undeniable impacts on the environment but through the EIA process, various green features have been recommended with a view to alleviating these impacts at both the construction and operational stages to within the established criteria.

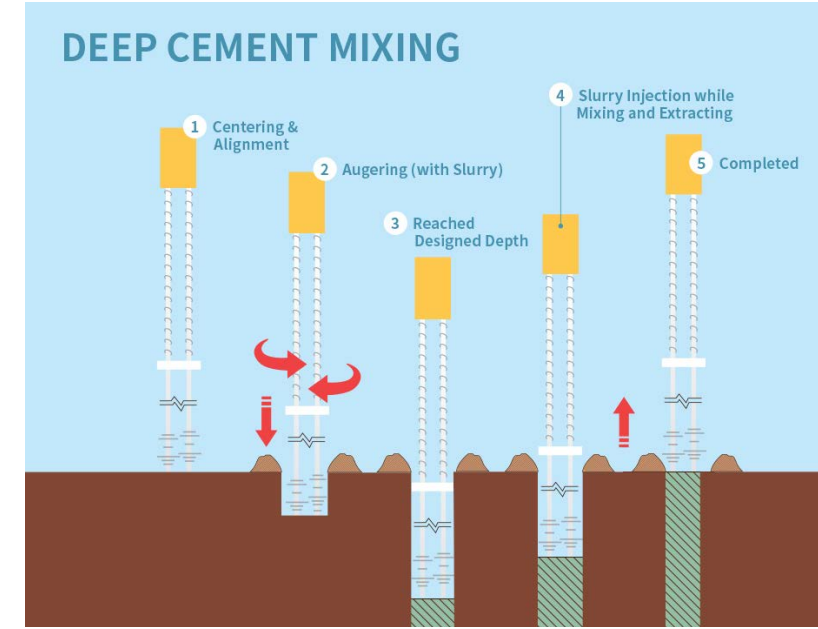


Designated travel route for construction vessels



Deep cement mixing barges

Firstly, the location of the reclamation has critically been selected for an area with the lowest use by Chinese white dolphins and it will not encroach on Tai Ho Wan or The Brothers Marine Park. Non-dredged reclamation is being carried out via the environmentally friendly “deep cement mixing” (DCM)



Schematic diagram of DCM process

method which eliminates the need to remove marine deposits, thus reducing impacts on water quality and marine ecology and avoiding disposal of marine deposits. This will also greatly shorten the construction period.



Silt curtain to mitigate water quality impacts



Perimeter silt curtain to enclose the reclamation works areas

Furthermore, a dolphin exclusion zone with a radius of 250 metres has been designated to keep out vessels and disruptive marine activities when dolphins are spotted in the area via a dolphin watch plan. This plan notifies vessels when dolphins are in the area so the vessel operators can adjust their activities accordingly. In addition, a stringent environmental monitoring and auditing programme has been implemented to ensure that the marine works are carried out in a proper and acceptable manner. Construction vessels are also required to follow designated travel routes to avoid dolphin hotspots.

Public fill (inert construction and demolition materials generated by the construction industry) is being used to form the land of the reclamation. This is a win-win option because it reuses public fill materials for beneficial use, while easing the burden on public fill banks, which are getting full.

The design of the project also incorporates green features, including a 3.8-kilometre eco-shoreline to enhance biodiversity in the inter-tidal zone. This shoreline will mimic the physical conditions of natural inter-tidal zones as far as practicable to provide a suitable habitat for a range of marine species. In future, the Tung Chung East waterfront will comprise a variety of shoreline features including mudflats, mangroves and a rocky coastline to create a habitat with diversified ecology.

The residents will be protected from traffic and railway noise impacts with a layout that strategically uses commercial buildings to block out noise from North Lantau Highway and railway lines. Space has been allocated for a new train station that will offer mass transit and quick access to the rest of Hong Kong while minimising vehicles using the roads. Cycle tracks will also be provided alongside a five-kilometre pedestrian promenade stretching from Tung Chung East to Tung Chung West, which will consist of landscaping and rest areas with seating, shelters and canopy tree planting. The Tung Chung East project therefore not only balances development and environmental protection, it provides residents with opportunities to enjoy and appreciate the natural world around them.



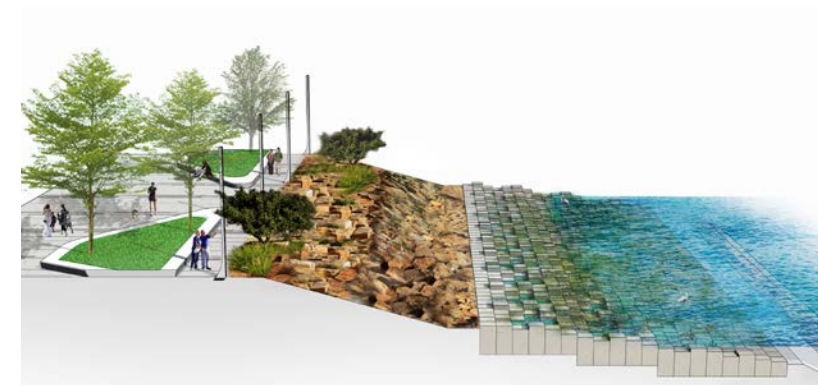
Dolphin watcher



Drill on implementation of dolphin watching plan



Design of Mangrove eco-shoreline



Design of Rocky eco-shoreline

Looking Ahead

Continue to address potential environmental problems at an early planning stage through the EIA process.

Encourage and facilitate the use of green and innovative designs and technologies to tackle environmental problems.

Environmental Compliance

Smarter Enforcement

The EPD has embraced new technologies that offer more effective detection and enforcement against pollution offences. Recently, we deployed drones and geographical information systems (GIS) and integrated them into our daily operations. The success of our efforts was recognised in the Geographical Information System Award 2020. Other highlights of the year include responding to an increase in illegal waste shipments and arranging the disposal of wastes arising from the COVID-19 pandemic.

Highlights

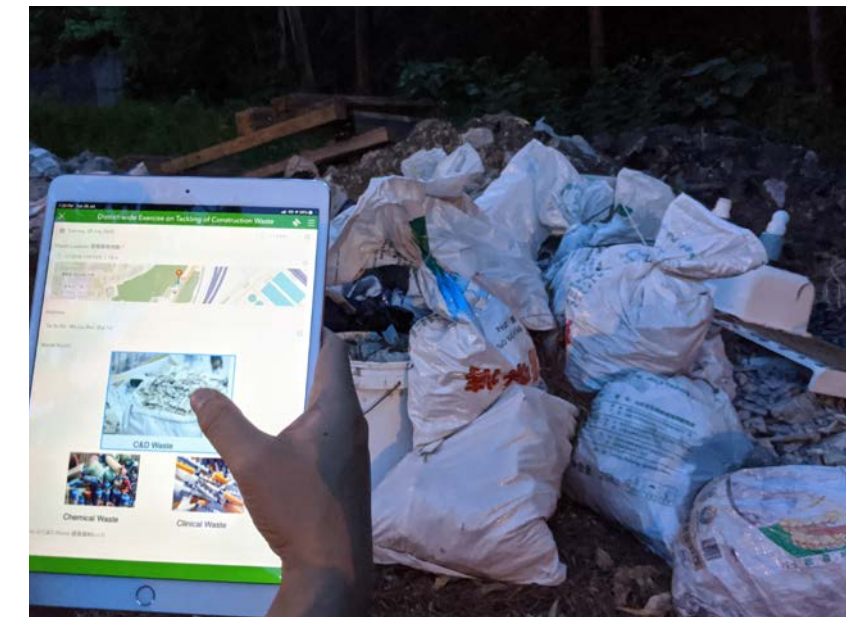
- ◆ Received a Special Achievement in Geographical Information System Award 2020 from the Environmental Systems Research Institute, in recognition of our achievements in developing innovative GIS applications.
- ◆ Inspected about 540 import shipments and intercepted about 90 containers of imported illegal waste.
- ◆ Arranged proper handling of the clinical and contaminated waste generated by COVID-19 testing and quarantine programmes.

New Technologies Up Our Game

Enforcement against polluters is often hindered by physical constraints. For example, it could take several EPD officers several days to investigate the source of an illegal discharge along a five-kilometre river. Now there is a better solution. Technology such as drones makes it possible to do such an investigation in an hour. Over the past couple of years, the EPD has made extensive use of drones, GIS technologies, and AI and big data analytics to improve our on-site intelligence gathering and enforcement planning.

GIS to combat illegal waste disposal: GIS technology is a highly versatile tool that can quickly identify and track pollution offences. The EPD has adapted this technology to our needs and developed several innovations, including a GIS-based Pollution Tracking Platform so frontline officers can conduct real-time spatial analysis of pollution sources; a district-geodatabase platform to provide real-time visualisation of complaint and enforcement statistics; a Flytipping Spotter App through which field inspectors can upload photos and locations of illegally-disposed construction waste; and an Operation Deployment Platform to enhance communication and information-sharing among enforcement team members. Our innovations have enhanced our work in three major ways:

- **Expedited construction and demolition (C&D) waste clearance.** Since the Flytipping Spotter App was launched in March 2020, the processing time for reported cases has been shortened by 40%.
- **Identified potential pollution from renovation sites.** Our GIS-based technology can collect information on the locations and status of shop renovations, which helps us to identify areas of potential risk for illegal C&D waste dumping. This information is used to plan ambush operations.
- **Provided better intelligence.** Our Construction and Demolition Surveillance Dashboard tracks pollution trends, blackspots, waste clearance progress and prosecution statistics and displays surveillance camera images – information that can help officers to make informed decisions about operations and resource management.



The Flytipping Spotter App developed using GIS technology for expediting waste reporting and referral to relevant departments for subsequent follow up and waste removal

POLLUTION PREVENTION & CONTROL

The EPD's success in developing innovative applications for a GIS platform was recognised with a Special Achievement in Geographical Information

System Award 2020, from the Environmental Systems Research Institute, which is the world leader in the GIS industry.



EPD has been awarded the Special Achievement in Geographical Information System Award 2020 by the Environmental Systems Research Institute for its outstanding performance in applying GIS technology



ENVIRONMENT HONG KONG 2021

Flight of the drones: The EPD drone team was established at the end of 2019 to monitor compliance, support enforcement, and respond immediately to emergencies with real-time photos and live-stream video. Drones make it possible to access and view sites that otherwise might be difficult or time-consuming to reach. Examples of their use in enforcement over the past year include:

- Identifying the source of a coloured waste discharge near Deep Water Bay that was the subject of a complaint.



EPD drone team was established in 2019 to monitor compliance, enhance enforcement operation efficiency, and respond immediately to emergencies with taking of real-time photos and live-stream video

- Spotting non-compliance in construction work at a bathing beach at Lung Mei in Tolo Harbour during routine surveillance.
- Using aerial photos to capture an illegal act in progress at a construction site in Southern District.
- Providing evidence for two illegal landfilling cases in Lut Chau, Yuen Long, that came before the courts in 2020. Both cases resulted in convictions.



Using drone to patrol and collect intelligence, more efficient and effective than traditional monitoring methods

Smart Command and Control Centre (SmartCCC):

The SmartCCC is the “brain centre” of our technological tools. Here, intelligence from the field is visualised through an integrated video wall that can live-stream more than 170 surveillance cameras simultaneously. The centre can also live-stream drone footage. Real-time interactions with field staff and branch offices are possible, enabling instant reporting and communications. There is also an interactive dashboard displaying enforcement statistics. The multi-purpose design supports a wide range of functions, such as daily monitoring, handling emergency response, field operations, strategic meetings, and training.



The Smart Command and Control Centre for enhancing department’s operational deployment capacity in enforcement action to detect and combat misbehaviour of polluters

Illegal Waste Intercepted

Restrictions are tightening around the world on the transboundary movement of waste. Mainland China introduced a total ban on foreign waste at the end of 2020 and the international Basel Convention to control shipments of regulated plastic wastes, which include mixed and contaminated waste plastics, will come into effect on 1 January 2021. Hong Kong will enhance control of plastic wastes from that date (see [Building Partnerships](#) chapter). At the same time, we have been working with the Customs & Excise Department (C&ED) to keep out other kinds of illegal waste shipments.

In 2020, we conducted about 540 inspections of import shipments and intercepted about 90 containers of illegal waste imports. By the end of the year, 58 prosecutions had been completed. The illegal waste, which was shipped back to the countries of origin, comprised municipal waste, waste flat-panel display units, waste batteries, waste printer toner/ink cartridges, e-waste and waste printed circuit boards.



EPD intercepted an illegal import shipment of municipal waste from the U.S. in October 2020



EPD intercepted an illegal import shipment of municipal waste from the U.S. in October 2020



Officials from C&ED and EPD conducted joint inspection to an import shipment carrying controlled wastes

A concerning trend has been the rise in municipal waste cases. From 2016-18, there was only one case. But in 2019 and 2020 there were 11 cases, including 5 in 2020. The EPD will continue to enhance intelligence exchanges and risk analyses with overseas authorities and work with C&ED to combat these and other illegal waste shipments.



| Illegal municipal waste intercepted in 2020

Handling COVID-19 Waste

The COVID-19 pandemic has impacted many aspects of daily life and waste is no exception. In September 2020, the Government’s Universal Community Testing Programme (UCTP) tested more than 1.7 million specimens in two weeks. There was concern that the large amount of laboratory waste from UCTP would go beyond the handling and transportation capacity of the licensed clinical waste collectors. Yet, through interdepartmental efforts, a new arrangement of using 20-foot containers for secure on-site temporary storage, and large red fibre bags to replace the smaller clinical waste bins for the safe bulk transfer of laboratory waste to the waste disposal facility was adopted.

The experience provided a template for handling the increased waste arising from the stepped up quarantine arrangements that ensued during Hong Kong’s fourth COVID-19 wave in December. The waste generated threatened to overwhelm the territory’s daily clinical waste handling capacity. Lunchboxes and general refuse from the quarantine centres were being collected by licensed clinical waste collectors and total quantity almost doubled, from 10 tonnes per day (tpd) to 18 tpd. Although the waste is not clinical waste as defined by the Waste Disposal Ordinance, with the advice from the Centre for Health Protection from an infection control angle, it was decided that such waste should be handled under the

same safety and health standard as clinical waste. The EPD worked closely and swiftly with the Department of Health and Civil Aid Service on developing an efficient and secure storage and delivery arrangement, following the protocol developed under the UCTP. This included providing large red fibre bags, giving advice on sourcing capable waste handlers, and conducting prior inspections of all diversion tippers and containers to make sure they achieved the same environmental, safety and health standards as clinical waste vehicles.

Looking Ahead

Begin enforcing new controls on shipments of plastic wastes.

Continue applying innovation and technology (I&T) to improve environmental enforcement and response.

RESOURCE MANAGEMENT

Waste Reduction

Recycling: The Next State

To prepare for the implementation of municipal solid waste (MSW) charging, the Government took major steps in 2020 to drill more recycling opportunities in the community by expanding our community recycling network and the range of recyclables collected. Incentives are also provided to encourage the public to practise source separation of waste and clean recycling. MSW charging has been proven to be a successful policy tool in other places to motivate people and enterprises to reduce waste. The broad and sophisticated recycling facilities being rolled out will help improve waste recycling, thus taking the pressure off Hong Kong's landfills and reducing associated carbon emissions.

Highlights

- Community recycling:** Brought 22 Recycling Stores (formerly known as Community Recycling Centres), 9 Recycling Stations (formerly known as Community Green Stations) and over 100 Recycling Spots under the new community recycling network, GREEN@COMMUNITY; extended Green Outreach, outreaching service providing assistance to the community in waste reduction and recycling, to 6 additional districts; and introduced the GREEN\$ electronic participation incentive scheme at all outlets of GREEN@COMMUNITY.
- Recycling facilities:** Conducted a public engagement on newly designed recycling bins that would be installed in public places; launched a pilot scheme on smart recycling systems at selected community recycling facilities; and took over management of waste separation bins in public places from the FEHD.
- Plastics:** Launched a two-year pilot scheme to collect and recycle all types of waste plastics from non-commercial and non-industrial (non-C&I) sources in Eastern District, Kwun Tong and Sha Tin; launched the Pilot Scheme for Provision of Necessary Equipment for "Plastic-free" School Lunch in about 45 primary and secondary schools; and completed the technical trial of reverse vending machines (RVMs), paving way for the launch of a pilot scheme on using RVMs for the collection of plastic beverage containers.
- Paper:** Commenced territory-wide collection and recycling services on waste paper to enhance the quantity and quality of local waste paper recyclables and promote sustainability of the local recycling industry.
- Support to industry:** Provided financial relief to recyclers to cope with the economic impacts of the COVID-19 pandemic.
- MSW charging:** Continued to fund Community Involvement Projects to try out the use of dummy designated garbage bags for waste disposal (similar to the arrangement under the proposed MSW charging regime) in different types of premises – by the end of 2020, about 180 projects had received a total of about \$150 million.



| Trial use and monitoring the usage of designated garbage bags

GREEN@COMMUNITY

Community participation in recycling is essential to reducing waste and complementing MSW charging. In 2020, we consolidated and expanded our recycling network under the new brand of GREEN@COMMUNITY, which was supported by the promotional efforts of the Green Outreach and a major publicity campaign.

More places to recycle

The GREEN@COMMUNITY is made up of three kinds of recycling outlets, which collect not only the usual types of recyclable such as paper, metals, plastics and glass bottles, but also regulated waste electrical and electronic equipment (WEEE), small electrical appliances, rechargeable batteries, and fluorescent lamps and tubes.

Recycling Stores are the rebranded and redesigned Community Recycling Centres, which in 2020 were expanded to all 18 districts (from 15 previously) with regularised funding support from the EPD. 22 Recycling Stores have been progressively put into operation since October 2020 to provide convenient and reliable outlets for the public to drop off their recyclables. Their effectiveness could be seen by the fact that from their launch in October 2020 to the end of the year, on average these Recycling Stores had collected 250 tonnes of recyclables each month, nearly 80% more than the previous Community Recycling Centres.

Recycling Stations is the new name of Community Green Stations, with the first one started operating in 2015. They provide a wide range of recycling options and environmental education support. They are also a testing ground for new technologies such as RVMs and smart recycling systems. The latest Recycling Station opened in 2020 to serve the Islands district, bringing the total to 9.

Recycling Spots are newly established kerb-side recycling points near residential buildings with limited waste separation facilities, such as single-block and “three-nil” buildings (which have no owners’ committees, residents’ committees nor property management companies). More than 100 Recycling Spots have been set up at fixed locations to collect recyclables on a weekly schedule. The public can check the schedule at the Waste Less mobile app and EPD’s Waste Reduction Website.



Recycling Stores progressively put into service since October 2020



A new Recycling Station GREEN@ISLANDS has commenced service to the public since 2020



Recycling Spots provide regular and flexible recycling service to encourage members of the public to participate in recycling



Recycling Stores accept more than 8 types of common recyclables

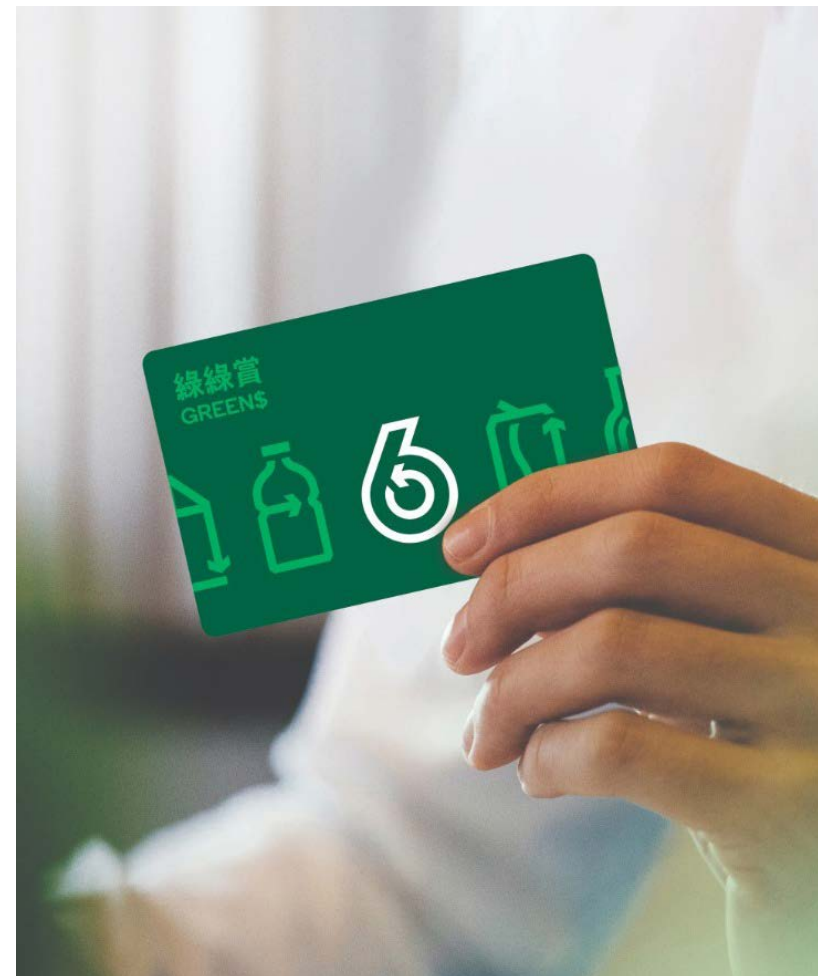
Support and incentives

More outlets alone is not sufficient for increasing recycling. It is also important to provide education, encouragement and incentives to motivate people to separate and recycle their waste. The Government is ramping up the relevant measures.

Green Outreach comprises a team of about 200 staff who are deployed to help the public practise proper waste separation and clean recycling and assist housing estates and residential buildings to identify proper outlets for recyclables. Green Outreach was launched on a pilot basis in three districts (Eastern, Kwun Tong and Sha Tin) in late 2018 and extended to six more in 2020. The service will be extended to the remaining districts in 2021.

Reduce and Recycle 2.0 is a major publicity campaign launched in 2020 to promote the community recycling network, educate the public on the range of recyclables accepted by the network, and encourage plastic-free living (see [Community Awareness](#) chapter for full details). The campaign features a chatbot service and augmented reality game in addition to promotions through various media and social media outlets.

GREEN\$ (Greeny Coins) electronic participation incentive scheme is a new initiative to give points to people who bring recyclables to outlets of GREEN@COMMUNITY. The earned points can be used to redeem gifts of daily necessities, groceries and eco-products, such as bamboo pulp tissue paper.



Members of the public can use the GREEN\$ smart card to earn bonus points when bringing recyclables to community recycling facilities and redeem gifts

Targeted Wastes

Recycling programmes in Hong Kong have traditionally revolved around waste paper, plastic bottles and metal. While this is a good starting point, there are other types of waste that can be recycled. In 2020, the Government continued to expand the range of recyclables collected by outlets of GREEN@COMMUNITY and improve the collection and recycling of plastic, paper and food waste.

Waste plastics account for about 21% of the total tonnage of MSW at landfills. To complement public education, drive behavioural changes and improve the recovery rate of waste plastics, the Government began a two-year pilot scheme on waste plastics collection and recycling in Eastern District, Kwun Tong and Sha Tin in January 2020. Under the scheme, which is being rolled out progressively, all types of waste plastics from non-C&I sources are collected for proper handling. By the end of 2020, about 400 housing estates, buildings and other premises had registered for the service, covering about half of the population in the three districts, and a total of about 480 tonnes of waste plastics was collected. Subject to the experience and effectiveness of the scheme, we will progressively extend the service to cover the entire territory.



Plastic Recycling Pilot Scheme provides services to collect and recycle all types of waste plastics from non-C&I sources

Since the use of plastic disposable tableware increased during the COVID-19 pandemic as people ordered more takeaway meals, a publicity campaign was organised urging people to opt for “no disposable tableware” when making their meal orders. A feasibility study on regulating plastic disposable tableware neared completion in 2020.

Waste paper accounts for about 24% of MSW disposed of at landfills. To enhance the quantity and quality of local waste paper recyclables and promote sustainability of the local recycling industry, the Government launched the territory-wide waste paper collection and recycling services in September 2020. This scheme aims to manage and incentivise the collection and recycling of cardboard, newspapers and office papers that meet the required quality standards. Service contractors process the collected waste paper through screening, sorting and baling, etc., then deliver them to various markets for recycling into paper products. To provide more diversified outlets for local waste paper recyclables, the Government also plans to develop a modern pulping facility in EcoPark, Tuen Mun.



| Sorted and baled waste cardboards

Food waste is the largest component of MSW disposed of at landfills (30%) and the Government has been trying to reduce that by building treatment facilities to convert the waste into biogas and compost, installing on-site composters, and promoting food waste reduction. The O-PARK1 which opened in 2018 can treat up to 200 tonnes per day of food waste, while O-PARK2 is scheduled for commissioning in 2023 to treat up to 300 tonnes per day (see also [Waste Facilities](#) chapter). A pilot food waste collection service launched in 2018 for the commercial & industrial sector, will be extended in 2021 to the domestic sector; by 2022 it is expected to collect about 250 tonnes of food waste per day.



| Food waste collection in a wet market



| Food waste collection by side-loader tanker

Efforts have also been made to promote on-site composting and waste reduction at the neighbourhood level. On-site composters were funded in about 36 housing estates since 2011 under a programme supported by the Environment and Conservation Fund (ECF), which ended in 2019, while about 90 schools had benefitted by the end of 2020 from the Pilot Programme on Provision of Small Food Waste Composters at School (Phase One) that was launched in 2018. In addition, the Pilot Scheme for Provision of Necessary Equipment for “Plastic-free” School Lunch was launched at about 45 primary and secondary schools in 2020. With \$4.5 million funding from the ECF, the schools are subsidised to install necessary equipment such as refrigerators, steam cabinets, dishwashers and disinfection machines to make it easier for students to bring their own lunch using reusable food containers. This is also expected to minimise food waste as students are asked to bring only as much food as they can consume.

Better, Smarter Collection

Several programmes are underway to improve the collection of recyclables. In 2020, smart recycling systems were installed in Recycling Stations in Tuen Mun and Eastern District, and the Recycling Store at Tai Kok Tsui for a one-year technical trial. The systems can automatically weigh the recyclables collected and generate alert signal in case of overflow to enhance the operation of the recycling bins. Data collected can help understand the recycling habit in the areas served by the systems to allow better planning of recycling service. In addition, one set of smart recycling system was installed on a Community Smart Recycling Vehicle under a six-month pilot. It toured several districts in Hong Kong with an outreach team on board to introduce the system to the public.

A public engagement was conducted during summer 2020 on the newly designed recycling bins in public places. After finalizing the design after taking into account public's feedback, the new bins will gradually replace the existing ones from 2022. In the meantime, EPD took over the management of about 1 800 recycling bins in public places from FEHD in October 2020. The bins were given a facelift, with the capacity enhanced by using the original litter compartments to receive recyclables. In addition, each bin has a unique QR code and hotline number so that members of the public can easily report incidents such as overflow or damage to the bins. The contractor has established a mechanism to quickly response to public's feedback.



Smart recycling bins provide new recycling experience to the public and enhance the efficiency of recycling operation



The Secretary for the Environment, Mr. Wong Kam-sing, introducing the new designs of roadside recycling bins to the public



Demonstrators introducing the features of the newly designed recycling bins to the public

The application of RVMs for collecting used plastic beverage containers was another new development. The contract for a one-year pilot scheme was awarded in August 2020 under which 60 RVMs were to be installed at public places or Government facilities with suitable foot traffic. RVMs provide rebate through electronic payment platform as an incentive to encourage people to return used plastic beverage containers. The pilot scheme will test out the use of RVMs in the local context, paving the way for a new producer responsibility scheme (PRS) on plastic beverage containers (see [next page](#)).



The Chief Executive tried out the operation of RVM at Green@Tuen Mun



A member of the public returned used plastic beverage containers via the RVM at Hong Kong City Hall



An ambassador guided a member of the public to use the RVM at Tin Shui Shopping Centre

Producer Responsibility Scheme

PRS is another policy tool in waste management. It requires relevant stakeholders to share responsibility for the collection, recycling, treatment and disposal of end-of-life products. The first PRS introduced in Hong Kong was the Plastic Shopping Bag Charging Scheme implemented in 2009, which was later extended to the entire retail sector in 2015. Since 2017, we have been implementing a PRS on glass beverage containers progressively and providing regional collection and treatment services for waste glass containers across the territory. In 2018, a PRS on WEEE (WPRS) was introduced. WEEE-PARK, which was set up by the Government to support WPRS, treated over 23 000 tonnes of regulated WEEE in 2020. In 2020, we made preparations for introducing a new PRS on plastic beverage containers.

Resources and Relief

The measures described above require considerable financial resources. The Government has been providing additional recurrent resources to strengthen our work on waste reduction and recycling starting from the financial year 2019-20. Starting from the financial year when MSW charging is implemented, this additional provision will be increased to no less than \$800-\$1, 000 million every year. This amount is commensurate with the estimated gross revenue to be generated from MSW charging, thus achieving the effect of “dedicated fund for dedicated use”.

The Government’s waste reduction strategy also includes supporting the development of a sustainable waste management industry. Given the great challenges faced by the industry due to the COVID-19 pandemic, we launched the One-off Recycling Industry Anti-epidemic Scheme under the Recycling Fund to provide recyclers with relief of up to \$20, 000 per month for six months. We also extended the One-off Rental Support Scheme, which was launched in October 2019 to help recyclers cope with the economic impacts of the social unrest that year, by an additional six months to September 2020. Together, these two schemes provided \$189 million in subsidies to more than 1 000 recycling enterprises.

Separately, we also offered tenants at EcoPark a rental concession of 75% from April to December 2020 to cope with the economic impacts of the pandemic, up from a 50% concession they received from October 2019 to March 2020. In early May 2020, about \$6.5 million was disbursed to 809 private waste collectors under the Subsidy Scheme for the Refuse Transfer Station Account Holders for Transporting MSW to help them enhance personal protective equipment for workers and strengthen disinfection of refuse transport vehicles, so as to curb the risk of virus transmission and maintain environmental hygiene.

Looking Ahead

Consult the trade and public on the way forward for regulating the use of disposable plastic tableware.

Launch a public consultation on introducing a PRS for plastic beverage containers.

Launch a pilot scheme to test out the application of RVMs in the local context.

Promote wider application of smart recycling systems and extend the pilot programme to more trial locations.

Expand Green Outreach to all 18 districts.

Continue to expand the community recycling network.

Invite tenders to develop a modern pulping facility in EcoPark.

Waste Facilities

Expanding Options for Managing Our Waste

Waste recycling and reduction can reduce waste loads but cannot eliminate it entirely. To cope with non-recyclable and non-reusable waste, the Government has been developing waste treatment facilities that derive energy and other resources from the waste. In 2020, we awarded a contract to develop a yard waste recycling centre (Y-PARK), and proceeded with building a second plant for treating food waste (O-PARK2) and an integrated waste management facility for treating MSW (I-PARK). We also continued with the work to extend the capacity of the existing three strategic landfills, and to convert restored landfills into community amenities and other beneficial uses.

Highlights

- ◆ Awarded the contract to build and operate the Y-PARK, which will turn yard waste into useful materials; it is expected to be commissioned in 2021.
- ◆ Continued with design and construction works of I-PARK, which will be commissioned in 2025.
- ◆ Continued to develop O-PARK2 to increase the capacity for recycling food waste; it is expected to be commissioned in 2023.
- ◆ Continued with construction works for the extension of the Southeast New Territories (SENT) Landfill and other preparations to extend the other two strategic landfills, namely Northeast New Territories (NENT) Landfill and West New Territories (WENT) Landfill.
- ◆ Announced the expansion of a trial scheme for co-digestion of food waste and sewage sludge to include Sha Tin Sewage Treatment Works in 2023.

Waste Arisings

The threat of the COVID-19 pandemic and increase in construction waste disposal charges, coupled with continuing waste reduction programmes, appeared to have reduced waste disposal in 2020 (the most recent year with available figures). Disposal of all wastes at landfills fell 5.7% compared with 2019 to 14 739 tonnes per day. MSW at landfills fell 2.2% to 10 809 tonnes per day; the per capita rate fell to 1.44 kilogrammes from 1.47 kilogrammes per day. Construction waste at landfills fell 13.4%, which may be partly due to the increase in construction waste disposal charges in April 2017; in recent years, more than 90% of inert materials sorted out from construction waste have been reused.

Yet, the MSW recovery rate fell 1% to 28% in 2020. This came alongside a challenging market outside Hong Kong for recyclables and stricter import controls imposed by nearby jurisdictions (see [Waste Reduction](#) and [Environmental Compliance](#) chapters), which has affected the overall performance of the recycling industry. However, the quantity of MSW recovered for local recycling rose 11% to 230 000 tonnes in 2020. With the EPD expanding the community recycling network and strengthening various waste reduction and recovery measures, the quantities of locally recycled plastics and food waste increased by about 27% and 19% respectively.

Waste Treatment Facilities

Waste treatment not only can reduce the bulk of waste requiring landfilling, it can also derive energy, compost, mulch and other useful products from the waste. The Government has been developing a variety of waste treatment facilities that are effectively advancing our waste management strategy onto a more sustainable path than in the past when non-recyclable waste was simply landfilled.

The centrepiece of our waste treatment programme is the I-PARK, which is being built on an artificial island near Shek Kwu Chau to treat 3 000 tonnes per day of MSW with advanced incineration technology and energy recovery. Construction is underway and the plant is scheduled for commissioning in 2025. Once fully operational, it is expected to produce 480 million kilowatt hours of surplus electricity each year.



Reclamation of artificial island in progress at I-PARK (December 2020)



Welding and erection of a steel frame for prefabricated electrical and mechanical units at I-PARK's Prefabrication Yard in Zhuhai (December 2020)

Specific types of waste are also being treated at dedicated facilities:

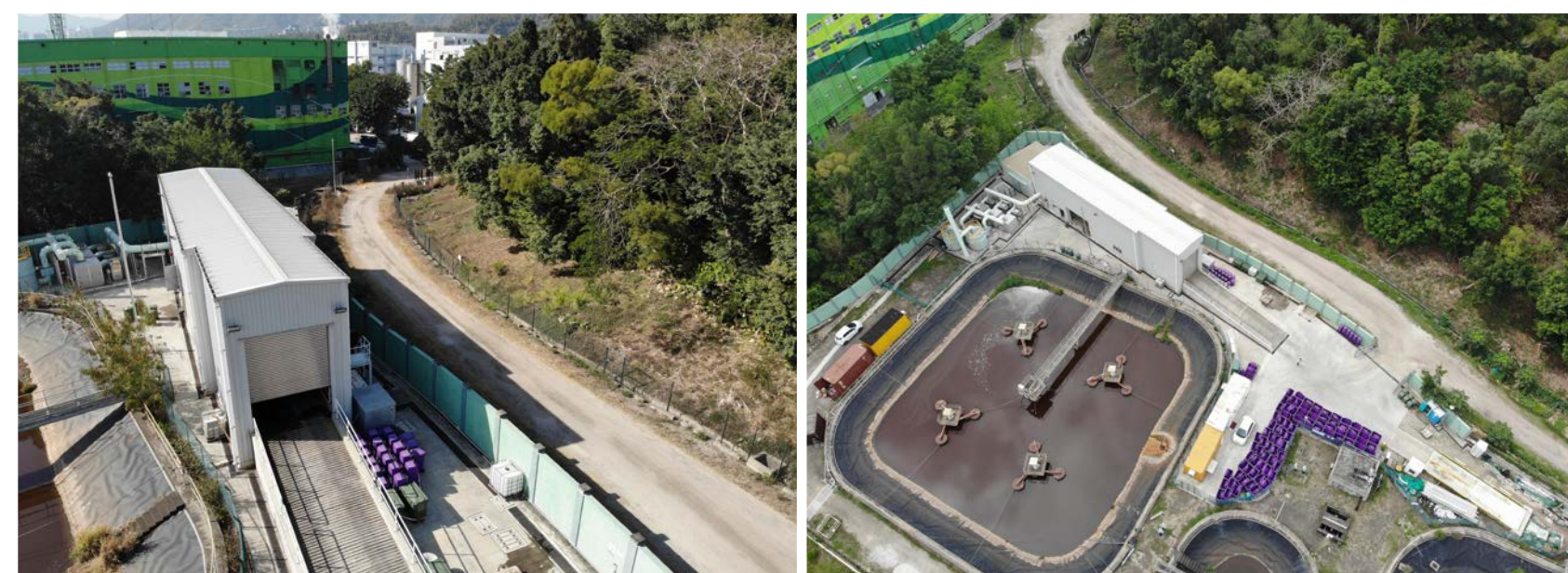
Food waste: The O-PARK1 at Siu Ho Wan in North Lantau was commissioned in 2018 to treat 200 tonnes per day of food waste. In 2020, it converted more than 82 000 tonnes of food waste into 17.3 million kilowatt hours of electricity and 2 300 tonnes of compost. O-PARK2 is being built in North District and will treat about 300 tonnes per day when commissioned in 2023. In addition, a trial scheme to pre-treat food waste and mix it with sewage sludge for anaerobic co-digestion is underway at Tai Po Sewage Treatment Works. It will be extended to Sha Tin Sewage Treatment Works and is scheduled for commissioning in 2023.



Photograph of O-PARK1



Photomontage of O-PARK2



Food Waste Pre-treatment Facilities for food waste/sewage sludge anaerobic co-digestion trial scheme at Tai Po Sewage Treatment Works

Sewage sludge: T-PARK was commissioned in 2015 to use waste-to-energy technology to reduce the bulk of sewage waste by up to 90%.



| T-PARK's 5th Anniversary: Continuing to engage the community in the goal of zero landfilling



| Online workshops to celebrate T-PARK's 5th Anniversary

Waste electrical and electronic equipment (WEEE): WEEE-PARK, which was developed to underpin the WPRS, has been in full operation since March 2018. WEEE-PARK has adopted advanced technologies and equipment for treating regulated WEEE – currently air-conditioners, refrigerators, washing machines, televisions, computers, printers, scanners and monitors – and turning them into reusable materials such as plastics and metals through a series of detoxification, dismantling and recycling processes. In 2020, 23 383 tonnes of regulated WEEE was processed by WEEE-PARK.



| WEEE Processing Line



| WEEE-PARK

Yard waste: The new Y-PARK was announced in 2020 to convert yard waste into useful materials such as wood chips, wood boards and wood beams. The facility is being built at Tsang Tsui in Tuen Mun and will begin operating in the second quarter of 2021 with the aim of handling about 11 000 tonnes of yard waste in the first year and 22 000 tonnes in subsequent years. The Government is the biggest producer of yard waste and will be the main user of Y-PARK initially, with plans to progressively expand the service to the private sector.

Y-PARK will also supply raw materials to a pilot biochar plant that the EPD is developing. Biochar can be used as soil conditioner, material for filtering pollutants and animal feed additive, and it retains carbon molecules which helps reduce carbon emissions.



| Photomontage of Y-PARK

Landfill Extensions

Landfills are necessary for depositing the residues of waste treatment, as well as wastes that cannot be treated, recycled or reused. Hong Kong has three strategic landfills and we are in the process of extending them and using the landfill gas to generate RE.

Work on the extension of the SENT Landfill was in full swing in 2020, while tenders were invited for extending the NENT Landfill, and preparatory design and other work was underway for the extension of the WENT Landfill.



| Construction of the SENT Landfill extension in progress

Facilities to recover landfill gas and export the surplus to produce town gas have been implemented at the SENT and NENT Landfills. In 2020, the landfill gas utilisation facility for power generation began partial operation at the WENT Landfill. Also in 2020, the Town Planning Board gave planning permission to develop a pilot solar farm project at the SENT Landfill, which will help to establish the technical requirements and suitable models for developing large-scale solar farms at landfills in future.

Once landfills are closed, they become valuable land resource. The Government has so far restored 13 closed landfills to make them suitable for community amenities. In 2020, a proposal to develop a camping ground and green education centre at the restored Tseung Kwan O Stage 1 Landfill was supported by the Panel on Environmental Affairs of the LegCo. Subject to LegCo's funding approval, the project will be implemented by the Tung Wah Group of Hospitals with a target commissioning date of 2023.



| WENT Landfill Gas Power Generation Project



| Landfill Gas Treatment Facility at the NENT Landfill



| Landfill Gas Utilization Plant at the SENT Landfill

Looking Ahead

Commission Y·PARK to receive and treat yard waste and continue to develop a pilot biochar production plant.

Complete construction of the SENT Landfill extension so that it can start receiving construction waste and continue preparations for extensions of the NENT and WENT Landfills.

Continue the pilot solar farm project at the SENT Landfill.

Start full operation of the landfill gas utilisation plant at the WENT Landfill.

Continue to develop O·PARK2 and prepare to extend the trial of food waste and sewage sludge anaerobic co-digestion to Sha Tin Sewage Treatment Works.

Continue with design and construction work of I·PARK.

Energy

Right on Target

In 2020, the Government met its target to cut Hong Kong's reliance on coal for electricity generation by half as compared with 2015 and replace it with cleaner fuel sources, a goal envisaged in the Hong Kong Climate Action Plan 2030+. We also continued to make progress in encouraging participation in distributed RE systems, promoting energy efficiency and conservation (EE&C), and setting an example through our own operations.

Highlights

- ◆ Met our target of improving the fuel mix for electricity generation by reducing the proportion of coal to one-quarter of the mix compared with one-half in 2015.
- ◆ Approved more than 11 000 applications under the Feed-in Tariff Scheme since its launch in 2018.
- ◆ Received approval of \$4.3 billion for an additional District Cooling System at Kai Tak Development.
- ◆ Achieved and exceeded our goal to reduce electricity consumption in Government buildings by 5% in the five years ending 2019-2020. The final saving was 7.8%.
- ◆ Saw more than 3 600 premises sign the Energy Saving Charter and over 500 premises sign the 4T Charter.

A Cleaner Fuel Mix

The Hong Kong Climate Action Plan 2030+ aims to reduce Hong Kong's carbon intensity by 65%-70% by 2030 using 2005 as the base year. An important factor in achieving that goal is to reduce reliance on coal. A new fuel mix target was announced in 2015 that aimed to reduce the share of electricity generated by coal from about half in 2015 to one-quarter by 2020. That ambitious goal has been achieved and paves the way for Hong Kong to have cleaner air and a smaller carbon footprint.

Natural gas is being used to replace coal for now, a transition made possible by the commissioning of two additional gas-fired generation units in 2020 bringing the total to 12. In 2020, about half of electricity in Hong Kong was fuelled by natural gas, compared with more than a quarter in 2015. The remaining quarter came from imported nuclear fuel.

While the final per capita greenhouse gas (GHG) inventory for 2020 will not be confirmed until 2022, the combined effect of the above measures and other decarbonisation initiatives was expected to have brought Hong Kong's per capita GHG emissions level down to about 4.5 tonnes in 2020, putting the city well on the path to achieving its 2030 carbon reduction goal.

Motivating RE Adoption

RE has exciting potential as an alternative source of fuel. The Government has been taking the lead in developing RE while creating conditions to facilitate the private sector in adopting RE where technically and financially feasible. For Government premises, we earmarked \$3 billion to support the implementation of small-scale RE projects by bureaux and departments. So far, more than \$1.5 billion has been approved for more than 130 projects. The Government is also actively developing large-scale waste-to-energy facilities and other RE projects at suitable locations in reservoirs and landfills.

To encourage the private sector to adopt distributed RE, the Government and the power companies introduced the Feed-in Tariff (FiT) Scheme in October 2018, which has had great success. FiT provides financial incentives to the private sector and community to invest in distributed RE. For each unit of electricity they generate, participants receive payments of \$3-\$5, thus shortening the payback period of their investment to about 10 years. By the end of 2020, more than 11 000 FiT applications had been approved by the power companies, compared with only about 200 private RE systems that connected to the power companies' grids in the decade prior to the FiT Scheme. To further simplify procedures and facilitate participation, legislation was amended in 2020 to exempt individuals from having to register as a business or pay profits tax on their FiT payments when an RE system is installed at their residential premises.

Other measures to promote RE have also been introduced in recent years, such as relaxing height restrictions on the installation of solar energy generation systems on New Territories' village house rooftops and launching the "Solar Harvest" to install solar energy generation systems in schools and welfare non-government organisations (NGOs) for free. By the end of 2020, about 230 applications had been approved under "Solar Harvest".



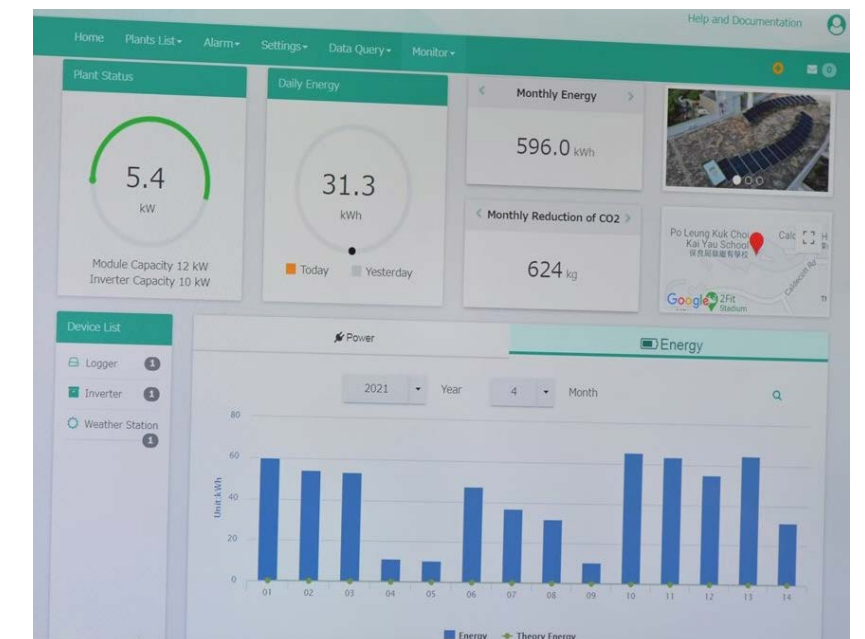
Aerial shot of solar panels installed at the rooftop of the Hong Kong University of Science and Technology (HKUST). The HKUST announced in 2020 that the school would install up to 8 000 solar panels at over 50 campus locations



Solar energy generation system installed at Hong Kong Red Cross Headquarters under Solar Harvest



Engineers carried out testing of the solar energy generation system installed under Solar Harvest



The real-time monitoring system shows the solar energy generation system's operation including the energy yield and reduction of carbon dioxide

Saving Energy

Buildings account for about 60% of Hong Kong’s total carbon emissions when both electricity and town gas are factored in. Making them more energy efficient is therefore a major plank in the Government’s strategy for reducing Hong Kong’s carbon footprint. Promotions and programmes have been rolled out to encourage energy efficiency and green buildings, with the Government leading by example.

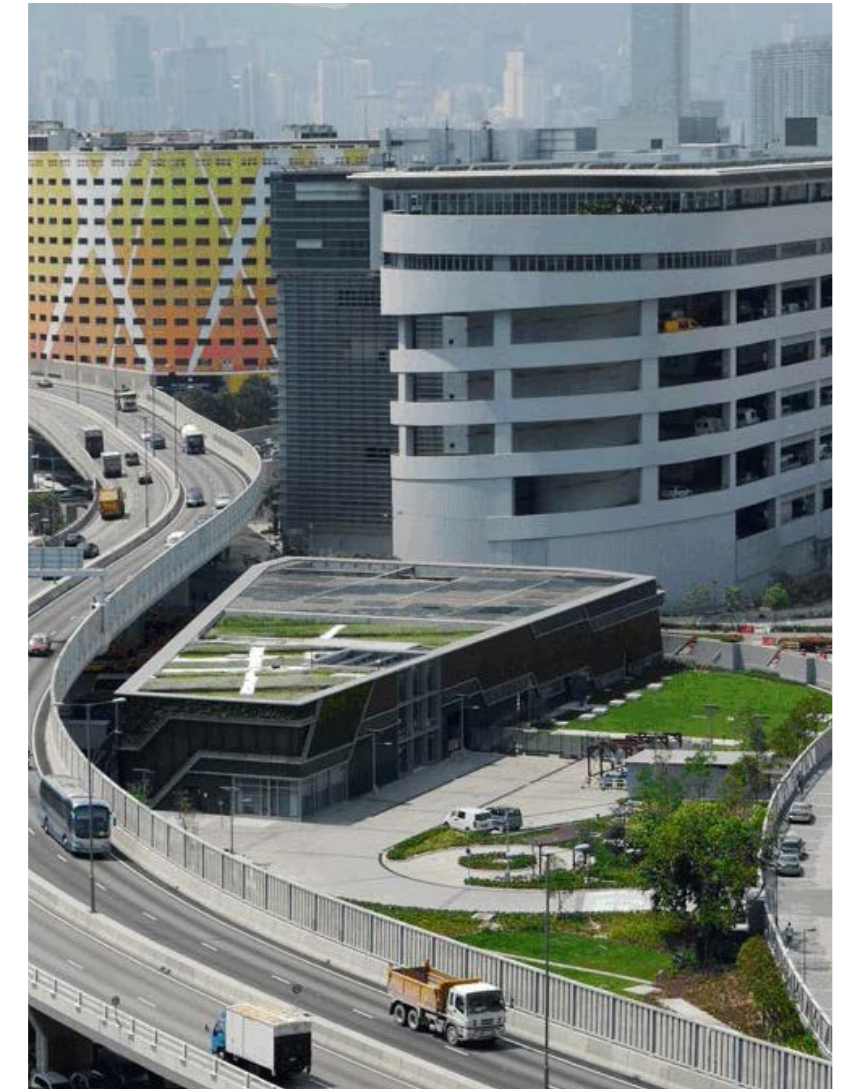
Energy-saving pledges: The “Energy Saving for All 2020” Campaign promoted energy saving to businesses, NGOs and schools. Although in-person events were curtailed due to the COVID-19 pandemic, webinars were organised to promote the Energy Saving Charter under which signatories pledge to maintain indoor temperatures at 24-26 degrees Celsius during summer months, switch off electrical appliances when not in use, procure energy efficient appliances, and engage staff, tenants and students in adopting energy-saving practices together. Over 3 600 premises signed up in 2020.

Another initiative under the campaign, the 4T Charter, is aimed at building owners and managers in the commercial and institutional sectors. They pledge to set a target for energy saving with a timeline, ensure transparency in tracking the result, and encourage people to work together to achieve the target. More than 500 premises signed up in 2020.



| 4T

Initiatives in the community: A District Cooling System (DCS) can centralise cooling services and save energy. The \$4.9 billion original DCS at Kai Tak Development (KTD), which has been under construction in phases since 2013, is expected to bring about electricity saving of 85 million kWh per year when fully operational. In 2020, \$4.3 billion in funding for an additional DCS at KTD was approved and, upon full operation, the additional DCS is expected to save about 53 million kWh in electricity consumption a year. Planning on DCS projects in new development areas is underway, including those in Tung Chung New Town Extension (East), Kwu Tung North New Development Area and Hung Shui Kiu New Development Area.



| DCS in Kai Tak

To encourage energy saving in schools and foster a green school culture, the Government introduced “Green Schools 2.0 – Energy Smart” to retrofit energy efficient equipment and install real-time energy monitoring system in schools. By the end of 2020, 114 applications were received under the scheme.

The Government has also set up the E&M InnoPortal through the Electrical and Mechanical Services Department to help public organisations, trades and Government departments connect with the I&T sector and universities to find I&T solutions for various issues, including EE&C and RE. Some 31 trials are underway under this scheme.

The Government has promoted public awareness of best practices in EE&C and RE through publicity and public education programmes. We also administer and promote the voluntary Hong Kong Energy Efficiency Registration Scheme for Buildings to encourage buildings to outperform the statutory energy efficiency levels.

Setting standards: The Building Energy Code (BEC) under the Buildings Energy Efficiency Ordinance requires central building services installations in prescribed types of new buildings and existing buildings undergoing major renovation to meet minimum energy efficiency standards. The Energy Audit Code (EAC) requires central building services installations in existing commercial buildings and the commercial portion of composite buildings to undergo an energy audit every 10 years to identify energy management opportunities for building owners’ consideration. The Government embarked on a review of the BEC and EAC in 2020 to be completed by the end 2021.

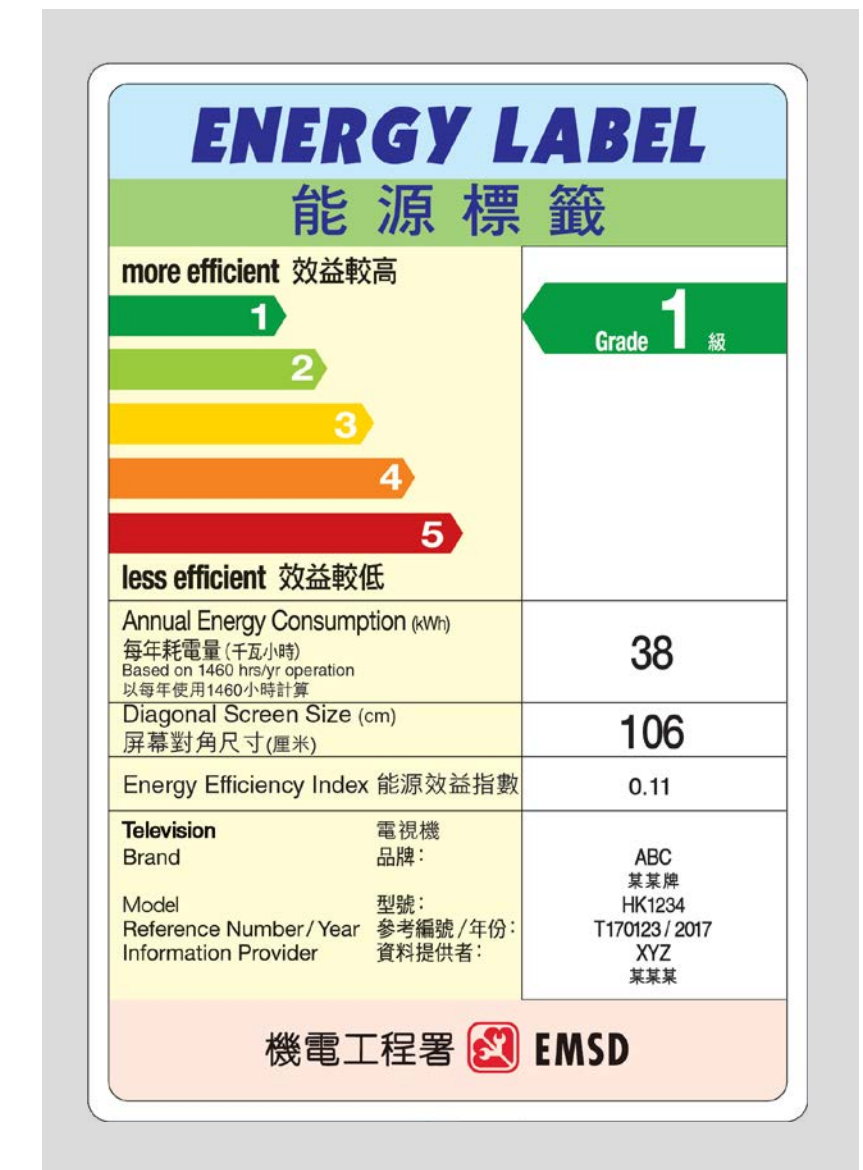


Central Air-conditioning Systems are covered by the Buildings Energy Efficiency Ordinance



Electrical Installations are covered by the Buildings Energy Efficiency Ordinance

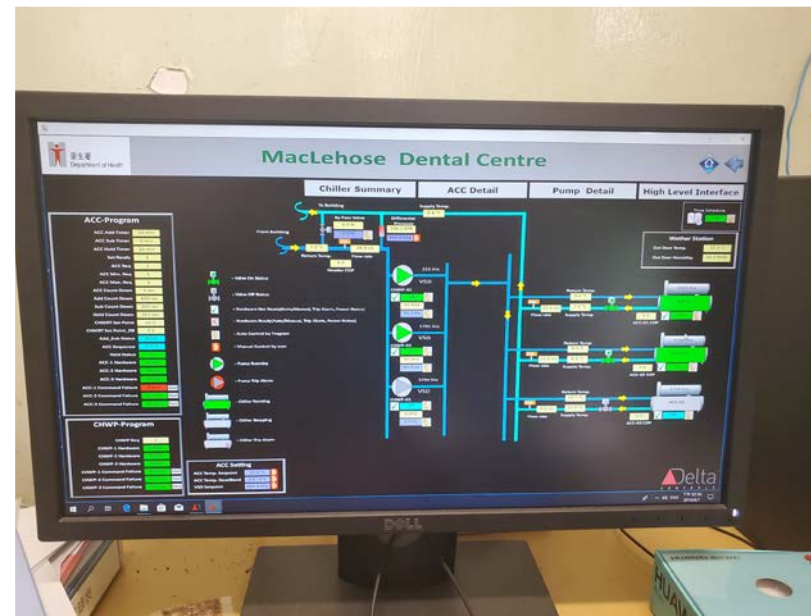
Certain appliances and fixtures used within buildings are subject to the Mandatory Energy Efficiency Labelling Scheme (MEELS). In 2020, the energy efficiency standard was tightened for single-package type room air-conditioners, dehumidifiers and compact fluorescent lamps, and a review was underway on including more products.



MEELS Energy Label (TV) sample

Setting an example: The Government aims to lead by example in enhancing energy efficiency and the development of green buildings. From 2015-16 to 2019-20, we targeted to reduce electricity consumption by 5% in our buildings using 2013-14 as the base year. We not only met our goal, but exceeded it, achieving a final saving of 7.8%. Various measures such as energy audits of about 340 major Government buildings and a \$900 million investment in energy-saving projects helped us achieve that goal.

Moving forward, we have set the Green Energy Target to improve our energy performance for both government buildings and infrastructure by a further 6% in the five years ending 2024-25. This goal was stated in the Chief Executive's 2019 Policy Address and we have already begun rolling out measures to achieve it, such as energy-cum-carbon audits, more energy-saving projects, retro-commissioning of existing buildings and use of innovative technologies.



Retrofitting of energy efficient chiller plant at MacLehose Dental Centre

Looking Ahead

Continue to phase out coal-fired generating units in power plants and replace them with natural gas and non-fossil fuel sources.

Continue to encourage the development of RE in both the public and private sectors.

Continue to implement energy-saving projects, retro-commissioning projects and small-scale RE projects at Government premises with a view to achieving our Green Energy Target for the five years ending 2024-25.

Continue to review and implement enhancements to the BEC and MEELS.

Continue to plan and implement DCS projects.

Continue to implement energy-saving projects and RE projects in schools and welfare NGOs.

Continue research and development on the application of new EE&C and RE technologies.

Nature Conservation

Taking Protective Actions

Hong Kong is surprisingly rich in natural attractions and assets, given its small size and dense urban areas. Proactive protection and conservation measures would be conducive to the protection of our natural environment and creation of environmental capacity. In 2020, the Government's actions included approving 10 projects involving \$60 million under the Countryside Conservation Funding Scheme (CCFS), designating a new marine park, adopting a new fisheries management strategy, and strengthening protection measures for Green Turtles. All this was done against the backdrop of the COVID-19 pandemic, for which country park management was enhanced to protect staff and visitors.

Highlights

- ◆ Approved a variety of countryside conservation and revitalisation projects under the CCFS.
- ◆ Implemented minor improvement works at Lai Chi Wo and Sha Lo Tung to enhance remote countryside revitalisation.
- ◆ Enhanced management of country parks in response to the COVID-19 pandemic.
- ◆ Designated the Southwest Lantau Marine Park.
- ◆ Implemented a new fisheries management strategy in marine parks.
- ◆ Proceeded with the proposed expansion of the Sham Wan Restricted Area and extension of the restricted period to enhance protection of Green Turtles.



Protecting Land Resources

Hong Kong has 44 300 hectares of country parks and special areas, plus remote countryside areas of ecological value that lie outside such designated sites. The Government aims to strike a balance between protecting these natural resources and enhancing their educational and recreational potential for diverse visitor experiences.

Countryside conservation: Conservation of the remote countryside is overseen by the Countryside Conservation Office (CCO), which administers the CCFS and has been coordinating with other Government departments and bureaux to carry out improvement works in pilot areas in Lai Chi Wo and Sha Lo Tung.

The CCFS was launched in October 2019, originally to provide funding for environmental conservation and revitalisation projects by non-profit organisations (NPO). In 2020, its remit was expanded to also embrace projects related to non-graded built heritage, cultural and historic assets and the like. By the end of the year, 10 projects had been approved to receive more than \$60 million in funding. The projects cover a wide range of activities, such as enhancing ecological and nature conservation through habitat management and farming activities; conducting feasibility studies on how to revitalise built heritage in villages; demonstrating Hakka-style craftsmanship techniques in village houses; and identifying the feasibility of

establishing licensed food businesses in the remote countryside.

On improvement works, the CCO has coordinated with other Government departments on works at two pilot areas in Lai Chi Wo and Sha Lo Tung. So far, they have upgraded a footpath at Lai Chi Wo and public toilets at Lai Chi Wo and Sha Lo Tung, and launched a feasibility study on improving sewerage systems at Lai Chi Wo. The CCO has also been working with other departments to jointly develop licensing requirements and procedural guidelines for guesthouses and catering businesses in countryside areas.



| A farmer who was briefing a Roselle adopter about the plant



| An on-site exhibition "Art on the Farm" in Lai Chi Wo showcasing sculptures of dragonflies



| The Eco-pond in Sha Lo Tung

Country parks: Visitation increased at country parks following the outbreak of the COVID-19 pandemic. Country park management was thus enhanced to facilitate public enjoyment and protect public health, while minimising the impact of increased visitation. Measures included closing campsites and barbeque sites during outbreaks; redeploying manpower to step up inspection, cleansing and repairing of country park facilities; increasing patrols at popular locations and taking action against violations of relevant regulations; and publicising protection of the natural environment and anti-epidemic measures through traditional and social media and the employment of Green Ambassadors.



| Country park staff stepped up enforcement against illegal camping and relevant activities

Part-time Green Ambassadors were hired starting in autumn 2020 through the ENB's Green Employment Scheme. They were tasked with supporting our Green Hiking Etiquette Campaign, which was launched in collaboration with several local NPO. The Ambassadors promoted green hiking messages, such as "Take Your Litter Home," "Bring Your Own Bottle" and "Properly Dispose of Masks" at five popular hiking spots on weekends. They also provided information on the local scenery and habitats, biodiversity and unique features of the hiking locations.



| The Green Hiking Etiquettes Campaign promotion booth at Yim Tin Tsai

The pandemic also disrupted the "Repair Our Trails" scheme in which volunteers have been engaged in trail maintenance works since 2016. While that scheme was suspended, hikers who passed by were instead invited to carry construction materials uphill in sections of trails under repair through the "You Give a Hand" programme.

Protecting Marine Resources

Marine parks limit activities in certain areas to help protect marine life and habitats. In April 2020, the new Southwest Lantau Marine Park was designated, covering about 650 hectares that provide an important habitat for the Chinese White Dolphin, Finless Porpoise and other marine lives.



| The Southwest Lantau Marine Park was designated in April 2020 to help better conserve the Chinese White Dolphins, other marine lives and the overall marine environment within the area



| A mother and calf pair of Chinese White Dolphins in western Hong Kong water

At the same time, a new fisheries management strategy was launched to enhance protection of marine resources in four marine parks at Hoi Ha Wan, Yan Chau Tong, Tung Ping Chau, and Sha Chau and Lung Kwu Chau. Commercial fishing is banned in these marine parks to protect coral communities and fish spawning and nursing grounds.

The Government also continued to pursue other measures to increase marine resources, such as artificial reef deployment and fish fry restocking, to facilitate ecosystem rehabilitation and promote eco-tourism in marine parks.

Strengthening Protection of Green Turtles

The Green Turtle nests in Hong Kong on the sandy beach at Sham Wan on Lamma Island – one of the few regular nesting sites for this endangered species across the whole South China Sea. Hong Kong has legislation to protect the Green Turtle, which is on the International Union for Conservation of Nature's Red List of Threatened Species, by restricting access to the beach during the breeding season when turtles are particularly sensitive to human disturbance and may abandon nesting if disturbed. However, the restriction has only covered the 0.5-hectare beach area from June 1 to October 31.

To strengthen protection, the Government announced plans in 2020 to expand the Sham Wan Restricted Area to include the sea inlet adjoining the beach (covering about 98.2 hectares) and apply restrictions from April 1 to October 31 each year. The new measures come into effect in April 2021 and still allow recreational boating and commercial fishing to take place from November 1 to March 31, striking a balance between protecting the Green Turtles and the livelihood of fishermen.



| To enhance protection of Green Turtles, the expansion of Sham Wan Restricted Area from the beach to the adjacent sea inlet, and the extension of the restricted period from five months to seven months (April 1 to October 31) every year, come into effect in April 2021

Enhancing Biodiversity in Hong Kong

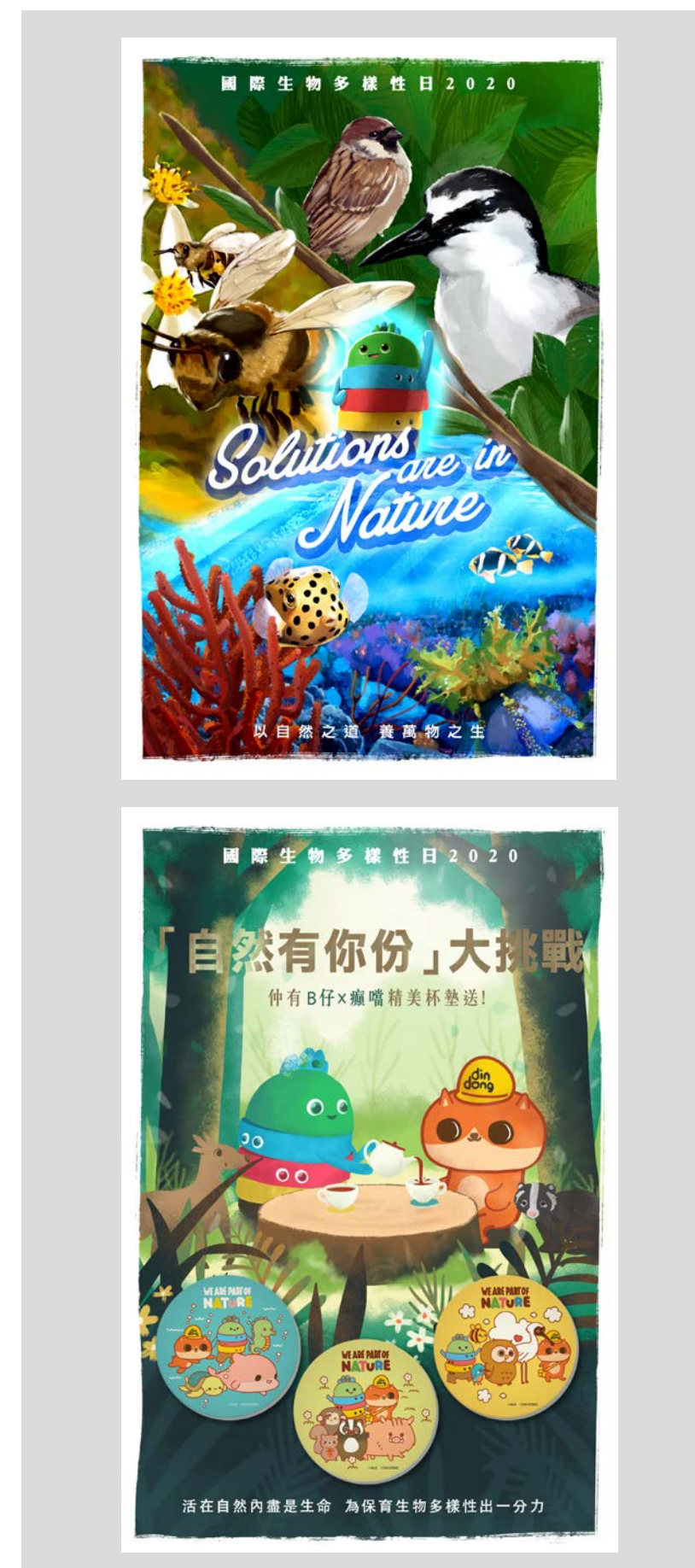
The Biodiversity Strategy and Action Plan (BSAP) was launched in 2016 to provide a framework for developing resources and systems to conserve biodiversity in Hong Kong. It consists of four areas of action and progress was made in each area in 2020:

Enhancing conservation: Progress was made in three major initiatives: a review was completed on the ecological monitoring and habitat management of Hong Kong Wetland Park; a risk assessment protocol was formulated for managing invasive alien species; and construction works began at Long Valley Nature Park to support long-term conservation of the area, targeted for completion by 2023.

Mainstreaming biodiversity: The Hong Kong 2020 International Urban Forestry Conference was held in January 2020 for local practitioners and international experts to exchange knowledge and insights on sustainable management of urban forests. In addition, construction works began on various river revitalisation projects that address biodiversity considerations.

Improving knowledge: Studies on coral bleaching and bioerosion were completed and a long-term coral monitoring plan was devised to enhance the protection of local coral communities. Substantial progress was made on several other studies to produce territorial habitat maps, identify ecosystem services, and develop a biodiversity information-sharing platform.

Promoting community involvement: Online activities and publicity campaigns were organised by the AFCD and NGOs in lieu of in-person activities due to the COVID-19 outbreak, in order to sustain momentum in the promotion of biodiversity awareness and participation among the public and stakeholders.



A series of educational joint social media posts with NPO partners were published in May 2020, and a public engagement campaign was launched on 22 May 2020 to encourage netizens to conserve local biodiversity

Looking Ahead

Roll out the pilot scheme for an advance booking system for country park campsites.

Develop licensing requirements and procedural guidelines for guesthouses and catering businesses in the countryside.

Continue to approve diverse conservation and revitalisation projects under the CCFS.

Continue to collaborate with other departments and stakeholders on conservation projects and minor improvement works at Lai Chi Wo and Sha Lo Tung.

Continue designation work for two new marine parks in western waters, starting with the South Lantau Marine Park, followed by the North Lantau Marine Park.

Commence operation of the Hoi Ha Visitor Centre.

Implement enhanced conservation measures at Sham Wan Restricted Area to protect the Green Turtle.

Continue to implement on-going and long-term actions under the BSAP.

STAKEHOLDER ENGAGEMENT



Building Partnerships

Skipping Ahead

Environmental laws set the rules to deter polluters. But coupled with enforcement of these laws, the EPD also tries to help operators comply with the law through engagement and support. In 2020, we stepped up our outreach on coming restrictions on the import and export of plastic waste, and trialled a new fixture design for construction waste skips that will help the trade stay well within requirements and reduce public nuisance.

Highlights

- Completed a trial programme on retrofitting skips.
- Held four briefings for the shipping and recycling trades on forthcoming controls over the import, export and re-export of plastic waste.

Better Storage of Builders' Waste

Skips that serve as temporary storage for construction waste can be unsightly and sometimes unsafe. They are mostly used for building and renovation works and often placed near work sites to hold waste before it can be delivered to landfills. However, in some cases skips block roads and footpaths, affecting drivers and

pedestrians. The Government therefore has produced guidelines on their use and recently conducted a trial in collaboration with the skip operator trade to address their concerns and encourage compliance. The guidelines also stipulate the kinds of locations where skips can be placed and the road clearance required to allow vehicles to pass.



| "Guidelines for Mounting and Placing of Skips" of the Transport Department

The trial involved retrofitting about 30 in-use skips with fixtures that meet the Transport Department’s warning and appearance requirements for road safety. These include yellow flashing lights, reflective strips in alternate red and white, hooks for cover mounting, display of a skip certification number and marking of the name and phone number of the skip company. Both ends were also painted in bright yellow.

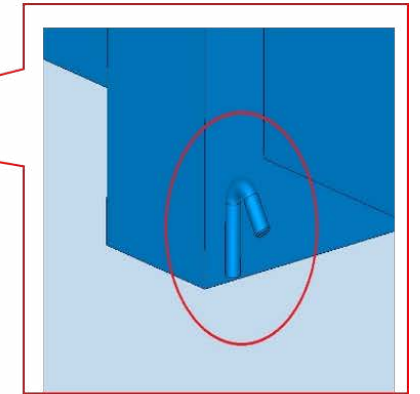
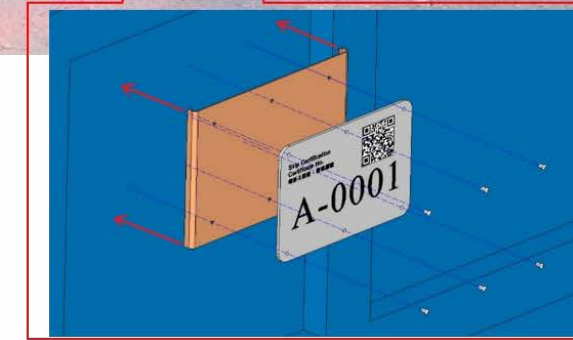
The trial proved to be successful so, in 2021-22, the EPD will implement a Subsidy Scheme for Retrofitting Roadside Skips that will retrofit around 300 in-use skips to enhance road safety and their environmental performance.



The Secretary for the Environment and Chairman of Panel on Environmental Affairs Hon Vincent Cheng were inspecting a retrofitted skip



Joint inspection of retrofitted skips by the representative of EPD, the project contractor (HKPC) and one of the skip trade associations



Retrofit items :

1. Yellow flashing lights with photo cell and solar charging panel and specifically designed protectors
2. Reflective strips in alternate red and white
3. Hooks for mounting top cover
4. Skip number plates
5. Clearly marked company name and 24-hour telephone number
6. Bright yellow painted at both ends



Pre-retrofitting Skip



Post-retrofitting Skip

New Plastic Waste Shipment Controls

Plastic waste shipments are coming under increasing control internationally to prevent countries becoming dumping grounds for this waste. The Basel Convention on transboundary movement of wastes was extended to plastic waste in 2019, while Mainland China imposed a total ban on plastic wastes at the end of 2018. In 2020, Hong Kong had prepared to enhance its control on the import, export and transhipment of plastic wastes from 1 January 2021.

Permits from the EPD will be required in advance to move regulated plastic wastes, which cover all waste plastics except those listed under entry B3011 of Annex IX of the Basel Convention, that are uncontaminated and are intended for reprocessing, recycling, recovery or reuse. It will also be prohibited to import or export regulated waste plastics from a non-Party to the Basel Convention.



Regulated waste plastics - waste plastics of mixed types to which permit from the EPD is required for such import

To prepare the shipping and recycling trades for this new control and ensure waste plastics are not left stranded or illegally disposed of in Hong Kong, the EPD held four briefings in 2020 to explain the requirements – two in January and two in October, which together attracted several hundred participants. Guidelines have also been prepared along with relevant forms and documents and all have been uploaded to the EPD’s website. Members of the trades were encouraged to get an early jump on preparatory work and maintain communication about shipments with their overseas partners, overseas authorities and the EPD.



Two briefings were held by the EPD in October 2020 for the plastic waste recycling trade and the shipping trade



More than 220 participants from the plastic waste recycling trade and the shipping trade attended the two briefings held in October 2020



Non-regulated waste plastics - waste plastics which is of single-type, uncontaminated and is imported for the purpose of recycling

Looking Ahead

Subsidise the retrofitting of around 300 roadside skips in the 2021-22 financial year.

Continue close liaison with stakeholders of the recycling trade and the shipping trade to facilitate the trade’s compliance with the Waste Disposal Ordinance and the Basel Convention.

Community Awareness

Staying Green in Good Times and Bad

Despite the challenges of the COVID-19 pandemic, the EPD and Environmental Campaign Committee (ECC) made good headway in 2020 reaching out to the community and encouraging everyone to adopt green lifestyles. A major new campaign, Reduce and Recycle 2.0, promoted our community recycling network, plastic-free living and food waste recycling. We also continued to promote green events and reusable tableware and honour green achievers. Our messages were also adapted to the waste arisings associated with the pandemic to encourage people to say no to disposable plastic tableware for takeaways, use refillable hand sanitisers and properly dispose of masks.

Highlights

- Launched the Reduce and Recycle 2.0 campaign to promote the community recycling network, plastic-free living and food waste recycling.
- Promoted the Eco Anti-pandemic through initiatives such as a publicity campaign to advocate plastic-free takeaway meals.
- Continued the reusable tableware lending programme to reduce the use of disposable plastic tableware.
- Approved 166 community-initiated projects in 2020 through the ECF, providing a total grant of about \$127 million.
- Received a record 2 785 entries to the 2020 Hong Kong Awards for Environmental Excellence (HKAEE) and 86 entries for the 2020 Hong Kong Green Innovation Awards (HKGIA), and honoured 214 winners from 2019.
- Enrolled more than 7 700 students in the Student Environmental Protection Ambassador Scheme and honoured 72 schools with the Hong Kong Green School Award (HKGSA).



With the support of the ECF, the EPD and ECC launched a two-year territory-wide promotional campaign in June 2020, which aims at encouraging the public to go green and stepping up calls on the public to make good use of our community recycling network, raising public awareness of plastic-free living and promoting food waste recycling.

Reduce and Recycle 2.0

The success of the Government's waste reduction and recycling campaigns hinges on participation by everyone in the community. To raise awareness and encourage people to go green and integrate the practice of waste reduction and recycling into their daily life, the EPD and ECC launched the two-year Reduce and Recycle 2.0 campaign in 2020 to promote the GREEN@COMMUNITY recycling network, highlight the wide range of recyclables being collected, and introduce new recycling initiatives and programmes (details are in the [Waste Reduction](#) chapter). A new character, Greeny, has also been developed to partner with Big Waster to promote the concept of "Save more, Recycle more". The campaign features advertisements in traditional outlets such as the MTR, as well as social media, and introduces new elements including games and a chatbot.

Themes around the campaign were promoted in phases. The first phase was rolled out in summer 2020 and focused on introducing the eight types of recyclables and the new community recycling network GREEN@COMMUNITY. A Chinese-language chatbot was launched on Facebook Messenger to provide quick information about the local recycling network, such as locations, tips for recycling and the latest news about pilot programmes, as well as respond to users' enquiries. At the same time, an augmented reality game was launched on Facebook and Instagram to educate the public about different types of recyclables in a fun way and let users share their gaming moments with friends on social media.



A Facebook Messenger Chatbot was launched in September 2020 to help provide quick information regarding local recycling network



The first stage of the Campaign focuses on introducing the eight types of recyclables and the community recycling network, GREEN@COMMUNITY



A fun Facebook/Instagram Augmented Reality (AR) camera filter game was launched in July 2020 to educate the public about different types of recyclables

The second phase of the campaign, launched in November, focused on raising awareness about plastic-free living and encouraging people to avoid single-use plastic tableware, plastic packaging materials and other single-use plastics at source. New initiatives were also promoted including a pilot scheme to collect and recycle all plastic wastes and another pilot scheme to test the application of RVMs for collecting plastic beverage containers (details in [Waste Reduction](#) chapter).

Future Reduce and Recycle 2.0 activities will promote food waste recycling to tie in with Hong Kong's progress in converting food waste into energy (see [Waste Facilities](#) chapter).

Green on Air

The ECC co-produced and sponsored a 10-episode television series with RTHK that looked at the impact of the environment on health and a wide range of issues such as climate change and waste reduction. The ECC also produced a 13-episode series with Open TV offering one-minute green tips.



An online kick-off ceremony, officiated by Prof. Joseph SUNG, former ECC Chairman, to launch the TV Programme on Environment and Health



Prof. SUNG was featured in the programme to provide professional insight

Eco Anti-pandemic

The restrictions imposed under the COVID-19 pandemic have helped to keep people safe and healthy, but in some cases, they have also given rise to more waste. To raise awareness and encourage people to continue being green during the pandemic, the ECC promoted the concept of the “eco anti-pandemic”, outlining specific ways to reduce waste while staying safe.

Since ordering takeaway meals became more popular as people tried to maintain social distance, the EPD and ECC launched the “Plastic-free Takeaway” campaign. People were urged to opt out of disposable tableware when ordering takeaways and avoid plastics. The messages were conveyed through posters on the public transport network, including the MTR, buses and trams, as well as through product placement on television and radio dramas and other outlets. People were also provided with guidelines on adopting a “Food Wise and Waste Less” lifestyle.

The EPD also produced guidelines for food delivery platforms and their partners on reducing the use of disposable plastic tableware, such as not providing straws and cutlery by default, providing portion options and avoiding the use of polyfoam containers.

Other types of waste associated with the pandemic were targeted, too. The public was asked to avoid the

use of disposable wet tissues, use refillable hand sanitisers, and properly use and dispose of masks. These messages were conveyed through a series of videos aired on online and offline platforms, advertisements in MTR stations and more than 1 000 commercial and residential buildings, a radio drama, an online movie party for the screening of ‘The Story of Plastics’, and tailor-made games on social media.

Softening the economic impacts

In addition to reducing the environmental impacts from the pandemic, the Government has also sought to provide relief to individuals and businesses negatively affected by the pandemic and its associated mitigation measures. The ENB oversaw several environmental related programmes, some of which were supported by the Government’s \$30 billion Anti-epidemic Fund (AEF).

A subsidy scheme for the laundry trade under the AEF provided each eligible laundry shop and workshop with a one-off subsidy of \$10,000 to \$150,000, depending on the size of the business. Any company shall be entitled to an aggregate subsidy of no more than \$1.2 million. They also had to pledge not to reduce the total number of elderly staff (who make up around 30% of employees in the trade) for three months upon receiving the subsidies, or else the Government might claw it back. A total of 1 387 applications were approved and nearly \$85 million was timely dispersed to the eligible applicants.



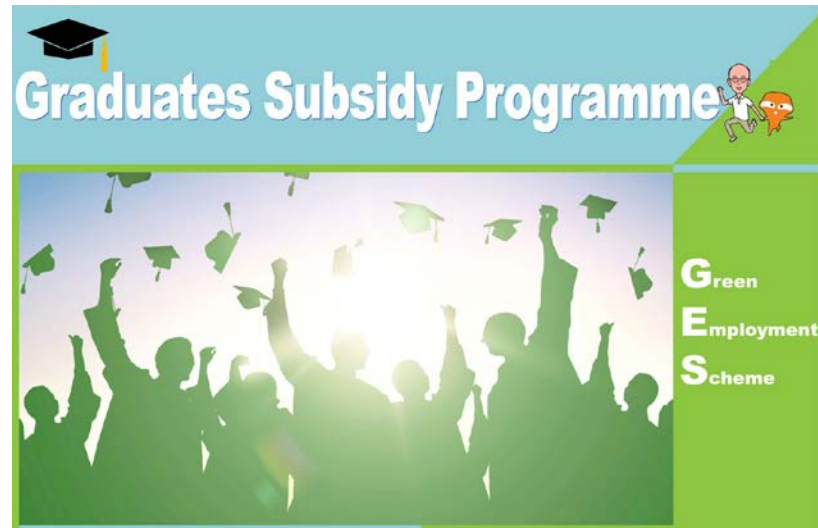
Anti-epidemic Subsidy Scheme for the Laundry Trade

To support waste collectors and recyclers, a scheme under the AEF was also implemented for the refuse transfer station account holders to enhance the personal and environmental hygiene during the collection and transportation of MSW and rental concession was provided to tenants of EcoPark; as well as two support schemes for recyclers under the Recycling Fund (see [Waste Reduction](#) chapter).



The EPD distributed face masks to drivers of refuse collection vehicles using the services at refuse transfer stations and landfills to support the work of frontline personnel

Support was also provided for young graduates in the environmental field through the AEF-funded Green Employment Scheme, which was launched in June 2020. The Scheme provides \$5,610 per month for 18 months to contribute to the salaries of 2019 and 2020 graduates working in private companies or suitable organisations in positions relating to environmental protection, nature conservation, green energy, climate change, sustainable development and the like. The Environmental Academy of EPD also provides professional training for these graduate employees through the GreenPro Training Programme. By the end of 2020, more than 500 job places had been approved under the Scheme.



Flyer for Graduates Subsidy Programme



Mr. Wong Kam-sing (the Secretary for the Environment) and Hon. Lo Wai-kiw gave a talk at the GreenPro Training Programme

Green Champions

Businesses, NPO and schools are honoured each year for their efforts to go green and encourage others to follow suit. In 2020, we moved the ceremonies online in adherence with social distancing requirements, to ensure wide recognition for recipients.

Businesses: The HKAEE and HKGIA honour companies for exceptional effort and achievement in environmental protection. The 2019 winners were honoured in a ceremony that was livestreamed in July 2020 and attracted an audience of nearly 500. The winners included 48 companies that received Gold, Silver or Bronze HKAEE awards and 160 companies awarded Certificates of Merit, as well as 6 companies that received the HKGIA. The winners were selected from 2,524 entries in total, a record high and 29% higher than in 2018. The upward trend continued in 2020 with the receipt of 2,785 entries; winners will be announced in 2021.

Three special commendation schemes were also featured at the ceremony. The Outstanding Green Achiever Commendation Scheme was awarded to 7 individuals who have made an exceptional effort to improve the environmental performance of their companies and the community. The Outstanding Promotional Partner Commendation Scheme was awarded to 20 companies that promoted HKAEE and

encouraged their business partners to participate. And the Green Outdoor Event Commendation Scheme was awarded to 19 events that featured waste reduction measures.

Alongside these competitive schemes, the Hong Kong Green Organisation title is conferred on companies that achieve multiple verifiable environmental benchmarks, such as ISO14001 certification and certificates in waste reduction, energy saving, carbon reduction and indoor air quality. Some 566 firms that attained this status in 2019 were honoured at the 2020 HKAEE ceremony.



The virtual Presentation Ceremony of 2019 HKAEE and HKGOC was held on 3 July 2020 and graced by Secretary for the Environment, the Honourable Wong Kam-sing, GBS, JP, the former Chairman of the Environmental Campaign Committee, Prof. Joseph Sung, SBS, JP, and the Chairman of Awards Committee on the HKAEE, Dr. Ir. Conrad Wong, BBS, JP.



17 Gold Awards were honoured at the virtual ceremony

Schools: The HKGSA honours schools based on their environmental policy and campus environment, environmental management measures, and environmental education plan, implementation and effectiveness. The 72 winning schools for 2020 were also noteworthy for organising environmental learning activities online. Fifteen primary schools and 13 secondary schools received the Gold award, 3 schools in each category received Silver, and 17 primary and 9 secondary schools received Bronze. In addition, 12 pre-schools were honoured for their outstanding performance.

The online award ceremony, scheduled for February 2021, is the last HKGSA event. From 2020-21, school awards will be subsumed under the HKAEE's Schools Sector awards.



The Award Presentation Ceremony for 18th Hong Kong Green School Award was held to recognise the efforts of winning schools in promoting environmental education



An environmental education activity of a participating school under the 18th Hong Kong Green School Award

Green Events

Although the COVID-19 pandemic limited the number of events held in 2020, the EPD and ECC were still able to make headway on those events that went ahead. At the start of the year, the Green Lunar New Year Fair initiative was in place in all 15 official fairs held in Hong Kong. Facilities and education were provided on resource recovery and recycling, stall holders were encouraged to join the Green Stall Scheme and reduce waste at source, reusable tableware and shopping bag sharing stands were on offer, a Mobile Recycling Team circulated to help in waste collection, sorting and handling, and a Resources Sharing Corner was set up to collect unsold and leftover materials for redistribution after the fair.

We also continued to promote the Green Event Pledge, having worked closely with organisers of mega events such as the Standard Chartered Hong Kong Marathon and the Hong Kong Flower Show. By the end of 2020, about 250 organisations had signed the pledge.

Looking Ahead

Continue to encourage the public to reduce waste, particularly by avoiding the use of disposable plastics and recycling properly, and to practise low-carbon living.

Continue to promote the Government's new environmental initiatives to the community.

Continue to organise environmental commendation schemes and other activities targeting different sectors of the community.



SUSTAINABLE DEVELOPMENT

Sustainable Development

Carbon Neutrality on the Table

Climate change remains one of the most worrying long-term challenges facing the world, threatening extreme temperatures, droughts, floods and a host of other problems. Everyone, everywhere, has an obligation to mitigate the problem. In response to an extensive public engagement and report by the Council for Sustainable Development (SDC) on long-term decarbonisation for Hong Kong, the Chief Executive announced in the 2020 Policy Address that Hong Kong would strive to achieve carbon neutrality before 2050.

Highlights

- ◆ Welcomed the Government's decision to aim for carbon neutrality before 2050, as recommended by the SDC following a public engagement exercise.
- ◆ Welcomed participation by 40 secondary and primary schools in the Sustainable Development School Outreach Programme, involving about 9 200 students and teachers.
- ◆ Honoured 50 secondary schools in the Sustainable Development School Award Programme, whose activities reached about 100 000 students, teachers and members of the community.

Hong Kong Adopts Long-term Decarbonisation

The 2015 Paris Agreement to limit increases in the global average temperature to well below 2 degrees Celsius above pre-industrial levels, while pursuing a limit of 1.5 degrees Celsius, has prompted action by signatories around the world. China, for instance, has set a national goal of carbon neutrality before 2060. Hong Kong, as an advanced city, has also taken appropriate action. In 2019 the SDC held a bottom-up, stakeholder-oriented engagement to gauge public views on reducing carbon emissions in Hong Kong over the coming decades. The results were reported to the Government in 2020 and form the basis of a new goal for Hong Kong, announced in the Chief Executive's 2020 Policy Address: carbon neutrality before 2050.

The report outlined six overarching objectives:

- Driving transformative societal change towards low-carbon lifestyles.
- Accelerating the shift to zero-carbon energy.
- Promoting a sustainable built environment.
- Governing transitions toward low-carbon transport systems.
- Unlocking green and sustainable finance potential for low-carbon transition.
- Steering innovations in climate change mitigation, adaptation and resilience.

The report identified eight areas of work for achieving these goals: target; lifestyles; education, training and research; built environment; energy; transport; city planning and management; and finance.

Under the broad brush of these areas are 55 specific recommendations for achieving decarbonisation in Hong Kong's daily life and operations. For example, consumers could be made more aware of the embedded carbon footprint of various types of consumer products and services and be given financial incentives or support to facilitate informed choices. Specialised training and certification programmes could be offered regarding expertise in decarbonisation. Small and medium-sized enterprises could be given financial incentives to save energy and reduce carbon. Faster adoption of new energy vehicles could be encouraged. City planners could continue to promote walkability and foster bicycle-friendly environments in new development areas and new towns.

The Government welcomed the SDC's report and is now examining the options. In any case, carbon neutrality and decarbonisation will not be confined to any single sector or party. Everyone will need to adopt a low-carbon lifestyle.



Press conference to release the Report on Public Engagement on Long-term Decarbonisation Strategy



Cover of the Report on Public Engagement on Long-term Decarbonisation Strategy

Public support for such a direction was found in the SDC's three-month public engagement in 2019, which entailed 65 engagement events with more than 4 500 participants and received more than 71 000 Views Collection Forms and more than 600 written submissions, all of which were analysed by the Social Sciences Research Centre at the HKU. However, more work needs to be done to make people aware of the urgency of the climate change challenge and the need to work together. Cross-sectoral actions are necessary to achieve low-carbon transformation and deep decarbonisation. With the ambitious target of 2050 before us, Hong Kong has taken a firm step down that path.

School Programmes

Low-carbon living was also a component of programmes aimed at raising awareness and promoting sustainable practices in schools. The Sustainable Development School Outreach Programme uses interactive dramas, seminars, and workshops (some with field trips) to convey the concept and importance of sustainable development. Originally targeted at secondary schools, it was tested on primary schools on a pilot basis in the 2020/21 school year. The response was encouraging, and primary schools will formally become part of the Programme in the 2021/22 school year. In 2020, a total of 40 secondary and primary schools participated, involving about 9 200 students and teachers.

The Sustainable Development School Award programme encourages secondary school students to adopt sustainable practices in their daily lives and spread the message to families and the local community. It also aims to create a community network at district level. Schools can receive either the Sustainable Development Participation Award for participating in at least three activities with at least 400 students attending, or the Sustainable Development Community Project Award for organising activities and projects for parents, residents and district organisations with at least 400 participants. In 2020, the Sustainable Development School Award Programme honoured 50 schools for their efforts to raise awareness and promote action among about 100 000 students and the nearby community during the 2018-20 round under the theme "Low-carbon Lifestyle". This theme is being continued in the current round, which runs from 2020 to 2022.



Interactive drama to arouse students' interest in low-carbon living practices



Workshop with field trip to explore how to put sustainable development concepts in practices

Looking Ahead

Develop an e-learning platform on long-term decarbonisation in collaboration with the Education Bureau.

Formally extend the Sustainable Development School Outreach Programme to primary schools from the 2021/22 school year onward.

Prepare to launch the next round of applications under the Sustainable Development Fund for projects that enhance public awareness of the principles of sustainable development and encourage sustainable practices.

CLIMATE CHANGE AND CROSS-BOUNDARY AND INTERNATIONAL COOPERATION

Climate Change and Cross-boundary and International Cooperation

Our Goal: Carbon Neutrality

Hong Kong signalled its determination to combat climate change with the announcement in the 2020 Policy Address that we would strive to achieve carbon neutrality before 2050. This ambitious target stands alongside the national government's endeavour to achieve carbon neutrality before 2060. In addition, Hong Kong continued to collaborate with our regional counterparts on other shared environmental issues during the year, as well as climate change, as we worked towards a greener future for all.

Highlights

Climate change

- ◆ Announced that Hong Kong would strive to achieve carbon neutrality before 2050.
- ◆ Launched the \$200 million Green Tech Fund to support research and development projects on decarbonisation and environmental protection.

Cross-boundary and International Cooperation

- ◆ Held the second meeting of the Hong Kong-Guangdong Joint Working Group on Environmental Protection and Combating Climate Change (JWGEPCCC).
- ◆ Conducted a joint study with Guangdong on post-2020 regional air pollution reduction targets and concentration levels.
- ◆ Allocated \$311 million for a new five-year phase of the Cleaner Production Partnership Programme.
- ◆ Amended regulations to control the import and export of mercury to fulfil our obligations under the Minamata Convention on Mercury.

Combating Climate Change

Combating climate change is high on the Government's agenda. With the implementation of various decarbonisation measures, we are moving steadily towards the 2030 target of reducing Hong Kong's carbon intensity by 65% to 70% as compared with 2005, the baseline year. Hong Kong's carbon emissions peaked in 2014 at 6.2 tonnes per capita. Based on preliminary estimation, the per capita carbon emissions in 2020 would be reduced to around 4.5 tonnes per capita in 2020.

The 2020 Policy Address announced that Hong Kong would strive to achieve carbon neutrality before 2050. To this end, we will update the Hong Kong Climate Action Plan in the middle of 2021 to set out more proactive strategies and measures to reduce carbon emissions. Among the areas being examined are zero-carbon energy and carbon technologies; more enhancement of energy efficiency in both new and existing buildings; further promotion of zero-carbon vehicles and green transportation; and the development of large-scale waste-to-energy facilities.

The ambitious target of carbon neutrality requires collaboration and cooperation across all sectors, including the public sector, businesses, the non-profit sector and individuals. To support public and private research organisations in developing technology-based solutions, the Government launched the \$200

million Green Tech Fund in December 2020. This provides better and more focused funding for research and development (R&D) projects that can help Hong Kong decarbonise and enhance environmental protection. The funding amount for each project ranges from \$2.5 million up to \$30 million. Public research institutes and R&D centres will receive full funding support, while private companies will be funded on a matching basis.



The Government set up a HK\$200 million Green Tech Fund in 2020 to fund local R&D projects which can help Hong Kong decarbonise and take advantage of green technologies

To enhance public awareness and engagement, another \$5 million has been reserved under the ECF to help NPO carry out public education activities and demonstration projects on combatting climate change. The Government also continued to promote the [Low Carbon Living Calculator](#), where more than 29 000 users have had their carbon emissions assessed since its launch in 2018.



The Low Carbon Living Calculator was launched to help the public assess their carbon emissions in respect of clothing, food, living and travel

Collaboration beyond Hong Kong

The Hong Kong Government continued to maintain close contacts with our regional counterparts in 2020, fulfil our obligations at the international level, and work with Hong Kong enterprises to reduce their regional environmental impacts.

Regional engagement

Due to travel restrictions arising from the COVID-19 pandemic, the second meeting of the Hong Kong-Guangdong JWGEPCCC was held via videoconference in October 2020. Good progress has been made in achieving the goals of improving regional air quality, protecting the water environment, combating climate change, and enhancing cooperation in forestry and marine resources conservation.



The Secretary for the Environment, Mr. Wong Kam-sing, and the Director-General of the Department of Ecology and Environment of Guangdong Province, Mr. Lu Xiulu, co-chaired the second meeting of the Hong Kong-Guangdong Joint Working Group on Environmental Protection and Combating Climate Change using video conferencing on 27 October 2020. The meeting reviewed the progress of collaboration between the two sides in 2020, and agreed on a work plan for 2021



The second meeting of the Hong Kong-Guangdong Joint Working Group on Environmental Protection and Combating Climate Change was held via video conferencing on 27 October 2020 to review the progress of collaboration between the two sides in 2020, and agree on a work plan for 2021. Photo shows the Secretary for the Environment, Mr. Wong Kam-sing (centre), together with the members of the Hong Kong Special Administrative Region Government delegation

On air quality, Hong Kong, Guangdong and Macao continued to collaborate in monitoring, abating and forecasting air pollution. In 2020, we reported continued improvement in air quality as measured by the Guangdong-Hong Kong-Macao PRDAQM Network. Our concerted efforts to reduce emissions have brought about that since 2006, annual concentration levels of SO₂, NO₂ and RSP have fallen by 86%, 43% and 49% respectively. In addition, levels of FSP and carbon monoxide (CO), which have been monitored since 2015, fell by 31% and 16% respectively. However, O₃ levels have risen by 27% since 2006. In 2021, we will embark on a three-year joint study to better characterise the origins of O₃ formation and formulate more effective control measures. (Details of Hong Kong's emission control efforts can be found in the [Air](#) chapter.)

Annual averages of the pollutants in the monitoring network

Year	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)	O ₃ (µg/m ³)	RSP (µg/m ³)	FSP (µg/m ³)	CO (mg/m ³)
2006	43	42	44	67	-	-
2007	44	41	46	72	-	-
2008	36	40	46	65	-	-
2009	26	38	51	64	-	-
2010	23	39	49	59	-	-
2011	21	37	53	59	-	-
2012	17	35	49	52	-	-
2013	17	37	49	59	-	-
2014	14	34	52	50	-	-
2015	12	30	47	44	29	0.730
2016	11	32	44	41	26	0.728
2017	10	31	52	45	28	0.665
2018	9	29	53	42	25	0.611
2019	7	30	60	42	25	0.700
2020	6	24	56	34	20	0.611

Note:
The concentrations of gaseous pollutants are calculated at a reference temperature of 298.15 K and a pressure of 101.325 kPa and the concentrations of RSP and FSP are measured at real-time temperature and atmospheric pressure

Our other regional air initiatives in 2020 included enhancing technical exchanges and air quality forecasting work and preparing to include VOC monitoring in more monitoring stations from 2021. Moving forward, we are formulating regional air pollutant emission reduction plans and targets for 2025 and 2030 with Guangdong. These plans have all been endorsed by the JWGEPECCC.

On water quality, the trial Notification and Alert System on Marine Refuse has been operating successfully since 2017. The JWGEPECCC was informed that the Hong Kong-Guangdong Notification Mechanism on Marine Refuse has been activated 22 times since then in response to heavy rainfall and other major environmental incidents.

On climate change, the Special Panel on Combating Climate Change under the JWGEPECCC continued to work on deepening exchanges and collaboration on issues relating to climate change, such as energy efficiency in buildings, climate forecast, sea level rise projection, urban drainage, and slope safety.

Other regional meetings are held in addition to the JWGEPECCC. In 2020, the HKSAR Government participated in the 12th Hong Kong-Macao Environmental Protection Liaison Meeting; the 16th Pan-PRD Regional Environmental Cooperation Joint Conference with authorities from the nine Pan-PRD provinces and Macao; and the 28th and 29th meetings of the Hong Kong-Shenzhen Environmental Cooperation Forum.



The Permanent Secretary for the Environment/Director of Environmental Protection, Ms. Maisie Cheng, co-chaired the twenty-eighth meeting of the Hong Kong-Shenzhen Environmental Cooperation Forum with the Director-General of the Department of Ecology and Environment of Shenzhen Municipality, Mr. Liu Chuhan, to discuss the environmental cooperation matters



The Permanent Secretary for the Environment / Director of Environmental Protection, Ms. Maisie Cheng Mei-sze, co-chaired the twelfth meeting of the Hong Kong-Macao Environmental Protection Liaison Meeting with the Director of Macao Environmental Protection Bureau, Mr. Raymond Tam via video conferencing, to discuss the environmental cooperation matters, review work progress in 2019 and agree on the 2020/2021 work plan

International commitments

Hong Kong works closely with the international community on climate change, in particular the Parties to the United Nations Framework Convention on Climate Change and the C40 Cities Climate Leadership Group.

The Government also undertook to fulfil its obligations under the Minamata Convention on Mercury to protect human health and the environment from anthropogenic emissions and release of mercury and mercury compounds. The People's Republic of China is one of the parties to this international legally binding treaty which came into force in 2017 and is applicable to Hong Kong. The Government amended the Import and Export (General) Regulations to restrict the import and export of mercury, which came into effect in November 2020. The Government has also begun to prepare the Mercury Control Bill to ensure Hong Kong's full compliance with the obligations under the Minamata Convention on Mercury.

A Boost to Cleaner Production

The Cleaner Production Partnership Programme (CPPP) was first launched in 2008 to provide funding support for Hong Kong-owned factories in Hong Kong and Guangdong to adopt cleaner production technologies and practices. By March 2020, \$293 million had been allocated to support about 3 300 applications, resulting in better energy saving and reduced emissions across the region. In light of these positive effects, the Government allocated another \$311 million from June 2020 to extend the programme to March 2025.



New Phase of Cleaner Production Partnership Programme (2020-2025)



Installation of composite exhaust air treatment system using a combination of UV photocatalytic oxidation and activated carbon adsorption to reduce VOC emissions



Installation of composite exhaust air treatment system using a combination of UV photocatalytic oxidation and activated carbon adsorption to reduce VOC emissions

Under the CPPP, Hong Kong-owned factories can apply for two kinds of funding support – onsite improvement assessments to identify room for improvement in cleaner production, and demonstration projects to either promote wider adoption of proven cleaner production technologies or conduct research and innovation on new technologies. NPO can also apply for funding support for trade-specific promotion and publicity activities.

To review progress and plan ahead, the EPD and the Department of Industry and Information Technology of Guangdong jointly held their seventh meeting of the Hong Kong-Guangdong Joint Working Group on Cleaner Production in 2020. They also administer the Hong Kong-Guangdong Cleaner Production Partnership Recognition Scheme, which in 2020 commended 181 enterprises, including 39 manufacturers named Excellent Partners and 129 named Partners, and 2 sourcing enterprises and 11 environmental technology service providers.



The Secretary for the Environment, Mr. Wong Kam-sing (second left), and the Director-General of the Department of Industry and Information Technology of Guangdong Province, Mr. Tu Gaokun, co-chaired the seventh meeting of the Hong Kong-Guangdong Joint Working Group on Cleaner Production via video conference on 29 October 2020. The meeting discussed and reviewed work progress in 2020 and participants agreed on the 2021 work plan



The seventh meeting of the Hong Kong-Guangdong Joint Working Group on Cleaner Production was held via video conference on 29 October 2020 to review the work progress in 2020. Participants also agreed on the 2021 work plan. Photo shows the Secretary for the Environment, Mr. Wong Kam-sing (centre), together with members of the Hong Kong Special Administrative Region Government delegation

Looking Ahead

Climate change

Update Hong Kong's Climate Action Plan in mid-2021 to set out more proactive strategies and measures to reduce carbon emissions.

Announce the results of the first round of applications for the Green Tech Fund and invite the second round of applications in mid-2021.

Cross-boundary and International Cooperation

Launch the study "Characterisation of photochemical O₃ formation, regional and super-regional transportation in the Greater Bay Area".

Continue the joint study with Guangdong on post-2020 regional air pollutant emission reduction targets and concentration levels for setting reduction targets for 2025 and 2030.

Progressively introduce monitoring of VOCs within the PRD Regional Air Quality Network.