2023 ENVIRONMENTAL PERFORMANCE REPORT

環保工作報告

環境及生態局(環境科)
Environment Branch
Environment and Ecology Bureau

環境保護署
Environmental Protection Department

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FOREWORD

In 2022, Hong Kong gradually resumed to normal after nearly three years of COVID-19 curbs.

Upon the re-organisation of the government structure in July 2022, the former Environment Bureau (ENB) was renamed as the Environment and Ecology Bureau (EEB) with an expanded portfolio. On the environmental front, we continued to implement initiatives and measures put forward in our various blueprints for environmental protection, including combating climate change to achieve carbon neutrality before 2050, improving air quality, promoting electric vehicles (EV) and other means of green transport, and enhancing waste reduction and resource circulation. We spared no effort in soliciting stakeholders' and public support on these issues.

To further promote research and development of technologies in decarbonisation and enhance environmental protection in Hong Kong, the Government injected an additional funding of $200 million to the Green Tech Fund in the 2022-23 Budget. Legislative amendments were introduced to expand the Mandatory Energy Efficiency Labelling Scheme to cover more household appliances, increasing the total coverage of energy consumption in the residential sector. The "EV-Charging Easy" mobile app was also launched to provide users a convenient way to receive real-time EV charger availability at different carparks in each district for the EV charging network opened for public use. In addition, to promote the use of green transport, over 1 000 medium EV charges were installed at government car parks for public use in 2022.

Our community recycling network GREEN@COMMUNITY continued to expand, comprising 11 Recycling Stations, 32 Recycling Stores, and more than 120 Recycling Spots across the territory as at end 2022, to collect recyclables for proper recycling. To step up efforts on plastics control, the enhanced Plastic Shopping Bag Charging Scheme was implemented in December 2022 with increased charging level and tightened control. A trial scheme on food waste collection at public rental housing estates was also launched to tackle the largest component of municipal solid waste (MSW) disposed of in the landfills.

The high quality of our service to the public was well recognised. The EPD won the Grand Award of The Ombudsman's Awards 2022 for Public Organisations for our dedication to build a good public administration culture; and an EPD colleague was also awarded "The Ombudsman's Award 2022 for Officers of Public Organisations" for his professional, proactive and responsive efforts in handling complaints from the public. Moreover, the EPD was honoured with the Gold Prize of Civil Service Outstanding Award Scheme 2022 - Innovation and Technology Awards (Best Use of Technology) in recognition of its efforts in applying smart technology in pioneering public service improvement.

Protecting our environment is a shared responsibility of all. We will continue to work hand in hand with all sectors of the community to make Hong Kong a greener and sustainable city.

Miss TSE Siu-wa, Janice, JP
Permanent Secretary for Environment and Ecology (Environment) /
Director of Environmental Protection

SCOPE OF THE REPORT

This Environmental Performance Report covers 1 January - 31 December 2022 unless otherwise stated. It provides an overview of the efforts of the Environment and Ecology Bureau (Environment Branch) (EEB(EB)) and Environmental Protection Department (EPD) to reduce the impacts of our internal operations, including office operations and waste facilities, and contribute to sustainable development in Hong Kong.

This report is published in English and Chinese on our website to reduce paper consumption. All monetary figures are in Hong Kong dollars.

OUR VISION, MISSION AND POLICY

Our Vision

Is of a Hong Kong

- that enjoys a healthy and pleasant environment;
- where the community places a premium on sustaining such an environment for both themselves and future generations, and pursues sustainable development; and
- where the community enjoys a reliable and safe energy supply at reasonable prices, while improving energy efficiency, promoting energy conservation and minimising the environmental impacts from the production and use of energy.

Our Mission

Is to contribute towards realising this vision by applying our professional knowledge and judgment and drawing on international experience

- to formulate policies and plans on environmental protection, energy, conservation and the promotion of sustainable development;
- to provide first-class physical infrastructure for the treatment and disposal of waste and wastewater;
- to raise community awareness of and promote public support for issues related to environmental protection, energy, nature conservation and sustainable development;
- to promote collaborative efforts through regional and international co-operation;
- to implement environmental protection and energy related legislation and plans; and
- to administer robust environmental impact assessment in the planning of new developments and major projects.

Environmental and Energy Policy

To realise our vision and mission, we have adopted an Environmental and Energy Policy that applies to our services, programmes and internal operations (see full text at Appendix I). The policy has adopted the following guiding principles: compliance with the spirit of all applicable environmental legislations, standards and regulations; pre-emption of environmental problems through planning and prevention; preparedness for dealing with emergency environmental incidents; minimisation of consumption; communication of our goals to our staff and the public; and training and professional development of our staff.

OUR ORGANISATION AND PRIORITIES

The EEB(EB) and EPD are responsible for developing government policies and programmes to protect Hong Kong's environment. The Secretary for Environment and Ecology reports directly to the Chief Executive.

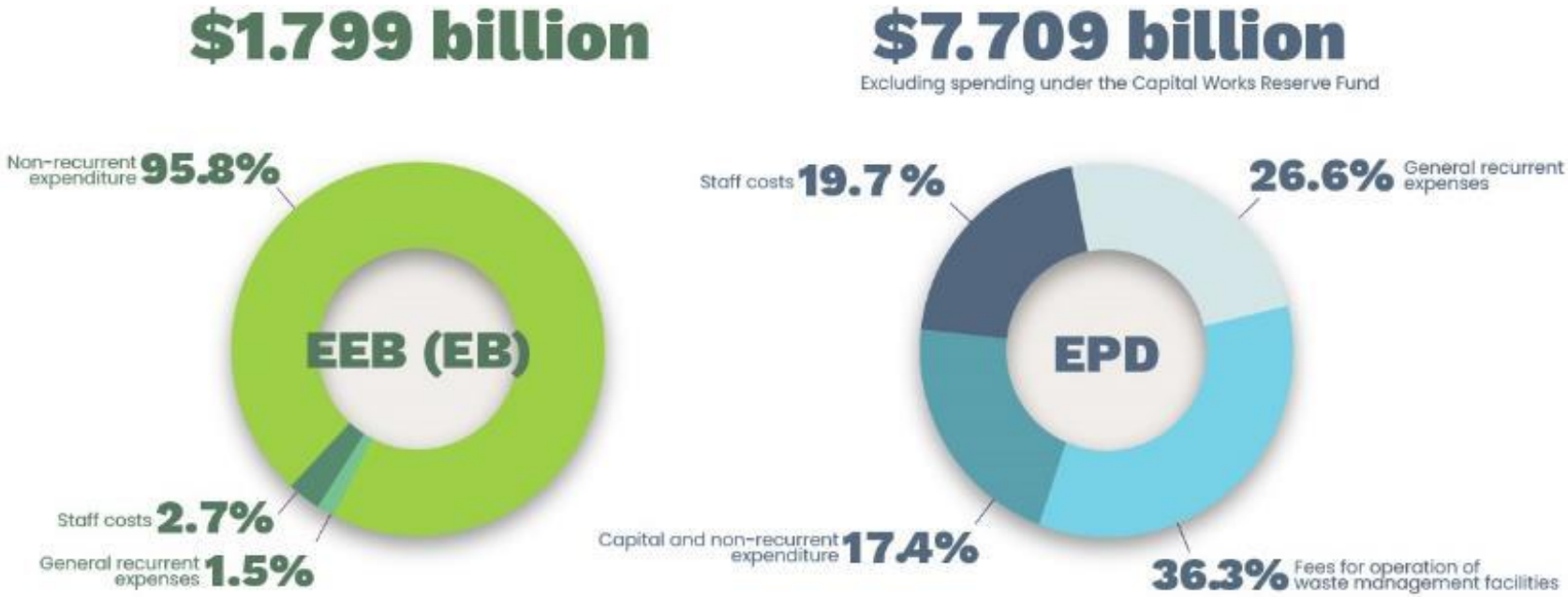
Areas of Responsibility

- **Environmental Protection**. The EEB(EB) is responsible for overall policy on the environment. The EPD assists EEB(EB) to develop and implement policies and programmes on climate change, air, environmental assessment and planning, noise, waste and water. The EEB(EB) also develops policy on nature conservation, which is implemented by the Agriculture, Fisheries and Conservation Department (AFCD).

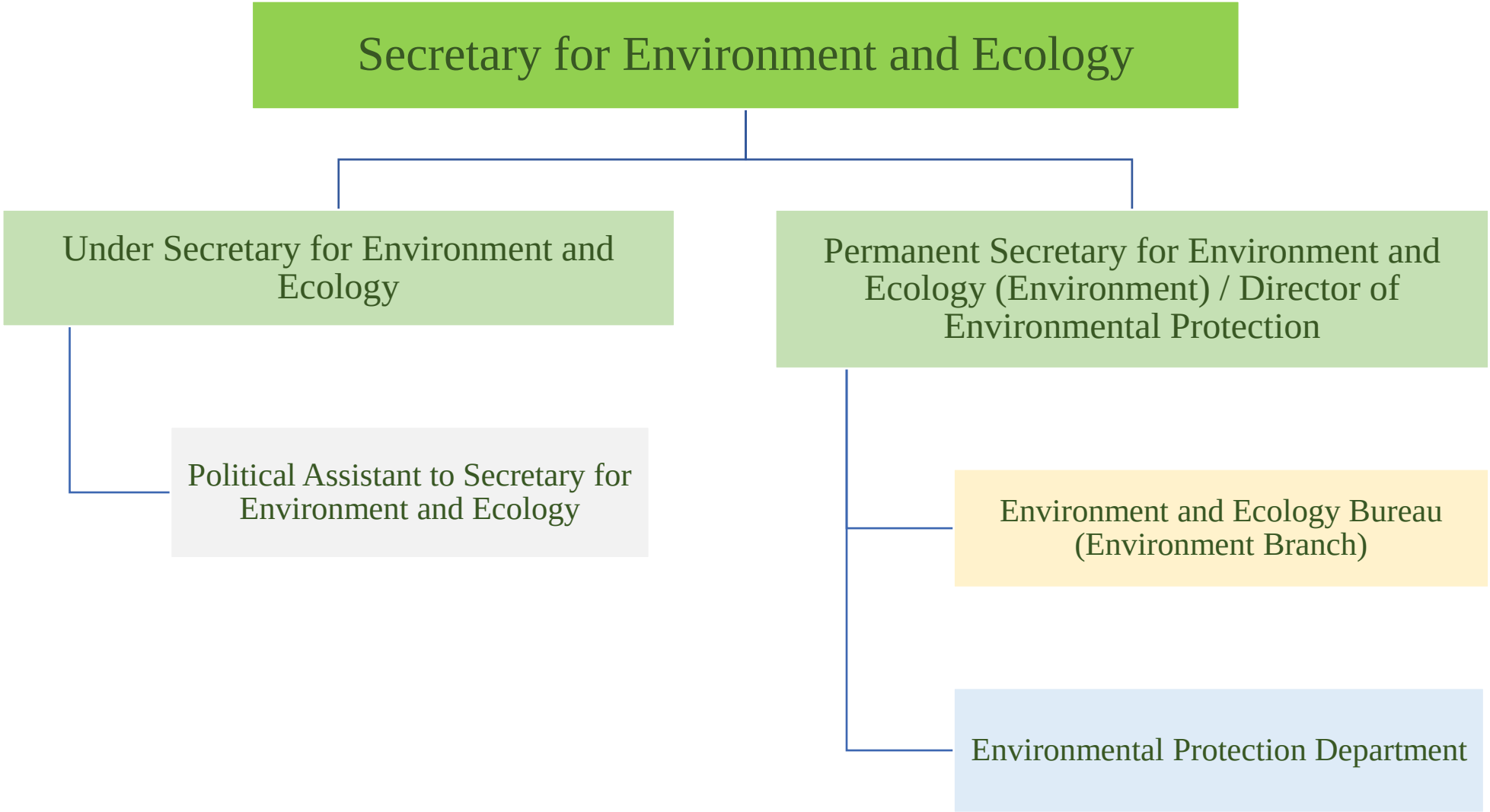
- **Energy**. The EEB(EB) sets overall energy policy. Energy conservation matters are executed by the Electrical and Mechanical Services Department.

- **Sustainable Development**. The EEB(EB) sets and implements the policy.

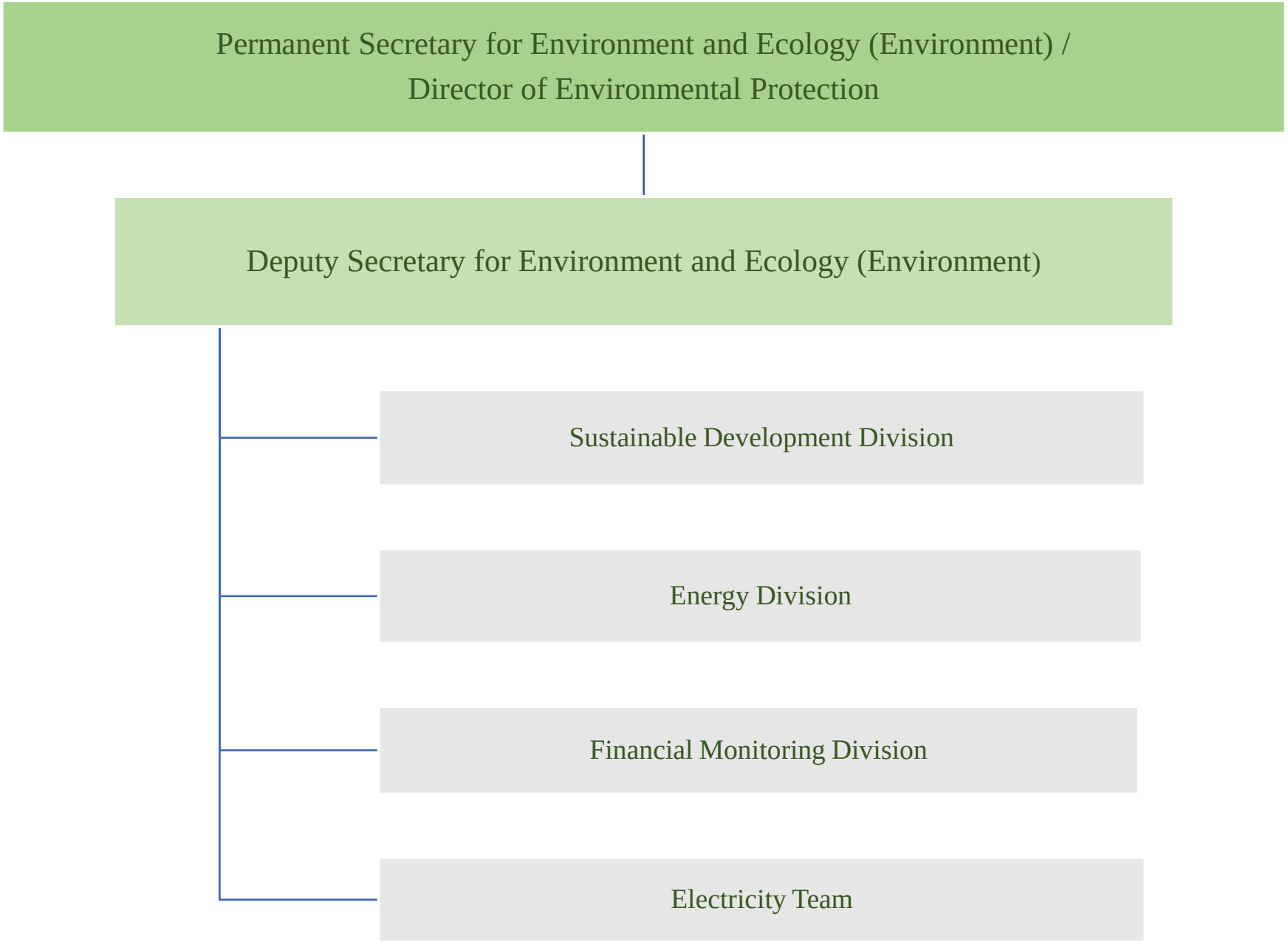
2022 EXPENDITURE



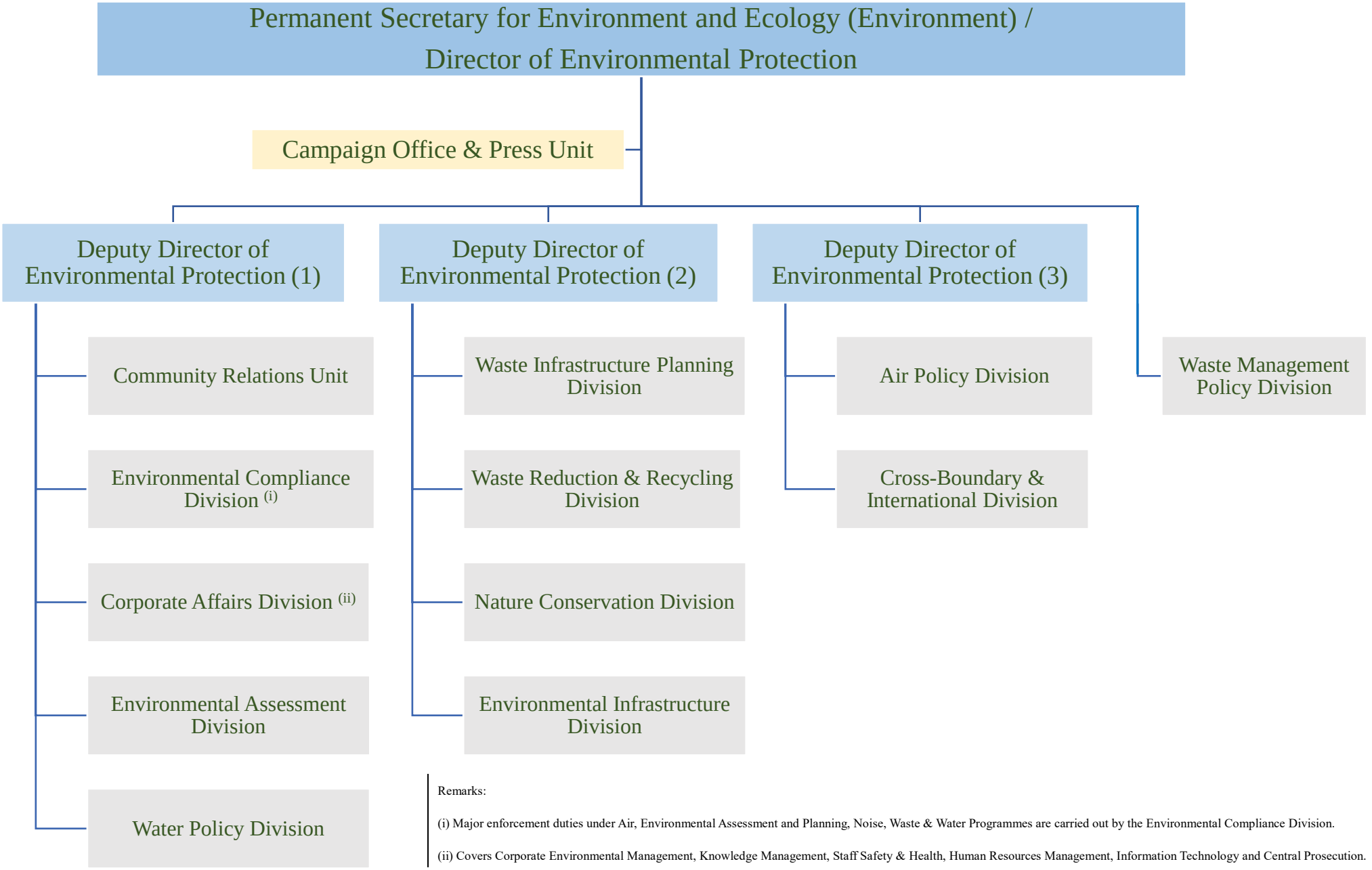
ORGANISATIONAL STRUCTURE



Environment and Ecology Bureau (Environment Branch)



Environmental Protection Department



Remarks:

(i) Major enforcement duties under Air, Environmental Assessment and Planning, Noise, Waste & Water Programmes are carried out by the Environmental Compliance Division.

(ii) Covers Corporate Environmental Management, Knowledge Management, Staff Safety & Health, Human Resources Management, Information Technology and Central Prosecution.

MANAGING THE ENVIRONMENTAL IMPACTS OF OUR OPERATIONS

GREENING OUR OFFICES

Green Management System

Aims: The EEB(EB)'s and EPD's work in 2022 focused on improving the environmental impacts of our office operations by the following means:

- Energy saving and efficient electricity consumption
- Promoting the use of non-fossil fuel vehicles
- Reduction of resources consumption
- Maintaining our recycling of waste paper and plastics, and printer cartridges and photocopier toner bottles

Lines of Responsibility: At the **departmental** level, the Departmental Environment, Safety and Health Committee (DESHC) steers our green management. The Knowledge Management Unit also monitors the offices' overall energy consumption trends and environmental impacts, and audits portions of the green audits that each group/unit of the EEB(EB) and EPD must conduct each year.

Each **group / unit** of the EEB(EB) and EPD has a Group Environmental Representative who helps implement green management measures, train other colleagues in implementing these measures, communicate with colleagues, and carry out green audits. Groups / units are also encouraged to invite other groups to cross-audit them every two years. Every office has an Energy Warden to monitor and co-ordinate energy-saving measures.

Communicating Green Goals to Staff: The EEB(EB) and EPD have produced a comprehensive circular that outlines how staff can support and implement green management practices in their offices. Staff are also regularly reminded to reduce their environmental impacts through the Green Tip of the Day distributed from time to time via our intranet, the Green Management circular re-circulated several times a year, staff training and human resources activities (see Training and Development).

Electricity Consumption

Performance in 2022: The EEB(EB) and EPD constantly monitor energy consumption and seek potential areas of saving, particularly in electricity consumption. A large portion of Hong Kong's electricity is generated by non-renewable fossil fuels, so any savings will have knock-on effects on local and regional air quality and our contribution to combating climate change.

In 2022, the total electricity consumption in all EEB(EB) and EPD Offices slightly increased by 3.6% compared to 2021, and annual electricity consumption per employee was 1 782 kilowatt hours (kWh). The slight increase is mainly due to the resumption of face-to-face courses at Environmental Academy and temporary extension of operating hours in some offices in 2022, following the resumption of public services after the pandemic.

Table 1: Electricity consumption in offices 2021-2022 *

	2021	2022
Electricity Consumption in all ENB / EEB(EB) and EPD Offices (million kWh)	4.059	4.205

* Includes electricity consumption from air conditioners installed in EEB(EB) / EPD offices that are managed by EEB(EB) / EPD staff. Most of the offices are in buildings shared with other users, with central air-conditioning systems. Since it is not possible to measure individual air-conditioning and related energy use in these buildings, such figures are excluded from the calculations.

Table 2: Breakdown of total electricity consumption and emissions 2021-2022

	2021	2022
Electricity consumption		
Office Electricity Consumption (million kWh)	4.059	4.205
EV Electricity Consumption (million kWh)	0.011	0.012
Total Electricity Consumption (million kWh)	4.070	4.217
Emissions from electricity consumption		
Carbon Dioxide-equivalent (CO_2-e) (tonnes) #	2 564	2 589
Sulfur Dioxide (SO_2) (kilogram) (kg)	8 546	8 856
Nitrogen Oxides (NOx) (kg)	5 291	5 482
Respirable Suspended Particulate (RSP) (kg)	407	422

#The latest emission factors were used for the calculation of CO_2-e emissions from electricity consumption.

Green energy measures: The DESHC has implemented measures for saving energy, including annual self-inspections of all offices to identify areas of improvement; regular monitoring in each office by Energy Wardens, who also co-ordinate the implementation of energy-saving measures; and reporting of annual energy consumption by each office. Annual Green Audits in offices identified the following energy-saving measures in 2022:

- **Delamping**: Offices with light intensity higher than the recommended values were suggested to delamp T5 fluorescent tubes (28 watts) as far as practicable.
- **Programmable timers**: These are installed in shared-use electrical and electronic equipment to switch them off outside office hours. In 2022, 18 new timers were installed.

Reducing Transport Impacts

Green transport is promoted by procuring environment friendly vehicles as new or replacement vehicles as far as practicable; encouraging staff to walk or use public transport where possible and to carpool when using government vehicles; and promoting green driving practices.

Performance in 2022: The EPD is gradually replacing its fleet with low to zero-emission vehicles. Emission of RSP and mileage of vehicles decreased when compared to 2021.

One of the EPD's EVs

Table 3: Annual fuel consumption and direct pollutant emissions[1] by vehicles 2021-2022		
	2021	2022
Vehicle Fleet	54 vehicles[2]	54 vehicles[3]
Diesel (litres) (l)	11 763	12 645
Petrol (l)	67 218	60 902
Liquefied petroleum gas (LPG) (ls)	127	35
Electricity (kWh) [4]	10 990	11 995
Mileage (kilometre)	582 933	560 505
NOx (kg) [5]	700	707
RSP (kg) [5]	96	87

Notes:

[1] Only tailpipe emissions are presented. Indirect emissions from the consumption of electricity by EVs are included in our office electricity consumption shown in Table 1.

[2] 10 diesel vehicles with AdBlue (urea solutions), 39 petrol, three electric, one electric / petrol, one LPG.

[3] 13 diesel vehicles with AdBlue (urea solutions), 36 petrol, three electric, one electric / petrol, one LPG.

[4] Only charging activities in government-owned carparks were captured.

[5] Vehicle emissions are estimated based on the equations given in The Clean Air Charter – A Business Guide Book.

Reducing Waste

The EEB(EB) and EPD collected more than 60 690 kg of waste paper and plastics for recycling in 2022, with quantity of waste paper collected increased by 10% in 2022. We continued to encourage our staff to reduce waste at source and use electronic and other alternatives e.g. tablet computers instead of hardcopies for meetings. In 2022, we had 149 e-fax accounts in use by which 18 430 incoming e-faxes were received, representing a saving of 75 175 pages of paper.

Ongoing initiatives to reduce office waste at source include a Consumables and Inventory Recycling Scheme, a programme to refurbish old computers and donate them to the needy. Staff have also been issued with guidelines on reducing waste.

Performance in 2022: The following wastes were collected for recycling:

- 60 632 kg of waste paper
- 359 kg of plastic waste
- 1 519 printer cartridge units
- 250 photocopier toner bottles

Other Green Measures

Carbon Audit:

Since January 2017, all government bureaux and departments have been required to conduct annual carbon audits of their buildings that have annual electricity consumption of more than 500 000 kWh. The Island West Transfer Station Admin Building is an EEB(EB) / EPD office that falls under this category. Compared to 2021, its annual electricity consumption and emissions of CO_2-e in 2022 increased by 2.50% and 2.86% respectively. The increase in electricity consumption was mainly due to the aged electrical appliances. To identify energy saving opportunities, an energy audit will be conducted in 2023 to enhance the energy performance of the said building.

	2021	2022
1. Scope of Reporting		
Total Scope 1 / Direct Greenhouse Gas (GHG) Emissions:	5.91 tonnes of CO_2-e	8.20 tonnes of CO_2-e
Total Scope 2 / Indirect GHG Emissions:	575.49 tonnes of CO_2-e	589.85 tonnes of CO_2-e
Total Scope 3 / Other GHG Emissions:	4.83 tonnes of CO_2-e	4.92 tonnes of CO_2-e
Total GHG Emissions:	586.22 tonnes of CO_2-e	602.97 tonnes of CO_2-e
2. GHG Performance in Ratio Indicators		
GHG Emissions per Floor Area (Total GHG Emissions / Floor Area):	0.16 tonnes of CO_2-e / square metre	0.16 tonnes of CO_2-e / square metre
GHG Emissions per Employee (Total GHG Emissions / No. of Employee):	2.66 tonnes of CO_2-e / employee	3.04 tonnes of CO_2-e / employee

Green Government Procurement:

The EPD compiles a list of green products and services commonly purchased by the Government, including specifications and other relevant information, to guide bureaux and departments to practise green procurement. In 2022, the EEB(EB) and EPD together spent about $12.36 million in purchasing products and services from the list.

Green Recognition:

The environmental improvement efforts of the EEB(EB) and EPD have earned us an Energywi$e Label, Wastewi$e Label, Green Organisation Label under the Hong Kong Awards for Environmental Excellence (HKAEE) and the Hong Kong Green Organisation Certification (HKGOC). The EPD also continued to qualify as a "Companion" under two categories of the Hong Kong Quality Assurance Agency (HKQAA) Registration Scheme – Recycling Services and Eco-friendly Series. In addition, we obtained "Excellent Class" or "Good Class" under the Indoor Air Quality Certification Scheme for 16 of our offices, visitor centre and facilities in 2022.

From left to right are the certificates of Energywi$e Label, Wastewi$e Label, Green Organisation Label under the Hong Kong Awards for HKAEE and HKGOC, Companion under the HKQAA Registration Scheme – Recycling Services and Eco-friendly Series.

Targets for 2023

Long Term Objectives	Programme Area	2023 Targets
Demonstrate efficiency and commitment to environmental conservation by reducing expenditure and resources consumption	Electricity Consumption	Reduce electricity consumption at our offices by 0.5% per employee when compared with 2022
	Fuel Consumption	Minimise fuel consumption by improving fuel consumption efficiency
Pursue continual improvement in the environmental performance of our internal operations by implementing an effective management system	Waste Reduction	Continue to reduce and recycle wastes generated in our offices as much as possible
	Green Recognition	Maintain the Energywi$e, Wastewi$e and Green Organisation Labels under the HKAEE and the HKGOC
		Continue as a “Companion” under the HKQAA Registration Scheme – Recycling Services
		Continue as a “Companion” under the HKQAA Registration Scheme – Eco-friendly Series

WASTE MANAGEMENT FACILITIES

Safe and Environmentally Effective

The EPD oversees Hong Kong's waste management, including managing existing waste treatment facilities, developing new ones, and managing programmes to reduce, recycle, treat and dispose of waste. Waste facility operators are contractually obliged to contain and minimise environmental impacts and ensure that the facilities operate efficiently. In 2022, work continued on developing new treatment facilities to turn waste into energy / resources and improving the operation and capacities of Hong Kong's landfills to meet the waste disposal demand in Hong Kong.

Waste Treatment Facilities

Food Waste:

In 2018, the EPD commissioned Phase 1 of the Organic Resources Recovery Centre (O·PARK1) in Siu Ho Wan, which has the capacity to turn up to 200 tonnes of food waste into renewable energy and compost each day. In 2022, it converted about 45 700 tonnes of food waste into 11.4 million kWh of electricity, which was used to support its own operation with the surplus exported to the grid. It also generated 2 558 tonnes of compost. Meanwhile, Phase 2 of the Organic Resources Recovery Centre (O·PARK2) at North District is under construction and it will be able to convert 300 tonnes of food waste per day into biogas and fertiliser.

O·PARK1

Photomontage of O·PARK2

Another food waste-related project, the Food Waste Pre-treatment Facilities for Food Waste / Sewage Sludge Anaerobic Co-digestion Trial Scheme at the Tai Po Sewage Treatment Works (TPSTW), is a joint project with the Drainage Services Department (DSD) launched in 2019. Food waste is pre-treated to reduce its mass and remove impurities, and turned into a semi-liquid product at the Food Waste Pre-treatment Facilities. This is then delivered to TPSTW for anaerobic co-digestion with sewage sludge. Biogas from the co-digestion process is used to generate electricity for use at TPSTW.

Food Waste Pre-treatment Facilities for food waste / sewage sludge anaerobic co-digestion trial scheme at TPSTW

Waste Electrical and Electronic Equipment:

The Waste Electrical and Electronic Equipment Treatment and Recycling Facility (WEEE·PARK) officially opened in March 2018 to dismantle, detoxify and recycle regulated waste electrical and electronic equipment (WEEE) to support the Producer Responsibility Scheme on WEEE. In 2022, it processed around 22 170 tonnes of regulated WEEE. In 2022, WEEE·PARK generated about 270 700 kWh of electricity through its solar panel system (about 10% of the total electricity consumption of the facility).

WEEE processing line

WEEE·PARK

Yard Waste:

The EPD commissioned the Yard Waste Recycling Centre (Y·PARK) at the end of June 2021 to turn suitable yard waste into recyclable products such as wood boards, wood logs and wood chips for reuse, recycling and upcycling. In 2022, Y·PARK received about 8 700 tonnes of yard waste, mainly from site formation works and clearance works relating to routine vegetation maintenance. Its solar panels generated around 65 000 kWh (about 22% of the total electricity consumption of the facility).

Apart from general yard waste, Y·PARK recycles natural Christmas trees and peach blossom trees collected after festive seasons. Y·PARK received about 2 200 visitors in 2022. The resource centre, including an upcycled products show room, introduces tree resources information, traditional skills and state-of-the-art wood upcycling technologies together with upcycled examples such as furniture, decorations and art pieces.

Integrated Waste Management:

Integrated Waste Management Facilities Phase 1 (I·PARK1) is under construction on an artificial island off Shek Kwu Chau, with an aim of commissioning in 2025. The facility will use advanced moving grate incineration technology to treat up to 3 000 tonnes of MSW per day. Once I·PARK1 is in full operation, energy recovered from the waste will generate annual surplus electricity of 480 million kWh and reduce GHG emissions by 440 000 tonnes per year. Modular integrated construction is adopted to enable parallel construction both on-site and off-site to streamline the overall construction process.

The EPD announced in January 2022 that the Integrated Waste Management Facilities Phase 2 (I·PARK2) will be developed at Tsang Tsui middle ash lagoon in Tuen Mun. The investigation and design study for the planning and development of I·PARK2 was commenced in January 2023.

On-site foundation works and steel structure erection for Process Building at the artificial island in progress at I·PARK1 (2022)

Off-site prefabrication of huge electrical and mechanical units at Zhuhai (2022)

Sludge:

Sludge Treatment Facility (T·PARK is one of the world's most technologically advanced sludge incineration facilities. In 2022, it treated a daily average of 1 058 tonnes of sewage sludge using high-temperature incineration. Energy recovered from the treatment process was converted into electricity for internal consumption and power export, while the incineration process reduced the bulk of sludge being landfilled by some 90%. T·PARK also features public amenities, such as an environmental education centre, spa pools and café. With the gradual relaxation of anti-epidemic measures, it attracted more than 19 000 visitors in 2022.

T·PARK combines advanced technologies including sludge incineration, power generation, seawater desalination, wastewater treatment, together with public amenities and an environmental education centre.

Other Waste Treatment Facilities:

- **Chemical Waste Treatment Centre (CWTC):** The CWTC provides integrated treatment and disposal services for almost all chemical waste and all clinical waste generated in Hong Kong. It treated an average 21.5 tonnes of chemical waste and 13.3 tonnes of clinical waste each day in 2022. The centre's environmental performance is closely monitored, including air emissions, stabilised residues and wastewater discharges. The CWTC also generated about 11 995 kWh of electricity from its solar panels in 2022.

The CWTC in Tsing Yi

- **Animal Waste Composting Plant (AWCP):** About 25.3 tonnes of horse stable waste and 0.3 tonnes of yard waste were treated here each day in 2022. The compost produced meets the standards of the Hong Kong Organic Resources Centre and is suitable for landscaping, horticultural and agricultural uses.

Animal waste composter at AWCP

- **EcoPark:** As of December 2022, about eight hectares of land had been leased to private recyclers at an affordable price. EcoPark generated about 19 600 kWh of electricity through its solar panel system (3.9% of the total electricity consumption of the facility) and used 150.3 tonnes of mulch generated by Y·PARK.

EcoPark

- **Low-level Radioactive Waste Storage Facility**: This facility continued to provide a very long-term (100 years) storage solution for low-level radioactive wastes such as calibration instruments, lightning conductors, smoke detectors and luminous watch dials and hands from medical, industrial and academic institutions. The facility is located on the remote island of Siu A Chau and meets international design standards. Radiation levels are continuously monitored both inside and outside the facility to ensure they are safe for the public and the environment.

Aerial view of the Low-level Radioactive Waste Storage Facility at Siu A Chau

GREEN@COMMUNITY

This community recycling network, which by the end of 2022 included 11 Recycling Stations, 32 Recycling Stores and more than 120 Recycling Spots, has been developed since 2015 to strengthen waste reduction and recycling support at district level. All facilities accept at least eight common types of recyclables, including paper, metals, plastics, glass containers, regulated electrical equipment, small electrical appliances, fluorescent lamps and tubes, rechargeable batteries, etc. The recyclables collected are delivered to downstream recyclers for processing. To facilitate and encourage the public to use the facilities, a "GREEN$ Electronic Participation Incentive Scheme" has been implemented under which the public can earn GREEN$ when they deposit recyclables for redeeming gift items. In 2022, the GREEN@COMMUNITY facilities collected over 20 300 tonnes of recyclables and received more than 5 200 000 visitors.

Recycling Station – GREEN@WAN CHAI

Recycling Store – GREEN@HAPPY VALLEY

Waste Collection and Disposal

The EPD manages three strategic landfills, namely Southeast New Territories (SENT) Landfill, North East New Territories (NENT) Landfill and West New Territories (WENT) Landfill. They are operated in accordance with international environmental standards and their environmental impacts are contained through a multi-layered and impermeable liner system, and comprehensive leachate and landfill gas management systems. Monitoring systems have been set up for landfill gas, leachate, air quality (relating to dust and odour), water quality (surface water and groundwater) and noise. Sampling and measurements are carried out by the EPD and landfill contractors. Independent consultants conduct audits of the monitoring work and results. The EPD has been putting much efforts in improving the operations of our landfills in particular the NENT Landfill during 2022. Additional resources have been put in place to strengthen odour

control by implementing a series of odour management measures such as application of Posi-Shell covers, reducing the operational areas of the landfill, operation of additional deodourisers, and enhancing the monitor of odour emission, etc. The EPD has also deployed more supervisory staff to station at the landfill in order to ensure effective implementation of the above measures and further optimise the operation of the landfill. The EPD has injected additional resources to advance the final restoration and greening works of the NENT Landfill with a view to improving its visual appearance.

Landfill extensions:

To meet Hong Kong's future landfill needs, the capacities of all three strategic landfills are being extended. In November 2021, initial construction works of the SENT Landfill extension were completed and it began to receive construction waste. The contract of the NENT Landfill extension project was awarded in January 2022 and its construction works started in December 2022. A tendering exercise for the WENT Landfill extension was initiated in 2022. The EPD has worked closely with district counterparts to address residents' needs and concerns and enhance communication.

SENT Landfill extension

NENT Landfill

WENT Landfill

Landfill gas utilisation and solar farm development:

Landfill gas is used to generate power and thermal energy for both on-site and off-site uses. For instance, the WENT Landfill uses surplus landfill gas to generate electricity for export to CLP Power Hong Kong Limited's power grid. The NENT Landfill exports surplus landfill gas to the plant of Hong Kong and China

Gas Company Limited at Tai Po as heating fuel. The SENT Landfill conveys its surplus landfill gas to the Hong Kong and China Gas Company Limited's on-site reprocessing facilities for conversion into synthetic natural gas before it is injected into the latter's off-take station at Tseng Lan Shu.

In addition, a pilot solar farm with a capacity of 1 megawatt has been actively taken forward at the SENT Landfill. This will help to establish the technical requirements and suitable models for developing large-scale solar farms at landfills in future.

Landfill Gas Utilisation Plant at the NENT Landfill

Gas Power Generation Project at the WENT Landfill

Landfill Gas Utilisation Plant at the SENT Landfill

Restored Landfills:

Hong Kong has 13 closed landfills, which ceased to operate between 1975 and 1996. The EPD has restored all landfills and continues to carry out after-care works such as leachate and landfill gas management and landscaping. Most of these closed landfills have been converted into recreational and conservation uses, such as parks, sports facilities, multi-purpose grass pitches and a butterfly conservation area.

The construction works for the E-Co Village by the Tung Wah Group of Hospitals, a camping and green education ground at the restored Tseung Kwan O Stage I Landfill, commenced in 2022 and targeted for completion by end-2023. The works for installation of a pilot solar photovoltaic system with a capacity of 150 kilowatts at Jordan Valley Landfill also began in late 2022 and completed in February 2023. The construction works for Kwai Chung Park Phase I at the restored Gin Drinkers Bay Landfill were still on-going and scheduled for completion by the first quarter of 2024. The year also saw the Government execute the

documents for a non-in-situ land exchange under which the Government granted an area of land at the restored Shuen Wan Landfill for developing a private golf course in exchange for the grantee's surrender of the ecologically important private land in Sha Lo Tung to the Government for conservation.

Artistic impression of the planned E-Co Village

Refuse Transfer Stations (RTSs):

Most collected MSW is delivered to RTSs and compacted into purpose-built containers for bulk transport to the strategic landfills, thus reducing transport costs and traffic and environmental impacts. There are six RTSs serving the urban areas and new towns and seven smaller facilities serving the outlying islands. The RTS network handles about 77% of the MSW generated in Hong Kong in an efficient and environmentally friendly manner.

The existing RTSs have been in operation for over two decades. The EPD has been implementing refurbishment and upgrading works to these RTSs under follow-on contracts so as to maintain their reliable and safe waste transfer services, and enhance their operational efficiency and environmental performance. The EPD is also planning new RTSs in new towns and strategic locations to keep up with the ever-growing demand for reliable and safe transfer of waste.

Island West Transfer Station

Operational Performance in 2022

Waste facilities contractors are closely supervised by the EPD. They are expected to achieve full compliance with legal and contractual environmental requirements. In 2022, 484 173 monitoring measurements were conducted at RTSs, strategic landfills, restored landfills, the CWTC, T·PARK, O·PARK1 and WEEE·PARK, and 97.02% complied with contractual requirements. For the small number of exceptions, corrective and remedial actions were taken immediately to the satisfaction of independent consultants and / or the EPD. Contract payments were deducted for non-compliance in accordance with contract provisions as appropriate.

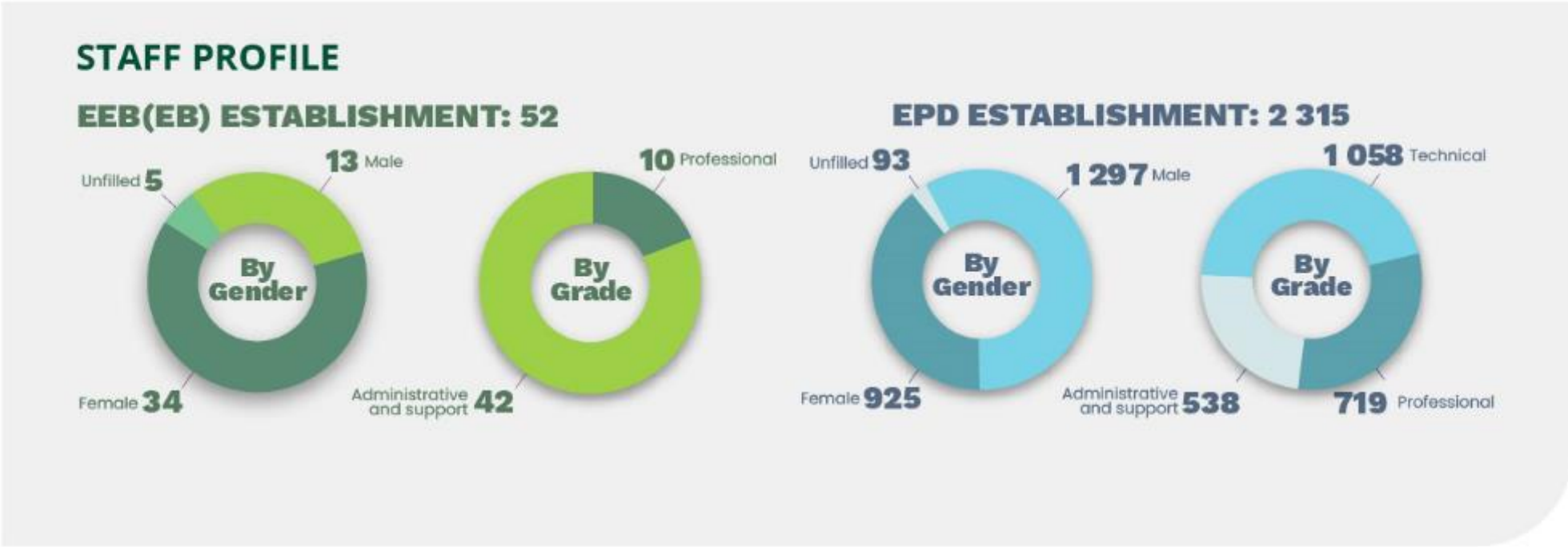
Targets for 2023

Long Term Objectives	Programme Area	2023 Targets
Ensure that the treatment and disposal of waste at our facilities are managed in the most environmentally acceptable manner	Waste Facilities	Maintain close supervision of our waste facility contractors, aiming at full compliance with both statutory and contractual requirements
		Continue to develop pilot solar farm(s)

HUMAN RESOURCES DEVELOPMENT AND TRAINING

Training and Development

The EEB(EB) and EPD organise training programmes for new recruits, mid-career staff, and staff with high potential to help them advance their skills so they can support our operations and develop their careers. In 2022, our staff attended 908 training programmes for a total 8 242 training days and received an average 2.96 days of training per staff member (see Table 4). Highlights included:



- 41 structured modules, four refresher training sessions and two sharing sessions provided through the Environmental Academy for about 680 newly recruited Assistant Environmental Protection Officers and Environmental Protection Inspectors, and around 260 senior / experienced professional staff.
- General training on carbon audit and on energy audit were held online in February and April 2022 respectively.
- Preparatory training and four sessions of zoom training on “Modelling and Operation of Wastewater Treatment Plants” were organised in May and July 2022 for EPD and DSD colleagues.

- Seminars on “Spirit of the President’s Important Speech” (「國家主席重要講話精神」座談會) were held for colleagues from EEB(EB) and EPD.
- A seminar on「學習二十大精神 推動香港發展」was held in December 2022, with Mr TAM Yiu-chung, member of the Standing Committee of the National People’s Congress as keynote speaker, for EEB(EB) and EPD officers.

Table 4: Staff Training in 2022

Grade of Staff	Average No. of Training Days
Senior Management	0.89
Professional	5.99
Technical	1.93
Other	1.36
Average per staff member	2.96



Training on “Modelling and Operation of Wastewater Treatment Plants”

Seminars on “Spirit of the President’s Important Speech” (「國家主席重要講話精神」座談會)

Seminar on「學習二十大精神 推動香港發展」

To enhance our understanding of and knowledge about decarbonisation technologies and formulate policies and strategies to achieve carbon neutrality before 2050, Carbon Neutrality Task Force (CNTF) has been established in May 2021. The CNTF aims to provide training opportunities for staff of EPD and other relevant departments to get prepared for the imminent challenge. In 2022, 13 in-class training sessions covering "Renewable Energy Development" and other related subjects were arranged for 40 CNTF members.

Staff Welfare

56 training classes on health and safety were organised in 2022 for more than 462 participants. Safety tips and reminders were also sent to staff regularly through the intranet system. The rate of occupational injuries was 2.1 per 1 000 staff during the year. Each case was followed up to identify the cause and, where appropriate, necessary measures were undertaken to prevent recurrence. Incidence summaries were also prepared for staff to heighten alertness and prevent further incidents.

At EPD's waste management facilities, the accident rate was 0.49 accidents per 100 000 man-hours worked. The facilities include the strategic landfills, CWTC, AWCP, Low-level Radioactive Waste Storage Facility, restored landfills, RTSs, Food Waste Pre-treatment Facilities for Food Waste / Sewage Sludge Anaerobic Co-digestion Trial Scheme, Pilot Biochar Production Plant, T·PARK, O·PARK1, WEEE·PARK and Y·PARK.

In terms of community-building, staff of the EEB(EB) and EPD are encouraged to join community activities supporting environmental and social causes. Staff social events are also organised to build team spirit and encourage networking. In 2022, staff participated in four fundraising events for the Community Chest, including Skip Lunch Day, Green Low Carbon Day, Dress Casual Day and Love Teeth Day.

Targets for 2023

Long Term Objectives	Programme Area	2023 Targets
Promote a lifelong learning culture among EEB(EB) and EPD staff and encourage their participation in training activities	Human Resources	Organise at least 80 in-house training programmes
		Arrange at least 90 in-house and external safety and health courses

RECOGNITION OF ACHIEVEMENTS

In 2022, the EPD and its staff were recognised with several awards for their efforts and commitment in providing quality public services and pioneering the use of smart technologies.

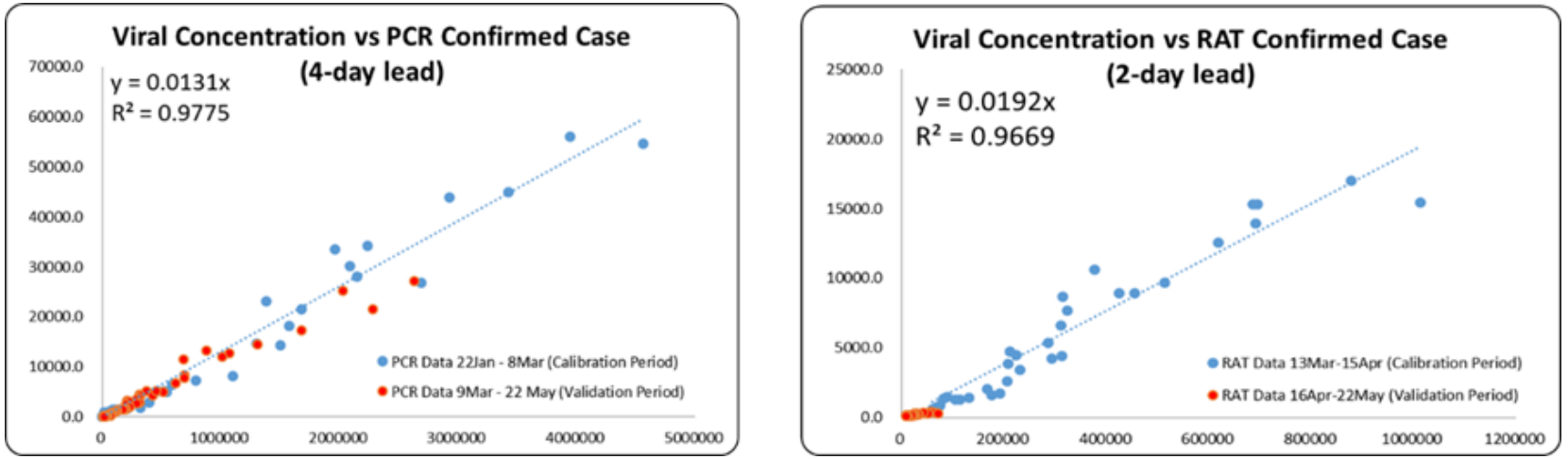
Territorial Sewage Surveillance Programme for COVID-19 in Hong Kong

Since the outbreak of the fourth wave of COVID-19 epidemic in late-2020, the EPD and the DSD have applied sewage testing as a non-intrusive approach for detecting the spread of the virus at community level. As infected patients will shed virus into their stool, sewage testing is used as a screening tool to assess the spread of the COVID-19 in the community for the Government to identify high-risk areas at the city block via analysis of the spatial and temporal variation of viral data. These data enabled the Government to devise appropriate anti-epidemic measures at district levels. Based on sewage virus testing results, the Government mobilised thousands of staff and contractors and executed 306 Restriction-Testing Declaration operations at high-risk residential buildings / street-block level, where over 26 700 confirmed cases were detected with a majority being asymptomatic, i.e. cases still potentially spreading the disease in the community if left undiagnosed.

Sewage sampling in action

Restriction Testing Declaration operations

Making use of the extensive amount of sewage data, the surveillance team also developed two real-time forecast statistical models to predict case counts. Through detailed data analysis, individual models were developed for case counts reported by positive polymerase chain reaction tests (through community clinical testing) and Rapid Antigen Test results (through self-testing) with a linear regression coefficient (r2) of 0.98 and 0.97 respectively. The models were simple to use with only per capita sewage viral concentrations as inputs, with a lead time of 2-4 days sufficient for the Government to adequately plan for intervention measures.



The linear relationship between viral concentration and the number of confirmed cases

The sewage surveillance programme has helped Hong Kong tide over the sudden arrival of the fifth peak wave of COVID-19, with daily new cases progressively dropping from 77 000 to less than 1 000 per day in mid-April 2022, within 1.5 months, and further reduction to 237 cases on 22 May 2022. The programme will continue to be utilised as an early warning system to detect possible re-emergency of COVID-19 in the future, as well as outbreaks of other sewage-borne diseases to afford early warning and preempt potential loading of local clinical capacity. To conclude, this programme, like the headlights for driving at night, has played a unique role in Hong Kong's monumental battle against the COVID-19 pandemic and has significant influence in wastewater epidemiological studies. By integrating technology development, policy initiative and community engagement, we have provided a unique model of sewage surveillance and public health action for other regions and nations to follow.

The HKIE Grand Award 2023

To commend exemplary services provided by the surveillance team in carrying out sewage testing, the team received an award in the category "Excellence in Partnership" of the Civil Service Outstanding Service Award Scheme 2022, as well as the Hong Kong Institute of Engineers (HKIE) Grand Award 2023. The surveillance approach was also lauded by our former Chief Executive, Mrs Carrie LAM, who indicated that "The sewage surveillance project is an extremely good example of our joint efforts to fight the virus with technology."

The Ombudsman's Awards 2022

Public Organisations – Grand Award

Subsequent to the winning of The Ombudsman's Award 2021 for Public Organisations, the EPD has gone further and won the Grand Award in 2022. The EPD was deeply honoured and encouraged to receive this award. It was a sound recognition to EPD's proactive and positive attitude towards complaint handling and its commitment to building a good public administration culture.

The EPD attaches great importance to pollution complaints as they serve as clues and impetus for our work, which enable us to gain a fuller understanding of the public's concern. The department provides frontline staff with professional training on a regular basis to strengthen their skills in communicating with the public. At the same time, the complaint handling procedure is reviewed and refined from time to time. The adoption of Geographical information System (GIS), mobile

electronic platforms as well as other advanced equipment also facilitates our work and greatly enhance the efficiency in complaint handling and enforcement work. The EPD will continue to spare no effort in serving the public and creating a healthy and pleasant living environment.

Presentation of the Grand Award to EPD at the Award Ceremony

Individual Award

Mr HUNG Ying-yin, Environmental Protection Officer of Regional Office (North), was honoured for his significant efforts to combat the pollution incidents associated with large-scale metal scrap open recycling yards in the North and Yuen Long Districts. This type of new gigantic recycling yards was found emerging in the recycling industry since 2021, which caused dust dissipation and environmental nuisance to the nearby residents. More than ten recycling sites of the same type emerged rapidly in the districts. This new type of business also boosted the demand of metal melting / casting operations which also imposed negative environmental impact on residents in the vicinity.

Mr HUNG Ying-yin receives the Individual Award

To tackle the new problem, Mr HUNG proactively followed up the environmental pollution cases and formulated thorough operation plans. For instance, he led his team and planned ahead the investigation works against those malpractice of metal scrap recycling sites in Yuen Long. Through his dedicated efforts including advising on dust and noise mitigation measures, issuing abatement notices and initiating prosecutions against the polluters, noticeable improvements in particular air and dust nuisance caused by the open recycling yards were achieved. Mr HUNG also advocated the synergistic effects of joint efforts with other

law enforcing departments (e.g. Lands Department and Planning Department) to tackle local pollution issues. With Mr HUNG's intervention, the number of complaint cases dropped drastically in the first quarter of 2022. He was a role model of our enforcement team and contributed a lot to enhance the environment of the community. His work was well recognised by the Office of The Ombudsman.

Gold Prize of 2022 Civil Service Outstanding Service Awards Scheme - Innovation and Technology Awards (Best Use of Technology)

The EPD was awarded the Gold Prize of 2022 Civil Service Outstanding Service Awards Scheme - Innovation and Technology Awards (Best Use of Technology) for its project "Licence to Clean - Robot, Wisdom and Combat". The Scheme, organised by the Civil Service Bureau, aims to recognise the exceptional achievements of departments and teams in providing quality service, to promote a citizen-centric culture in the civil service, to encourage team spirit, to inspire innovation and to share experience in pioneering public service improvement.

Through the illustration of the outcomes of the use of various smart technologies, including the smart drones with high zooming power camera in surveilling illegal landfilling activities, the self-designed water samplers for drone in collecting water samples at remote locations, the multi-terrain robot in tracing the pollution at underground drainage systems, the AI surveillance camera system in assisting the evidence collection in the prosecution of illegal waste disposal, and the mobile application of "EC Enforce" in improving the efficiency of pollution investigation, the adjudicators highly commended the applications as pragmatic, down-to-earth, with remarkable results, demonstrating explicitly the benefits brought by the application of technologies.

Trophy of the Gold Prize

To attain these innovative and practical technological achievements, the Environmental Compliance Division (ECD) of the EPD collected stakeholder opinions from various channels, including face-to-face communication, media publicity, inviting frontline colleagues to try out and give opinions, and listening to suggestions from green groups and research institutions. Moving forward, ECD will continue to explore and apply smart technology for environmental protection and for the benefit of the public.

The senior management and the team members after the Awards Presentation Ceremony

Smart drones with high zooming power camera in surveilling illegal landfilling activities

Self-designed water samplers for drone in collecting water samples at remote locations

Mobile application “EC Enforce” for improving the efficiency of pollution investigation

Multi-terrain robot in tracing the pollution at underground drainage systems

AI surveillance camera system in assisting the evidence collection for prosecution of illegal waste disposal

Appendix I Environmental and Energy Policy

Vision

Our vision is of a Hong Kong

- that enjoys a healthy and pleasant environment;
- where the community places a premium on sustaining such an environment for both themselves and future generations, and pursues sustainable development; and
- where the community enjoys a reliable and safe energy supply at reasonable prices, while improving energy efficiency, promoting energy conservation and minimising the environmental impacts from the production and use of energy.

To realise our vision, we will continue to strengthen our ability to meet environmental sustainability goals. We will formulate policies and implement programmes to improve and safeguard the environment while contributing proactively to strategic decision-making in the Government that will have an impact on the environment. We are committed to ensuring that all policies, services and programmes offered by the EEB(EB) and the EPD, as well as our own internal operations, are developed and conducted in an environmentally responsible manner.
To realise our vision on energy side, we will continue to monitor the operations of the two power companies and the towngas supply company through the established monitoring arrangements. We will strive to achieve energy efficiency and conservation through public education, promotion, legislation and implementation of various programmes. We will also promote competition and transparency in the local fuel market.

In pursuance of these goals, the EEB(EB) and EPD have adopted the following principles:

Compliance

We aim to establish an effective legislative and efficient control framework to safeguard the health and welfare of the community from any adverse environmental, conservation and energy-related issues. We will facilitate businesses to comply with environmental legislation through educational and promotional programmes,

and encourage our business partners to further enhance their performance by adopting green practices with a view to going beyond compliance.

We will seek to provide moral leadership by not only complying with the letter of the law, but the spirit of all applicable legislation, standards and regulations, as well as our internal guidelines and procedures, in all our operations within the EEB(EB) and EPD. We will endeavour to surpass them whenever possible.

Pollution prevention

We aim to pre-empt environmental problems associated with development projects, plans and policies by applying environmental impact assessment in the planning process and seeking opportunities to improve the environmental quality of Hong Kong.

We will implement ISO14001 environmental management systems to improve continually the environmental performance of our major facilities. We will avoid, reduce and control environmental pollution arising from our day-to-day working practices. We will require our contractors to adopt and implement sound environmental management systems and pollution control measures, and actively encourage businesses and other organisations in Hong Kong to adopt similar systems and measures. We will help reduce air emissions by implementing plans and measures that are relevant to our operations to meet the commitments of the Clean Air Charter.

Adequate infrastructure for waste treatment

We will provide first-class physical infrastructure for the treatment and disposal of waste and wastewaters in line with international best practice.

Response to environmental incidents

We will implement an emergency response system for handling environmental incidents and we will work closely with other government departments in responding quickly to minimise the damage to the environment.

Minimisation of consumption

We aim to plan and provide convenient and cost-effective waste management facilities, as well as promote a sustainable approach to waste management in Hong Kong under which we consume less, produce less waste, and reuse or recover value from waste.

We will exercise the principles of Reduce, Reuse, Recycle and Responsibility in the consumption of materials and seek continual improvement in the efficient use of natural resources and energy in all our operations.

Energy supply and efficiency

We will continue to oversee the reliability of power supply and monitor the performance of the power companies. We will also actively promote energy efficiency and energy saving in the planning, design, production, use and maintenance of products, buildings and services. We aim to integrate energy conservation and efficiency considerations into policies, strategies, plans, programmes, implementation and operations in both the public and private sectors. We will actively promote partnership and community support, facilitate suitable research and development, and raise the awareness of the community on energy efficiency and conservation matters.

Sustainable development

We will actively promote and contribute to Government-wide policies and programmes that support sound environmental management and sustainable development. We will use and promote evolving scientific and technological systems, work with other stakeholders and continue to build new partnerships in the pursuance of sustainable development objectives.

Communication and partnership

We aim to promote community awareness of the environment, energy and sustainable development through campaigns, publicity, education and action programmes. We strive to partner with all relevant stakeholders in promotion and public education activities with a view to harnessing the community's support

for, and contribution to, achieving our desired goals for the environment, energy efficiency and sustainable development.

We will also publicise to the community our policies on the environment, energy and sustainable development and report annually on our environmental performance. We will ensure that all our staff are aware of our policies and that they are able to provide detailed information about our policies and initiatives to stakeholders in their particular areas of concern.

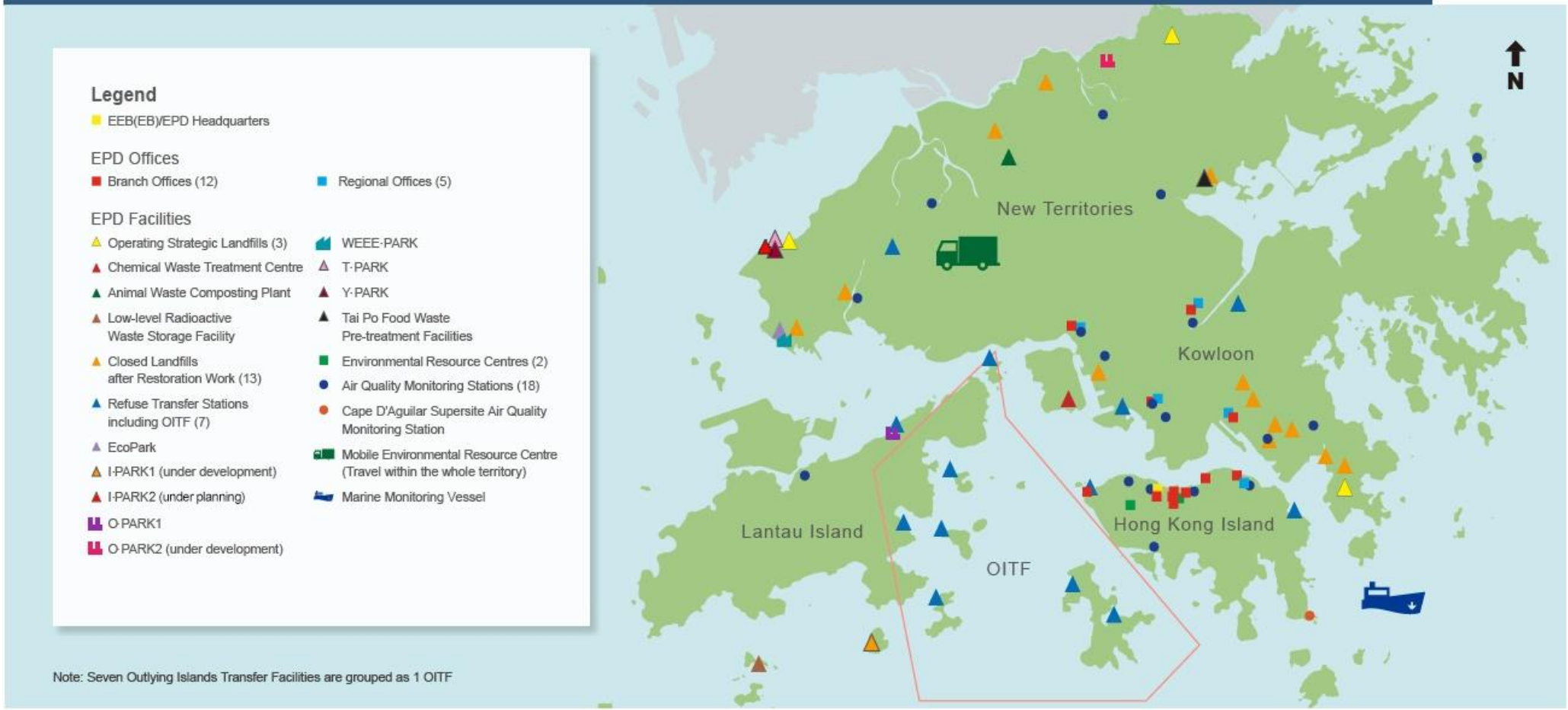
Training

We will ensure that, through appropriate training and professional development, every member of our staff has the knowledge and competency to assume his / her responsibilities and to participate constructively in relevant activities.

Management review

The Management will review this policy as well as our objectives and targets on the environment, energy and sustainable development with regard to changing internal and external factors, and seek continual improvement in our performance.

APPENDIX II
EEB(EB) / EPD OFFICES AND FACILITIES



APPENDIX II
EEB(EB) / EPD OFFICES AND FACILITIES

Photos of some Offices and Facilities

EEB(EB) / EPD headquarters at the Central Government Offices

Revenue Tower Office

Regional Office (North)

Customer Service Centre

Roadside Air Monitoring Station at Central

Mobile Environmental Resource Centre

Y·PARK

O·PARK1

T·PARK

GREEN@COMMUNITY facility

Animal Waste Composition Plant

WEEE·PARK

Chemical Waste Treatment Centre

EcoPark

Island West Transfer Station

WENT Landfill

NENT Landfill Extension

SENT Landfill Extension

2022 Expenditure

EEB(EB) Expenditure: $1.799 billion	
Expenditures	**Percentage**
Staff Cost	2.7%
General recurrent expenses	1.5%
Non-recurrent expenditure	95.8%

EPD Expenditure: $7.709 billion (Excluding spending under the Capital Works Reserve Fund)	
Expenditures	**Percentage**
Staff Cost	19.7%
General recurrent expenses	26.6%
Fees for operation of waste management facilities	36.3%
Capital and non-recurrent expenditure	17.4%

Staff Profile[1]

EEB(EB) Establishment:52	
Employee Breakdown by Gender	
Gender	**People**
Male	13
Female	34
Unfilled	5
Employee Breakdown by Grade	
Grade	**People**
Professional	10
Administrative and support	42

EPD Establishment: 2 315	
Employee Breakdown by Gender	
Gender	**People**
Male	1 297
Female	925
Unfilled	93
Employee Breakdown by Grade	
Grade	**People**
Professional	719
Administrative and support	538
Technical	1 058

Note: [1] As at 31. December 2022.