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同心互勵 創建未來



# 部門簡介及架構

## Organisational Profile and Structure



機電工程署（機電署）是中華人民共和國香港特別行政區政府轄下提供機電工程服務的部門，下設兩個功能機構，即規管服務及營運服務，後者又稱為機電工程營運基金（營運基金）。機電署致力優化香港的生活環境，分別透過執法及公眾教育規管機電設施的安全運作，並為政府部門及公營機構提供專業、全面和具成本效益的機電工程服務。

規管服務團隊身兼多項規管和公眾教育職能，範圍涵蓋機電、氣體及鐵路安全，保障香港的機電安全和努力推廣能源效益。規管服務團隊亦監察電力公司的技術表現及發展計劃，以及為政府各類安全和環保措施提供專業意見及技術支援。

營運基金竭誠為各政府部門和公營機構提供專業、全面及優質的機電工程服務，範圍涵蓋機電設施的操作、維修保養、工程策劃和顧問服務。除此之外，我們也為客戶的各類場地及設施的屋宇裝備和電子系統與設備提供支援服務，包括但不限於醫院、學校、紀律部隊設施、運輸設施及公路、港口及海港、機場、政府合署和法院大樓，同時亦涵蓋公眾文娛康樂設施。

The Electrical and Mechanical Services Department (EMSD) is a department of the Government of the Hong Kong Special Administrative Region of the People's Republic of China, providing electrical and mechanical (E&M) services through two functional units, namely Regulatory Services (RS) and Trading Services. The latter is known as the Electrical and Mechanical Services Trading Fund (EMSTF). Striving to enrich the living environment in Hong Kong, the EMSD regulates E&M safe operations through law enforcement and public education, while providing professional, comprehensive and cost-effective E&M engineering services for government departments and public bodies.

Performing various regulatory and public education roles, including E&M, gas and railway safety, the RS team shoulders the responsibility for safeguarding E&M safety and enhancing energy efficiency in the city. The team also monitors the technical performance and development plans of power companies, as well as providing professional advice and technical expertise to the Government on various safety and environmental initiatives.

The EMSTF attaches paramount importance to providing professional, comprehensive and quality E&M engineering services to government departments and public bodies, including operation, maintenance, project management and consultancy of E&M facilities. In addition, we offer support for building services, electronic systems and equipment at a wide range of client venues and facilities, including but not limited to hospitals, schools, disciplined services facilities, transport facilities and highways, port and harbour, airport, government offices and law court buildings as well as public recreational and leisure facilities.

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## 署長的話

### Message from the Director

機電工程署(機電署)在2021/22年度表現優秀，規管服務和營運服務兩大職能單位分別在各範疇為市民及客戶部門提供卓越服務，成績斐然，抗疫工作尤其出色。規管服務繼續致力規管工作，使機電事故數目保持平穩或處於稍微下降的水平，又積極推行各項能源效益措施，而營運服務則透過數碼化工作與機電工程服務，為客戶創造極大價值。

我們的營運服務單位，也稱機電工程營運基金(營運基金)，年內業務錄得穩健和持續增長。由於我們成功為2021/22年度屆滿的所有服務水平協議續約，並透過參與公開招標贏得新業務，總收入上升約1.6%，增至87.19億港元。收入回報率則維持在2.9%的穩定水平，符合我們收回成本的營運原則，讓客戶能保留資金，投放於公共服務。

#### 四大範疇的佳績

##### 抗疫工作

儘管第五波疫情於2022年年初為香港帶來沉重打擊，我們的同事始終團結一致，同心合力為港抗疫。我們欣然報告，機電署同寅在抗疫過程中不但成功運用創新科技(創科)方案，更展現本港聞名於世的「拼搏精神」和「香港速度」。

舉例而言，我們在14天甚至更短的時間內，提供機電工程支援，把現有場地改裝為社區隔離設施，並在2022年年初為600多個場地進行通風評估，以便日後有需要時用作全民強制檢測中心。

此外，第五波疫情高峰期間，本港對遺體貯存設施出現前所未見的龐大需求。我們協助客戶在富山公眾殮房和葵涌公眾殮房附近設立戶外冷凍櫃，並聯絡中華電力有限公司，為此協調安裝臨時供電系統。

The Electrical and Mechanical Services Department (EMSD) staged an impressive performance in 2021/22. The Regulatory Services and the Trading Services demonstrated excellence in serving the public and client departments respectively, with remarkable results in all areas of work, especially on anti-epidemic efforts. The Regulatory Services continued to keep electrical and mechanical (E&M) incidents on a steady or slightly declining trend and actively pursued its energy efficiency initiatives, while the Trading Services created great value for clients through digitalisation and E&M engineering services.

Our Trading Services, also known as the Electrical and Mechanical Services Trading Fund (EMSTF), saw healthy and sustained business growth during the year. Total revenue rose by about 1.6% to HK\$8,719 million, as we successfully renewed all existing Service Level Agreements due for expiry in 2021/22 and won new businesses through open tender. Return on revenue remained stable at 2.9%, in line with our cost recovery operating principle to enable clients to retain funding for their public services.

#### ACHIEVEMENTS IN FOUR AREAS

##### Anti-Epidemic Work

Though the fifth wave of the epidemic hit Hong Kong hard in early 2022, our colleagues stayed united in the mission to help the city beat the virus. We are pleased to report that EMSD colleagues have not only deployed innovative and technology (I&T) solutions in the process, but also demonstrated the "can-do spirit" and "Hong Kong speed" which our city is known for.

For example, we provided E&M support for the conversion of existing venues into Community Isolation Facilities, often within 14 days or fewer, and rendered our ventilation assessment in early 2022 at over 600 venues for use as Compulsory Universal Testing Centres, if necessary, in the future.

Apart from that, we helped clients meet the unfortunately huge demand for body storage spaces at the peak of the fifth wave by setting up outdoor refrigerated containers near the Fu Shan Public Mortuary and Kwai Chung Public Mortuary and liaised with CLP Power Hong Kong Limited to install a temporary power supply system for the purpose.

我們在第五波疫情高峰期間，也積極支援政府重啟跨境鐵路貨運服務，在短短一星期內完成一系列相關程序，從規管角度保障鐵路安全。有關程序包括審核鐵路營運者對內地來港列車的技術評估，監察營運者就列車、軌道、電力及通訊系統的現場測試，並檢視相關路段是否已準備就緒可供營運，以及評估營運者制訂的應急方案等。機電署各部別同事都全情投入，竭力盡心完成這些工作，充分展現足智多謀的才能，工作速度更超乎想像。

We also supported the Government in reactivating cross-boundary railway freight service at the peak of the fifth wave by completing a series of relevant procedures to ensure railway safety from the regulatory perspective within seven days. These included reviewing the railway operator's technical assessment of the Mainland freight trains operating to Hong Kong; monitoring on-site tests of the trains, tracks, power and communication systems conducted by the operator; and assessing the adequacy of operation preparedness of the relevant track section and emergency response plans formulated by the operator. In carrying out these tasks, colleagues from all divisions under the EMSD have demonstrated great enthusiasm, ingenuity and a speed never thought possible before.

##### 彭耀雄太平紳士 Mr Pang Yiu-hung, JP

機電工程署署長  
機電工程營運基金總經理  
Director of Electrical and Mechanical Services  
General Manager, Electrical and Mechanical Services Trading Fund



## 署長的話 Message from the Director

至於「圍封強檢」行動方面，我們提供人力、物資及其他資源，例如在行動現場運用團隊的資訊科技專長，進行數據配對，使行動更有效率。我們同事的「拼搏精神」，在行動中表露無遺，贏得客戶和其他持份者的讚賞。

我們在2022年2月也應當局要求，運用營運基金在操作客戶故障熱線及提供客戶服務方面的豐富經驗，於短時間內為政府的專屬的士車隊設立電話熱線系統。專屬車隊為確診2019冠狀病毒病的居家隔離病人，提供免費接送往返指定診所及其住所的服務，避免造成社區感染。

### 政府技術顧問

年內我們進一步加強擔任政府技術顧問的工作，涉及範圍已不限於我們作為規管者、促成者和提供機電工程服務的角色。事實上，我們善用部門在專業才能、科技和財務這三方面的優勢，為客戶及公眾提供更多技術意見和各種增值服務。

部門多個部別的同事紛紛參與抗疫行動，貢獻其專業才能。我們又為爆發羣組感染的堂食食肆、學校及住宅樓宇進行通風評估。事實上，我們有一位同事更獲邀以觀察員身分，為餐飲處所換氣量或空氣淨化設備工作小組提供專業意見。

### 創科成績獲肯定

要全面回顧年內的工作，不得不提我們近年在創科方面的努力已見初步成效。營運基金主動協助客戶為其機電資產進行數碼化，並促進客戶使用各種創科方案，而監管服務也積極運用創科，以助執法工作和提升機電安全。我們作為精明規管者，於年內率先推出45項線上申請服務、150多種電子表格，以及八種具備動態二維碼防偽功能的數碼機電牌照，更加便利業界和公眾。機電署規管服務和營運服務的創科項目於年內均贏得多個獎項，包括在2022年日內瓦國際發明展榮獲19個獎項，我們對此深感高興。

For “restriction-testing declaration” (RTD) operations, we provided manpower, supplies and other resources, such as information technology expertise for on-site data mapping to enhance the efficiency of the operations. The “can-do spirit” of our colleagues was evident in these operations and has won praises from the Government and other stakeholders.

We were also called upon in February 2022 to set up a hotline for the Government’s designated taxi fleet within a short time, with our rich experience in operating client fault call hotline system and providing customer service. The fleet provided Coronavirus Disease 2019 patients in isolation at home with free transport services between the designated clinics and their residences to avoid infection in the community.

### Government’s Technical Advisor

During the year we stepped up our role as the technical advisor to the Government, above and beyond our duty as a regulator, promoter and E&M service provider. Indeed, leveraging our strength in the three aspects of expertise, technology and finance, we have been able to provide more technical advice and value-added services to clients and the community.

Colleagues from various divisions have contributed their expertise through participating in anti-epidemic operations. We also conducted ventilation assessments at the dine-in restaurants, schools and residential buildings with cluster outbreaks. In fact, one of our colleagues was invited to provide professional advice to the Working Group on Air Change or Air Purifiers in Catering Premises in the capacity as an observer.

### I&T Recognition

This review would not be complete without outlining the initial achievements of our I&T efforts in recent years. The EMSTF has proactively facilitated the digitalisation of clients’ E&M assets and their use of I&T solutions. The Regulatory Services lost no time in using I&T to facilitate law enforcement work and enhance E&M safety. As a smart regulator, we initiated 45 online application services, more than 150 e-forms as well as eight digital E&M licences with dynamic QR Codes during the year, bringing greater convenience to the trade and the public. We are glad that I&T projects from both arms of the EMSD have won a number of awards in the past year, including 19 medals from the International Exhibition of Inventions of Geneva 2022.

規管服務的其中一個創科項目「智能數碼自動梯監測系統」，運用光纖傳感技術、人工智能和大數據分析，能及早發現故障，防止因外來物件阻塞梯級而發生「炒梯」意外。該項目不但在上述的國際發明展榮獲金獎，實際應用時更成效顯著。該項目在多個政府和私營場地共15台自動梯試用後，該等場地於年內再無發生因設備故障或外來物件阻塞梯級而引致的事件或故障，顯示該項目能大大提升自動梯安全。

### 國際交流

國際及區域交流合作，包括我們在亞太區經濟合作組織（亞太經合組織）的工作，是第四個創出佳績的範疇。年內，機電署助理署長/電力及能源效益獲選為2021至2023年亞太經合組織能源工作組副主席，而機電署一位前助理署長也在2021至2023年繼續代表香港，擔任能源工作組之下的能源效益及節能專家小組主席。

值得注意的是，這兩位香港代表都獲得亞太經合組織21個成員經濟體一致支持，在能源工作組擔當領導。這不但充分肯定機電署多年來對亞太經合組織的貢獻，也有助提升香港在亞太區內節能工作的影響力。此外，亞太經合組織是一個重要平台，讓我們宣傳《香港氣候行動藍圖2050》，並與各成員經濟體就碳中和交流經驗。

事實上，中華人民共和國中央政府也期望香港繼續進行國際交流。誠如國家主席習近平先生於2022年在慶祝香港特別行政區成立25周年的講話中提到，香港的四個「必須」之一，是「必須保持香港的獨特地位和優勢」，以「拓展暢通便捷的國際聯繫」。我們本着這種精神，近年一直積極拓展各項國際聯繫和協作。除亞太經合組織外，我們與其他主要國際機構如國際鐵路安全議會等也保持緊密聯繫，而機電署亦是該議會的核心小組成員之一。

我們一直尋求與海外機構合作的機會，近期例子包括在2020年與新加坡能源市場管理局簽訂諒解備忘錄，以加強雙方在能源安全方面的合作。另外，我們正積極籌備主辦第71屆國際纜車監管機構會議，該會議暫定於2023年9月在香港舉行。

Among the I&T projects of the Regulatory Services is an Intelligent Digital Escalator Monitoring System (i-DEMS) using optical fibre sensing technology, artificial intelligence (AI) and big data analytics to identify faults early and prevent step dislocation caused by foreign object obstruction. The i-DEMS project not only won a gold medal from the above international exhibition, but also produced impressive results in practical application. With its trial use at 15 escalators in both government and private-sector venues, zero incident or breakdown caused by equipment fault or foreign object obstruction was found at the above venues during the year, indicating that the i-DEMS project could greatly boost escalator safety.

### International Exchange

International and regional co-operation, including our work in the Asia-Pacific Economic Cooperation (APEC), was the fourth area of our achievements. During the year, our Assistant Director/Electricity and Energy Efficiency was elected as Deputy Lead Shepherd of the Energy Working Group (EWG) under the APEC for session 2021/23. A former Assistant Director also continues to represent Hong Kong and serve as Chairman for the Expert Group on Energy Efficiency and Conservation under the EWG for session 2021/23.

It is noteworthy that these two Hong Kong representatives obtained unanimous support from all 21 member economies of the APEC to take on leadership roles in the EWG. This not only represents recognition of the EMSD’s contribution to the APEC over the years, but also expands the influence of Hong Kong in regional energy conservation work. The APEC is also an important platform for us to promote Hong Kong’s Climate Action Plan 2050 and share experiences with member economies on carbon neutrality.

Indeed, the Central Government of the People’s Republic of China expects Hong Kong to maintain its international exchanges. As President Xi Jinping remarked in his speech marking the 25th anniversary of the establishment of the Hong Kong Special Administrative Region in 2022, one of the four “musts” is that “we must maintain Hong Kong’s distinctive status and advantages” so as “to expand and facilitate its exchanges with the world”. It is in this spirit that we have forged various regional and international exchanges and collaborations in recent years, not only with the APEC but also other major international organisations, such as the International Railway Safety Council. The EMSD is also a member of its Core Group.

In fact, we always look out for overseas collaboration opportunities. Recent examples include signing a Memorandum of Understanding with the Energy Market Authority of Singapore in 2020 for closer co-operation in enhancing energy safety. Preparations are also underway for hosting the 71st International Meeting of Technical Authorities for Cableways, tentatively scheduled for September 2023, in Hong Kong.

## 署長的話 Message from the Director

### 總結第五波疫情的抗疫經驗：硬件和軟件

第五波疫情的抗疫經驗，顯示「硬件」和「軟件」在抗疫工作上同樣重要。「硬件」包含各種必須於極短時間內準備就緒的抗疫物資、系統、儀器和創科方案等，而「軟件」則指在面對各種變數和新挑戰時所展現的技能和才能，包括團隊合作精神和協作，以及靈活調配人手的能力。兩者對應付未來可能發生的重大疫情及其他緊急情況，都至關重要。

年內我們既努力強化「硬件」，同時也在各層面提升「軟件」能力，例如協作能力。團隊協作由分部開始，例如在「圍封強檢」行動中，多個分部共同協作去完成任務。另外有些工作則涉及跨部別協作，例如衛生工程部、市政工程部和綜合工程部攜手合作，研發社區疫苗接種中心遙距監察系統。

該系統運用物聯網技術，全天候24小時監察全港所有社區疫苗接種中心的疫苗冷藏櫃、升降機及自動梯、空調系統和供電系統的運作狀況。這個跨部別項目相當成功，大大提升了社區疫苗接種中心的營運效率和疫苗儲存的成效。

此外，很多抗疫工作都需要跨部門協作，包括於極短時間內設立社區隔離設施，為公眾殮房增加遺體貯存設施，以及進行「圍封強檢」行動等。在這些共同協作的緊急工作中，我們的同事都能與其他政府部門人員衷誠合作完成任務，表現非常出色。能與眾多不同人士在不同情況下合作，是很寶貴的實力，機電署同事未來定能與其他機構繼續合作無間。

### INSIGHTS FROM FIFTH WAVE OF THE EPIDEMIC: HARDWARE AND SOFTWARE

Experience from fighting the fifth wave of the epidemic shows that “hardware” and “software” are equally important in anti-epidemic work. The “hardware” covers the necessary anti-epidemic supplies, systems, equipment and I&T solutions which must be ready for deployment at very short notice. The “software” refers to skills and capabilities including teamwork and collaboration as well as flexible manpower deployment in the face of uncertainties and new challenges. Both are key to dealing with major epidemics and other emergencies in future.

As we strove to enhance our “hardware”, our “software” capabilities, such as collaboration, also improved on many levels. Collaboration started at sub-division level, including colleagues from different sub-divisions working together in RTD operations. Certain tasks required cross-division collaboration, such as the development of the Community Vaccination Centre (CVC) Remote Monitoring System involving our Health Sector Division, Municipal Sector Division and General Engineering Services Division.

The system uses Internet of Things technology to monitor the operation of medical fridges for vaccine storage, lifts and escalators, air-conditioning and power supply systems at all CVCs across the territory round the clock. The cross-division project was a success and greatly enhanced the operation efficiency of the CVCs and effectiveness of vaccine storage.

Many anti-epidemic tasks called for inter-departmental collaboration, including setting up Community Isolation Facilities, increasing body storage spaces at public mortuaries and carrying out RTD operations, all at short notice. Our colleagues have excelled in these joint urgent tasks, working well with staff from other departments. The ability to collaborate with different people under different circumstances is valuable, and the EMSD colleagues will no doubt collaborate effectively again with other organisations in future.

### 為減碳出一分力

在2021/22年度，我們致力減碳工作，以協助政府於2050年或以前達致碳中和。政府在2021年10月公布了《香港氣候行動藍圖2050》，提出四大減碳策略，即「淨零發電」、「節能綠建」、「綠色運輸」和「全民減廢」。機電署積極參與落實有關策略。

「淨零發電」策略的目標是不再使用煤作日常發電，並於2035年或以前，把可再生能源在發電燃料組合中的比例增加至7.5%至10%，往後再提高至15%。我們的能源效益事務處近年透過「採電學社」等社區項目，推廣使用太陽能發電系統，而電力法例部也為上網電價計劃提供支援，為計劃參加者的天台太陽能發電系統進行登記，以及監察其運作。營運基金也持續為客戶部門的政府辦事處及公共場地，安裝太陽能發電系統，加強使用可再生能源。

為協助市民善用上網電價計劃，能源效益事務處多走一步，與一間大學和數個政府部門攜手研發兩個創科項目，其中一個項目是「香港太陽輻照圖」。該項目運用香港天文台及其他政府部門的數據建立數碼三維模型，模擬現場日照情況，以計算全港所有建築物天台的年均輻照量，讓有意安裝太陽能發電系統的市民可以初步評估其建築物天台的太陽能發電潛力，估算可賺取的上網電價收入和回報期。

另一個項目是「綜合太陽能管理系統」，該系統運用人工智能和數位孿生技術，估算太陽能發電系統的發電效能，以及預測系統需要進行維修保養的時間。「香港太陽輻照圖」和「綜合太陽能管理系統」於2022年日內瓦國際發明展分別獲得銀獎和銅獎。

### CONTRIBUTING TO DECARBONISATION

In 2021/22, we focus on decarbonisation work to help the Government achieve carbon neutrality by 2050. In October 2021, the Government announced Hong Kong's Climate Action Plan 2050 which outlined four major decarbonisation strategies, namely “net-zero electricity generation”, “energy saving and green buildings”, “green transport” and “waste reduction”. The EMSD has a role to play in implementing these strategies.

The “net-zero electricity generation” strategy aims to cease using coal for daily electricity generation and increase the share of renewable energy (RE) in the fuel mix for electricity generation to 7.5% to 10% by 2035, and to 15% subsequently. Our Energy Efficiency Office (EEO) has been promoting the use of solar photovoltaic (PV) systems through community programmes such as Solar Harvest, while our Electricity Legislation Division has supported the Feed-in Tariff (FiT) Scheme by registering roof-top solar PV systems for those participating in the scheme and monitoring the operation of such systems. The EMSTF has also continued to help client departments install solar PV systems at government offices and public venues so as to use more RE.

To help the public make the most of the FiT scheme, the EEO went the extra mile to develop two I&T projects with a university and several government departments, one of which being the Hong Kong Solar Irradiation Map (the Map). The project uses data from the Hong Kong Observatory and other departments to build a digital 3D model for simulation of solar irradiation on site in order to calculate the annual irradiation of all building rooftops in Hong Kong, so that those interested in setting up solar PV systems can perform a preliminary assessment of the solar energy potential for their building rooftops and estimate the potential FiT income and payback period.

Another project was the Integrated Solar Energy Performance Management Toolkit (iSMS), which uses AI and digital twin technology to estimate the power generation performance of solar PV systems and predict the timing of necessary system repair and maintenance. The Map and the iSMS won a silver and a bronze medal respectively at the International Exhibition of Inventions of Geneva 2022.

## 署長的話 Message from the Director

政府最近也推出新措施，便利私營界別在非住宅處所的室外停車場安裝太陽能發電系統，措施包括豁免太陽能板所覆蓋的面積計算入總樓面面積內。我們已準備就緒，隨時因應需要支援新措施的落實工作。

機電署也積極支持「節能綠建」策略。政府的目標是在2050年或之前，商業樓宇耗電量較2015年減少三至四成，以及住宅樓宇耗電量減少兩至三成；並在2035年或之前能達到以上目標的一半。雖然我們已在建築物和社區層面進行大量提升能源效益的工作，但要達到上述目標，仍有很多工作要做。

我們致力推動使用人工智能，提升機電服務的能源效益和運作效能。機電署於2021年與內地伙伴合辦的「國際建築機電人工智能大挑戰」相當成功。我們亦陸續應用人工智能提升製冷機組的運作效率，例如營運基金已在將軍澳醫院的製冷機組應用這項技術，為醫院節省了6%耗電量。此外，鐵路研發了一個名為「語義人工智能預測鐵路軌道維修工作」的創科方案，以語義人工智能技術防止鐵路事故，方案於2022年日內瓦國際發明展榮獲銀獎。

我們運用豐富的氣體安全知識，支援「綠色運輸」策略。氣體標準事務處正協助負責推動氫燃料應用的跨部門工作小組，進行有關在香港使用氫燃料的風險評估及安全標準的顧問研究。政府計劃於2023年年底，開展為期12個月的氫燃料電池巴士及重型車輛測試。這個項目具突破性，讓香港在全面使用氫能的準備工作方面，包括興建氫能基礎設施的方式、供應鏈及加氫站的安全要求、氫燃料電池車輛及所需的操作與維修保養人才等，領先全球。如一切順利，香港有望成為全球少數成功做到綠色運輸的主要城市之一。

The Government also introduced measures recently to facilitate the installation of solar PV systems by the private sector in open car parks at non-domestic premises. Such measures include exempting the coverage of PV systems from the gross floor area calculation. We stand ready to support the implementation of the measures whenever required.

The EMSD has proactively supported the “energy saving and green buildings” strategy. It is the Government’s goal to reduce the electricity consumption of commercial buildings by 30% to 40% and that of residential buildings by 20% to 30% by 2050 from the 2015 level, and to achieve half of these targets by 2035. This means that in addition to our work in improving energy efficiency in buildings and the community, much still needs to be done to achieve the above target.

We endeavoured to promote the use of AI to enhance the energy and operation efficiency of E&M services. Further to the success of the Global AI Challenge for Building E&M Facilities which the EMSD jointly organised with partners in the Mainland in 2021, we have been using AI to optimise the operation efficiency of chiller plants. For instance, the EMSTF has been deploying the technology in the chiller plant at Tseung Kwan O Hospital, achieving a saving of about 6% of the total electricity consumption of the hospital. Moreover, the Railways Branch has developed an I&T solution namely Semantic AI for Predictive Maintenance of Railway Track Systems, which uses semantic AI technology to prevent railway incidents. The solution has won a silver medal in the International Exhibition of Inventions of Geneva 2022.

We support the “green transport” strategy with our rich knowledge on gas safety. The Gas Standards Office (GasSO) has been assisting the inter-departmental working group dedicated to promoting the use of hydrogen as fuel to conduct consultancy studies on risk assessment and safety standards for using hydrogen as fuel in Hong Kong. The Government plans to start a 12-month test of hydrogen fuel cell buses and heavy vehicles in late 2023. This ground-breaking project will put Hong Kong ahead of the world in the preparation for holistic adoption of hydrogen, including the way hydrogen infrastructures are built, supply chain and safety requirements for hydrogen filling stations, hydrogen fuel cell vehicles and the operation and maintenance personnel required. If all goes well, Hong Kong is expected to be one of the few major cities in the world that achieves green transportation successfully.

### 與內地進一步合作

在2021/22年度，我們繼續與內地進行各方面的合作。作為「聯繫人」，我們的主要職能在於運用我們在科技和人才方面的優勢，促進香港與內地的經濟進一步融合。

我們有一個新構思，就是由機電署與個別人士、機構、業界、學術界及科研機構攜手合作，成立「機電人工智能實驗室」，目的是加快促成各方建立合作夥伴關係，以支援適用於建築物機電設施的大數據及人工智能發展。該實驗室本質上會是一個核心小組，由志同道合的人士組成，共同目標是把人工智能應用於建築物。不少內地機構已表明，這個構思大有可為，合作空間極大。「機電人工智能實驗室」會進一步加強現有的協作渠道，例如「機電創科網上平台」。這個平台自推出以來，已促成香港及內地的創科解決方案供應商與公營機構的用戶建立各種聯繫，惠及有關各方，成效卓著。

我們也透過線上培訓及交流，為粵港澳大灣區（大灣區）的人才發展獻出一分力。最近的例子莫如為廣州市工貿技師學院學生舉辦有關應用「建築信息模擬—資產管理」系統的線上分享會。機電署根據在2020年與廣州市人力資源和社會保障局簽訂的《深化機電人才發展合作備忘錄》，舉辦是次分享會。另一例子是為大灣區青年聯合舉辦一個有關新材料的線上創科研討會。

機電署其實早在2018年已為本港機電業界安排到大灣區探訪的活動。待香港與內地逐步有序恢復人員正常往來（即「通關」）後，我們在大灣區的各種協作活動，必定會為香港年青人帶來新機遇，無論是機電業或其他行業的青年人都會受惠。

### FURTHER CO-OPERATION WITH THE MAINLAND

Our co-operation with the Mainland continued in 2021/22. As a “connector”, our main role is to facilitate further economic integration between Hong Kong and the Mainland by leveraging our edge in technology and talent.

A new idea is to establish the “E&M AI Lab”. The EMSD will set up the Lab in collaboration with individuals, entities, industry, academia and research institutions to accelerate the forging of partnerships to support big data and AI development for E&M facilities in buildings. In essence, the Lab will be a core group, comprised of like-minded people with the common goal of applying AI to buildings. Mainland entities have already indicated that there will be ample room for co-operation in this promising idea. The “E&M AI Lab” will augment existing collaboration platforms, such as our E&M InnoPortal, which was proved effective in connecting I&T solution providers from Hong Kong and the Mainland with users in the public sector, benefitting all concerned.

We have also contributed to talent development in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) via online training and exchange. The latest example is an online sharing session on the application of Building Information Modelling-Asset Management (BIM-AM) for students of the Guangzhou Industry and Trade Technician College. The sharing session was organised under a Memorandum of Co-operation on Enhanced E&M Talent Development signed with the Guangzhou Municipal Human Resources and Social Security Bureau in 2020. Another example is an online I&T seminar on new materials jointly organised for young people in the GBA.

In fact, the EMSD had already organised visits to the GBA for the E&M sector of Hong Kong back in 2018. When normal cross-boundary travel with the Mainland resumes, our collaboration with the GBA will undoubtedly provide new opportunities for Hong Kong youth in the E&M sector and beyond.

## 署長的話 Message from the Director

### 2022/23 年度工作重點

我們希望繼續進行四個方面的工作。首先是碳中和，我們計劃於2023年實施「強制性能源效益標籤計劃」第四階段，又會就巴士和重型車輛使用氫燃料進行籌備工作。作為氣體安全規管者，我們氣體標準事務處的同事對推展氫能工作有種使命感，也深明未來的相關安排，必須安全並符合香港的實際情況。此外，營運基金會持續協助客戶的建築物和場地節能，以及使用更多可再生能源。

第二個方向是創科。營運基金會不斷為客戶的機電資產進行數碼化，並協助客戶在日常運作中應用更多創科方案，而規管服務也會多加使用創科技術以助執法工作和提升機電安全。其中，一般法例部研發的「升降機及自動梯數碼工作日誌」系統是一個令人雀躍的項目，將於2022年年底推出。系統運用區塊鏈技術，把升降機及自動梯的維修保養記錄，全部上載至雲端進行綜合儲存、管理和分析，不但可取代紙本記錄，還可讓所有持份者，包括政府、物業管理公司和業主，以及升降機與自動梯業界，更有效地監察升降機與自動梯安全。這項目也有助推動業界應用數碼科技和大數據分析。

第三個方向是擴展我們作為政府技術顧問的職能。自2020年以來，機電署無論在進行抗疫工作或應對其他突如其來的挑戰時，都能在極短時間內動員足夠人手、提供所需專業知識和運用各種科技解決問題，工作卓有成效。我們已預留所需資源，並獲得政府支持，繼續發揮所長，執行有關工作。具體來說，我們已調動資源，為私營安老院舍及殘疾人士院舍檢查其通風系統，並提供改善建議。

最後一個方向是固本培元。規管服務必須加強「治未病」文化，防患於未然，務求在事故發生前已除去風險。營運基金則必須保持危機感，不斷提升市場競爭力。事實上，營運基金的第二個五年策略計劃會在2022/23年度完結，我們已着手制訂第三個五年策略計劃，並更重視增強競爭力。我們很高興見到，無論規管服務和營運基金的同事，都非常熱衷參與創科項目及科技比賽，並不限於小部分員工。

我們期望在香港與內地恢復通關後，能重新整合機電署與內地的聯繫網絡。我們會加強在「建築信息模擬—資產管理」等科技領域的交流活動，並會帶領更多年青人參觀大灣區的機電機構，也歡迎大灣區城市的年青人來港交流。

### PRIORITIES IN 2022/23

We would like to see a continuity of work in four directions. First is carbon neutrality. We plan to implement Phase 4 of the Mandatory Energy Efficiency Labelling Scheme in 2023, and make preparatory work on the use of hydrogen as fuel for buses and heavy vehicles. As the gas safety regulator, our GasSO colleagues have approached the hydrogen initiative with a sense of mission. We are fully aware that all eventual arrangements must be safe and suitable for the circumstances of Hong Kong. The EMSTF will also continue to help clients' buildings and venues save energy and use more RE.

The second direction is I&T. The EMSTF will continue its efforts to help clients digitalise their E&M assets and deploy more technology solutions in day-to-day operations, while the Regulatory Services will further the use of I&T to facilitate law enforcement work and enhance E&M safety. An exciting project is the Digital Logbook System for Lifts and Escalators developed by the General Legislation Division to be launched by the end of 2022. Using blockchain technology, the system enables the upload of all lift and escalator repair and maintenance records to the cloud-based Digital Logbook in real-time for centralised storage, management and analysis, replacing paper records and making monitoring of lift and escalator safety by all parties, including the Government, property management companies/owners, and the lift/escalator trade, more effective. It will also promote the application of digital technologies and big-data analysis among the trade.

We shall expand our role as the technical advisor to the Government, as our third direction. Since 2020, the EMSD has proved its effectiveness in mobilising manpower, expertise and technology at short notice to take on anti-epidemic and other unforeseen work. We have already set aside the necessary resources and obtained the Government's support to continue the role. In particular, we have mobilised our resources to inspect and offer advice on the ventilation systems of private residential care homes for the elderly and disabled.

Last but not least, consolidating our foundation and strengths is our final direction. The Regulatory Services must step up its "prevention culture" to the extent that risks are eliminated before incidents happen. The EMSTF must maintain a sense of crisis and continue to enhance its competitiveness. Indeed, as the EMSTF's second Five-year Strategic Plan will come to a close in 2022/23, we have started formulating the third Strategic Plan, with more emphasis on competitive strengths. It is also gratifying to note that colleagues of both the Regulatory Services and the EMSTF have been passionate about taking part in I&T projects and technology competitions, displaying an enthusiasm shared not only by a few but many.

We look forward to re-consolidating our network with the Mainland once normal travel resumes. We will step up exchanges in technology areas such as BIM-AM. We shall also take more young people to visit E&M entities in the GBA, and welcome youth from GBA cities to visit Hong Kong for exchange activities.

### 由衷感謝

過去一年，香港雖飽受第五波疫情衝擊，但見到社會大眾仍能團結一致，同舟共濟度過難關，實在令人欣慰。一如以往，我們由衷感謝各決策局和政府部門大力支持我們的規管工作，以及各位營運基金客戶給予信任和通力合作。我們也誠摯感謝部門全體員工竭誠盡心工作，提供優質卓越的服務。

年內，各商會和業界伙伴、專業團體、學者、培訓和研究機構、非政府組織以及所有內地與海外的合作伙伴鼎力襄助，彼此合作無間，謹此致謝。機電署能持續進步，實有賴市民、傳媒、立法會議員及其他意見領袖的回饋和監察，我們深表謝意。

機電署看到未來機遇無限。憑着大家的支持，我們期望來年再創佳績，成果豐碩。



**彭耀雄**  
機電工程署署長  
機電工程營運基金總經理

### HEARTFELT APPRECIATION AND GRATITUDE

In a year when Hong Kong was hard hit by the fifth wave of the epidemic, we were heartened to see the community united to overcome the challenges. As always, we sincerely thank the policy bureaux and government departments for their support in our regulatory work, and all our EMSTF clients for their trust and strong partnership. Our heartfelt gratitude also goes to all our colleagues for their commitment and excellent service.

We are grateful to the trade associations and partners, professional bodies, academics, training and research institutions, non-governmental organisations and the Mainland and overseas partners for their unfailing support and collaboration. Our continuous improvement would not have been possible without the vigilance and feedback from the public, the media, members of the Legislative Council and other opinion leaders, and we owe them a big thank you.

The EMSD sees many new opportunities ahead. With your support, we look forward to another fruitful year.



**Pang Yiu-hung**  
Director of Electrical and Mechanical Services  
General Manager, Electrical and Mechanical Services Trading Fund



## 我們的管理層 Our Management

### 署長 DIRECTOR

1

**彭耀雄太平紳士**  
Mr Pang Yiu-hung, JP

機電工程署署長  
Director of Electrical and  
Mechanical Services

2

**潘國英太平紳士**  
Mr Poon Kwok-ying, Raymond, JP

副署長 / 規管服務  
Deputy Director/Regulatory Services

6

**周厚強先生**  
Mr Chow Hau-keung, Vincent

助理署長 / 氣體及一般法例  
Assistant Director/Gas and  
General Legislation

10

**李慧儀女士**  
Ms Lee Wai-ye, Cindy

總庫務會計師 / 財政管理  
Chief Treasury Accountant/  
Financial Management

3

**張遠芳太平紳士**  
Mr Cheung Yuen-fong, JP

副署長 / 營運服務  
Deputy Director/Trading Services

7

**陳嘉聰先生**  
Mr Chan Ka-chung

助理署長 / 1  
Assistant Director/1

11

**朱雅琦女士**  
Ms Chu Nga-ki

高級庫務會計師 / 會計服務  
Senior Treasury Accountant/  
Financial Services

4

**陳秋發太平紳士**  
Mr Chan Chau-fat, JP

助理署長 / 鐵路  
Assistant Director/Railways

8

**黃偉光先生**  
Mr Wong Wai-kwong

助理署長 / 2  
Assistant Director/2

12

**劉志偉先生**  
Mr Lau Chi-wai, Wilfred

員工關係主任  
Staff Relations Officer

5

**朱祺明先生**  
Mr Chu Kei-ming, Barry

助理署長 / 電力及能源效益  
Assistant Director/Electricity and  
Energy Efficiency

9

**陳志偉太平紳士**  
Mr Chan Chi-wai, Richard, JP

助理署長 / 3  
Assistant Director/3

13

**韋美珠女士**  
Ms Wai Mei-chu, Jenny

署理主任秘書  
Departmental Secretary (Acting)

\* 袁秀明女士出任機電工程署主任秘書至2022年5月17日  
Ms Yuen Sau-ming, Anna was Departmental Secretary, EMSD up to 17 May 2022





# 規管服務業務概覽

## REGULATORY SERVICES ACHIEVEMENTS OVERVIEW

### 抱負 VISION

我們的抱負，是要成為促使香港在機電安全及善用能源方面，都達到世界首要都會水平的政府機構。

Our vision is to be the government agency that makes Hong Kong a top-ranking city in E&M safety and in the utilisation of energy.

### 使命 MISSION

我們的使命，是確保機電及能源科技均以安全、可靠、經濟及環保的方式得以善用，並藉此促進社會的安全及提升生活質素。

Our mission is to enhance the safety and the quality of life of our community by ensuring that E&M and energy technologies are harnessed in a safe, reliable, economical and environment-friendly manner.

### 信念 VALUES

專業才能 EXPERTISE

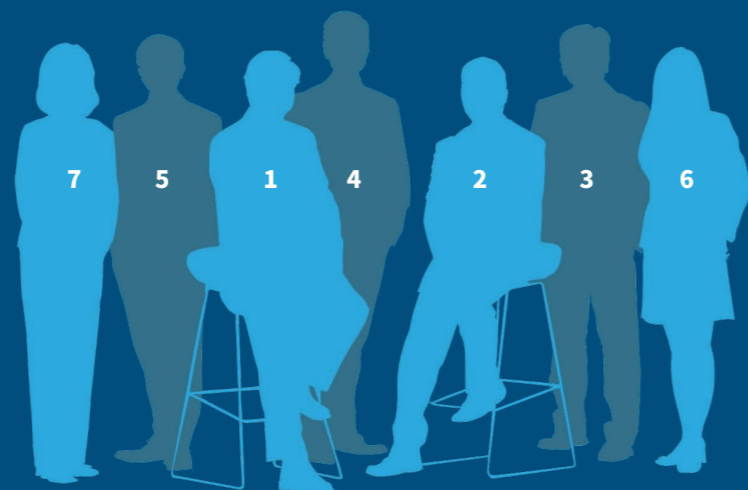
誠信 INTEGRITY

可靠 RELIABILITY

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# 服務回顧

## Operations Review

2021/22年對規管服務來說是成果豐碩的一年，儘管香港在2022年年初受到2019冠狀病毒病第五波疫情嚴重影響，我們仍達成了許多里程碑。本文會闡釋規管服務年內在六個主要策略範疇的成績和未來計劃。

年內，規管服務一如以往，全力支持香港特別行政區政府的防疫抗疫工作。我們的工作包括支援建設社區隔離與治療設施、執行「圍封強檢」行動，以及支援與疫情爆發有關的調查工作。在執行所有這些抗疫任務時，我們都與營運基金及其他政府部門的同事並肩攜手。事實上，「同心互勵」是我們所有服務的核心理念。我們相信同理心不僅對抗疫重要，對落實高效的規管方案，切合市民實際所需，也同樣重要。

### 數碼化與創科：通往未來的鑰匙

今時今日，創新科技（創科）是開啟美好未來的鑰匙，規管服務也緊貼時代步伐，把日常運作和服務數碼化。年內，我們推出多項新服務，包括流動應用程式、電子牌照服務、電子表格和線上持續專業進修課程與平台等，為業界提供高效服務，以配合政府的「精明規管」及「精簡政府服務」計劃，並充分發揮機電工程署（機電署）作為政府「創新促成者」的角色。

截至2022年3月，規管服務已率先推出45項網上註冊申請服務，並在2022年6月推出150多種「電子表格」和八類具備動態二維碼防偽功能的「數碼機電牌照」。使用這些數碼工具不但節省時間和成本，在疫情期間更能減低感染風險，深受機電業界歡迎。

我們亦積極鼓勵受規管者採用創科方案提升安全表現。作為規管機構，我們主動多走幾步，積極開展創科項目，向受規管者示範如何通過智能技術提高安全水平，並推動他們做得更多。我們還希望以身作則，鼓勵企業和製造商研發更多有潛力的創科項目，幫助業界加強安全。

港鐵有限公司（港鐵）就是好例子。港鐵如能持續提升鐵路安全，可令全港數百萬乘客受惠。我們於2021年發起與港鐵公司合辦創科論壇，探討怎樣應用實時鐵路系統監察等智能科技，以提升鐵路維修保養質素和營運安全。

The year 2021/22 has been a fruitful one for the Regulatory Services of, with many milestones reached despite the serious impact of the fifth wave of the Coronavirus Disease 2019 epidemic in early 2022. In this overview, we highlight our achievements and future plans in six areas of strategic importance to the Regulatory Services.

The Regulatory Services remained as committed as ever to supporting the Hong Kong Special Administrative Region Government in fighting the epidemic during the year. Our work included helping to set up community isolation and treatment facilities, carrying out "restriction-testing declaration" (RTD) operations and supporting outbreak-related investigations, all in close co-operation with colleagues from the Trading Services and other government departments. Indeed, "serving with one heart and mutual support" is at the core of everything we do. We believe that empathy is crucial not only in fighting the epidemic but also in delivering effective regulatory solutions that satisfy the genuine needs of the public.

### DIGITALISATION AND I&T: KEYS TO THE FUTURE

In an age when innovation and technology (I&T) are the keys to unlocking a bright future, the Regulatory Services is moving in pace with the time to digitalise our regulatory operations and services. In the year, we introduced an array of new services, including mobile apps, online registration services, e-forms and online Continuing Professional Development (CPD) courses and platforms to provide efficient services for the trade, tying in with the "Be the Smart Regulator" and "Streamlining of Government Services" programmes of the Government as well as playing the role of the Electrical and Mechanical Services Department (EMSD) as the Government's Innovation Facilitator.

As at March 2022, the Regulatory Services initially launched 45 online registration application services and more than 150 e-forms and eight "digital E&M licences" with anti-forgery Dynamic Code features have also been launched in June 2022. Our digital tools are well received by the electrical and mechanical (E&M) trade as they help save time and cost while reducing the risk of infection in the epidemic.

We also incentivise regulatees to use I&T to elevate their safety performance. As the regulator, we have gone the extra mile by initiating various I&T projects to show regulatees how their operational safety can be improved via smart technology and to drive them to do more. We also aim to set a good example to encourage businesses and manufacturers to pursue more projects that capture the potential of I&T to enhance safety of the industries.

A case in point is the MTR Corporation Limited (MTRCL), where continuous safety improvements can benefit millions of railway passengers. We initiated a joint I&T forum with the MTRCL in 2021 to discuss the use of smart technologies such as real-time railway system monitoring for enhancing railway maintenance quality and improved operational safety.



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## 服務回顧 Operations Review

那次的論壇後來逐漸發展為雙方定期的創新交流峰會，我們鐵路科和港鐵高層人員均積極參與，交流創科知識與經驗。雙方更合作進行多項先導項目，包括為鐵路軌道系統進行預測性維修保養的人工智能方案，以及用以監測路軌範圍及外來異物的光學雷達實時監察方案等。由於與港鐵合辦的創科論壇成效極佳，我們正考慮以類似模式，與其他公共事業機構進行創科交流。

此外，我們善用政府科技統籌（整體撥款）的資金，以提升公眾安全為目標，進一步與初創企業和研究機構合作，進行創科項目研發和生產原型樣品。舉例而言，我們與一家初創企業合作研發的「智能數碼自動梯監測系統」，運用經過改良的扶梯梳齒板、光纖傳感器、無線射頻辨識和雲計算技術，為自動梯進行智能實時安全監察和預測性維修保養。該系統不單在2022年日內瓦國際發明展榮獲金獎，更已於多個政府和私營場所合共15台自動梯進行測試，包括中環至半山自動扶梯系統。系統運作理想，在試驗期間，從沒發生因自動梯設備故障而引致的事故。

「智能數碼自動梯監測系統」其實是規管服務「人工智能光纖傳感梳齒板」項目的加強版，後者也曾於2021年的日內瓦發明展比賽贏得金獎。我們歡迎受規管者及機電業界人士，在日常營運中採用我們以科技統籌（整體撥款）研發的上述及其他項目。

### 更積極致力實現碳中和

氣候變化是迫切的全球議題，嚴重影響天氣和民生。2021年10月，政府公布《香港氣候行動藍圖2050》，以「零碳排放・綠色宜居・持續發展」為願景，並配合行政長官在2020年施政報告的承諾，勾畫出本港在2050年前實現碳中和的策略和措施。

我們的能源效益事務處在能源效益和節能方面經驗豐富，因此我們既有責任也有能力支持政府實現碳中和的工作。事實上，機電署是由行政長官擔任主席的跨部門氣候變化和碳中和督導委員會的成員之一。我們一直就各種策略提供意見，例如怎樣推動社會更廣泛使用可再生能源，也就沿海地區關鍵基礎設施在面對超級颱風和其他極端天氣時，應採取什麼緩解風險的措施等問題，提供專業支援。

研究如何使用新的零碳能源，是我們碳中和工作的重要環節。氣體標準事務處在規管氣體安全方面豐富經驗，積極參與環境及生態局轄下的「碳中和專責小組」，致力推廣使用潔淨燃料，並正協助進行有關在本港使用氫氣作為巴士和重型車輛燃料的可行性研究。

Over time, the forum has evolved into innovation summits held regularly between senior personnel from our Railways Branch and the MTRCL to exchange I&T know-how and experience. Both sides have also collaborated on various pilot projects, including an artificial intelligence (AI) solution for predictive maintenance of railway track systems and a Light Detection and Ranging solution for real-time monitoring of track area and intrusion objects. Having regard to the impressive results of the I&T forum, we are exploring the potential of emulating it with other utility companies.

Funding secured from the TechConnect (Block Vote) of the Government further enables us to develop I&T projects, conduct research and development, and produce prototypes jointly with start-ups and research institutions, with the aim of enhancing public safety. A good example is the Intelligent Digital Escalator Monitoring System (iDEMS) we developed with a start-up, which makes use of improved escalator comb plates, optical fibre sensors, RFID and cloud computing technologies to perform intelligent real-time escalator safety monitoring and predictive maintenance. Having won a gold medal at the 2022 International Exhibition of Innovations of Geneva, the system has been trialled successfully on 15 escalators at various government and private sector venues, including the Central to Mid-levels Escalator and Walkway System, with zero incident due to equipment failure during the trial period.

Indeed, the iDEMS is an enhanced version of another Regulatory Services project namely Artificial Intelligent Nylon Optical Fibre Sensing Escalator Combs, which also won a gold medal at the Geneva competition in 2021. We welcome regulatees and the E&M industry to adopt these and our other TechConnect-funded projects in their operation.

### MORE AMBITIOUS STEPS TOWARDS CARBON NEUTRALITY

Climate change is a pressing global issue having serious implications on weather and every aspect of life. In October 2021, the Government published Hong Kong's Climate Action Plan 2050, laying out a vision for "Zero-carbon Emissions • Liveable City • Sustainable Development" and outlining strategies and measures to achieve carbon neutrality before 2050, as pledged by the Chief Executive in her 2020 Policy Address.

With our Energy Efficiency Office (EEO) and its rich experience in energy efficiency and conservation, we are duty bound and well positioned to support the Government's works to achieve carbon neutrality. Indeed, the EMSD is a member of the inter-departmental Steering Committee on Climate Change and Carbon Neutrality chaired by the Chief Executive. We have been providing input on strategies, like the wider use of renewable energy, as well as professional support on issues such as risk mitigation measures for critical infrastructure in coastal areas vulnerable to super typhoons and other extreme weather events.

Exploring the use of new zero carbon energy is an important aspect of our carbon neutrality work. With solid experience in regulating gas safety, our Gas Standards Office (GasSO) has been participating in a Carbon Neutrality Task Force under the Environment and Ecology Bureau to promote the use of clean fuels and to assist in a feasibility study on using hydrogen as fuel for buses and heavy vehicles in Hong Kong.

由於香港現行法例並未就使用氫為燃料作出規定，因此我們成立了有關使用氫的內部工作小組，對氫氣供應鏈進行相關風險評估、擬訂安全標準草案、研究如何修改現行法例以制訂氫燃料規管制度，以及研究如何處理跨境氫能貨車的規管問題。政府計劃於2023年年底開始為期12個月的氫能汽車測試，將會涵蓋巴士、重型車輛和垃圾收集車。氣體標準事務處已成立兩支新團隊，負責落實有關工作。

減碳工作的另一個環節，是以更進取的措施進一步提高建築物，尤其是商業樓宇的能源表現。《香港氣候行動藍圖2050》已訂立目標，本港商業樓宇至2035年，要比2015年減少15至20%的用電量，隨後更要減少30至40%用電量。只有加強商業樓宇的節能措施，才能達標。

年內，能源效益事務處檢視了《建築物能源效益條例》，並考慮一系列措施，包括修改現行法例，要求商業樓宇於進行每十年一次的強制性能源審核後，必須按在審核過程中找出的能源管理機會執行節能措施，提高建築物能源表現。其他研究推行的措施包括要求加密進行能源審核，以及強制披露建築物能源消耗指標。另外，我們還會考慮禁止銷售最低節能表現級別以下的訂明電器，換言之，在「強制性能源效益標籤計劃」的某個指定能效級別或以下的產品，日後可能不准在港出售。

我們減碳工作的第三個範疇是優化區域供冷系統的表現。在能源效益事務處於東涌新市鎮擴展區（東）、古洞北及洪水橋/廈村等新發展區規劃及興建更多區域供冷系統的同時，我們積極營運啟德發展區域供冷系統，並持續累積系統操作經驗，以及蒐集更豐富的能源表現數據，以聚焦探索如何可更廣泛運用人工智能和大數據分析方案，不斷優化區域供冷系統機組的能源績效。

### 深化「治未病」文化

常言道預防勝於治療，機電安全也不例外。規管服務一直透過多種措施，包括進行以風險為本的巡查、宣傳和公眾教育，以及在需要時主動加強進行機電設施重點安全檢查等，致力建立「治未病」的文化。我們的努力繼續成效卓著，年內大部分類型的機電事故的數目都維持平穩或略為減少，例如氣體事故就由2020年的179宗，下降至2021年的176宗，再創歷史新低。

As the existing legislation in Hong Kong does not cover the use of hydrogen as fuel, we have set up an internal hydrogen working group to conduct the relevant risk assessment of the hydrogen supply chain, formulate the draft of safety standards, look into ways to amend existing legislation to set up a regulatory regime, as well as studying how to tackle the regulatory issue regarding cross-boundary hydrogen-fuelled freight vehicles. A 12-month test of hydrogen-fuelled vehicles including buses, heavy vehicles and refuse collection vehicles is planned to be conducted at the end of 2023. The GasSO has already set up two new teams for these tasks.

We also focus on another aspect of our decarbonisation work, which is taking more ambitious steps to further enhance the energy performance of buildings, in particular commercial buildings. Only with strengthened measures will commercial buildings be able to meet the target of reducing electricity consumption by 15 to 20% by 2035 compared with 2015, and 30 to 40% subsequently, as proposed in the Climate Action Plan 2050.

During the year, the EEO reviewed the Buildings Energy Efficiency Ordinance (BEEO) to consider measures such as legislative amendments to require commercial buildings to implement measures regarding energy management opportunities identified in mandatory energy audits conducted at 10-year intervals to enhance energy performance of the buildings. Other measures being studied to enhance the energy performance of buildings include more frequent energy audits and mandatory disclosure of the building-based Energy Utilisation Index. We are also considering the prohibition of sales of prescribed appliances below a minimum energy efficiency performance rating. This means products at or below a specific grade under the Mandatory Energy Efficiency Labelling Scheme might not be allowed to be put on sale in Hong Kong.

The third aspect of our decarbonisation work involves optimising the performance of District Cooling Systems (DCSs). As the EEO plans and builds more DCSs in new development areas such as Tung Chung New Town Extension (East), Kwu Tung North and Hung Shui Kiu/Ha Tsuen, we continue to accumulate operational experience and augment energy performance data of the DCS at the Kai Tak Development Area. The focus is to explore opportunity on wider use of AI and big data analytics solutions for continuing energy optimisation of operation of DCS plants.

### DEEPENING OUR CULTURE OF PREVENTION

As the saying goes, prevention is better than cure. It is no exception when it comes to E&M safety. The Regulatory Services has always endeavoured to foster a culture of prevention or "curing diseases before they arise", via a multi-pronged approach, which included conducting risk-based inspections, publicity and public education, as well as proactively stepping up focused safety checks of E&M facilities where necessary. These efforts continued to yield positive results. The numbers of most types of E&M incidents remained stable or slightly declined during the year, including a record low of 176 gas incidents in 2021, down from 179 in 2020.

## 服務回顧 Operations Review

然而，打個醫學比喻，身體沒有病徵並不一定代表健康。近期某些意外事故，例如一位長者乘客在港鐵站洗手間內昏迷數小時後不幸離世，以及元朗中電電纜橋火警意外，都值得我們反思，即使事故看似極不可能發生，或幾十年來從未發生過意外，我們都必須時刻警惕，提高對風險的敏感度，防範和杜絕意外事件。

我們正是本着這種精神，在年內推出了多項新措施，包括推動在村屋安裝共用的中央石油氣供應系統。目前，村屋用戶大多自行訂購石油氣瓶供氣，並自行個別儲存氣瓶，或會因多個用戶同時過度儲存而導致不必要的安全風險。

我們於年內走訪了34條村的3800多幢村屋，就用戶的石油氣需求和用氣習慣進行抽樣調查，現正提倡村屋用戶使用中央石油氣供應系統。我們也藉此機會向村屋住戶解釋新系統的好處，讓居民明白使用新系統不但更加方便，也可避免個別用戶在石油氣未用盡時已更換氣瓶而造成浪費。明年我們更會就新建的村屋推廣中央石油氣供應系統。儘管村屋儲存石油氣瓶從未引致任何事故，我們仍主動出擊推動新措施，這正是規管服務以積極手法提升安全的一例。

另外，我們會繼續透過部門將於2022/23年舉辦的內部活動，例如「員工激勵計劃」的「治未病」建議書比賽，鼓勵員工提出如何在部門日常工作中預防意外的新構思，並為業界和市民提出預防意外建議，目的是鼓勵員工甚至每個人，在意識到可能發生意外時儘管說出來，特別是幾乎發生事故的情況。這樣才能及早消除風險，阻止事故發生。

### 為機電業吸引新血爭取更大認同

培育新血及改善機電從業員的晉升階梯，對機電業的未來發展至關重要。2021年，我們除了繼續舉行和參與各種為青年人而設的活動，吸引更多新血入行外，更與香港工程師學會合作，促成升降機/自動梯行業的註冊工程師可透過新設途徑取得《工程師註冊條例》(第409章)所訂明的註冊專業工程師資格。這項突破是年內另一重要工作成果。

However, to draw a medical analogy, an absence of symptoms does not necessarily indicate wellness. Recent incidents, such as the tragic death of an elderly passenger after being unconscious for hours in a lavatory in an MTR station and the CLP cable bridge fire in Yuen Long, are timely reminders that we must stay alert to risks even where incidents seem very unlikely or have not happened for many years. We must enhance our risk sensitivity to pre-empt any unexpected incident.

It is in this spirit that we introduced a number of new initiatives during the year, including the promotion of installation of centralised LPG supply systems for shared use at village houses. Currently, LPG users living in village houses mostly order their own LPG cylinders, and each user keeps their own reserve cylinders. This may lead to excessive storage and induce unnecessary risks if too many LPG cylinders are aggregately stored by multiple users.

We are now advocating the use of centralised LPG supply systems after conducting a sample survey on gas usage needs and practices of over 3800 village houses in 34 villages during the year. We also took the opportunity to explain to households of village houses the benefits of the new system, which is more convenient for residents and can also help prevent LPG wastage arising from replacement of LPG cylinders before gas is exhausted. We shall further promote centralised LPG supply systems to newly built village houses next year. This exemplified our proactive approach to enhance safety as we took the initiative to promote new measures even though no incident has happened due to LPG cylinder storage at village houses.

Besides, we will continue to leverage internal events in 2022/23, such as a proposal competition on "Prevention Culture" under the "Staff Motivation Scheme", to encourage staff to come up with new ideas on how we can prevent incidents in our own operations, as well as for the trade and the public. The competition aims to encourage staff and indeed everyone to speak out when they sense something may go wrong, especially after near-miss events, which will go a long way towards nipping risks in the bud.

### NEW BLOOD AND GREATER RECOGNITION FOR THE E&M TRADE

Nurturing new blood and improving the progression pathways of practitioners are vital to the future of the E&M industry. Apart from our ongoing youth engagement activities to attract more young people to join the trade, an achievement in 2021 was the progress made towards the provision of means for Registered Engineers (REs) in the lift/escalator industry to achieve the qualification of a Registered Professional Engineer (RPE) under the Engineers Registration Ordinance (Cap. 409) through our joint effort with the Hong Kong Institution of Engineers (HKIE).

在機電署與香港工程師學會共同努力下，後者把升降機/自動梯工程行業從業員的技能和知識，與香港工程師學會的資歷要求作配對，並於2022年1月發布了兩份指引，為行業從業員提供清晰途徑，闡明升降機/自動梯註冊工程師可以申請成為香港工程師學會的企業會員，並在取得學會專業會員資格後，再累積一年的本地工作經驗，從而成為註冊專業工程師。這是提升註冊工程師專業地位的重要里程碑，有利升降機/自動梯行業的長遠發展。我們已在多場研討會和透過其他業界宣傳渠道，積極向從業員和工程系畢業生介紹相關指引。

我們將於2022/23年推出另一新猷，為註冊氣體裝置技工發出新的技工註冊卡，讓氣體標準事務處能及時更新註冊氣體裝置技工的記錄，並於發出新卡後每五年換卡一次，同時更新記錄，而無須修改現行法例。更換新卡純屬自願性質，費用全免。註冊氣體裝置技工還可申請備有動態二維碼防偽功能的電子技工卡，方便市民掃描卡上的二維碼，以核證註冊氣體裝置技工的註冊資料。業界對這項新服務十分期待，我們預計服務推出時，反應會相當踴躍。氣體標準事務處也會於來年推出新的自願性持續專業進修計劃，協助註冊氣體裝置技工加強專業及技術知識。

在可再生能源方面，我們為參與「採電學社」計劃的小學開發了一套STEAM(即科學、科技、工程、藝術及數學)教材套，令人鼓舞。教材套旨在透過互動學習，幫助學生認識可再生能源，並激發他們對潔淨能源與低碳生活的興趣。我們已於2021/22學年完成製作教材套，學校在2022/23學年即可使用。

教育局也參與我們製作教材套的工作，協助增潤教材內容，使之符合小學常識課程指南的指引。我們很高興這套「採電學社」教材有機會納入小學課程內，而教育局的認可會增加教材對學生的影響力。

我們以「同心互勵」的態度，幫助業界加強實力、提升專業資格和爭取更大認可，上面只是部分例子。事實上，正如習近平主席在7月1日慶祝香港特別行政區成立25周年的講話中指出：「要幫助廣大青年解決學業、就業、創業、置業面臨的實際困難」，「青年興，則香港興；青年發展，則香港發展；青年有未來，則香港有未來。」我們會本着這種精神，繼續與年青人保持聯繫接觸，促進年青人在機電業發展和向上流的機會。

As a result of the joint effort, the HKIE matched practitioners' skills and knowledge in lift/escalator works with the HKIE's competency requirements and released in January 2022 two sets of guidance notes, providing a clear pathway for trade practitioners to become an RPE by obtaining the HKIE's corporate membership first, and after that one year of post-qualification local work experience. This is an important milestone in enhancing the professional status of REs, which is beneficial to the long-term development of the lift/escalator industry. We have been actively promoting the guidance notes to practitioners and engineering graduates via seminars and other trade publicity.

Another initiative to be launched in 2022/23 is the introduction of a new registration card for Registered Gas Installers (RGIs), a measure that will enable the GasSO to update RGI records in a timely manner and then every five years upon card replacement without having to amend the existing legislation. The replacement of new card is voluntary and free of charge. An RGI can also apply for a digital E&M licence which contains a dynamic QR code for anti-forgery purposes, where members of the public can scan the QR code to verify the registration information of the RGI. The trade is excited about the new service and we expect a good response when it is launched. Concurrently, the GasSO will also introduce a new voluntary CPD scheme in the next year to help RGIs enhance their professional and technical knowledge.

On renewable energy, another exciting development was that we developed a STEAM learning kit for primary schools participating in the Solar Harvest scheme. With its production completed in 2021/22 for schools to use in the 2022/23 academic year, the kit aims to help students better understand renewable energy through interactive learning and inspire their interest in clean energy and a low-carbon lifestyle.

The Education Bureau (EDB) has also joined us in the production of the educational kit by enriching its content and aligning it with the general studies curriculum guide for primary schools. We are delighted by the opportunity that the Solar Harvest educational kit would have an opportunity to be included in the primary school curriculum, as the stamp of approval of the EDB will boost the impact of the kit on students.

These are just some examples of our approach of "serving with one heart and mutual support" in helping the trade build capacity and competency, enhance its professional qualifications and gain recognition. Indeed, President Xi Jinping remarked in his recent speech marking the 25th anniversary of the Hong Kong Special Administrative Region on 1 July that "we must help young people with their difficulties in studies, employment, entrepreneurship, and purchasing of housing" and that "Hong Kong will prosper only when its young people achieve well-rounded development". In this spirit, we shall continue to engage with our young people and facilitate their development and upward mobility in the E&M industry.

## 服務回顧 Operations Review

### 與內地及國際合作的里程碑

我們於2021/22年在國際合作方面達致里程碑，兩位機電署高層人員獲選為2021至2023年亞太區經濟合作組織（亞太經合組織）能源工作組的領導，二人分別擔任能源工作組副主席，以及能源效益和節能專家小組主席。他們作為香港代表，其任命有助提升香港在亞太區節能工作的形象，並突顯本港的貢獻。

我們還開展了兩個由亞太經合組織撥款資助的項目，其一是研究亞太經合組織區內七個都市化城市（包括香港）減少能源強度的關鍵成功因素；另一項目則研究如何建立重新校驗能力。由於競爭激烈，成功獲得撥款資助是令人鼓舞的成績，大會對項目的質素也期望極高。

規管服務多年來與內地對口單位保持聯繫，尤其與中國海關總署更建立了長期合作伙伴關係。成功合作的例子包括一套行之有效的通報機制，透過有關機制，可查找進口本港的不合規電器和氣體爐具，並進行跟進工作。

在2021/22年度，我們與深圳海關和拱北海關建立了機構合作網上平台，以密切監察由廣東進口本港的石油氣的質素。年內，我們與北京市城市管理委員會也建立了燃氣安全交流平台。

能源效益事務處與中國海關總署和中國標準化研究院正就內地與香港的能源標籤技術評估要求和評級原則，研究進行互認。此外，一般法例部則參與起草《在用電梯安全評估規程—曳引驅動電梯》參考標準文件的研究工作：這份文件是廣東省特種設備檢測研究院為粵港澳大灣區彙編結集的其中一章。

規管服務的策略方向之一，是「積極融入大灣區以至全國發展和參與國際協作」，這不但與我們致力拓展內地及海外合作關係的做法一致，也跟習主席7月1日的講話相呼應，他表示「香港積極融入國家發展大局，對接國家發展戰略」。

待疫情緩和，內地與香港恢復通關時，我們會重啟各種實體交流和培訓活動。另一優先項目是往訪近鄰廣東和北京與上海的氫設施，進一步觀摩了解氫能電池汽車和相關基建系統。

### MILESTONES ON MAINLAND AND INTERNATIONAL COOPERATION

We achieved a milestone in international cooperation in 2021/22 as two senior EMSD officials were elected as leaders of the Asia-Pacific Economic Cooperation (APEC) Energy Working Group (EWG) for 2021-2023, including the EWG Deputy Lead Shepherd and Chairman of the APEC Expert Group on Energy Efficiency and Conservation respectively. As they are representatives of Hong Kong, their representation in the EWG will help enhance Hong Kong's profile in energy conservation work in the region and underscore its contribution.

We also conducted two APEC-funded projects, one to study the key success factors of energy intensity reduction in seven urbanised cities in APEC, including Hong Kong, and the other to study Retro-commissioning (RCx) capacity building. This was no small feat as competition was keen and the APEC's expectation on the project quality was very high.

The Regulatory Services has long been cooperating with our Mainland counterparts over the year, most notably through our long-standing partnership with the General Administration of Customs China (GACC). Among our successful cooperation is a well-proven notification mechanism to identify and follow-up on non-compliant electrical and gas appliances imported to Hong Kong.

In 2021/22, we worked with the Shenzhen Customs and Gongbei Customs to set up an institutional cooperation online platform to closely monitor the quality of LPG supplied from Guangdong to Hong Kong. We also established a gas safety communication platform with the Beijing Municipal Commission of Urban Management during the year.

The EEO is also working with the GACC and China National Institute of Standardisation on mutual recognition of technical assessment requirements and grading principles for energy labels used on the Mainland and Hong Kong. Besides, the General Legislation Division has taken part in the research for a reference document entitled "Rules for Safety Assessment of Lifts in Use – Traction Lifts", part of a collection being compiled by the Guangdong Institute of Special Equipment Inspection and Research for the Greater Bay Area (GBA).

Our Mainland and overseas engagement efforts are consistent with one of the Regulatory Services' strategic directions, which is "to integrate proactively into the Greater Bay Area and national development as well as participating in international collaboration". This also echoes President Xi's speech delivered on 1 July in which he mentioned that Hong Kong was "proactively integrating itself into the country's overall development and carving out its role in national strategies".

Upon the resumption of normal travel between the Mainland and Hong Kong when the epidemic eases, we will reactivate face-to-face exchanges and training. We will also accord priority to visiting the hydrogen facilities in nearby Guangdong, as well as Beijing and Shanghai to learn more about hydrogen fuel cell vehicles and the related infrastructure systems.

### 同心互勵

無論是支援抗疫、執行日常規管工作、進行創科項目或是與本港和海外持份者聯繫合作，所有規管服務的共通點，是關顧市民的安全和福祉。此外，值得一提的是機電署每年舉辦「好人好事嘉許計劃」，對作出激勵人心的好事及熱心服務社會的員工予以嘉許，可培養以人為本和服務社會的關懷文化。

### 來年展望

作為政府的「創新促成者」，我們計劃於2022/23年發布的規管服務「抱負、使命和信念」聲明中，強調創新的重要性。我們還會推出新措施，鼓勵創科發展，精簡工作流程，支援政府近期的重組工作，努力實現碳中和，以及加強與大灣區的聯繫。

我們也希望加快安全使用氫作為燃料的工作，推出更積極進取的碳中和措施，並鼓勵業界即使在疫情減退後，仍繼續使用各種電子牌照和數碼化服務。

過去一年本港在疫情下充滿挑戰，我們要感謝全體員工竭誠提供卓越服務，特別是在各項抗疫工作表現出色。我們也感謝決策局和其他政府部門指導和配合，以及受規監管者努力不懈。一如既往，我們必須感謝業界伙伴、學者、專業團體、非政府組織、培訓和研究機構以至市民大眾支持。我們也幸得內地和海外伙伴鼎力合作，分享經驗，謹致謝忱。

規管服務既有明確目標，也得到持份者全力支持，期望來年再有長足發展，續創佳績。

### SERVING WITH ONE HEART AND MUTUAL SUPPORT

Caring for the safety and wellbeing of the public is a common thread weaving through all Regulatory Services activities, be they anti-epidemic support, day-to-day regulatory work, I&T projects or stakeholder engagement locally and overseas. Also worth-mentioning is the EMSD's annual Good People Good Deeds Commendation Scheme, which recognises staff who have performed inspiring deeds and served the community enthusiastically. It would foster a caring culture that attaches importance to the people and social service.

### THE YEAR AHEAD

As the Government's Innovation Facilitator, we are planning to publish the Regulatory Services' Vision, Mission and Values statement in 2022/23 with highlight on the importance of innovation. We will also introduce new initiatives to encourage I&T development, streamline workflow processes, support work related to the recent government restructuring, strive towards carbon neutrality and strengthen GBA ties.

We would also like to expedite progress in our work on the safe use of hydrogen as fuel, initiate more ambitious carbon neutrality measures, and encourage the trade to keep using our e-licensing and digitalised services even after the epidemic subsides.

With numerous challenges under the epidemic in the past year, we wish to thank all our staff for their excellent service, in particular in carrying out myriad anti-epidemic tasks. We also thank the policy bureaux and other government departments for their guidance and cooperation, and our regulatees for their great efforts. As always, we must thank our trade partners, academia, professional bodies, NGOs, training and research institutions and the public for their support. We are also grateful to our cooperation partners on the Mainland and overseas for their collaboration and experience sharing.

With clear objectives and strong support from all stakeholders, we anticipate another year of progress and accomplishment for the Regulatory Services.



潘國英  
機電工程署副署長/規管服務



Raymond Poon Kwok-ying  
Deputy Director/Regulatory Services, EMSD

## 年度亮點 Highlights of the Year

### 為電業界推出一站式網上申請服務平台

#### ONE-STOP ONLINE APPLICATION SERVICE PLATFORM FOR ELECTRICAL TRADE



為配合政府近年推動「精明規管」計劃，我們於2021年7月推出一站式網上申請服務平台，簡化所有關於《電力條例》及《電力（註冊）規例》的申請。註冊電業工程人員如欲申請註冊續期，只需登入一站式平台，即可在網上完成填寫申請表格、提交證明文件及繳費等各項手續，並可透過電郵收取電子註冊證明書。為了向註冊電業工程人員及業界推廣網上申請服務並協助他們使用服務，我們已製作教學短片，並上載到社交媒體平台。由2022年6月底開始，該平台會提供有關以下事宜的網上申請服務：電業工程人員註冊或電業承辦商註冊；為發電設施註冊；認為確定地下電纜所在的合資格人士；註冊為認可核證團體或認可製造商；加簽定期測試證明書（表格WR2）；以及在智能手機使用註冊電業工程人員和已被認可作為確定地下電纜所在的合資格人士的數碼機電牌照等。網上申請服務平台不但可便利業界，也有助提升服務效率。

In line with the “Be the Smart Regulator” Programme implemented by the Government in recent years, we have introduced a one-stop online application service platform in July 2021 to streamline all applications related to the Electricity Ordinance and Electricity (Registration) Regulations. Registered Electrical Workers (REWs) who wish to renew their registration can now fill in the application forms, submit supporting documents and make payment through the one-stop platform, and receive the electronic registration certificates via email. To promote the online application service to REWs and the trade and help them use it, we have produced and uploaded a tutorial video on social media platforms. Starting from late June 2022, online application services for the following matters will be available on the platform: electrical worker registration or electrical contractor registration; registration of generating facilities; approval as competent persons for locating underground electricity cables; registration as recognised certification bodies or recognised manufacturers for electrical product, endorsement of periodic test certificates (Form WR2); and the use of the digital E&M licences for REWs and Approved Competent Persons for Locating Underground Electricity Cables (CPS) on mobile phone. The online application service platform has not only brought greater convenience to the trade, but also improved service efficiency.

### 全數更新五份有關機械安全的實務守則及網上預約檢查系統卓見成效



#### ALL FIVE CODES OF PRACTICES RELATED TO MECHANICAL SAFETY UPDATED AND ONLINE BOOKING SYSTEM FOR INSPECTION PROVED EFFECTIVE

我們在2021年全數更新有關機械安全的五份實務守則。新版本的內容與最新的國際標準看齊，並因應本地的具體需要，提升有關機械裝置的安全要求，為業界提供更詳盡的指引，以便參考。在五份實務守則中，有兩份是關於升降機及自動梯，另外三份則分別關於建築工地升降機、塔式工作平台和機動遊戲機，由2021年11月至2022年10月相繼生效。另外，隨著升降機和自動梯網上預約檢查系統在2021年繼續深化落實，在升降機和自動梯進行主要更改工程後的法定審批流程得以進一步加快進行，由以往平均需時九天審批申請大大縮短至三天，公眾就此提出的查詢個案也減少七成，無論服務效率及公眾滿意度均大幅提升。

All five Codes of Practices (CoPs) related to mechanical safety were updated in 2021. The updated versions were aligned with the latest international standards and the safety requirements for mechanical installations were enhanced based on specific local needs, giving the trade more detailed guidelines for reference. The five CoPs included two on lifts and escalators, and three others on builders' lifts, tower working platforms and amusement rides respectively, with effective dates ranging from November 2021 to October 2022. With the deepened implementation of the online booking system for inspection in 2021, the statutory approval process for lifts and escalators after major alternation works was further expedited. The average application processing time was greatly reduced from nine days to three days, and the related public enquiries were also reduced by 70%. The online booking system has significantly increased both service efficiency and public satisfaction.

### 推廣村屋氣體安全改善措施、提升氣體立管安全計劃及全新專用石油氣加氣站



#### PROMOTION OF GAS SAFETY IMPROVEMENT MEASURES FOR VILLAGE HOUSES, GAS RISER SAFETY ENHANCEMENT PLAN AND NEW DEDICATED LPG FILLING STATIONS

年內我們走訪34條鄉村逾3 800幢村屋進行抽樣調查後，推出全新措施，推廣在村屋安裝共用的中央石油氣供應系統，目的是協助用戶減少儲存石油氣，以及進一步提升氣體安全。此外，為提升全港住宅大廈的煤氣立管安全，我們曾選定22個屋苑推行加強檢查煤氣立管的先導計劃，藉此鼓勵用戶盡早更換老化和銹蝕的煤氣立管。由於計劃頗見成效，我們在本年度再選定另外14個屋苑推行計劃。兩批選定屋苑共有逾400幢建築物，樓齡大多超過30年。至於專用石油氣方面，全港12個專用石油氣加氣站（專用氣站）在營運約22年後，其合約已陸續到期。新合約經公開招標後已全數在2021年5月批出。為減少對的士及小巴業界的影響，我們制訂分階段進行翻新工程的時間表，並與業界保持聯繫，讓業界清楚了解各專用氣站的翻新工程時間表，以及促請新營運商盡早完成翻新工程。首個經翻新的觀塘專用氣站已在2021年12月重投服務。

After visiting over 3 800 village houses in 34 villages to conduct sample surveys, we launched a new initiative to promote the installation of centralised liquefied petroleum gas (LPG) supply systems for shared use of village houses during the year. The initiative aims to help users reduce LPG storage and further enhance gas safety. In addition, to enhance town gas riser safety at residential buildings across the territory, 22 residential estates were selected for the implementation of a pilot scheme to step up inspection of town gas risers, with a view to encouraging users to replace aged and corroded gas risers as early as possible. As the scheme was proved effective, additional 14 residential estates were selected for the scheme during the year. In these two batches of selected estates, there were over 400 buildings in total and mostly are aged over 30 years. As to auto-LPG, the contracts of all 12 Dedicated LPG Filling Stations (DFSs) in Hong Kong have expired one after another after 22 years of service. All new contracts were awarded on May 2021 through an open tendering process. To minimise disruption to the taxi and mini-bus trades, we worked out a staggered programme for renovation, liaised with the trades to keep them well-informed of the renovation schedule of the DFSs, and urged the new operators to expedite the works as soon as possible. Kwun Tong DFS, being the first renovated station, was re-opened in December 2021.



## 年度亮點 Highlights of the Year

### 屯馬線全線開通

#### FULL LAUNCH OF TUEN MA LINE



由西鐵線、屯馬線一期和一段新延伸路段(宋皇台站至紅磡站)組成的屯馬線,在2021年6月27日全線開通,正式投入服務。屯馬線全長約56公里,是全港最長的鐵路線,連接屯門至烏溪沙,共有27個車站,屯馬線全線開通標誌本港鐵路發展踏進新里程。屯馬線開通前,我們密切監察港鐵公司進行嚴謹的全線行車測試,包括就開通首日在繁忙時段及非繁忙時段可能出現的不同情境進行演練,以及測試全線系統的可靠性。經過多月的嚴謹驗收和檢測,機電署及相關部門確認屯馬線「安全妥善」,可以開通為市民服務。

The Tuen Ma Line (TML), comprising the West Rail Line, TML Phase 1 and a newly added section from Sung Wong Toi Station to Hung Hom Station, commenced its full launch and service on 27 June 2021. The TML, which covers about 56 kilometres with 27 stations connecting Tuen Mun to Wu Kai Sha, is the longest railway line in Hong Kong. Its full launch marks another milestone in the city's railway development. Prior to its launch, we closely monitored the MTR Corporation Limited to carry out stringent full-line train tests, including exercises on different scenarios which might occur in peak and non-peak hours during the day-one operation, and test the reliability of the systems of the entire line. After several months of rigorous inspection and testing, the EMSD and relevant government departments confirmed that the TML was in "safe and sound" condition for opening for public service.

### 強制性標籤計劃第四階段

#### FOURTH PHASE OF THE MEELS



「強制性能源效益標籤計劃」(強制性標籤計劃)旨在方便市民挑選具能源效益的器具及提升市民對節約能源的意識。強制性標籤計劃首三階段已經全面實施。根據強制性標籤計劃,現時共有八類家用電氣產品必須張貼能源標籤。為進一步善用潛在的節能機會,我們建議推行強制性標籤計劃第四階段,把計劃的涵蓋範圍擴展至氣體煮食爐、即熱式氣體熱水爐及發光二極管(LED)燈。加入這三類產品後,強制性標籤計劃下所有訂明產品所佔的住宅總能源消耗量會由49%增至80%。

The Mandatory Energy Efficiency Labelling Scheme (MEELS) is aimed at facilitating the selection of energy-efficient appliances of the public and raising public awareness on energy conservation. The first three phases of the MEELS have been fully implemented. Under the MEELS, eight types of household electrical products are currently required to be affixed with energy labels. To further achieve potential energy saving, we have proposed to take forward the fourth phase of the MEELS, expanding the coverage of the MEELS to include gas cookers, gas instantaneous water heaters and light emitting diode (LED) lamps. Upon addition of the three, the total residential energy consumption accounted for by all the prescribed products under the MEELS will increase from 49% to 80%.

### 亞太經合組織工作及區域供冷服務再創新里程和綠色社福機構計劃開展

#### MILESTONES IN APEC WORK AND DISTRICT COOLING SERVICES ATTAINED AND GREEN WELFARE NGOS SCHEME LAUNCHED



機電署近年積極參與亞太區經濟合作組織(亞太經合組織)的工作,現時更有兩位同事代表香港參與其能源效益事務的領導工作。機電署助理署長/電力及能源效益於年內獲選為2021至2023年亞太經合組織能源工作組副主席,而機電署一位前助理署長也會在2021至2023年繼續代表香港,擔任能源工作組旗下的能源效益及節能專家小組主席。這不但是對部門的肯定,也有助提升香港在能源效益工作方面的聲譽。此外,環境局(時稱)與機電署推出「綠色社福機構」計劃,協助合資格的非政府福利機構進行能源審核,以及安裝能源效益較高的變頻式冷氣機及發光二極管燈,目標是為300個福利機構的處所提供服務。至於由機電署規劃及建造的啟德區域供冷系統,也踏入新里程,為區內首個私人用戶(即一個大型商場及寫字樓綜合發展項目)供冷。

In recent years, the EMSD has been actively involved in the Asia-Pacific Economic Cooperation (APEC), and now there are two officers from the EMSD representing Hong Kong and taking leading roles in the energy efficiency work under the APEC. Our Assistant Director/Electricity and Energy Efficiency was elected as Deputy Lead Shepherd of the Energy Working Group (EWG) under the APEC for session 2021-23 during the year, in addition to a former Assistant Director of the EMSD who continues to represent Hong Kong and serve as Chairman of the Expert Group on Energy Efficiency and Conservation under the EWG for session 2021-23. This does not only represent recognition of the EMSD, but also gives a boost to the reputation of Hong Kong in the field of energy efficiency. Besides, the then Environment Bureau and the EMSD launched the Green Welfare NGOs scheme to help eligible welfare NGO premises conduct energy audits and install more energy efficient variable-speed air-conditioners and LED lighting. We aim to provide services at 300 premises of the participating welfare NGOs. As to the Kai Tak District Cooling System planned and built by the EMSD, it also reached a milestone with the provision of cooling services to its first private user, a major integrated shopping mall and office development in the district.





# 重要數字 Key Figures

## 電業工程人員 ELECTRICAL WORKERS

註冊電業工程人員  
REGISTERED ELECTRICAL WORKERS



81 818 名  
2020/21 NOS.

83 298 名  
2021/22 NOS.

## 電業承辦商 ELECTRICAL CONTRACTORS

註冊電業承辦商  
REGISTERED ELECTRICAL CONTRACTORS



14 781 間  
2020/21 NOS.

15 107 間  
2021/22 NOS.

## 升降機及自動梯 LIFTS AND ESCALATORS

升降機  
LIFTS



70 322 部  
2020/21 NOS.

71 295 部  
2021/22 NOS.

自動梯  
ESCALATORS



10 067 部  
2020/21 NOS.

10 255 部  
2021/22 NOS.

## 燃氣供應 GAS SUPPLY

氣體喉管網絡總長  
TOTAL LENGTH OF GAS PIPE NETWORK



3 705 公里  
2020/21 KM

3 709 公里  
2021/22 KM

## 車輛維修技工 VEHICLE MECHANICS

註冊車輛維修技工  
REGISTERED VEHICLE MECHANICS



8 056 名  
2020/21 NOS.

8 235 名  
2021/22 NOS.

## 車輛維修工場 VEHICLE MAINTENANCE WORKSHOPS

註冊車輛維修工場  
REGISTERED VEHICLE MAINTENANCE WORKSHOPS



2 052 間  
2020/21 NOS.

2 065 間  
2021/22 NOS.

## 鐵路 RAILWAY

鐵路年度載客量  
RAILWAY ANNUAL PATRONAGE



1 280 百萬  
2020/21 MILLION

1 499 百萬  
2021/22 MILLION

# 保障公眾安全

## Protecting Public Safety

### 電力安全

#### 電力事故數目微升

2021年機電署共錄得121宗電力事故，較2020年的97宗稍微上升，主要原因可能是2021年疫情稍為放緩後，市民開始恢復各種活動。

### ELECTRICAL SAFETY

#### Slight Increase in the Number of Electrical Incidents

The EMSD recorded 121 cases of electrical incidents in 2021, slightly higher than the number of 97 cases in 2020. This might be mainly due to the resumption of activities in the community after the COVID-19 epidemic had eased slightly.

### 過去二年本港電力事故宗數

#### NUMBER OF ELECTRICAL INCIDENTS OVER THE PAST TWO YEARS



97 宗  
2020 CASE

121 宗  
2021 CASE

### 科技方案提升電力安全

過去兩年，機電署一直積極善用創新科技方案，加強電力安全規管工作。在2021/22年度，我們推動的兩個創科方案已準備就緒，開始投入測試運作。第一個方案是人工智能偵測系統，可利用香港的鳥瞰圖片自動偵測村屋及其他建築物屋頂的太陽能發電設施，並對比機電署的註冊記錄，從而找出沒有按《電力條例》規定註冊的發電設施，以便我們跟進調查。該人工智能偵測系統於2022年2月投入運作後，已成功找到香港沒有註冊的太陽能發電設施，以便我們跟進調查。

### I&T Solutions to Enhance Electrical Safety

In the past two years, the EMSD has been actively making use of innovation and technology (I&T) to step up regulatory work on electricity safety. In 2021/22, two I&T solutions we promoted were ready for trial runs. The first solution is an intelligent detection system which can automatically detect solar photovoltaic generating facilities on the roofs of village houses and other buildings by using the aerial photos of Hong Kong. The detection results would then be checked against the registration records in the EMSD by the system, so as to identify the generating facilities which have not been registered under the Electricity Ordinance for our follow-up investigation. The intelligent detection system has successfully identified unregistered generating facilities in Hong Kong for our follow-up investigation since it came into operation in February 2022.

第二個方案是智能數據分析系統，可有效蒐集和整理在不同電商平台上出售的各種家用電氣產品資料，找出懷疑不安全或不符合香港法規的產品。該系統有助加強監察在電商平台上供應的家用電氣產品，以及提升調查和執法工作的效率。該系統於2022年1月開始運作，已完成約400間網上商店的查核工作。我們會就所發現的懷疑個案作出跟進調查。

The second solution is an AI and data analytics system which can effectively collect and sort out information of household electrical products put on sale on various e-commerce platforms and identify items suspected to be unsafe or non-compliant with the statutory requirements in Hong Kong. The system can help strengthen the monitoring of household electrical products supplied on e-commerce platforms and enhance the efficiency of investigation and law enforcement action. The system has completed the search of about 400 online stores since it commenced operation in January 2022. Follow-up investigation will be carried out for suspicious cases identified.

### 確保舊樓的電力安全

根據《電力(線路)規例》規定，固定電力裝置擁有人須為其固定電力裝置安排定期檢查、測試及領取證明書。如固定電力裝置的允許負載量超過100安培，該裝置必須最少每五年接受一次檢查、測試及領取證明書(表格WR2)。然而，上述的定期檢查及測試規定並不適用負載量為100安培或以下的固定電力裝置，而樓齡達60年或以上的舊樓內往往常有這類裝置。為確保舊樓內的固定電力裝置運作安全，機電署已建立機制，約每五年巡查這些樓宇內的電力裝置。如發現電力安全問題，我們會要求有關裝置擁有人進行檢查及維修工作。在2021/22年度，我們按上述機制已巡查多區內約1 045幢設有這類固定電力裝置的舊樓。日後，我們計劃把巡查範圍擴大至樓齡達50年或以上的樓宇。

### Ensuring Electrical Safety of Aged Buildings

According to the Electricity (Wiring) Regulations, the owners of fixed electrical installations shall have their electrical installations inspected, tested and certified periodically. Fixed electrical installations with an approved loading exceeding 100 amperes shall be inspected, tested and issued with a Periodic Test Certificate (Form WR2) at least once every five years. However, the above periodic inspection and testing requirement does not apply to fixed electrical installations with a loading of 100 amperes or below, which are common in old buildings aged 60 or above. To ensure that the fixed electrical installations in aged buildings operate safely, the EMSD has set up a mechanism to inspect the electrical installations in these buildings about once every five years. If any electrical safety problem is found, we will require the installation owners to carry out inspection and repair. In 2021/22, we inspected 1 045 aged buildings with such installations in various districts under the above mechanism. In the future, we will extend the scope of inspection to buildings aged 50 or above.

### 促進酒店和賓館的電力安全

上年度，我們與香港酒店業主聯會及香港酒店業協會合作，向酒店業界推廣客房電力安全的信息。另外，我們在2021年5月至7月及2021年11月至2022年1月期間，安排人員探訪約1 500家持牌酒店和賓館，以加強酒店及賓館業界對客房電力安全的意識。探訪期間，本署人員向負責人詳細講解新版《電力(線路)規例工作守則》及《電氣產品(安全)規例》中與酒店息息相關的項目，包括在住宿處所加設電弧故障檢測裝置的建議，安裝USB插座的安全規定，以及向客人提供電氣產品時的安全須知等。外展探訪人員亦向酒店業界提供本署的聯絡資料，方便業界就上述事宜作出進一步查詢。

### Promoting Electrical Safety in Hotels and Guesthouses

In the past year, we promoted electrical safety in hotel rooms to the hotel sector in collaboration with The Federation of Hong Kong Hotel Owners and the Hong Kong Hotels Association. We also arranged visits to about 1 500 licensed hotels and guesthouses from May to July 2021 and from November 2021 to January 2022, with the aim of raising the awareness of electrical safety in guest rooms among the hotel and guesthouse sector. During the visits, our staff explained in detail the requirements applicable to the hotel sector in the latest Code of Practice for the Electricity (Wiring) Regulations and the Electrical Products (Safety) Regulation, including the recommendation for the installation of arc fault detection devices, safety requirements for the installation of USB outlets and safety tips for providing electrical appliances to guests at accommodation premises. The outreach team also provided our contact details to the hotel sector for further enquiries of the above.

► 為加強酒店及賓館業界對客房電力安全的意識，我們在年內探訪了約1 500家持牌酒店和賓館，向負責人講解新版《電力(線路)規例工作守則》及《電氣產品(安全)規例》中與酒店及賓館相關的安全規定。

To raise the awareness of electrical safety in guest rooms among the hotel and guesthouse sector, we visited about 1 500 licensed hotels and guesthouses during the year to explain to the operators the safety requirements applicable to hotels and guesthouses in the latest Code of Practice for the Electricity (Wiring) Regulations and the Electrical Products (Safety) Regulation.



## 保障公眾安全 Protecting Public Safety

### 加強部門間對火警事故調查的協作

當發生與電力有關的火警事故時，機電署通常會聯同消防處等相關部門，到現場調查和搜證。為加強彼此的溝通和合作，機電署和消防處於2021年9月舉行首次定期協作會議。雙方在會上就協調及工作安排、如何加強火警事故調查的培訓，以及預防火警的宣傳工作等事宜進行討論。為進一步加強與相關部門的合作，日後我們會邀請政府化驗所和衛生署等部門參加會議，藉此加強各部門的溝通和協作，提高事故調查效率。

### Enhancing Inter-departmental Collaboration on Fire Investigation

Generally, when electricity-related fire incidents occur, the EMSD will join the Fire Services Department (FSD) and other relevant departments for on-site investigation and evidence gathering. To enhance communication and collaboration, the EMSD and FSD held the first regular collaboration meeting in September 2021. The two departments discussed matters such as coordination and work arrangements, how to strengthen training on fire investigation, and fire prevention promotion at the meeting. To further enhance collaboration with other related departments, we will invite the Government Laboratory, the Department of Health, etc. to attend the meeting in the future, with a view to enhancing the investigation efficiency of such incidents through closer communication and better collaboration among different departments.

### 與內地及區域組織聯繫

儘管過去一年疫情持續，我們一直與國家海關總署保持緊密聯繫，並善用科技於2021年12月首次以視像會議形式舉行第17次《機電產品安全及能源效益合作安排》(《合作安排》)年度會議，就兩地在機電產品安全及能效範疇的合作進行討論及交換意見。在《合作安排》下的電氣產品工作小組及跨境電商工作小組亦一直就電氣產品安全的事宜保持聯繫和合作。兩個工作小組分別於2021年10月及2022年3月就輸港家用電氣產品的相關法例規定及安全須知等課題舉行網上研討會，以推廣和加深內地製造商、檢測機構及電商平台對有關事宜的認識。兩個工作小組亦於過去一年按既定機制向對方通報六款懷疑不合規格的電氣產品(包括燈具、適配接頭、小型電源供應器等)，並已就通報個案作出深入調查和採取適當的跟進行動。

### Collaboration with Mainland and Regional Counterparts

Although the epidemic continued last year, we stayed connected with the General Administration of Customs of the People's Republic of China and leveraged technology to conduct the 17th annual general meeting on the Cooperation Arrangement on Electrical and Mechanical Products Safety and Energy Efficiency (Cooperation Arrangement) via video conferencing for the first time in December 2021. At the meeting, we discussed and exchanged opinion on cooperation between the Mainland and Hong Kong on the safety and energy efficiency of electrical and mechanical products. The Electrical Safety Working Group and Cross-border E-commerce Working Group under the Cooperation Arrangement also kept connected and maintained collaboration. The two working groups held online seminars in October 2021 and March 2022 respectively, focusing on topics such as the regulatory requirements and safety rules for electrical household products supplied to Hong Kong. The seminars served to promote and deepen the understanding of these topics among manufacturers, testing organisations and e-commerce platforms in the Mainland. During the year, the two working groups also notified their counterparts of six suspected non-compliant electrical products, including lighting, adapters and small power supply units according to the established mechanism. In-depth investigation and appropriate follow-up action were taken for the reported cases.



◀機電署與國家海關總署《合作安排》第17次年度會議於2021年12月舉行，這是首次以視像會議形式進行，圖為出席會議的機電署代表。即使疫情持續，在《合作安排》下的電氣產品工作小組及跨境電商工作小組亦一直就電氣產品安全的事宜保持緊密聯繫和合作。

The 17th annual general meeting on the Cooperation Arrangement between the EMSD and the General Administration of Customs of the People's Republic of China was held in December 2021. It is the first time that such meeting was held via video conferencing. Photo shows the EMSD representatives attending the meeting. Despite the prolonged epidemic, the Electrical Safety Working Group and Cross-border E-commerce Working Group under the Cooperation Arrangement maintained close liaison and collaboration on matters related to the safety of electrical products.

疫情亦無阻我們與區域組織之間的溝通交流。我們於2021年8月及2022年2月參加亞太區經濟合作組織(亞太經合組織)電氣及電子儀器聯合規管顧問委員會的視像會議，並就規管電氣產品安全與亞太經合組織超過20個成員經濟體的監管機構進行深入交流和討論。會議的目的是提升各成員經濟體的相關技術及安全水平。

Communication and exchange with regional organisations were also maintained despite the epidemic. In August 2021 and February 2022, we attended video conferences of the Asia-Pacific Economic Cooperation (APEC) Joint Regulatory Advisory Committee on Electrical and Electronic Equipment, in which we had in-depth discussion and exchange with the regulatory organisations of more than 20 APEC economies on the regulation of safety of electrical products. The meetings aimed at promoting the relevant technical and safety level among member economies.

### 為業界提供的服務

近年政府致力推動「精明規管」政策。為配合該項政策，我們承接上年度的規管服務電子化進程，於2021年7月推出與《電力條例》相關的一站式網上註冊申請服務。申請註冊續期的註冊電業工程人員現可通過電子平台填寫申請表、提交證明文件及繳費，並以電郵接收註冊證明書。截至2022年3月底，我們共收到超過1 900份通過平台提交的續牌申請，佔申請總數約17%。考慮到不少註冊電業工程人員較為年長，使用網上服務或需更多指引，我們在2022年年初製作了教學影片並把影片上載至社交平台。我們還在「機電行業通」流動應用程式上發放信息、向工會和商會發出電子郵件，以及為業界代表舉行簡報會等，以鼓勵更多註冊電業工程人員使用電子化服務。截至2022年3月底，有關電子服務已涵蓋《電力條例》所規管的多項註冊申請，包括註冊電業工程人員、註冊電業承辦商、已被認可作為確定地下電纜所在的合資格人士、電氣產品認可核證團體及電氣產品認可製造商等的註冊申請。

### Services provided for the Trade

In recent years, the Government has been committed to taking forward the "Be the Smart Regulator" initiative. In line with the initiative, we sustained our digitalisation momentum on regulatory services of last year and introduced the one-stop online registration application services regarding the Electricity Ordinance in July 2021. Registered Electrical Workers (REWs) applying for registration renewal can now fill in application forms, submit supporting documents and make payment on the electronic platform. They can also receive the registration certificates by email. As at the end of March 2022, we received a total of over 1 900 registration renewal applications submitted online, equivalent to about 17% of the total number of applications. Having regard to that many REWs are of older age and may need more guidance on using online services, we produced an instructional video and uploaded it to social media platforms in early 2022. We also distributed messages via the E&M Trade app, sent emails to trade unions and associations, as well as holding briefings for trade representatives to encourage more REWs to use the electronic services. As at the end of March 2022, electronic services have already been provided for a number of registration applications under the Electricity Ordinance, including that of the REWs, Registered Electrical Contractors (RECs), CPs, Recognized Certification Bodies for Electrical Products (RCBs) and Recognized Manufacturer for Electrical Products (RMs).

此外，於上年度推出的網上持續進修訓練平台，繼續獲業界大力支持及廣泛使用。由2021年1月至2022年3月期間，全港近28 000名註冊電業工程人員需要續期，當中約84%通過網上平台完成訓練，達至持續進修的要求。

In addition, the online Continuing Professional Development (CPD) training platform introduced last year continued to receive enthusiastic support and was widely used by the trade. From January 2021 to March 2022, near 28 000 REWs across the territory had to renew their registration, and about 84% of them fulfilled their CPD training requirements by completing training on the online platform.

10:51  
最新消息  
註冊電業工程人員 REW  
網上持續進修  
CPD訓練平台  
同心祈禱 EMSD

行業訊息  
機電工程署公共服務最新安排  
機電工程署(機電署)宣布，「機電·夢飛翔」展覽館由四月二十日起重新開放，惟因應疫情，展覽館將實施特別安排，包括限制館內參觀人數、要求所有參觀人士須佩戴口罩及進場前發佈日期：7天前

由2021年1月至2022年3月期間  
FROM JANUARY 2021 TO MARCH 2022

84% 註冊電業工程人員通過網上平台  
完成訓練  
REWs completed CPD training  
on the online platform

◀註冊電業工程人員現可於本署的網上持續進修訓練平台，完成持續進修培訓。完成培訓後，他們又可透過本署的一站式網上申請服務平台，填寫並遞交申請表格及繳費。該平台於2021年7月推出，目的是簡化所有關於《電力條例》及《電力(註冊)規例》的申請。  
Registered Electrical Workers can now use our online CPD training platform to complete CPD training. After that, they may renew their registration by filling in and submitting the application forms as well as making payment online through the one-stop platform we introduced in July 2021 to streamline all applications related to the Electricity Ordinance and Electricity (Registration) Regulations.

## 保障公眾安全 Protecting Public Safety

### 對公眾及業界的宣傳工作

年內，我們通過多個渠道推展全方位公眾宣傳教育工作，在不同季節及時段，通過電視、電台、公共交通工具及社交媒體等渠道，發放有關安全使用電熱水爐和充電器、為發電設施進行註冊，以及為固定電力裝置安排定期檢查、測試及領取證明書等重要安全信息。我們亦安排了28次幼兒園及長者院舍探訪活動，共接觸了近2 300名人士。在其中兩次幼兒園探訪活動中，我們更出動了機電署吉祥物「機智啤啤」和「智析寶寶」，以生動的方式向學生宣傳電力安全的信息。此外，我們在2021年11月舉辦了網上STEM工作坊，向年輕人宣傳電風扇安全。

在對業界宣傳方面，我們在2021年11月，與建造業議會及勞工處以視像形式合辦電力規例研討會，吸引約900名業界人士參與。



### 未來工作方向

在規管服務數碼化方面，來年我們會進一步擴大電子表格服務的涵蓋範圍。由2022年6月起，我們提供更多網上服務，包括提交定期測試證明書(表格WR2)供機電署加簽的服務，以及提交發電設施的註冊申請等。我們亦會為電力法例及規管服務電腦運作系統進行升級，以簡化及加快工作流程，提升規管服務的水平。此外，我們會申請撥款，開發語音識別和語言處理技術，以便處理有關證供、巡查報告等的文書工作，提升執法和日常工作的效率。另外，在宣傳教育方面，我們會更廣泛使用電子及社交平台舉行活動。

隨著疫情轉趨穩定，我們會重新開展外展活動，以加強宣傳電力安全。來年我們會探訪約2 000間售賣全新及二手家用電氣產品的零售店舖，以宣傳相關法例及安全要求。此外，我們會陸續把電氣安全宣傳品的內容，翻譯成少數族裔的語言，務求更有效地向不同羣體宣傳電力安全的信息。

### Promotion to the Public and the Trade

During the year, we carried out multi-pronged publicity campaigns through various channels, disseminating important safety messages including the safe use of electric water heaters and electric chargers, registration of generating facilities, and periodic inspection, testing and certification for fixed electrical installations through channels such as television, radio, public transport and social media in different seasons and time periods. We also arranged 28 visits to kindergartens and elderly homes, reaching nearly 2 300 people. In two kindergarten visits, we arranged the EMSD mascots Witty Bear and KnowBot to promote electrical safety to students in a lively way. In addition, we held an online STEM workshop in November 2021 to promote safe use of electric fans to young people.

Regarding promotion work for the trade, we held the Annual Technical Seminar in collaboration with the Construction Industry Council and the Labour Department via video conferencing in November 2021, with about 900 trade practitioners joining the event.

◀為擴大電子表格服務的涵蓋範圍，我們會由2022年6月起提供更多網上服務，包括提交定期測試證明書(表格WR2)供機電署加簽的服務，以及提交發電設施的註冊申請等。我們亦計劃開發語音識別和語言處理技術，以把處理證供、巡查報告等的文書工作數碼化。  
To expand the scope of e-form services, from June 2022, we will provide more online services, including e-submission of Periodic Test Certificates (Form WR2) for the EMSD's endorsement as well as applications for generating facility registration. We also plan to develop speech recognition and language processing technologies to digitalise the paperwork on evidence and inspection reports, etc.

### Future Endeavours

For the digitalisation of regulatory services, we will further expand the scope of e-form services next year. Since June 2022, we have provided more online services, including e-submission of Periodic Test Certificates (Form WR2) for EMSD's endorsement as well as applications for generating facility registration. The computer operating system of the Electricity Legislation and Regulatory Services (EORS) will also be upgraded to streamline and expedite the work process, and enhance the standard of regulatory services. In addition, we will apply for funding to develop speech recognition and language processing technologies for processing paperwork on evidence and inspection reports, etc., so as to enhance the efficiency of law enforcement and routine duties. Besides, we will use electronic and social platforms more extensively for publicity and educational activities.

As the epidemic stabilises, we will resume outreach activities to step up promotion of electrical safety. In the coming year, we will visit about 2 000 retail stores selling new and second-hand household electrical products to promote the relevant regulations and safety requirements. We will also translate the promotional materials about electrical safety into ethnic minority languages progressively to promote electrical safety to various communities more effectively.



### 「機電偵探」克服鮮為人知的困難 深入調查電力事故 “E&M Detective” Overcoming Challenges Rarely Known in Conducting In-depth Investigation of Electrical Incidents

機電署每年平均調查超過400宗懷疑電力事故，當中超過100宗經調查後證實與電力有關。電力法例部總技術主任林偉基先生以豐富經驗克服鮮為人知的困難，每次調查均詳細檢查肇事現場的電器及電力線路，為死者或苦主找出事故成因，並識別發生電力事故的各種風險，加強相關的電力安全宣傳教育。

Every year, the EMSD investigates over 400 suspected electrical incidents on average, and over 100 of them are confirmed to be related to electricity after investigation. Overcoming manifold difficulties rarely known to people with his rich experience, Mr Lam Wai-kei, a chief technical officer of the Electricity Legislation Division (ELD) thoroughly examines the electrical appliance and all wiring at the incident site in each investigation, in order to identify incident causes for the deceased or victims, as well as spotting various risks of electrical incidents with a view to strengthening relevant promotion and education efforts on electrical safety.

林先生憶述一宗在2016年發生的家居觸電事故，一名配樂師在村屋沐浴時觸電身亡。當時林先生領導的調查團隊逐一檢查村屋內的電器及電力線路，然而在現場工作超過18小時後，依然未找到任何存在漏電問題的裝置。經再三仔細視察現場後，他才發現附近一所距離涉事村屋100米並用作工作室的村屋，有不合規格的拖板連接至涉事村屋的電源取電。工作室內一盞錯誤接駁線路的電燈連正接至該拖板。由於電燈引致漏電，電流經接地線意外觸及的喉管流入涉事村屋的浴室；加上涉事村屋並沒有安裝漏電斷路器及有效接地，最終導致致命事故發生。

進行電力事故調查時，機電署調查人員對電力系統的經驗和知識固然十分重要，然而，他們承受心理及生理壓力的能耐也不容忽視。「舉例而言，我們有時需要在遺體仍未被移走並且危機四伏的火災現場，對有關的電器及電力線路進行檢查及搜證，以確定火警是否由電力事故引起。」林先生說。

在肇事單位或意外現場搜證難免令人恐懼。「我時常提醒自已，我是幫助死者或苦主找出事故成因，以減少恐懼感。在當值的月份，由於可能在深夜收到行動的指示，因此難以熟睡。遇上一天內收到五、六宗與電力有關的事故時，我們亦須因應緩急先後處理。此外，由於搜證需時，有時更要到偏遠地區工作，我們需要彈性處理同事用膳或其他個人需要。這都是在電力法例部工作的艱辛，不足為外人道。」林先生說。

林先生表示，發生電力意外往往可歸因於三個巧合，即保護裝置失靈、電器損壞，以及不適當使用電器。林先生舉例指有住戶用完風筒後，未有充分散熱即隨手將風筒放在以易燃物料製成的床褥上，令床褥因過熱而起火。

林先生說：「其實很多事故都可以避免。市民只需要在出門前先關掉所有電氣產品或充電裝置的電源；經常清理雪櫃和洗衣機，以避免機件運作時出現的火花點燃積聚的塵埃而導致火警；以及拔掉閒置電器的電源即可。這些日常習慣很簡單，卻有助保障電力安全。」

Mr Lam recalled that there was, in 2016, a home electrocution incident, in which a scoring engineer died of electrocution while bathing in a village house. At that time, the investigation team Mr Lam led checked every electrical appliance and all wiring in the house. Nevertheless, after more than 18 hours of work at site, the team still could not find any installation with electricity leakage problem. It was only after repeated thorough site inspection that he found out that a nearby house, which was used as a studio and about 100 metres away from the house concerned, had a non-compliant extension cord connected to the material house to obtain power supply. A wrongly wired lamp that was plugged into the extension cord caused electricity leakage and the electric current was transmitted through the earthing wire to the accidentally connected water pipes of the bathroom of the material house. Coupled with the lack of a residual current circuit breaker and effective earth connection in the material house, the fatal incident eventually occurred.

During the investigation of electrical incidents, the experience and knowledge in electrical systems of the EMSD's investigators are certainly vital, but their ability to withstand psychological and physical stress should not be overlooked. “For instance, we are sometimes required to examine and collect evidence from the electrical appliance and all wiring at perilous fire scenes, where the bodies of the deceased have not yet been removed, to determine if the fires are caused by electrical incidents,” Mr Lam said.

It is only human to be apprehensive working in the material places of incidents or accidents. “To ease my mind, I often remind myself that I’m there to find the causes of incidents for the deceased or victims. During duty months, it is difficult to have a deep sleep as I may be called for operation in the middle of the night. We also have to prioritise when there are five to six electricity-related incidents in a single day. Furthermore, as evidence collection takes time and sometimes we have to work in remote areas, we have to be flexible with colleagues’ meal-taking or other personal needs. Such are the untold trials and tribulations of the work in the ELD,” Mr Lam said.

Mr Lam told us that the occurrence of electrical incidents was often attributed to the coincidence of three elements, which were a faulty protection device, electrical appliance breakdown or damage and improper use of electrical appliances. He cited an example in which a resident casually placed a hairdryer still hot after use on the mattress made of flammable materials, causing the mattress to catch fire due to overheating.

“Many incidents are actually avoidable. All it takes is cutting the power supply to all electrical appliances or charging devices before leaving home; cleaning refrigerators and washing machines regularly to avoid fire accidents caused by sparks from an operating machine igniting the gathered dust; and unplugging idle appliances. These daily habits are simple yet helpful for ensuring electrical safety,” Mr Lam said.

## 保障公眾安全 Protecting Public Safety

### 氣體安全

#### 氣體事故數目穩定下降

經過多年來積極推行氣體安全宣傳工作，氣體事故數目持續穩定下降，由2020年的179宗下降至2021年的176宗，再創歷史新低。儘管過去一年疫情持續，我們仍持續深化「治未病」的文化，從多方面保障公眾氣體安全。

#### 氣體事故數目 NUMBER OF GAS INCIDENTS



179 宗  
CASE  
2020

176 宗  
CASE  
2021

#### 推廣村屋氣體安全改善措施

在2021/22年度，我們開展全新項目，推動在村屋安裝共用的中央石油氣供應系統，進一步提升氣體安全水平。目前，村屋用戶大多使用瓶裝石油氣作為燃料。由於法例未有規管石油氣裝置的設計，部分村屋外牆設有多條不規則的石油氣立管；又有住戶儲存多於一個石油氣瓶作備用，亦可能在石油氣未用盡時更換氣瓶，導致多付石油氣費用。有見及此，我們著手向村屋業主推廣使用中央石油氣供應系統，年內走訪了34條村超過3 800幢村屋，進行抽樣調查，同時宣傳氣體安全改善措施及宣揚採用中央供氣系統的好處。

同時，我們已向註冊氣體供應公司、地區防火委員會及相關持份者等推廣中央供氣系統，取得廣泛支持。此外，我們諮詢石油氣業界的意見後，推出新版《瓶裝石油氣分銷商工作守則》，作為推動中央供氣系統的基礎，亦製作了宣傳單張、海報、四格漫畫、動畫短片等宣傳材料，宣揚中央供氣系統的優點。長遠目標是爭取村屋業主及建造商的支持，在新建村屋採用中央供氣系統。

### GAS SAFETY

#### Steady Decline in the Number of Gas Incidents

With our vigorous efforts in promoting gas safety over the years, the number of gas incidents has been on a steady decline from 179 cases in 2020 to 176 cases in 2021, marking a new record low. Despite the ongoing epidemic in the past year, we continued to deepen our culture of prevention to ensure gas safety for the public through multi-faceted measures.

#### Promotion of Gas Safety Improvement Measures for Village Houses

In 2021/22, we embarked on a new initiative to promote the installation of centralised liquefied petroleum gas (LPG) supply systems for shared use of village houses to further enhance gas safety standard. Currently, LPG users living in village houses mostly use LPG cylinders for fuel. As there are no statutory regulation on the design of LPG installations, some houses have multiple irregular LPG risers on external walls. Some households store more than one LPG cylinder for spare use, and may replace cylinders that are not fully emptied, ending up with higher gas expenses. In view of this, we began to promote the use of centralised gas supply systems to village house owners. During the year, we have visited more than 3 800 village houses in 34 villages to conduct sample surveys while promoting gas safety improvement measures and championing the advantages of adopting centralised gas supply systems.

Meanwhile, we promoted centralised gas supply systems to Registered Gas Supply Companies (RGSCs), the District Fire Safety Committees and relevant stakeholders, and gained extensive support. In addition, after consulting with the LPG trade, we issued a new edition of Code of Practice for LPG Cylinder Distributors, to serve as the basis for the promotion of centralised gas supply systems. Promotional materials such as leaflets, posters, four panel comic strips and short animation videos were produced to advocate the benefits of centralised gas supply systems. The long-term goal is to gain the support of village house owners and developers to adopt centralised gas supply systems in new village houses.

#### 加強大廈氣體立管安全

氣體事故的記錄及數據顯示，在住宅單位內發生的氣體洩漏事故大多與屋苑的煤氣立管老化有關。現時香港約有17 000幢住宅大廈使用煤氣，共裝設約70 000多條煤氣立管。自2020年起，我們與香港中華煤氣有限公司(煤氣公司)合作，加強檢查煤氣立管的狀況，並在22個選定屋苑推行加強檢查煤氣立管的先導計劃，藉此鼓勵用戶盡早更換老化和銹蝕的煤氣立管。年內，煤氣公司在當中17個選定屋苑完成更換銹蝕喉管的工程。煤氣公司借鑒先導計劃的成功經驗，選定額外14個屋苑，在本年度推行上述計劃，其中11個屋苑的更換煤氣喉管工程已展開。兩批選定屋苑共有逾400幢建築物，大多樓齡超過30年。與此同時，我們亦督促註冊氣體供應公司密切監察使用中央供氣系統屋苑的氣體立管狀況。根據檢查報告，已確定本年度依次在九個屋苑，更換老化的石油氣立管。

為加強大廈立管安全，我們在有需要時會以規管者的身分，向氣體用戶解釋更換老化氣體立管對保障氣體安全，預防事故和維持正常氣體供應的重要性，並敦促氣體用戶積極配合註冊氣體供應公司更換氣體喉管的工作。

▼本署人員監察煤氣公司人員檢測煤氣立管。我們鼓勵用戶盡早更換老化和銹蝕的煤氣喉管，避免發生氣體洩漏事故。  
Our staff monitored the inspection of town gas risers by the staff of the HKCG. We encourage users to replace aged and corroded gas pipes as early as possible to prevent gas leakage incidents.



#### Enhancement of Gas Riser Safety in Buildings

Gas incident records and data indicated that the majority of gas leakage incidents in residential units were related to ageing town gas risers in the estates. Currently, there are about 17 000 residential buildings using town gas in Hong Kong, with more than 70 000 town gas risers. Since 2020, we have been collaborating with the Hong Kong and China Gas Company Limited (HKCG) to step up inspection of town gas risers. A pilot scheme was also launched to step up inspection of town gas risers in 22 selected estates, with a view to encouraging users to replace aged and corroded gas risers as early as possible. During the year, the HKCG completed the replacement of corroded gas pipes in 17 of the selected estates. Leveraging the successful experience of the pilot scheme, the HKCG has selected 14 additional residential estates for launching the above scheme in the current year. The gas pipe replacement works have commenced in 11 of the estates. These two batches of selected estates totally covered more than 400 buildings, most of which are aged over 30 years. Meanwhile, we have been urging the RGSCs to closely monitor the condition of gas risers at estates that use centralised LPG supply systems. According to inspection reports, it was confirmed that the replacement of aged LPG risers would be conducted in 9 estates in succession in this year.

To ensure gas riser safety in buildings, when necessary, we would explain in the capacity of the regulator to gas users the importance of replacing aged gas risers in ensuring gas safety, preventing incidents and maintaining normal gas supply. We would also urge gas users to facilitate the gas pipe replacement works conducted by the RGSCs.



▲煤氣公司及機電署人員運用激光甲烷檢測儀，遙距探測室外氣體喉管有否洩漏煤氣。檢測儀固定在三腳架上，配備長焦距鏡頭相機，有效探測距離高達200米，即約30層樓高。由於在疫情下難以進入住宅單位檢查氣體喉管，檢測儀配備的遙距檢測功能尤其有用。  
Staff of the HKCG and EMSD used a laser methane detector for remote detection of town gas leakage of external gas pipes. Mounted on a tripod and equipped with a long focal length camera, the detector has an effective detection range as high as 200 metres, which is about 30-storey high. Given the difficulty in gaining access to residential units for inspection of gas pipes under the epidemic, the remote detection function of the detector is particularly useful.

## 保障公眾安全 Protecting Public Safety

### 持續推動氣體裝置定期安全檢查

我們一直與香港房屋委員會(房委會)、香港房屋協會(房協)及註冊氣體供應公司合作宣傳定期安全檢查，並主動向「長期沒接受安全檢查服務」公共屋邨氣體用戶提供入屋檢查服務，多年來成效相當顯著。在2021/22年度，我們更將這項計劃推展至九個私人屋邨。年內，我們根據此計劃為全港101個分別使用煤氣或中央石油氣的公共及私人屋邨內，總數逾11 600戶「長期沒接受安全檢查服務」的住戶進行定期安全檢查，整體的入屋檢查率提升至超過99%。

### Continuous Promotion of Regular Safety Inspection of Gas Installations

We have been collaborating with the Hong Kong Housing Authority (HKHA), Hong Kong Housing Society (HKHS) and RGSCs to promote regular safety inspection (RSI) and proactively offer inspection services to “long-time-no-service” (LTNS) gas users in public housing estates, with notable results over the years. In 2021/22, we extended the programme to nine private estates. During the year, a total of over 11 600 LTNS households in 101 public and private housing estates using town gas or centralised LPG supply received RSIs under this programme. The overall RSI coverage rate was elevated to above 99%.

### 批出專用石油氣加氣站新合約維持石油氣加氣網絡穩定

全港12個專用石油氣加氣站的銷量佔全港專用石油氣總銷量的65%。專用氣站在舊合約下營運了約22年，新合約已於2021年5月全數批出。其中一個專用氣站已經進行翻新工程，包括更換石油氣加氣設施，並重新投入服務。餘下11個專用氣站亦會陸續進行翻新工程。為了盡量減低對石油氣的士和小巴業界造成不便，我們一直與業界保持良好溝通，讓業界清楚了解各專用氣站翻新工程的時間表，並督促新營運商盡早完成翻新工程。業界對我們的統籌安排反應非常正面。我們預料六個專用氣站的翻新工程將於2022年展開，並於年底完工，餘下五個專用氣站將於2023年完成翻新。

### Awarding New Contracts of Dedicated LPG Filling Stations to Maintain Stability of the LPG Filling Network

The 12 Dedicated LPG Filling Stations (DFSs) accounted for 65% of the total auto-LPG sales volume in Hong Kong. The DFSs had been operating under the old contracts for 22 years and new contracts were awarded on May 2021. One of the DFSs was re-opened for operation after renovation which included replacement of LPG filling facilities. Renovation works will also be carried out for the remaining 11 DFSs subsequently. To minimise the inconvenience caused to the LPG taxi and minibus trades, we maintained good communication with them to keep them well informed of the renovation schedule of the DFSs, and urged the new operators of DFSs to expedite the renovation works. The trade responded positively to our co-ordination arrangement. It is expected that the renovation works for six DFSs will commence in 2022 and will be completed by end of the year, while the remaining five DFSs will also be renovated by 2023.

### 整體入屋檢查率 OVERALL RSI COVERAGE RATE



99% ▲▲

為提升食肆的氣體安全，我們由2019年起開展全港食肆問卷調查計劃，到訪超過15 000家持牌食肆及會所，收集其氣體爐具種類及狀況的資料，之後從中篩選超過300家較急切需要外展支援的食肆，並安排註冊氣體供應公司為其氣體裝置進行快速檢查。有見於快速檢查的成效理想，我們會繼續與註冊氣體供應公司合作推動計劃，鼓勵持牌食肆為其氣體裝置進行定期安全檢查，以提升氣體安全。

To enhance gas safety at food premises, we have launched a territory-wide survey programme since 2019, and visited more than 15 000 licensed food premises and clubhouses to collect information on the types and condition of gas appliances they used. We subsequently identified more than 300 food premises that required outreach support more urgently, and arranged RGSCs to conduct quick checks on their gas installations. As quick checks achieved positive results, we will continue to collaborate with the RGSCs to promote the programme and encourage licensed food premises to conduct RSI for their gas installations to enhance gas safety.

▶ 機電署員工向食肆負責人派發氣體安全單張。我們到訪持牌食肆及會所，收集其氣體裝置狀況的資料，更為其中300多家較急切需要外展支援的食肆，安排註冊氣體供應公司為其氣體裝置進行快速檢查。  
Our staff distributed gas safety leaflets to a restaurant operator. We visited licensed food premises and clubhouses to collect information on the condition of their gas installations; and arranged RGSCs to conduct quick checks on gas installations at over 300 food premises requiring outreach support more urgently.



▲ 經翻新後的觀塘專用石油氣加氣站已於2021年12月重新投入服務。觀塘專用石油氣加氣站是全港12個專用石油氣加氣站之一，也是首個完成翻新工程及更換石油氣加氣設施的專用加氣站。  
The Kwun Tong DFS was re-opened for operation in December 2021 after renovation. Being one of the 12 DFSs in Hong Kong, it is the first DFS whose renovation and replacement of LPG filling facilities have been completed.



▼ 觀塘專用石油氣加氣站設有特別通道，供免費接送2019冠狀病毒病人往返求診的專屬的士使用。這項特別安排有助減低社區感染風險。  
The Kwun Tong DFS had a special aisle reserved for the use of designated taxis which provided confirmed COVID-19 patients with free transport services to medical consultation. The special arrangement at the DFS helped reduce the risk of community infection.

## 保障公眾安全 Protecting Public Safety

### 促進更換大型石油氣缸

全港有93個屋邨使用中央石油氣供應系統，共設有175個大型石油氣缸。法例規定，這類氣缸在啟用後十年內必須進行一次全面測試及檢驗，隨後則須每五年進行一次，確保氣缸狀況良好。2021年，我們監督了22個大型氣缸的定期測試及檢驗或更換程序。其中三個氣缸所在的屋邨只配備一個氣缸，我們與有關氣體裝置擁有人保持緊密溝通，適時批出其臨時石油氣系統的使用許可，確保用戶在氣缸測試及檢驗期間不受影響。此外，由於大型氣缸多在東南亞製造，疫情期間封關及海外運輸問題嚴重影響新氣缸的交付。我們與本港註冊氣體供應公司保持聯繫，並與海外製造商緊密協調，確保氣缸更換工程能如期完成，保障氣體供應。

### Facilitating Replacement of LPG Bulk Tanks

There are 93 housing estates using centralised LPG supply system in Hong Kong, with a total of 175 LPG bulk tanks. The legislation stipulates that these bulk tanks must undergo a complete test and examination at least once within ten years after commissioning, and subsequently once every five years to ensure that the bulk tanks are in good condition. In 2021, we supervised the regular test and examination or replacement of 22 bulk tanks. Three of the bulk tanks are located in estates with only one tank. We maintained close communication with the owners of the gas installations, and granted approval for temporary LPG systems in those three estates in a timely manner to ensure that gas users would not be affected during the test and examination period. In addition, as bulk tanks are mostly made in Southeast Asia, new tank delivery was seriously affected by lockdowns and overseas transportation problems during the epidemic. We stayed in touch with local RGSCs and closely co-ordinated with overseas manufacturers to ensure that the replacement of bulk tanks could be completed as scheduled to safeguard gas supply.

► 馬灣一個使用中央石油氣供應系統的屋苑進行更換大型石油氣缸工程，機電署人員監察施工情況。  
The EMSD staff monitored the replacement of a bulk LPG tank at a housing estate using the centralised LPG supply system in Ma Wan.



▼ 由於大型氣缸多在東南亞製造，其付運因疫情期間封關而大受影響。我們與本港註冊氣體供應公司及有關製造商緊密協調，確保氣缸更換工程能如期完成，保障氣體供應。  
As bulk tanks are mostly made in Southeast Asia, their delivery is seriously affected by lockdowns during the epidemic. We liaised closely with local RGSCs and relevant manufacturers to ensure that the replacement of bulk tanks could be completed as scheduled to safeguard gas supply.



◀ 第五波疫情期間，為應對確診及隔離人數大增可能對人手構成的影響，我們密切監察煤氣公司及各註冊氣體供應公司，確保煤氣廠生產設施及石油氣庫正常運作。機電署人員檢查煤氣公司廠房的運作情況(左圖)，並監察煤氣品質抽樣檢測(右圖)。

During the fifth wave of the epidemic, in view of the possible impact of the surge in the number of confirmed and quarantined cases on manpower, we closely monitored the HKCG and other RGSCs to ensure normal operation of the town gas production facilities and LPG compounds. The EMSD staff inspected the operation of the HKCG's town gas production plant (left) and monitored a sampling test of town gas quality (below).



### 確保疫情高峰期的氣體供應正常

2021年第四季，由於內地港口的引航員人手短缺，令從珠海和東莞輸送石油氣到港的船隻船期嚴重延誤。我們即時請廣東省交通運輸廳及廣東省科學技術協會進行協調。在廣東省政府的支援下，香港的石油氣船隻獲安排優先進出口口。另外，在2022年3月疫情踏入第五波高峰時，本港一家石油氣供應商於向我們求助，指內地供氣商因疫情無法為其供港石油氣瓶及時供氣。我們即時再請廣東省科學技術協會與深圳市政府協調，最終內地方面以特事特辦方式恢復輸港供氣。粵港兩地齊心合力，終確保疫情下輸港石油氣供應正常。

### Ensuring Normal Gas Supply at the Peak of Epidemic

In the fourth quarter of 2021, the LPG carriers to Hong Kong from Zhuhai and Dongguan were seriously behind schedule due to a shortage of pilots at the Mainland ports. We swiftly contacted the Department of Transport of Guangdong Province and the Guangdong Provincial Association for Science and Technology (GPAST) for co-ordination. With the support of the Guangdong Provincial Government, Hong Kong LPG carriers were given priority to enter and exit the ports. Besides, at the peak of the fifth wave of COVID-19 in March 2022, a local LPG supplier sought our assistance as its Mainland supplier could not supply gas in time for their LPG cylinders bound for Hong Kong due to the epidemic. Once again we immediately contacted GPAST which co-ordinated with the Shenzhen Municipal Government, and gas supply for Hong Kong was resumed under the approach of special arrangements for special circumstances. With the concerted efforts of Hong Kong and Guangdong, normal LPG supply for Hong Kong was ensured despite the epidemic.

此外，第五波疫情期間，為應對業界可能出現染疫或隔離人數大增的問題，我們加強與業界溝通並持續監察煤氣公司及各註冊氣體供應公司，確保煤氣廠及石油氣庫正常運作，業界遵守所有防疫及緊急應變措施。同時，由於專用石油氣加氣站的人手亦受到影響，我們立刻積極協調各註冊氣體供應公司及專用氣站，確保的士及小巴業界有穩定的石油氣供應。

Furthermore, during the fifth wave, in view of the possible surge in the number of confirmed or quarantined cases in the industry, we strengthened communication with the trade and continued to monitor the HKCG and RGSCs to ensure normal operation of the town gas production plant and LPG compounds, as well as observance of all anti-epidemic and contingency measures. At the same time, as the manpower of DFSs was also affected, we immediately took the lead to co-ordinate with all RGSCs and their DFSs to ensure stable LPG supply for taxis and minibuses.

最終，在我們全方位統籌下，疫情高峰期間全港家用及商用的燃氣供應維持正常。

Eventually, through our comprehensive co-ordination, normal gas supply for residential and commercial premises was maintained during the peak of the epidemic.

## 保障公眾安全 Protecting Public Safety

### 跨境合作 確保燃氣產品安全及石油氣質量

年內，我們繼續與杭州海關緊密合作，由源頭打擊未獲批准的燃氣產品（包括家用氣體爐具及氣瓶）經內地電商平台輸港。雙方跨境規管合作模式及防控措施已見成效，年內我們一共向內地機構呈報六類經內地電商平台輸港的未獲批准燃氣產品。石油氣的質量對石油氣車輛及爐具性能非常重要，因此，我們與深圳海關和拱北海關共同構建了輸港石油氣粵港澳大灣區機構合作網上平台，並將有關供港石油氣質量檢報告上載至網上平台，以助兩地更快捷有效地共同監管供港石油氣的質量。全新的網上平台已於2022年第一季啟用。年內，我們亦與北京市城市管理委員會攜手建立京港燃氣安全監管和管理交流平台，進一步促進兩地分享燃氣安全監管的監管和發展經驗。

此外，我們正與廣東省科學院合作共同研發特種機械人，以人工智能技術檢測及分析石油氣缸車氣缸的內部狀況。檢測機械人配備特制的工作模組，可進行全方位夜視拍攝、超聲波探測和數據分析，有效協助規管團隊遙距檢測氣缸的厚度、焊縫完整性及銹蝕情況等。檢測機械人將於2023年第一季送港作調校和試行。



▲ 機電署與國家海關總署的代表出席於2021年11月在線上舉行的第32次燃氣工作小組會議。雙方在會上熱烈討論多個共同關注的議題，包括如何進一步提升氣體爐具安全和石油氣品質等。

Representatives of the EMSD and GACC attended the 32nd Meeting of the Gas Working Group held online in November 2021. At the meeting, the two parties had a lively discussion on various issues of mutual interest, including measures to further enhance gas appliance safety and LPG quality.

### Cross-border Co-operation to Ensure Gas Product Safety and LPG Quality

During the year, we continued to maintain close ties with Hangzhou Customs to tackle at source the import of unapproved gas products, including domestic gas appliances and gas cylinders via Mainland e-commerce platforms. The cross-border regulatory collaboration regime and control measures have begun to yield results. In the year, we reported to our Mainland counterparts six types of unapproved gas products imported to Hong Kong via Mainland e-commerce platforms. As the quality of LPG is vital to the performance of LPG vehicles and gas appliances, we joined hands with Shenzhen Customs and Gongbei Customs to set up a Greater Bay Area institutional co-operation online platform on LPG supply to Hong Kong. Quality examination reports of LPG supplied to Hong Kong are uploaded to the online platform, which will facilitate the two cities' co-monitoring of the quality of LPG supplied to Hong Kong in a more efficient and effective manner. The new online platform was launched in the first quarter of 2022. During the year, we also collaborated with the Beijing Municipal Commission of Urban Management to set up a communication platform between Beijing and Hong Kong on the regulation and management of gas safety, to further promote mutual exchange of experiences on such areas in the two cities.

Moreover, we have been working with the Guangdong Academy of Sciences to co-develop specialised robots using artificial intelligence (AI) technology to inspect and analyse the inner shell condition of the tank of LPG road tankers. The inspection robot is equipped with specialised work modules, which can capture night-vision images from all directions, and carry out ultrasonic inspection and data analysis, effectively assisting the regulatory team in the remote inspection of the tank shell thickness, integrity of welds and state of corrosion. The inspection robot will be delivered to Hong Kong for calibration and trial in the first quarter of 2023.



▲ 出席第32次燃氣工作小組會議的天津海關代表。  
Representatives of the Tianjin Customs attending the 32nd Meeting of the Gas Working Group.

### 持續宣傳使用「GU」標誌家用氣體爐具

自2020年起，我們積極展開公眾宣傳教育，鼓勵市民盡快更換老化及沒有「GU」標誌的舊式家用氣體爐具。根據註冊氣體供應公司所提供的資料估算，現存沒有「GU」標誌爐具的數目已下降至少於3%。我們會繼續與註冊氣體供應公司合作，請他們為用戶進行定期安全檢查時，鼓勵和建議用戶更換沒有「GU」標誌的爐具，或在爐具上張貼安全標貼，以作提醒。另外，我們亦會主動聯繫各個目標屋邨和屋苑的物業管理公司，與他們共同進行氣體爐具安全的宣傳教育工作。

### 推動持續專業進修 提升車輛維修業界水平

註冊車輛維修技工須要每三年完成最少20小時持續專業進修以更新註冊。在疫情期間，為滿足業界持續專業進修的需要，我們為車輛維修技工舉辦網上培訓活動。由2020年2月至2022年1月期間，我們舉辦了30次網上培訓活動，共有17 000人次參與，提供28 000小時的持續專業進修時數，佔註冊車輛維修技工所需持續專業進修時數的大多數。由於反應熱烈，我們於2022年3月推出網上持續專業進修平台「VM加分站」，該平台設有管理持續專業進修記錄的功能，簡化註冊續期流程，惠及8 000名註冊車輛維修技工。

「VM加分站」內容豐富，除本地教材外，我們與海外大學合作，提供由該些大學製作的教學影片，並配上中文字幕，方便車輛維修技工於網上自學車輛維修知識。除自學課程外，我們由2021年起與香港汽車工業學會合作，舉行網上車輛維修技術講座，內容涵蓋汽車業各種知識，包括車輛維修工場的法規、車輛維修工作的職安健要求、車輛維修技術及最新發展、電動車和新能源車輛等。每次講座均吸引超過500名車輛維修技工參加。

### Continuous Promotion on the Use of Domestic Gas Appliances Bearing GU Mark

Since 2020, we have stepped up our public education and promotion work to encourage the public to replace aged domestic gas appliances that do not have a GU mark as soon as possible. Based on the information provided by RGSCs, it is estimated that the number of gas appliances without a GU mark has decreased to less than 3% of the total. We will continue to work with RGSCs and ask them to encourage and advise users to replace gas appliances without a GU mark, or affix a safety label on the appliances in question as reminder during RSI. Moreover, we will proactively contact the property management companies of targeted housing estates to carry out joint gas safety promotion and education work on gas appliance safety.

### Promoting Continuing Professional Development to Enhance the Standard of Vehicle Maintenance Trade

Registered vehicle mechanics (RVMs) are required to complete at least 20 hours of Continuing Professional Development (CPD) training every three years to renew their registration. During the epidemic, in order to meet the CPD needs of the trade, online training for RVMs were held. From February 2020 to January 2022, we held 30 online training sessions, which were attended by 17 000 participants in total, with 28 000 CPD hours granted, which accounted for a majority of the RVMs' requisite CPD hours. In view of the enthusiastic response, we introduced an online CPD platform, namely VM Learning Station, in March 2022. With the CPD record management function of the platform, the registration renewal procedures were simplified, benefitting 8 000 RVMs.

The VM Learning Station is rich in content. Apart from local learning materials, education videos produced by overseas universities appointed specifically, with Chinese subtitles added, were also provided to facilitate RVMs' acquisition of knowledge about vehicle maintenance by online self-learning at their convenience. In addition to self-study courses, since 2021, we have been collaborating with the Institute of the Motor Industry Hong Kong to organise technical webinars on vehicle maintenance, covering a wide range of knowledge related to the automotive industry, including the statutory requirements for vehicle maintenance workshops, occupational safety and health requirements related to vehicle repair work, technology and latest development of vehicle repair, as well as electric vehicles and new-energy vehicles. Each webinar attracted more than 500 vehicle mechanics.



## 保障公眾安全 Protecting Public Safety

### 推動輕度易燃雪種家用冷氣機安全 不斷提升技術人員水平

鑑於本港家用冷氣機使用輕度易燃的R32環保雪種已成為新趨勢，我們積極與各大供應商和培訓機構協調，為處理這類冷氣機的技術人員提供相關訓練。目前，全港約六成技術人員已接受訓練。為進一步加強技術人員的安全意識，我們正研究可否為這些技術人員引入自願註冊計劃，以提升他們的專業知識。

### 研究使用氫燃料

政府於2021年3月公布《香港電動車普及化路線圖》，並於同年5月成立碳中和專責小組。為配合應用氫能的大趨勢，我們已派員協助碳中和專責小組開展首期以氫燃料作為主題的課程，共同探討在香港使用氫燃料的可行性。同時，氣體標準事務處已成立氫燃料小組，了解國內、國外氫能發展、相關的法律法規和風險管理，為日後參與政府推廣使用氫燃料的工作做好準備。

此外，政府正探討氫燃料電池車輛（特別是中大型及中長途車輛）在本港應用的可行性。政府在2021年10月公布《香港氣候行動藍圖2050》後，已成立跨部門工作小組，處理在香港應用氫能所需的工作，並計劃在未來3年與專營巴士公司及其他持份者合作，試行氫燃料電池巴士和重型車輛。為此，我們計劃在氣體標準事務處內成立氫能分部，為跨部門工作小組提供有關燃氣安全的專業意見，以及統籌有關使用氫燃料的可行性和相關法例要求的顧問研究，並會積極參與氫能發展的工作。

### Promoting Safety of Domestic Air-Conditioners with Mildly Flammable Refrigerants by Continuously Improving the Skills of Technicians

Given that the use of R32 mildly flammable and eco-friendly refrigerants in domestic air-conditioners has become a new trend, we have been coordinating with major suppliers and training organisations to provide relevant training for technicians to deal with such air-conditioners. Currently, about 60% of the technicians have received the training in Hong Kong. To further increase their safety awareness, we are exploring the feasibility of introducing a voluntary registration scheme for these technicians to enhance their professional knowledge.

### Studies on the Use of Hydrogen Fuel

The Government released the Hong Kong Roadmap on Popularisation of Electric Vehicles in March 2021 and set up a Carbon Neutrality Task Force in May the same year. To tie in with the macro trend of the application of hydrogen energy, we have assigned colleagues to assist the Task Force in embarking on its first-phase programme with hydrogen fuel as its theme, exploring together the feasibility of using hydrogen fuel in Hong Kong. Meanwhile, the Gas Standards Office (GasSO) has set up an in-house hydrogen team to look into the development of hydrogen energy on the Mainland and overseas, related laws and regulations and risk management, paving the way for our participation in the Government's efforts in promoting the use of hydrogen fuel in the future.

Furthermore, the Government is exploring the feasibility of adopting hydrogen fuel cell vehicles, especially medium to large as well as medium-haul and long-haul vehicles, in Hong Kong. Following the release of the Hong Kong's Climate Action Plan 2050 in October 2021, the Government has set up an inter-departmental working group to handle the work relating to the application of hydrogen energy in Hong Kong, and planned to collaborate with the franchised bus companies and other stakeholders to test out hydrogen fuel cell electric buses and heavy vehicles in the next three years. In this connection, we plan to set up a hydrogen sub-division under the GasSO to support the inter-departmental working group by providing professional gas safety advice and coordinating consultancy studies on the feasibility of using hydrogen fuel and related legislative requirements. The sub-division will also actively take part in the development of hydrogen energy.

### 來年展望 落實六大重點工作

### The Year Ahead: Six Key Focuses

#### 重點工作一：延續「治未病」規管

我們會延續「治未病」的整體規管工作方針，全面落實各項重點工作，以提升氣體安全水平及預防事故發生。

因應村屋石油氣供氣模式的現況，我們會繼續聯同業界推廣改善村屋氣體安全措施（例如安裝中央石油氣供應系統），以提升供氣效率及改善氣體安全水平。我們的長遠目標是將全港瓶裝石油氣的物流運作現代化，應用創新科技（創科）工具提升供氣效率，減少浪費資源。由於氣體裝置「快速檢查」計劃能顯著提升使用瓶裝石油氣的持牌食肆的氣體安全水平，有關計劃已擴展至使用煤氣及中央管道式石油氣的持牌食肆，目標是在2023年中完成所有檢查工作。我們會繼續向市民及工商業氣體用戶（例如食肆和洗衣店）推廣氣體安全，包括提供最新法規資訊、優良作業方法和指引，推介模範做法和創科工具等，以進一步提升氣體裝置的操作安全。

此外，我們會為註冊氣體供應公司及專用石油氣加氣站營運商設立專用的網上平台，以便他們定期把氣體設備資料、安全論證報告、事故數據、日常檢查及保養維修記錄等上載該平台。此舉有助我們更便捷地查閱和分析石油氣儲存庫及專用石油氣加氣站的風險，並預先計劃監管工作，預防事故發生。

#### Focus 1 : Continuing to adopt Culture of Prevention

We will continue to adopt the overall regulatory approach by culture of prevention for the full implementation of the various focuses to enhance overall gas safety and prevent incidents.

In view of the LPG supply models at village houses, we will continue to collaborate with the trade to promote gas safety improvement measures for village houses, such as installing centralised LPG supply systems, to enhance the efficiency and safety of gas supply. Our long-term goals are modernising the logistics of LPG cylinders throughout the territory, as well as enhancing the efficiency of gas supply and reducing wastage through the application of innovation and technology (I&T) tools. As the "Quick Check" scheme can significantly improve gas safety at licensed restaurants which use LPG cylinders, it has been extended to licensed restaurants which use town gas or piped LPG. All the checks are targeted to be completed in mid-2023. We will continue to promote gas safety to the public and industrial and commercial gas users, such as licenced restaurants and laundry shops. The work includes providing information about the latest regulatory framework, best practices and guidelines, and recommending model practices and I&T tools, etc. to further enhance the operational safety of their gas installations.

Moreover, we will set up a dedicated online platform for the RGSCs and DFS operators to regularly upload information, such as gas installation records, safety case reports, incident data, records of regular inspection and maintenance, etc. onto the platform. This will facilitate our review and analysis of the risks of LPG storage facilities and DFSs, and enable us to plan ahead our regulatory work and prevent incidents.

#### 重點工作二：善用創科工具

我們會繼續與業界協作，善用創科工具（例如激光甲烷檢測儀及智能煤氣喉管狀況分析系統）優化現行的煤氣喉管洩漏檢測工作，加強檢測舊樓的氣體喉管狀況，希望這些創科工具有助監測整個氣體供應鏈的安全情況。近年，煤氣公司積極研發一款備有安全功能的智能煤氣錶。除了可自動報錶外，該智能煤氣錶內置安全閥門，可持續監測室內煤氣供應情況。如發生異常情況（例如流量過大、長時間持續用氣或長期沒有進行安全檢查），該煤氣錶會停止供氣，並即時向煤氣公司發出警示，以便安排技術人員跟進。我們將會密切留意智能煤氣錶的進展進度，期望該裝置可以全面提升用戶的氣體安全水平。

此外，我們會利用人工智能及全影像分析系統監察專用石油氣加氣站外的交通情況，確保營運商按合約規定妥善管理加氣站的車輛流量。利用創科工具實時監察站外加氣車輛的排隊情況，不但可省卻人手點算車輛的工作，亦可讓我們掌握車輛排隊情況的實時及準確數據，以便與其他相關政府部門分享，從而迅速作出妥善應對，避免交通狀況惡化，以及減少每日加氣高峰時段加氣車輛排隊對附近交通造成的影響。

#### Focus 2 : Leveraging I&T Tools

We will continue to collaborate with the trade to apply I&T tools such as the laser methane detector and the artificial intelligence (AI)-based Riser Health Condition Analytics System to enhance the leakage inspection of existing gas pipes and strengthen the examination of gas pipe condition in aged buildings. It is hoped that such I&T tools can help to monitor the safety of the entire gas supply chain. In recent years, the HKCG has actively explored and developed a smart gas meter with safety features in addition to the automatic meter reading function. Equipped with a built-in safety valve, the smart gas meter can continuously monitor indoor gas supply. If anomalies, such as excessive flow, prolonged and continuous gas use or prolonged absence of safety checks, are detected, the gas meter will stop the gas supply and promptly alert the HKCG for follow-up action by technicians. We will keep a close look at the extension progress of the smart gas meter, in the hope that the device will enhance the overall gas safety for users.

Furthermore, we will use AI and video analytics system to monitor the traffic outside DFSs to ensure that the operators manage the traffic flow at the stations properly according to the contracts. Using I&T tools to monitor car queuing situations outside the stations in real time can not only save the manpower required for manual counting of the vehicles, but also enable us to obtain real-time and accurate car queuing data, for sharing with other government departments, so that they can make swift and appropriate responses to avoid deterioration of the traffic situation and mitigate the impact on nearby traffic caused by the queue at daily refuelling peak hours.

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### 重點工作三：繼續積極參與政府的減碳及碳中和工作

隨著電動車日漸普及，我們正積極與業界人士、學術和培訓機構、專業團體、車主會等持份者及相關部門合作，共同探討在車輛維修技工自願註冊計劃下為電動車維修技工及工場增設專屬的服務類別。此舉可推動電動車業界參與自願註冊計劃，確保電動車有適當的維修支援，以及協助維修電動車的技工及工場掌握相關的維修知識和技術，藉此保障道路安全。

除了致力有關電動車的工作外，氣體標準事務處將成立氫能分部，密切跟進氫燃料電池巴士和重型車輛試驗工作的最新發展，並會應跨部門工作小組要求，委託顧問就氫燃料車輛、加氫站及其配套設施進行風險評估，以及就相關法規、安全設計、標準及技術指引等範疇進行深入研究。研究結果將有助政府在試驗工作完成後，就應用新能源交通工具制定更具體的未來路向和時間表，使運輸業界可在2050年前實現碳中和的目標。

### Focus 3 : Continuing to participate in the Government's effort in carbon reduction and carbon neutrality

As electric vehicles (EVs) has become increasingly popular, we are working closely with stakeholders such as the trade practitioners, academic and training organisations, professional groups, car owner associations, and relevant departments to explore the addition of a dedicated service category for EV mechanics and workshops under the Voluntary Registration Scheme for Vehicle Mechanics (VRSVM). This can, on one hand, encourage the EV trade to take part in the VRSVM and in turn ensure that proper maintenance support will be available for the EVs, and on the other hand, help EV mechanics and workshops acquire relevant knowledge and techniques, thereby ensuring road safety.

In addition to our work on the EVs, the GasSO will set up a hydrogen sub-division to keep track of the latest development of the trial of hydrogen fuel cell electric buses and heavy vehicles. As requested by the inter-departmental working group, we will commission consultancies to conduct risk assessments for hydrogen fuel cell vehicles, hydrogen filling stations and associated infrastructures, and carry out an in-depth study on the relevant regulatory framework, safety design, standards, technical guidelines, etc. The results of these studies will help the Government formulate a more concrete way forward and a timetable for the adoption of new energy vehicles upon the completion of the trial, enabling the transport industry to achieve carbon neutrality before 2050.

### 重點工作四：全力支持氣體基建項目

年內，我們已完成審批兩間電力公司提交有關建造海上液化天然氣接收站的申請，並繼續監察各項氣體裝置的建設工程。工程竣工後，我們會審批接收站各項氣體裝置的使用申請。同時，我們會檢視接收站和相關系統的安全管理系統，以及審查因接收站而出現的新氣體業務申請，確保接收站的運作符合《氣體安全條例》的要求。接收站投入運作後，可大大提升香港天然氣供應的穩定性，以及增加天然氣在本港整體發電燃料組合中的比例。我們的目標是在2035年或之前以零碳能源組合（包括天然氣）全面取代燃煤發電。

### Focus 4 : Giving Full support to gas infrastructure projects

During the year, we approved the two power companies' application for the construction of an offshore liquefied natural gas terminal, and continued to monitor the construction of various gas installations. After the completion of the project, we will process applications for the use of gas installations at the terminal. Meanwhile, we will review the safety management systems of the terminal and related systems, and examine applications for new gas businesses arising from the terminal, to ensure that its operation will comply with the Gas Safety Ordinance. After commissioning, the terminal will greatly enhance the stability of local natural gas supply and increase its proportion in the overall fuel mix for power generation in Hong Kong. Our goal is to replace coal entirely with a mix of zero-carbon energy, including natural gas, for power generation by 2035.

### 重點工作五：提升從業員的專業能力及資歷認可

我們一向鼓勵機電從業員進行持續的專業進修，提升個人專業能力。參考多個機電業持續專業進修計劃的成功經驗，我們會在來年為註冊氣體裝置技工推出「自願持續專業進修計劃」。業界一致表示支持計劃，認為計劃可提升氣體裝置技工的技術水平及氣體行業的專業形象。此外，我們會設立網上平台，上載計劃資訊及方便技工查閱個人進修記錄。為進一步推廣行業作業典範以供同業借鏡，我們計劃聯同業界舉辦「傑出氣體裝置技工選舉」，鼓勵氣體裝置技工及工程承辦商推動工作安全，並孕育持續進修的文化。來年，我們會開始為所有註冊氣體裝置技工免費更換全新設計的技工卡，更會配合部門數碼機電牌照服務，向氣體裝置技工及相關的勝任人士提供數碼牌照。

我們與資歷架構秘書處多番商議，並取得車輛維修技術諮詢委員會同意，安排在香港資歷架構第三級中新增四項與註冊車輛維修技工相關的資歷，近5 000名註冊車輛維修技工因此可透過「過往資歷認可」機制獲取香港資歷架構第三級的認可。該項安排得到業界的廣泛支持。新資歷預計在2023年生效。

### Focus 5 : Upgrading professional competency and qualification recognition for practitioners

We always encourage electrical and mechanical (E&M) practitioners to pursue continuing professional development (CPD) to upgrade their professional competency. Drawing on the successful experience of various E&M CPD programmes, we will launch a Voluntary CPD Scheme for registered gas installers (RGIs) in the coming year. The trade has expressed unanimous support for the scheme, considering that it can enhance the technical skills of RGIs and the professional image of the gas industry. We will also set up an online platform to upload information about the scheme and give RGIs convenient access to their individual CPD records. To further promote model practices in the industry for reference of practitioners, we plan to co-organise an "Outstanding Gas Installers Award Scheme" with the trade, with the aim of encouraging gas installers and contractors to promote work safety and fostering a culture of continuing learning. In the coming year, we will commence the replacement of RGI cards with newly designed ones free of charge for all RGIs and provide digital licences to RGIs and related competent persons in line with the department's digital E&M licence services.

After discussions with the Qualifications Framework Secretariat, and having obtained the endorsement by the Vehicle Maintenance Technical Advisory Committee, we will arrange for the addition of four new qualifications for RVMs under Level 3 of the Hong Kong Qualifications Framework. Nearly 5 000 RVMs will be able to obtain recognition of their qualifications as Level 3 under the Hong Kong Qualifications Framework through the "Recognition of Prior Learning" mechanism. The arrangement is widely supported by the trade and the new qualifications are expected to come into effect in 2023.

### 重點工作六：與時並進 審視工作守則和指引

為確保我們的規管服務能夠配合氣體行業的新發展和創新技術，我們會不時審視、更新及新編有關氣體安全的工作守則、安全指南及宣傳品，並同時積極諮詢業界及各持份者的意見。來年，我們會全面審視《香港石油氣業工作守則第一單元：石油氣庫及石油氣瓶儲存間》，涵蓋範疇包括氣體安全、穩定供應及提升技術等。我們會與業界及各持份者（包括註冊氣體供應公司、石油氣儲存裝置擁有人、勝任人士、氣體系統承辦商及學術團體等）保持緊密聯繫，適當廣納他們提出的意見，以確保新版守則能夠充分配合石油氣業界的發展需要。有關檢討及更新工作預計在2022年底完成。我們會繼續審視和更新其他相關的工作守則。

我們已委託顧問研究在香港建設多層式車輛維修工場建築物的可行性。首階段的顧問研究集中探討有關建築物的設計和海外經驗，並已於2021年9月完成，第二階段的顧問研究會探討首階段提出的設計是否適用於香港。有關研究預計在2022年底完成。我們會按研究結果，制訂一套有關多層式車輛維修工場建築物的一般設計指引，以供業界參考。

### Focus 6 : Keeping abreast of the times by reviewing and updating codes of Practice and guidelines

To ensure that our regulatory services can keep abreast of the new development and innovation of the gas industry, we will review, update and produce codes of practice (CoPs), guidance notes and publicity materials on gas safety from time to time, in consultation with the industry and stakeholders. In the coming year, we will comprehensively review Module 1- LPG Compounds and Cylinder Stores of the CoP for Hong Kong LPG Industry, covering areas such as gas safety, supply stability and technological enhancement. We will maintain close contact with the industry and stakeholders (including the RGSCs, owners of LPG storage installations, competent persons, gas systems contractors and academic organisations) and incorporate their opinions into the CoP as appropriate to ensure that the updated CoP meets the development needs of the LPG industry. The review and updating process is expected to be completed by the end of 2022. We will continue to review and update other related CoPs.

We have commissioned consultancy studies on the feasibility of constructing multi-storey buildings for vehicle maintenance workshops in Hong Kong. The first-stage consultancy study, focusing on the designs of such buildings and related overseas experience, was completed in September 2021. The second-stage consultancy study will examine whether the designs identified in the first stage can be applied to Hong Kong. The study is expected to be completed by the end of 2022. Based on the study results, we will formulate a set of general design guidelines for multi-storey buildings for vehicle maintenance workshops for reference of the trade.

## 保障公眾安全 Protecting Public Safety



### 用心創作 說好氣體安全的故事 Telling Compelling Stories about Gas Safety in Creative Ways

近年，我們不斷採用多元化的創新手法，進行氣體安全的公眾教育。除了以創意無限和生動有趣的動畫及四格漫畫作宣傳外，我們廣泛利用社交平台接觸市民大眾，更特地為本港各種族社羣翻譯宣傳信息。這些宣傳工作的幕後「創作總監」，是氣體標準事務處工程師陳慧嫦女士。她預告，更多新穎的宣傳活動會「不日公映」。

In recent years, we have continued to take forward public education on gas safety by diversified new approaches. In addition to creative and vivid animations and four-panel comic strips for publicity, we have made extensive use of social media platforms to engage the public, and translated the gas safety messages for various ethnic groups in Hong Kong. Ms Chan Wai-sheung, Michelle, an engineer of the Gas Standards Office, is our behind-the-scenes "Creative Director" for all these publicity initiatives. She told us that more novel promotions would be coming soon.

疫情期間，由於通過探訪和外展活動等直接接觸市民的機會大減，陳女士與其團隊加強探討除了慣用的宣傳手法和渠道外，有何其他宣傳方法，例如更廣泛運用創新製作、社交媒體平台及STEM教育等方式，接觸各階層的市民。

談到推出新猷，陳女士表示並非一帆風順：「社會上不同的種族社羣一直是我們宣傳教育的對象之一。我們已把氣體安全的信息翻譯成為多個民族語言，以透過網上平台及專設的電台頻道向他們清晰傳達有關信息。不過，由於團隊成員都不懂少數族裔語言，我們面對的最大挑戰是如何確保傳達給不同種族社羣的譯文信息準確無誤。」

為確保譯文信息言簡意賅，更貼近目標對象的家鄉用語，工作團隊與各族羣的領事館聯絡，並登門拜訪求助。領事館人員都樂意幫忙，與團隊成員一同合作，用心修訂譯文，確保氣體安全的信息更加清晰和親切。

團隊再接再厲，正在籌備另一個系列的創新外展宣傳活動，例如互動劇場及活動等，希望向學生及外傭等宣傳氣體安全信息。此外，團隊與少數族裔人士支援服務中心合作，制訂不同形式的宣傳活動，以接觸更多不同的種族社羣。

陳女士透露：「我們已利用創造職位計劃的資助，增聘年輕人參與外展計劃的籌備工作，例如編寫劇本及預備劇作所需物資。演出時，我們的團隊和其他同事也會粉墨登場，用心說好氣體安全的故事。我們希望學生、外傭和不同種族社羣會成為宣傳氣體安全的『種子』，向他們的家人、朋友或僱主傳達氣體安全的信息。」

As the opportunity for face-to-face contact with the public through visits and outreach programmes was greatly reduced during the epidemic, Ms Chan and her team stepped up their efforts in exploring publicity approaches other than the traditional means and channels, such as more extensive use of creative productions, social media platforms and STEM education to engage people from all walks of life.

Taking forward the new initiatives was not plain sailing, she said, "As ethnic groups in society have always been one of our targets for promotion and education, we have translated the messages on gas safety into various ethnic languages for dissemination to them clearly through online platforms and dedicated radio channels. However, as none of our team members knew the languages of ethnic minorities, the biggest challenge we have faced was how to ensure that the translated messages to be delivered to different ethnic groups were accurate."

To ensure the translated message was concise and closer to the dialects of these target audiences, the team contacted and visited the consulates of ethnic groups for assistance. The consulate staff were very helpful and worked with our team members to revise the translated texts to ensure that the gas safety messages were clear and engaging.

Keeping up their good efforts, the team is embarking on a new series of innovative outreach programmes, such as interactive storytelling theatres and activities, to extend the promotion of gas safety messages to students and foreign domestic helpers. The team also collaborates with support service centres for ethnic minorities to work out promotion programmes in different forms for engaging more ethnic groups.

Ms Chan said, "We have made use of the subsidies granted under the Job Creation Scheme to recruit young people for the preparation work of the outreach programmes, such as compiling the drama scripts and preparing the materials required for theatrical production. Our team and other colleagues will perform on stage to tell a compelling story about gas safety. We hope that students, foreign domestic helpers and ethnic groups will become the 'seeds' for disseminating gas safety messages to their family members, friends and employers."



### 勇於承擔解決車用石油氣短缺危機 Going Above and Beyond to Avert Auto-LPG Supply Shortage Crisis

香港的石油氣供應向來穩定，不過在2021年第四季，在2019冠狀病毒病疫情、國際航運瓶頸及颱風等多重因素夾擊下，從珠海和東莞運載石油氣到港的船期出現嚴重延誤，導致本港的石油氣供應緊張，甚至面臨短缺的危機。氣體標準事務處工程師林向涌先生負責規管石油氣加氣站、石油氣車輛及氣體安全相關事宜。鑑於當時情況危急，林先生即時應變，協調業界合作，並尋求內地協助，極速化解這次供氣危機。

The supply of liquefied petroleum gas (LPG) had been generally stable in Hong Kong, but it was almost disrupted in the fourth quarter of 2021 when LPG vessels transporting LPG to Hong Kong from Zhuhai and Dongguan were severely delayed due to the collective impact of COVID-19, international shipping bottlenecks and typhoons, putting Hong Kong on the verge of a LPG shortage. In view of the imminent plight then, Mr Lam Heung-chung, Marco, an engineer of the Gas Standards Office in charge of regulating LPG filling stations, LPG vehicles and gas safety, reacted immediately by coordinating the collaboration among companies in the trade and seeking help from the Mainland, and hence resolved the crisis promptly.

當時，林先生和他的團隊得悉，若干氣體供應公司的車用石油氣加氣站僅餘數日的庫存，如未能及時補給，部分加氣站的服務或需暫停，此舉將直接影響全港合共兩萬多輛石油氣的士及小巴的日常運作。

團隊察覺事態緊急，於是在處理規管氣體安全工作之餘，多走一步，與各氣體供應公司召開緊急會議，掌握全港的石油氣庫存量及每日使用量的數據，以便制訂解決方案，確保的士及小巴業界獲得穩定供氣。

由於行動刻不容緩，團隊在極短的時間內與本港不同的氣體供應公司協調，在有關加氣站的庫存量耗盡的前一晚危急關頭，促成氣體供應公司之間的借貨安排，確保第二天和短期內所有加氣站均可維持正常加氣服務。

同時，團隊直接向大灣區的協作單位求助，通過廣東省科學技術協會與廣東省交通運輸廳取得聯絡，並在翌日修函解釋供港石油氣危機。經過內地相關部門的協調，本港的石油氣船隻獲安排優先進出內地港口，最終及時運送石油氣抵港補給。

林先生說：「這次危機得以化解，全賴業界同舟共濟、內地單位迅速支援和團隊共同努力。在12月，本港的石油氣供應已回復正常。事件之後，我乘搭的士時，不時都回想起當晚的危急情況。因此，我常常與的士司機閒談，關心他們到哪個加氣站入氣、石油氣價格和輪候入氣的情況等，藉此加深了解業界的運作。經過今次事件，我更感受到一份使命感，更加投入工作。」

At that time, Mr Lam and his team learned that certain auto-LPG supply companies only had a few days of inventory left, and some LPG filling stations might have to suspend operation if replenishment could not be made in time. This could upset the normal operation of more than 20 000 taxis and light buses across the territory.

To deal with the emergency, the team went above and beyond its gas safety regulatory duties and held an urgent meeting with all gas supply companies to gauge the territory-wide LPG inventory and daily consumption rate, so as to work out informed solutions and ensure stable LPG supply for taxis and light buses.

As immediate action was vital, the team promptly coordinated with local gas supply companies within a tight time frame and successfully facilitated an inventory-on-loan arrangement among suppliers in the nick of time, on the night before the inventory of the LPG filling stations concerned was totally depleted. The arrangement ensured that all LPG filling stations could maintain normal LPG filling services the following day and in the immediate period afterwards.

At the same time, the team sought assistance directly from the co-operating counterparts in the Greater Bay Area. Through the Guangdong Provincial Association for Science and Technology, they contacted the Department of Transport of Guangdong Province and explained in writing the next day the LPG supply crisis in Hong Kong. Upon coordination of the Mainland departments, Hong Kong LPG vessels were given priority for entering and departing from the Mainland ports, and finally LPG was shipped to Hong Kong for replenishment in time.

"The crisis was resolved thanks to the gas supply companies' mutual support, the swift assistance of the Mainland departments and the team's collective efforts. By December, local auto-LPG supply has been returned to normal. After the incident, the acute situation that night often springs to mind when I take a taxi. That's why I often chat with taxi drivers to find out which stations they go for refuelling, the auto-LPG prices and queuing time, so as to learn more about their daily operation. The experience of the emergency has endowed me with a stronger sense of mission and greater dedication to my work."

## 保障公眾安全 Protecting Public Safety

### 機械安全

#### 事故數字維持平穩

以全港共有約八萬部可運作的升降機和自動梯計算，升降機和自動梯事故數目一直維持偏低，2021年共有2 247宗。機電署會繼續多管齊下，積極提升業界的專業水平和安全意識，加強對業界及公眾的宣傳教育，並借助創新科技提升升降機及自動梯安全。

### MECHANICAL SAFETY

#### Incident Number Remained Stable

Among the total of about 80 000 lifts and escalators in operation in Hong Kong, the number of lift and escalator incidents stayed relatively low over the years and stood at 2 247 cases in 2021. The EMSD will continue to pursue a multi-pronged approach to actively enhance the professional standards and safety awareness of the trade, strengthen education and promotion for the trade and public, and promote lift and escalator safety with the aid of innovation and technology (I&T).

問題。由2021年9月至2022年3月底，共有300多幢建築物根據該計劃完成升降機優化工程，期間有32幢建築物約40個住戶獲得這項關愛服務。

modernisation works of two to three months, in order to help them resolve the problems arising from the travelling difficulties due to lift suspension. Under the LIMSS, lift modernisation works for more than 300 buildings had been completed from September 2021 to the end of March 2022, and about 40 households in 32 buildings were provided with the caring services during the period.

#### 促進業界專業發展

另外，我們為業界建立更具認受性的資歷架構和明確的晉升階梯。《升降機及自動梯條例》定下將行業要求的註冊工程師資歷提升至註冊專業工程師資格的長遠目標。就此，我們在2021年與香港工程師學會深入探討如何把升降機及自動梯工程師的行業經驗配合學會的資歷要求。隨後，學會於2022年1月發布兩份指引，詳細闡述升降機及自動梯工程師取得註冊專業工程師資歷的途徑。當註冊工程師取得學會的專業會員資格，並在註冊後取得一年工作經驗，即符合資格申請成為註冊專業工程師。這可說是提升業界專業認可的一大突破。我們亦積極向業界推廣該兩份指引，鼓勵註冊工程師成為香港工程師學會會員。香港工程師學會於2022年3月就兩份指引舉行線上研討會，吸引了約300名人士出席，反應熱烈，當中包括行內人士及應屆工程學系畢業生。學會亦於2022年4月舉行了另一場線上研討會。

#### Facilitating Professional Development of the Trade

In addition, we established a more recognised qualification framework and clear progression pathways for the trade. The Lifts and Escalators Ordinance sets a long-term goal of raising the qualification requirements of the industry from Registered Engineer (RE) to Registered Professional Engineer (RPE). To this end, we had in-depth discussion with the Hong Kong Institute of Engineers (HKIE) in 2021, exploring how to match the industry experience of lift and escalator engineers with the HKIE's competency requirements. Subsequently, the HKIE released two guidance notes in January 2022, detailing the pathways for lift and escalator engineers to acquire the RPE qualification. An RE is eligible to apply for registration as an RPE after obtaining the HKIE's professional membership (MHKIE) and a year of work experience after registration. This marked a breakthrough in enhancing the professional recognition of the trade. We also actively promoted the two guidance notes to the trade to encourage REs to become MHKIEs. In March 2022, the HKIE held a webinar about the guidance notes, which attracted enthusiastic response and was attended by about 300 participants, among them were trade practitioners and fresh engineering graduates. The HKIE has also held another webinar in April 2022.

此外，為了提升行業從業員的專業地位，我們開設了名為「電梯大師」的職業專業資歷。經過近兩年與職業訓練局（職訓局）及業界的共同努力後，「升降機及自動梯大師級專業文憑」已正式推出。該專業文憑屬資歷架構的第五級（QF5），相等於學士學位資格。有關課程為期兩年，第一期課程於2022年6月開課，共有18名合資格的註冊升降機及自動梯工程人員參與。課程期間，學員的受聘公司會提供在職培訓。該專業文憑引領行業從業員踏上明確的晉升階梯，有助提升業界專業水平。

In addition, to raise the professional status of industry practitioners, we established the skill-based professional qualification named "Lift Master". After nearly two years of joint efforts with the Vocational Training Council (VTC) and the trade, the Professional Diploma Meister in Lift and Escalator Engineering (PDM-LEE), pegged at Level 5 (QF5) of the Hong Kong Qualifications Framework, equivalent to a bachelor's degree, was introduced officially. The debut of the two-year programme, with 18 eligible Registered Lift and Escalator Workers enrolled, has been started in June 2022. During the course, on-the-job training will be offered by the students' employers. Leading industry practitioners to a clear progression pathway, the PDM-LEE contributes to raising the professional standards of the trade.

隨着本港勞動人口老化，可以預見行內有經驗的工程人員會陸續到達退休年齡，業界將無可避免面對技術及經驗流失，加上社會對升降機及自動梯服務的要求日益提高，科技又急速發展，行業對掌握工程項目管理和良好溝通技巧，以及先進科技知識的管理人員需求將有增無減。我們預計業界每年需要超過300名工程人員及超過10名工程師加入，以補充流失的人手和應付日益增長的需求。以上提升升降機及自動梯從業員專業地位和為他們提供晉升階梯的措施，有助吸引新血和提升現有人才技能，長遠支持業界健康發展。

As the workforce in Hong Kong is ageing, it is foreseeable that experienced trade practitioners will gradually reach the retirement age, inevitably leading to the loss of technical knowhow and experience. The above factor, together with the rising community expectation for lift and escalator services and the rapid technological advancement, will give rise to a continued increase in the demand for management personnel with a good grasp of project management and good communication skills, as well as knowledge of advanced technology in the industry. We estimate that the industry will need an annual intake of more than 300 technicians and 10 engineers to replenish the manpower attrition and meet growing demand. The above initiatives to raise the professional status and provide progression pathways for lift and escalator practitioners will help to attract new blood to the industry and upskill existing practitioners to support healthy development of the industry in the long run.

## 本港升降機及自動梯事故數目 NUMBER OF LIFT AND ESCALATOR INCIDENTS



2 247 宗  
2021 CASE

### 同心服務市民

過去一年，我們開展多項工作，致力服務市民，以及提升業界專業水平。

### Serving the Community with One Heart

In the past year, we embarked on a range of initiatives, exemplifying our dedication to serving the community and elevating the professional standards of the trade.

機電署年內繼續與市區重建局（市建局）合作，推行優化升降機資助計劃，有關計劃並為有特殊需要的受影響市民提供貼心服務。例如參與計劃的建築物若只有一部升降機，市建局會委託東華三院等社福機構，在為期兩至三個月的優化工程期間，為行動不便或需要支援的長者住戶，安排送飯和代購物資等服務，協助他們解決因升降機停用而難以外出的

During the year, the EMSD continued to implement the Lift Modernisation Subsidy Scheme (LIMSS) in partnership with the Urban Renewal Authority (URA), and thoughtful services were offered to affected residents with special needs under the Scheme. For example, in respect of participating buildings with only one lift, the URA would engage social and welfare organisations like the Tung Wah Group of Hospitals to provide services such as meal delivery and purchase of supplies for elderly residents with mobility difficulties or requiring support during the lift

◀ 機電署與市區重建局合作推行優化升降機資助計劃，協助在全港合資格舊樓進行升降機優化工程。在計劃下，一部舊式升降機（左圖）已換成新安裝的升降機（右圖）。

In partnership with the URA, the EMSD implements the Lift Modernisation Subsidy Scheme to enable the modernisation works of aged lifts in eligible aged buildings across the territory. An aged lift (left) has been replaced by a newly installed lift (right) under the scheme.



## 保障公眾安全 Protecting Public Safety

### 首個公共機械化泊車系統面世

機電署近年積極支援政府引入機械化泊車系統，以紓緩泊車位短缺問題，並為由運輸署協調的機械化泊車系統先導項目提供技術意見及設計審核。全港首個公共機械化泊車系統已於2021年11月投入服務，該系統位於荃灣海盛路政府短期租約停車場內。停車場採用六組拼圖型泊車系統，提供78個自動泊車位，把有限空間內的泊車位數量增加了160%。

### 多方位落實科技應用

機電署運用科技統籌(整體撥款)的資助研發應用區塊鏈技術的「升降機及自動梯數碼工作日誌」系統，目的是全面更新和提升升降機與自動梯的維修保養記錄及管理記錄模式。機電署目前規管七萬多部升降機和一萬多部自動梯，並按法例要求升降機/自動梯的負責人(如升降機/自動梯的擁有人或物業管理公司(物管公司))備存工作日誌，以記錄關乎升降機/自動梯的工程資料。自1987年以來，工作日誌一直以紙本形式備存。我們的目標是把所有紙本記錄上載至雲端進行綜合儲存和管理，長遠以數碼工作日誌取代紙本工作日誌作為法定的記錄方式。

### First Public Mechanized Vehicle Parking System Inaugurated

In recent years, the EMSD has been actively supporting the Government in introducing the Mechanized Vehicle Parking System (MVPS) to alleviate the shortage of parking spaces, and provided technical advice and design reviews for a pilot project on the MVPS coordinated by the Transport Department. The first public MVPS in a short-term tenancy car park at Hoi Shing Road in Tsuen Wan, has commenced service in November 2021. The car park adopted six modules of a puzzle stacking system, providing 78 automated parking spaces and increasing the number of parking spaces within limited space by 160%.

### Applying I&T in Multiple Ways

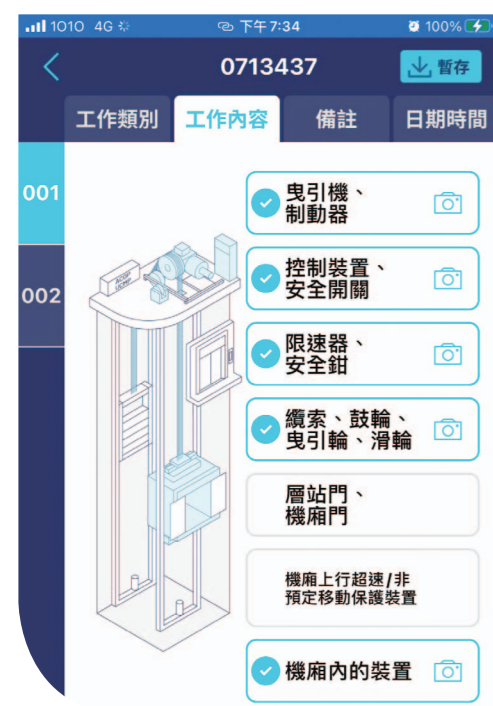
The EMSD is developing the system of Digital Logbook for Lifts and Escalators using blockchain technology, with the funding support from TechConnect (Block Vote). The system is designed to revamp and enhance the record-keeping and management model of lift and escalator repair and maintenance records. The EMSD currently regulates more than 70 000 lifts and 10 000 escalators, and requires according to the law that the responsible persons for lifts/escalators, such as the owners of lifts/escalators or property management companies, keep a logbook to record the work details in relation to their lifts/escalators. Since 1987, the logbooks have always been in the paper format. We aim to upload all the paper records to the cloud for centralised storage and management, with a view to using the Digital Logbook, instead of paper logbooks, as the statutory record-keeping means in the longer term.

機電署於2021年6月展開數碼工作日誌系統的研發工作，隨後與業界進行為期六個月的實地測試。系統將於2022年年底正式推出供業界使用，費用全免。工程人員可通過掃描升降機准用證上的二維碼獲取升降機的電子記錄，並可透過上載圖片、文字備註或語音記錄的方式，更新維修保養記錄。由於系統使用區塊鏈技術，記錄不能隨意更改，若有更改亦會留下痕跡，可確保系統的記錄可靠。此外，系統所收集的豐富大數據，可用作檢視狀況、進行數據分析和預測風險。承辦商可清楚了解工程所需的時間，優化工作編排，達致更合適的人力及資源分配。物管公司更可在單一平台更有效管理旗下所有升降機及自動梯的維修保養詳情，有助大幅加強升降機和自動梯的管理效益。承辦商及物管公司亦可讀取精明提示，避免誤墮法網。

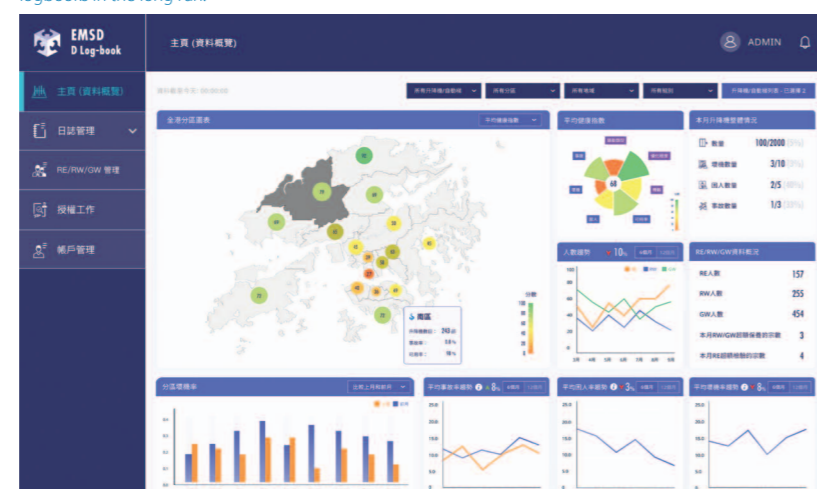
我們於開發數碼工作日誌系統初期已經與不同持份者組成工作小組，共同設計並推廣該系統。工作小組的成員具廣泛代表性，包括電梯業商會、工會、屋宇設備運行及維修行政人員學會、香港房屋委員會、港鐵公司等，他們管理全港超過5萬部升降機與自動梯。經過多番努力，數碼工作日誌的開發得到各持份者的積極參與和支持。機電署會繼續與業界及負責人緊密合作，確保這個創新方案能落實應用，並惠及各持份者。

The EMSD began research and development of the Digital Logbook System in June 2021, and subsequently conducted a six-month on-site testing with the trade. It will be officially commissioned by the end of 2022 and made available to the trade for free. Workers can scan the QR code on the use permit of a lift to access its digital record, and use the system to upload photos, texts or voice recordings to update the repair and maintenance record of the lift. As the system uses blockchain technology, its record is immutable and all modifications will be traceable, thus ensuring the reliability of the records on the system. In addition, the abundant big data collected by the system can be used for inspection of lift condition, data analysis and risk prediction. Contractors can have a clear understanding of the duration required for works and optimise the work schedule to better allocate manpower and resources. Property management companies can more effectively manage the detailed information on the repair and maintenance of lifts and escalators in their portfolio on one platform, which greatly enhance the efficiency of lift and escalator management. Contractors and property management companies can also access smart tips to avoid breaching the law inadvertently.

At the early stage of the development of the Digital Logbook System, we have formed a working group with different stakeholders to jointly design and promote the system. The working group has a broad representation, comprising members from trade associations and trade unions of the lift and escalator trade, the Building Services Operation and Maintenance Executives Society, Hong Kong Housing Authority and MTR Corporation Limited, who manage more than 50 000 lifts and escalators in Hong Kong. With our efforts, the development of the Digital Logbook System has won active participation and support from the stakeholders. The EMSD will continue to work closely with the trade and stakeholders to ensure that the innovative solution will be implemented and benefit all stakeholders.



◀ 我們近年積極應用區塊鏈技術研發「升降機及自動梯數碼工作日誌」系統，讓升降機及自動梯業界可把所有維修保養記錄上載至雲端，以便綜合儲存和管理。系統會在2022年年底推出，並可透過手機應用程式(左圖)及網上平台(右圖)使用，長遠或會取代紙本工作日誌。In recent years, we have been developing the system of Digital Logbook for Lifts and Escalators with the application of blockchain technology to enable the lift and escalator trade to upload all repair and maintenance records to the cloud for centralised storage and management. The system to be launched by the end of 2022 can be used through a mobile app (left) and web portal (right). It may replace paper logbooks in the long run.

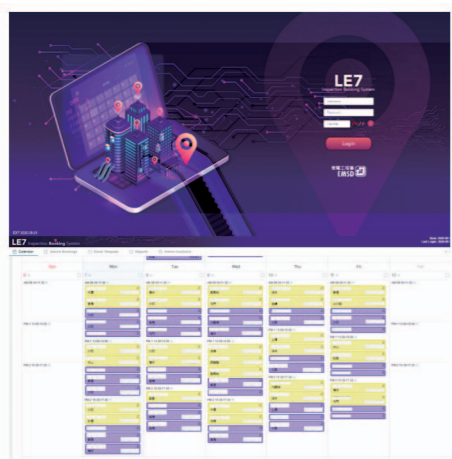


## 保障公眾安全 Protecting Public Safety

### 電子化大大提升工作效率

機電署的網上註冊服務已於2022年年初全面落實，而與一般法例部執行的四條法例相關的23款政府表格已全部電子化。業界及公眾可透過已開啟數碼簽署功能的「智方便」帳戶填寫和提交申請。機電署另於2021年9月推出電子准用證，註冊承辦商可選擇以電郵接收准用證，自行打印後張貼在升降機內。電子准用證亦加入二維碼，方便公眾人士掃描二維碼核實有關該升降機的資料。自2021年起，一般法例部採用人工智能光學文字辨識技術去識別人手填寫的表格，把每年所收到約4 800份LE27及LE29表格進行電子化處理。人工智能亦可從檔案中搜尋與特定類型事故相關的內容，方便統計數據及分析事故成因，以助提供更適切的宣傳教育工作，事半功倍。

此外，我們早於2020年已推出網上預約系統，方便業界預約機電署在升降機維修後進行檢查以簽發升降機復用證。以往業界往往在完成維修後，才聯絡機電署安排檢查，獲發復用證一般需時九天，期間對使用升降機的人士造成諸多不便，更引來受影響人士的大量查詢。網上預約系統推行兩年以來，發出復用證的時間已縮短至平均三天，不但相關公眾查詢大減七成，我們更收到多封公眾讚許信。



### Digitalisation Greatly Enhanced Efficiency

The Web-Based Registration Services of the EMSD have been fully implemented since early 2022. Our 23 government forms related to the four ordinances enforced by the General Legislation Division (GLD) have been fully digitalised. The trade and the public can now complete and submit the forms using an “iAM Smart” account with digital signing function. The EMSD has also introduced the e-permit since September 2021. Registered contractors can choose to receive the use permits by email and print the permits themselves for display in lifts. The e-permit includes a QR code for the public to scan and verify the information about the respective lifts. Since 2021, the GLD has been using artificial intelligence (AI) optical character recognition technology to identify manuscripts, and about 4 800 LE27 and LE29 forms submitted were processed digitally every year. AI can also search for content related to specified types of incidents from the archive to facilitate compilation of statistics and analysis of incident causes, so that more appropriate publicity and education can be provided efficiently.

In addition, since 2020, we have introduced an online booking system for the trade to make an appointment with the EMSD for the post-maintenance inspection of a lift before a resumption permit is issued. In the past, the trade had to contact the EMSD to arrange for inspection after maintenance was completed, and it generally took nine days to get a resumption permit issued, causing inconvenience to lift users, which then led to a large number of enquiries from affected users. Since the launch of the online booking system two years ago, the time required for the issue of a resumption permit has been shortened to three days on average. Related public enquiries have been reduced by 70%, and we have also received a number of commendation letters from the public.

◀我們在2020年推出網上預約系統，方便業界預約機電署在升降機維修完成後進行檢查以簽發升降機復用證。自系統推出以來，發出復用證所需的時間由平均九天縮短至三天，公眾查詢也大減七成。

In 2020, we introduced an online booking system for the trade to make an appointment with the EMSD for the post-maintenance inspection of a lift before a resumption permit is issued. Since the introduction of the system, the time required for the issue of a resumption permit has been shortened from nine days to three days on average and related public enquiries have been greatly reduced by 70%.

### 升降機及自動梯科技獲國際大獎

我們耗用兩年時間研發及進行實地測試的「智能數碼自動梯監測系統」，在2022年日內瓦國際發明展上取得金獎，並已在五個港鐵站、朗豪坊、職業訓練局、金鐘道政府合署、中環至半山自動扶梯系統及屯門兆麟政府綜合大樓內合共15條自動梯啟用，大大減少因機件故障或外來因素而造成的意外。因此，我們正積極與業界及其他政府部門分享有關科技。據悉，有部門正申請撥款，計劃在安達臣道的行人連繫設施安裝該系統。

我們另有兩項創科方案亦在2022年日內瓦國際發明展獲得佳績。智能升降機移動監測裝置取得金獎，智能架空纜車監測系統取得銀獎。智能升降機移動監測裝置同時在2022年的香港電子工程項目比賽奪冠。

我們亦已就有關創科方案先後取得了六項短期專利，成績斐然，有目共睹。

▶▶我們的升降機及自動梯創科方案在2022年日內瓦國際發明展贏得多個獎項，例如智能數碼自動梯監測系統和智能升降機移動監測裝置取得金獎，而智能架空纜車監測系統也獲得銀獎。圖為機電署得獎隊伍展示其獎牌和證書。

Our innovative solutions for lifts and escalators won a number of awards at the International Exhibition of Inventions of Geneva 2022, including two gold medals for the Intelligent Digital Escalator Monitoring System and the Intelligent Elevator Movement Surveillance Device, and a silver medal for the Artificial Intelligent Monitoring System for Aerial Ropeways. Photos show the award-winning teams with their medals and certificates.



### International Awards Obtained for Technological Solutions for Lifts and Escalators

The Intelligent Digital Escalator Monitoring System, which took us two years to develop and conduct on-site trials, won a gold medal at the International Exhibition of Innovations of Geneva 2022. The system has come into operation in 15 escalators at five MTR stations, Langham Place, the Vocational Training Council, Queensway Government Offices, Central to Mid-Levels Escalator and Walkway System and Tuen Mun Siu Lun Government Complex. The solution has greatly reduced the number of incidents caused by mechanical failure or external factors. As such, we are actively sharing the technology with the trade and other Government departments. It is learnt that a department is seeking funding to install the system in the pedestrian connectivity facilities on Anderson Road.

Our two other innovative solutions also received recognition at the International Exhibition of Innovations of Geneva 2022. The Intelligent Elevator Movement Surveillance Device was awarded a gold medal and the Artificial Intelligent Monitoring System for Aerial Ropeways a silver medal. The Intelligent Elevator Movement Surveillance Device also won the championship in the Hong Kong Electronics Project Competition 2022.

Six short-term patents have also been obtained for these innovative solutions, underscoring our notable results.



## 保障公眾安全 Protecting Public Safety

### 全數更新五份實務守則

儘管疫情高峰期間公務員需要在家工作，我們仍能在2021年內完成一項「創舉」，全數更新五份有關機械安全的實務守則，內容與最新的國際標準看齊，並因應本地的特殊需要提升各類機械裝置的安全要求，為業界和有關機構提供更詳盡的指引。新版《升降機工程及自動梯工程實務守則》在2021年11月1日生效。新版《建築工地升降機設計及建造實務守則》及《塔式工作平台設計及建造實務守則》在2022年3月1日生效。新版《機動遊戲機實務守則》在2022年4月1日生效，而新版《升降機及自動梯設計及建造實務守則》會於2022年10月1日生效。

### All Five Codes of Practice Updated

While civil servants had to work from home during the peak of the outbreak, we were able to achieve a major feat in 2021 by updating all five Codes of Practices (CoPs) related to mechanical safety. The latest versions were aligned with international standards and incorporated enhanced safety requirements for mechanical installations with regard to specific local needs, providing the trade and related organisations with more detailed guidelines. The updated CoP for Lift Works and Escalator Works took effect on 1 November 2021. The CoP on the Design and Construction of Builders' Lifts and the CoP on the Design and Construction of Tower Working Platforms took effect on 1 March 2022. The CoP for Amusement Rides took effect on 1 April 2022 and the CoP on the Design and Construction of Lifts and Escalators will take effect on 1 October 2022.



◀我們在2021年全數更新有關機械安全的五份實務守則，涵蓋升降機及自動梯、建築工地升降機、塔式工作平台和機動遊戲機。新版本的內容與國際標準看齊，並因應本地的特殊需要，提升有關機械裝置的安全要求，為業界提供更詳盡的指引，以便參考。All five Codes of Practice related to mechanical safety were updated in 2021, covering lifts and escalators, builders' lifts, tower working platforms and amusement rides. The updated versions were aligned with international standards and the safety requirements for mechanical installations were enhanced based on specific local needs, giving the trade more detailed guidelines for reference.

### 靈活應對疫情挑戰

受第五波疫情影響，在2022年2月至3月期間，升降機及自動梯業界有900多名從業員先後染疫，佔業內人手超過一成。我們除與業界攜手合作，加強防疫抗疫措施外，更與房屋署和機電工程營運基金商討，在不影響安全及不抵觸相關法例要求的大前提下，調低轄下升降機及自動梯的定期維修保養次數，從而減少有關人手需求。我們亦大力鼓勵業界接種疫苗，並建議註冊承辦商安排員工在出勤前進行快速抗體測試。經各方通力合作，在第五波疫情期間，本港升降機及自動梯的服務並未受到嚴重影響。

### Overcoming Epidemic Challenges with Flexibility

During the fifth wave of the epidemic, over 900 practitioners or more than 10% of the manpower in the lift and escalator trade were tested positive for COVID-19 in February and March 2022. In addition to collaborating closely with the trade to strengthen anti-epidemic measures, we discussed with the Housing Department and the Electrical and Mechanical Services Trading Fund to reduce the frequency of their lift and escalator repair and maintenance without compromising safety and related legislative requirements, thereby alleviating the manpower demand. We also vigorously encouraged the trade to get vaccinated and advised registered contractors to arrange their staff to take rapid antigen tests before they reported for duty. As a result of these concerted efforts, the lift and escalator services were not severely affected during the fifth wave of the epidemic in Hong Kong.

疫情期間，雖然主題公園的機動設施、昂坪纜車和香港摩天輪等必須關閉，但我們仍繼續執行各種檢測及突擊檢查，確保機動遊戲機日後在景點重開時仍能安全運作。

Though the mechanical rides in theme parks, the Ngong Ping Ropeway and the Hong Kong Observation Wheel had to be closed during the epidemic, we continued to conduct routine and spot checks to ensure the mechanical rides will be safe to operate when the attractions reopen in the future.

### 與內地及國際合作

年內，我們參與由廣東省特種設備檢測研究院牽頭的《在用電梯安全評價規範—曳引驅動電梯》的研究和籌備工作，文件列舉對曳引式電梯進行安全評估的要求，包括安全評估程序、內容、方式及風險等級評定等。有關規範將適用於粵港澳大灣區各城市。我們正積極與香港業界聯繫，共同推展相關工作。

### Mainland and International Co-operation

During the year, we took part in the research and preparation regarding the Rules for Risk Assessment of the Traction Lifts spearheaded by the Guangdong Institute of Special Equipment Inspection and Research. The document sets out the safety assessment requirements for traction lifts, including safety assessment processes, content, methods and risk level assessments. The above Rules will be applicable to the cities in the Guangdong-Hong Kong-Macao Greater Bay Area. We are actively liaising with the trade in Hong Kong to take forward the relevant work together.

在國際合作方面，我們在2021年9月以視像會議方式參加在英國舉行的第12屆升降機及自動梯科技研討會，發表題為《提升香港老舊升降機安全》的報告，分享推行優化升降機資助計劃及特別保養工作的經驗。

Internationally, we took part in the 12th Symposium on Lift and Escalator Technologies in the United Kingdom via video-conferencing in September 2021 and presented the paper "Uplifting the Safety of Aged Lifts in Hong Kong", sharing our experience in implementing the Lift Modernisation Subsidy Scheme and special maintenance.

▶我們在2021年9月以視像會議方式，參加英國第12屆升降機及自動梯科技研討會，發表題為《提升香港老舊升降機安全》的報告，分享機電署推行優化升降機資助計劃的經驗。

In the 12th Symposium on Lift and Escalator Technologies in the United Kingdom we participated via video-conferencing in September 2021, our team presented the paper "Uplifting the Safety of Aged Lifts in Hong Kong", sharing our experience in implementing the Lift Modernisation Subsidy Scheme.



### 未來工作

來年，我們會繼續檢討業界的註冊程序，務求提升業界的地位和形象，並籌備在2022年年中推出革新的考核升降機及自動梯工程師面試框架，以提高工程師的專業水平。同時，我們會積極鼓勵註冊承辦商提供更多培訓機會，努力提升業界的整體水平。

### Future Work

In the coming year, we will continue to review the registration procedures of the trade, with a view to enhancing its status and image. We also plan to introduce a revamped interview framework for the assessment of lift and escalator engineers in mid-2022 to raise the professional standards of engineers. Meanwhile, we will encourage registered contractors to provide more training opportunities, in an effort to raise the overall standards of the trade.

2022年年底，我們會推出「升降機及自動梯數碼工作日記」系統，由2023年起分階段實施。長遠目標是以電子工作日記取代紙本工作日記，並為系統開發更多功能，包括數據分析及發出智能通知，提醒註冊承辦商為指定的升降機進行每月例行維修保養，以及在出現異常情況時向承辦商發出警示，以便跟進。

We will launch the system of Digital Logbook for Lifts and Escalators in the end of 2022, with its implementation by phases from 2023. The long-term goal is to substitute the paper logbooks with the Digital Logbook and develop more features for the system, including conducting data analysis and sending smart notification to remind registered contractors to carry out monthly routine maintenance for designated lifts, as well as sending alerts to the contractors for following up on any irregularities identified.

## 保障公眾安全 Protecting Public Safety

在機械化泊車系統方面，一個在大埔白石角的政府短期租約停車場正籌備安裝自動泊車系統，提供50個自動化泊車車位，預計該系統可在2022年年底投入服務。至於香港國際機場第三條跑道項目已規劃的自動泊車系統，我們會繼續提供技術建議、審批設計及牌照申請等支援，期望加快有關系統在本港的發展。首期工程包括安裝21部汽車升降機及48部自動導引車，可提供1 550個車位。我們正審批該系統的種類許可申請，預計首期的系統可在2024年年初投入服務。

對外聯繫方面，我們會繼續與廣東省特種設備檢測研究院保持溝通，分享經驗和一同探討提升升降機安全的方法。另外，我們正積極籌備主辦第71屆國際纜車監管機構會議，但因疫情反覆，該會議已延期至2023年9月舉行。

至於推動創科，我們會繼續開發創科工具以提升升降機及自動梯安全，以及探討如何利用科技支援升降機及自動梯的定期檢查及維修保養工作，減輕人手壓力。項目之一是研發智慧升降機及自動梯設計審批平台，利用光學字符識別技術和人工智能自動處理設計申請。此外，我們計劃開發一個手機應用程式，讓機電署督察在現場檢查機件後，即場以手機輸入資料和處理相關申請，項目可望在2023/24年度完成。

另外，我們已委託顧問研究分析老舊升降機及自動梯的電子元件數據，例如電路板的特性、在各種運作情況下的壽命等。研究結果將有助我們制訂相應的規管政策，例如規定不同電子組件的更換年期，從另一層面保障高齡升降機及自動梯的安全。預計研究可在2022年年底前完成。

Regarding mechanized vehicle parking systems, an automated parking system is planned for a short-term tenancy carpark at Pak Shek Kok in Tai Po to provide 50 automated parking spaces. The system is expected to commence service by the end of 2022. For the automated parking system planned in the third runway project of the Hong Kong International Airport, we will continue to provide support on technical recommendations, design vetting and permit applications, etc., with a view to expediting the development of such systems in Hong Kong. The first phase works will include the installation of 21 car lifts and 48 automatic guided vehicles, providing 1 550 parking spaces. We are processing the type approval application for the system. The first phase system is expected to commence service in early 2024.

For external relation, we will maintain communication with the Guangdong Institute of Special Equipment Inspection and Research to share experience and jointly explore ways of improving lift safety. Besides, we are actively preparing for hosting the 71st International Meeting of Technical Authorities for Cableways, but the meeting has been postponed to September 2023 due to the fluctuating epidemic situation.

With regard to the promotion of I&T, we will continue to develop I&T tools to enhance the safety of lifts and escalators, and explore ways of using technologies to support regular inspection, repair and maintenance of lifts and escalators to relieve the pressure on manpower. In one of the projects, we will develop a smart lift and escalator design approval platform, using optical character recognition and AI technologies to automatically process design applications. We also plan to develop a mobile app for the EMSD inspectors to input information and process the relevant application during on-site inspections. The project is expected to be completed in 2023/24.

Furthermore, we have commissioned a consultancy study to analyse data of the electronic components of aged lifts and escalators, including the characteristics of circuit boards, their life spans under various operation conditions, etc. The results of the study will facilitate the formulation of corresponding regulatory policies, such as setting the timings for replacing different electronic components, ensuring the safety of lifts and escalators from a different perspective. The study is expected to be completed by the end of 2022.



### 為安全把關： 檢驗全港首個公共斜道升降機系統 Inspecting the First Public Inclined Lift System in Hong Kong as the Gatekeeper for Safety

兩部連接葵涌邨及禾塘咀街的斜道升降機在2022年2月落成。一般法例部督察梁維彥先生為升降機進行法例規定的最後檢驗，證實升降機安全，完成簽發准用證前的重要步驟。升降機在2022年4月投入運作，葵涌邨居民自此可以輕鬆出行，告別徒步上落百多級樓梯之苦。

Two inclined lifts connecting Kwai Chung Estate and Wo Tong Tsui Street were completed in February 2022. Mr Leung Wai-yin, an inspector of the General Legislation Division, conducted the final inspection on the lifts as required by the legislation to confirm their safety, completing a crucial step before use permits were issued. Since the lifts commenced operation in April 2022, residents of Kwai Chung Estate can travel easily without having to climb more than a hundred steps.

這是全港首個公共有蓋斜道升降機系統，長約36米。系統的兩部升降機，升降機以每秒1.5米的速度，在禾塘咀街與大窩口道之間約30度的斜坡上行走，行程只需少於一分鐘。每部升降機可容納24人，載重1 800公斤。預計升降機每日載客約8 600人次，為該區居民帶來莫大方便。

梁先生表示，由於斜道升降機方便長者及乘坐輪椅的人士使用，更符合該區的人口，因此在上述位置安裝斜道升降機比設置自動梯更為合適。

斜道升降機與垂直式升降機在檢驗方面存在巨大技術差異。梁先生解釋：「斜道升降機的安全部件，例如曳引機、限速器及制動器，都是倒着或傾斜安裝的，而且每條帶動機廂的主鋼纜的鬆緊度和牽引力都必須相同。此外，鑑於斜道升降機的牽引方向及機廂導軌的安裝斜度，導軌必須承托機廂的部分重量，而垂直上落升降機的導軌則只控制升降機上落方向，相對而言較為簡單。」

除了測試部件外，梁先生也在檢驗過程中乘搭斜道升降機，以使用者的角度體驗升降機的運作，從而設法改善乘客在升降機加速或減速時的體驗。他說：「從過往經驗所得，大多數自動梯意外都是因乘客沒有緊握扶手，以致失平衡跌倒，而升降機事故則多數涉及機廂出現平層偏差令乘客絆倒。有見及此，在斜道升降機系統的機廂抵達或離開層站前，會播放安全廣播，提醒乘客小心升降機門及緊握扶手。」

斜道升降機啟用後，每逢梁先生在附近工作，都會專程去乘搭升降機，察看其運作是否正常。他表示：「乘搭升降機讓我可以察覺到導軌有沒有出現損耗，令機廂移動時不穩定。」梁先生用心服務市民的態度，從言談間自然流露。

The first public covered inclined lift system in Hong Kong, which is about 36-metre long, has two inclined lifts plying at a speed of 1.5 metres per second on the 30-degree slope between Wo Tong Tsui Street and Tai Wo Hau Road, with a journey time of less than one minute. Each lift can carry 24 passengers and has a loading capacity of 1 800 kg. The lifts are expected to have a daily patronage of 8 600 passenger trips every day, bringing great convenience to residents of the area.

Mr Leung remarked that inclined lifts are convenient for the use of the elderly and wheelchair users and can better meet the needs of the population in that area, hence they are more suitable than escalators for installation at the above location.

There are huge technical differences in inspecting inclined lifts and vertical lifts. "For inclined lifts, safety components such as traction machines, overspeed governors and brakes, are installed upside down or at an angle, and the tension and traction of each suspension rope that propels the lift car must be the same. Besides, due to the traction direction of inclined lifts and the inclination of their car guide rails, the car guide rails of inclined lifts must bear part of the car weight, whereas that of vertical lifts only control the up or down direction of the lift, which is relatively simpler," Mr Leung explained.

In addition to testing the components, Mr Leung took the lift during the inspection to experience the lift operation as a user, with a view to figuring out how to improve passenger experience during lift acceleration and deceleration. "From past experience, most escalator incidents were caused by passengers who lost balance and fell over due to their failure to hold the handrail tightly, while most lift incidents involved passenger tripping due to levelling difference of the lift car at landing. In view of this, safety announcements will be broadcast before the cars of the inclined lift system arrive at or depart from the landing, to remind passengers to mind the lift door and hold the handrail tightly," he said.

After the inclined lifts were put into service, Mr Leung made a point of taking the lifts whenever he worked in the neighbourhood to see if they were working properly. "Taking the lifts makes me aware of any wear and tear in the guide rails causing unstable car movement," he said. Mr Leung's commitment to serving the community naturally shone through in his words.



## 保障公眾安全 Protecting Public Safety



### 同心協力齊抗疫 機電署全力支持抗擊第五波疫情 Pulling Together to Support the Fight against the Fifth Wave of the Epidemic

2022年初，香港爆發第五波嚴峻疫情，抗疫工作刻不容緩，公務員紛紛出動，肩負支援社區及參與圍封強檢行動等重要工作。一般法例部高級工程師陳志偉先生當時負責協調機電署規管服務各部別的同事，齊心參與前線抗疫工作。

With the outbreak of the serious fifth wave of the epidemic in early 2022, the fight against the virus was a race against time. Civil servants were mobilised to take up important tasks such as supporting the community and participating in "restriction-testing declaration" (RTD) operations. Mr Chan Chi-wai, a senior engineer of the General Legislation Division, took up the role of coordinating members from different divisions and sections under the Regulatory Services of the EMSD to participate in the anti-epidemic efforts on the frontline.

在第五波疫情初期，政府下令葵涌邨居民禁足。機電署抗疫團隊的首項主要工作，就是為該邨一幢樓高40層大廈的居民每日送上三餐。儘管行動緊急，部署時間很短，但機電署的同事妥善完成任務，迅速安排由50人組成的團隊，在禁足期間每日為居民送上三餐。

陳先生說：「當時疫情來勢洶洶，大家當然關注自身的安全。不過，作為公務員，我們堅持走上前線，為市民送上暖暖的飯餐。期間我們雖然沒有與居民直接接觸，不過一些居民仍自發地在門前貼上感謝信息，表達心意，令我們感到特別窩心。」

隨着疫情繼續肆虐，機電署團隊積極參與不同的抗疫工作，當中最具挑戰性的要算是圍封強檢行動。在疫情高峰期，全港每日需要出動多支公務員團隊，進行圍封強檢行動。機電署平均每星期都要組織一支超過150人的團隊參與圍封強檢行動。規管服務和營運基金都有不同職級和崗位的同事參與其中。無論是文職同事、督察或工程師，在抗疫行動中都成為不分彼此的親密戰友。

「在那些日子，在機電署總部大樓的通道上，往往會聽到同事談論他們在不同抗疫工作中的點滴。有人訴說抗疫的困難，希望疫情盡快完結等等。大家都明白，作為抗疫隊伍的一分子，縱使困難不斷，壓力沉重，我們仍需努力不懈，迎難而上，積極前行。」

談到抗疫工作的困難，陳先生說：「每次行動都時間緊迫，但規模龐大，涉及多個政府部門。大家必須在短時間內安排物資，動員人手，並只能靠社交媒體應用程式保持聯繫，完成一次又一次在保護衣下充滿汗水的任務。由於每次行動都不一樣，大家都要摸着石頭過河，保持警惕，隨機應變。每次行動之後，同事都會熱心分享經驗，務求提升未來抗疫工作的效率和水平，減少同事的染疫風險，以及有關工作對市民大眾的影響。」

At the onset of the fifth wave of the epidemic, residents of Kwai Chung Estate were mandated to stay at home. The first major task of the EMSD's anti-epidemic team was to deliver three meals a day to the residents in one of the 40-storey blocks of the estate. Despite the very limited time for us to prepare for this urgent operation, our colleagues completed the task successfully by promptly arranging a team of about 50 members to deliver three meals to the residents every day during the mandated period.

"Everyone was surely concerned about their own safety in the face of the rapid development of the fifth wave of the epidemic that time. However, as civil servants, we were determined to stay on the frontline to deliver hot meals to the residents. Though we do not have any direct contact with the residents, some of them posted thank-you notes outside their doors to express their gratitude, which means so much to us," Mr Chan said.

As the epidemic continued to rage on, the EMSD team actively participated in various anti-epidemic tasks, of which the RTD operations were the most challenging. At the peak of the epidemic, a number of teams of civil servants were required to conduct these operations every day. On average, the EMSD had to arrange a team of more than 150 colleagues to join the RTD operations every week. Participating colleagues were of different ranks and posts under the Regulatory Services and the Electrical and Mechanical Services Trading Fund. Whether they were administrative staff, inspectors or engineers, they became close comrades in these anti-epidemic operations.

"In those days, we often heard colleagues recounting stories about their anti-epidemic work on the hallways in the EMSD Headquarters. Some talked about the difficulties they faced and their hope for the epidemic to die down as soon as possible. We all understood that as part of the anti-epidemic force, we had to remain resilient and committed despite all the challenges and immense pressure ahead."

"Every operation was very urgent in time and large in scale, involving a number of government departments," Mr Chan said when he talked about the difficulties in the anti-epidemic work. "We had to arrange for supplies and mobilise manpower within a short period of time. And we could only rely on social media apps to stay connected and complete every operation, in which we would invariably end up with sweat-soaked clothing under the protective gear. As every operation was different and there was no past experience for reference, we had to play by ear and stay vigilant. After each operation, we all enthusiastically shared experience to help improve the efficiency and efficacy of our anti-epidemic work in the future, and to minimise the risk of infection for our colleagues and the impact of such work on the general public."

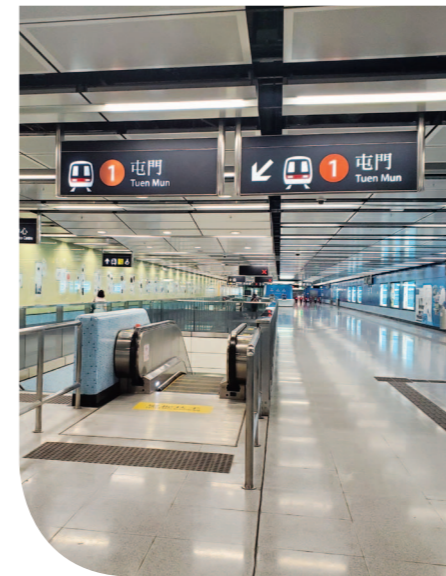
## 鐵路安全

### 鐵路事故數目平穩

港鐵於2021年的總載客量約為15.7億人次，與2020年約12.7億人次相比，升幅為23.6%。2021年共錄得823宗鐵路事故，與2020年相比略升，總體趨勢大致平穩。

### 屯馬線全線開通

由西鐵線、屯馬線一期和一段新路段（宋皇台站至紅磡站）組成的屯馬線，是全港最長的鐵路線，全長約56公里，共設有27個車站，全程行車時間約為73分鐘。屯馬線開通前，鐵路科監督港鐵公司進行嚴謹的全線行車測試，就開通首日在繁忙時段及非繁忙時段可能出現的不同情境進行演練，以及測試全線系統的可靠性。機電署及相關政府部門確認全線安全妥善後，屯馬線於2021年6月27日全線開通。



◀◀由西鐵線、屯馬線一期和一段新路段（宋皇台站至紅磡站）組成的屯馬線在2021年6月全線開通。屯馬線是全港最長的鐵路線，全長約56公里，共設有27個車站。

The Tuen Ma Line (TML), comprising the West Rail Line, TML Phase 1 and a new section from Sung Wong Toi Station to Hung Hom Station, commenced its full launch in June 2021. Being the longest rail line in Hong Kong, it covers a length of about 56 kilometres and 27 stations.

## RAILWAY SAFETY

### Number of Railway Incidents Stable

In 2021, the patronage of MTR services amounted to 1.57 billion, an increase of 23.6% compared with the number of 1.27 billion in 2020. A total of 823 railway incidents were recorded in 2021, a slight increase from 2020. The overall trend was generally stable.

### Full Launch of Tuen Ma Line

The Tuen Ma Line (TML), comprising the West Rail Line, TML Phase 1 and a new section from Sung Wong Toi Station to Hung Hom Station, is the longest rail line in Hong Kong. It is about 56 kilometres long and covers 27 stations, with end-to-end journey time of about 73 minutes. Before its launch, the Railways Branch (RB) had supervised the MTR Corporation Limited (MTRCL) to carry out stringent full-line train tests, conduct exercises on different scenarios which might occur in peak and non-peak hours during the day-one operation, and test the reliability of the systems of the entire line. After the EMSD and the related government departments had confirmed that the whole line was in safe and sound condition, the TML commenced its full launch on 27 June 2021.

## 保障公眾安全 Protecting Public Safety

### 東鐵線過海段順利通車

全城期待的東鐵線過海段建造工程在2021/22年進入衝刺階段。重點之一是在紅磡站以北進行新舊路軌接駁工程。港鐵公司於2021年分別在七個周日暫停旺角東至紅磡站的鐵路服務，以便進行上述工程。為加強監督工程，鐵路科引入新的「工程項目安全檢討」程序，在項目周期的最初階段已開始對鐵路項目的安全性進行系統性評估，並參與關鍵項目測試。

鐵路科於2021年底展開一連串法定檢查，涵蓋信號系統、紅磡新月台、新建的會展站和金鐘擴建部分新鐵路系統及設施的測試等，並參與港鐵公司在夜間進行的全線行車壓力測試。經過各方努力，各項測試順利完成。東鐵線過海段在2022年1月31日進入試營運階段，並於2022年5月15日正式開通。

### 旅客捷運系統引入六卡列車

在香港國際機場一號客運大樓運行的旅客捷運系統由四卡列車重新組編為六卡列車。鐵路科在2021年3月開始為新組編的列車進行法定檢查，並於同年8月完成檢查。自2021年11月16日開始，香港國際機場可按運作需要使用四卡或六卡列車接載旅客往返一號客運大樓與中場客運廊。

### 克服疫情挑戰

2022年初第五波疫情爆發，鐵路科有多位負責規管和監督鐵路營運機構的員工確診，以致人手緊張，對鐵路的正常運作及相關設施和系統的操作和維修工作造成一定影響。儘管如此，鐵路科仍努力不懈，密切監察有關情況，確保受規管機構有效落實業務延續計劃，安排足夠人手保障鐵路安全，以及備存足夠的主要零部件。

### Smooth Launch of East Rail Line Cross-harbour Extension

The highly anticipated cross-harbour extension of the East Rail Line (EAL) went into the final stage of construction in 2021/22. One of the critical tasks was to carry out bifurcation works at the north of Hung Hom Station. The MTRCL suspended train services between Mong Kok East Station and Hung Hom Station to carry out the above works on seven Sundays in 2021. To enhance supervision over the works, the RB introduced a new Project Safety Review process, under which it conducted a structured assessment on the safety aspects of the railway project and took part in critical tests from the very beginning of the life cycle of the project.

In late 2021, the RB started a series of statutory inspections, covering tests of the signalling systems, the new railway system and facilities of the new platform of Hung Hom Station, the newly constructed Exhibition Centre Station and the extended section of Admiralty Station. The RB also took part in the stress tests for full-line operation conducted overnight by the MTRCL. Through concerted efforts, all the tests were completed smoothly. The EAL cross-harbour extension started trial operation on 31 January 2022 and launched officially on 15 May 2022.

### Six-car Formation Introduced for Automated People Mover

The Automated People Mover (APM) operating at Terminal 1 of the Hong Kong International Airport (HKIA) re-organised its trains from 4-car formation to 6-car formation. The RB began statutory inspections of the newly formed trains in March 2021 and completed the inspections in August 2021. Since 16 November 2021, the HKIA has been able to use either the 4-car or 6-car trains to carry passengers to and from Terminal 1 and the Midfield Concourse based on operational needs.

### Overcoming COVID-19 Challenges

Amid the outbreak of the fifth wave of the epidemic in early 2022, a significant number of staff responsible for regulating and overseeing railway operators in the RB were tested positive for COVID-19, resulting in a shortage of manpower. This affected the routine operation of railways, as well as the repair and maintenance of railway facilities and systems to a certain extent. Nonetheless, the RB spared no efforts in monitoring the situation closely to ensure that the regulatees implemented their business continuity plans effectively, arranged adequate manpower to ensure railway safety, and maintained sufficient key spare parts.

### 重啟鐵路貨運服務應對疫情

在第五波疫情爆發期間，跨境貨車運輸大受影響，政府開通多個物流渠道，以保障香港與內地之間的物資運送穩定，包括重開已停辦多年的跨境鐵路貨運服務。鐵路科配合計劃，在短短七日內完成保障鐵路安全的相關程序，包括審核港鐵公司有關內地來港列車的技術評估，監察港鐵公司就列車、軌道、電力、通訊系統的現場測試，並視察內地來港列車帶道演練及檢視港鐵公司按風險評估結果制定的應急方案。相關的測試及演練於2022年3月1日順利完成後，鐵路貨運服務隨即於2022年3月2日開始運作。首班列車共有九個貨卡，運載18個貨櫃（約50噸）的防護服、2019冠狀病毒病快速抗原測試包等防疫抗疫物資到港。在疫情高峰期，鐵路貨運在確保供港物資穩定方面，發揮重要作用。

### Reactivating Railway Freight Service in Response to Epidemic

During the outbreak of the fifth wave of the epidemic, cross-boundary cargo flows were severely disrupted. The Government took initiatives to open up a number of logistics channels to ensure steady flows of supplies between Hong Kong and the Mainland, which included reactivating the cross-boundary railway freight service which had been suspended for years. To support the plan, the RB completed, within a period as short as seven days, all related procedures for ensuring railway safety. These included reviewing the MTRCL's technical assessment regarding the Mainland freight trains coming to Hong Kong, monitoring the MTRCL's on-site tests of the trains, tracks, power and communication systems, inspecting the driving guidance drills for the Mainland freight trains and examining the emergency response plans drawn up by the MTRCL based on its risk assessments. Following the completion of all the tests and drills on 1 March 2022, the railway freight service commenced operation immediately on 2 March 2022. The first train carried nine freight wagons, transporting 18 containers or about 50 tonnes of anti-epidemic supplies such as personal protective equipment and COVID-19 rapid antigen tests to Hong Kong. The railway freight service played an important role in ensuring the steady supply of goods to Hong Kong at the peak of the epidemic.



▲▲ 為重開跨境鐵路貨運服務，以紓緩疫情對跨境貨運造成的嚴重影響，鐵路科在七日內完成確保鐵路安全所需的各項審核及檢查工作，包括監察有關軌道（左上圖）、內地來港列車（右上圖）及貨櫃吊運車（下左圖）等的現場測試。在2022年3月2日舉行開通儀式後，跨境鐵路貨運服務正式重開（下右圖）。

In order to reactivate the cross-boundary railway freight service to ease the severe cargo flow disruption caused by the epidemic, the Railways Branch completed within seven days all necessary safety review and inspection procedures, which included monitoring on-site tests of the tracks (top left), Mainland freight trains (top right), cranes for hoisting containers (bottom left), etc. The cross-boundary railway freight service re-opened on 2 March 2022 after an official ceremony (bottom right).

## 保障公眾安全 Protecting Public Safety

### 第六代山頂纜車測試完成

山頂纜車優化工程在2021/22年度踏入最後階段。山頂纜車自2021年6月起暫停服務，以進行優化工程，包括採用第六代纜車系統和引入可載客210人的新款纜車。纜車公司完成更換拖曳系統、控制系統、纜索和路軌等工程後，鐵路科在2022年3月一連六日聯同德國纜車專家進行最後階段的行車安全法定檢查，確認纜車系統運行安全暢順。在2022年6月，車務運行可靠性測試亦順利完成，為新纜車系統正式開通作好準備。

### Sixth-generation Peak Tram Testing Completed

The upgrading project for the Peak Tram entered the final stages in 2021/22. Its service had been suspended since June 2021 for upgrading works, which included adopting the sixth-generation tram system and introducing new tramcars with a capacity for 210 passengers. After the Peak Tramways Company Limited had completed the replacement of the haulage system, controls, ropes and track rails, the RB conducted the final-stage statutory inspections with a ropeway specialist from Germany for six consecutive days in March 2022 and confirmed that the tram systems were in safe and sound condition. In June 2022, reliability tests of the tramway operation were also completed successfully, meaning that the new Peak Tram system was ready for its official launch.



◀▲山頂纜車系統優化工程完成後，第六代山頂纜車系統的新款纜車外觀煥然一新，載客量增至210人。由於所有法定安全檢查和車務運行可靠性測試已順利完成，新纜車系統隨時可正式開通。

Upon the completion of the Peak Tram upgrading project, the new tramcars of the sixth-generation peak tramway system have a new stunning look, with an increased capacity for 210 passengers. As all statutory inspections and reliability tests of the tramway operation have been completed, the new tramway system stands ready for official launch.

### 擴大創科應用

鐵路科與各鐵路營運機構定期舉行創新科技（創科）論壇，交流技術及分享創科應用心得。此外，鐵路科亦與鐵路營運機構合作推行多個先導創科項目，利用創科方案提升鐵路服務及安全。例如，鐵路科與港鐵公司合作在大圍站的東鐵線及屯馬線路軌範圍安裝「智能鐵路入侵物探測系統」，實時偵測車站上蓋樓宇工程中有外物跌落路軌範圍的情況，並即時通報車務控制中心人員處理，從而提升列車運作安全。由於系統運作成效理想，港鐵公司已計劃陸續在約80個鄰近公路或高架橋的露天路軌路段安裝有關系統。

就乘客不當使用港鐵自動梯的情況，鐵路科與港鐵公司研究在車站引入「光學雷達物體偵測系統」。當系統偵測到有乘客攜帶大型行李、單車或嬰兒車擬乘搭自動梯時，系統會發出多媒體信息，提醒乘客改用升降機，以策安全。系統已於2022年1月在港鐵彩虹站開始試用。

在電車方面，鐵路科與香港電車有限公司合作開發兩個創科項目，監控超速和異物落入路軌的情況，以進一步提升電車安全。至於香港國際機場的旅客捷運系統，在夜間進行測試或維修保養時，列車會由司機人手操控。為加強在司機人手操控列車時的行車安全，鐵路科與香港國際機場合作推出「司機隨身寶」。該裝置適用於各種列車。司機可把裝置放在控制台前端，該裝置便可同時監察前方的路面情況和司機的狀態（例如燈號、轉向及司機的專注度等），並適時向司機發出警示，即使列車在黑暗的隧道中行駛，裝置也可如常運作。「司機隨身寶」在2022年度日內瓦國際發明展榮獲金獎。

在內部流程方面，鐵路科已應用區塊鏈技術儲存所有與審批鐵路項目相關的文件，鐵路科會繼續利用相關技術，進一步改善審批工作流程，提升審批效率，以及備存更完整的文件記錄。

### Wider I&T Application

The RB and railway operators conducted regular innovation and technology (I&T) forums to exchange and share views on I&T application. The RB also carried out a number of I&T pilot projects with railway operators to enhance railway services and safety with I&T solutions. For example, in collaboration with the MTRCL, the RB installed a Smart Railway Intrusion Detection System on the EAL and TML tracks at Tai Wai Station. The system can detect in real-time any objects from building works above the station falling onto the track areas and alert the railway operation control centre promptly for appropriate action, thereby enhancing train safety. Given that the system was proved effective, the MTRCL planned to install the system at about 80 open-track sections near highways or bridges by phases.

The RB and the MTRCL jointly explored the introduction of alight detection and ranging (LiDAR) system at stations in response to improper use of MTR escalators by passengers. When the LiDAR system detects any passengers with bulky luggage, bicycles or baby strollers intending to use the escalators, it will broadcast multi-media messages to remind them to use the lifts instead for their own safety. The LiDAR system began its trial run at Choi Hung Station in January 2022.

For the tramway, the RB and the Hong Kong Tramways Limited jointly developed two I&T projects to monitor speeding and foreign objects falling onto the tracks, so as to further enhance tramway safety. Regarding the APM at the HKIA, having regard to that the trains are controlled by drivers manually when testing or repair and maintenance are carried out at night, the RB and the HKIA jointly introduced a Smart Driver Assistant for APM, in order to enhance train safety during its manual control by the driver. The device is suitable for use with any type of trains. Drivers can place it on the dashboard of the train, and the device can monitor both the track condition in front and the driver's condition, such as track signals, change of direction and the driver's concentration, even when the train is running through dark tunnels. Alert signals would be sent promptly to the driver as necessary. The Smart Driver Assistant for APM won a gold medal in the International Exhibition of Inventions of Geneva 2022.

On internal processes, the RB has adopted blockchain technology to store all documents related to the approval of railway projects. The RB will continue to make use of the technology to further improve the approval process, increase approval efficiency and enhance documentation integrity.

## 保障公眾安全 Protecting Public Safety

### 參與國際鐵路會議

鐵路科是國際鐵路安全議會(議會)核心小組的成員，於2021年10月13日參加核心小組的高層會議，與各成員共同規劃議會的未來發展方向，維持議會的核心價值。鐵路科透過視像參與會議，分享應用創科提升鐵路安全的經驗。歐盟鐵路局、西班牙鐵路局和西班牙鐵路設施管理局將於2022年第四季在西班牙舉行議會的周年大會，鐵路科會派代表出席會議。

### Participating in International Railway Meetings

As a member of the Core Group of the International Railway Safety Council (IRSC), the RB joined a high-level meeting of the Core Group on 13 October 2021 to jointly plan the future direction of the IRSC with fellow members, with a view to upholding its core values. The RB took part in the meeting via videoconferencing and shared its experience in promoting railway safety through I&T application. The European Union Railway Agency, the Spanish Railway Agency and the Railway Infrastructure Administrator will co-organise the IRSC annual meeting in Spain in the fourth quarter of 2022. The RB will arrange representatives to attend the meeting.

◀機電署代表在國際鐵路安全議會核心小組於2021年10月舉行的高層會議上發言，與各成員共同規劃議會的未來發展方向。多年來，我們與議會緊密合作，積極在國際層面推動鐵路安全和分享香港的相關經驗。The EMSD representatives spoke at a high-level meeting of the Core Group of the International Railway Safety Council (IRSC) in October 2021 to jointly plan the future direction of the IRSC with fellow members. Over the years, we have worked closely with the IRSC to actively promote railway safety and share Hong Kong's experience in this respect internationally.



### 未來路向

東鐵線過海段於2022年1月31日進入試營運階段，並準備在2022年5月正式開通，較預期時間早。東鐵線過海段開通，標誌著整個東西及南北走向的鐵路網絡工程全部完成，為本港鐵路發展寫下重要一頁。

鐵路科正就規劃/設計中的項目，包括北環線、東涌線延線、小蠔灣站、屯門南延線及洪水橋站，開展在設計期確保鐵路安全的工作。另外，鐵路科將會就較長遠的鐵路發展項目作準備。有關項目為《北部都會區發展策略》所載的五個新鐵路項目。

同時，鐵路科會繼續鼓勵鐵路營運機構加強應用創科，以保障列車安全。舉例而言，鐵路科正與港鐵公司合作研發一套利用語義人工智能及數據分析技術為鐵路軌道進行預測性維修工作的創科方案。這個方案在2022年日內瓦國際發明展獲得銀獎。另一個例子是在列車安裝智能基礎設施監察系統。系統採用先進的人工智能、光學雷達和熱成像技術，即使列車在高速行駛時亦能監察和偵測隧道內基礎設施的異常狀況，例如滲水、混凝土剝落、裂縫及架空電纜鬆脫等，從而盡量減少意外事故發生的可能。

鐵路科會繼續加強與內地及國際鐵路組織機構的交流及合作，特別是在創科合作和人員往來等方面。

### Way Forward

The EAL cross-harbour extension began trial operation on 31 January 2022 in preparation for its official launch in May 2022, which will be earlier than planned. The launch of the EAL cross-harbour extension will herald the completion of the entire east-west and north-south links of our railway network, marking a major chapter in Hong Kong's railway development.

The RB is carrying out work to ensure railway safety during the design stage of the projects under planning/design, which include the Northern Link, Tung Chung Line Extension, Oyster Bay Station, Tuen Mun South Extension and Hung Shui Kiu Station. Moreover, the RB will get prepared for the longer-term railway development projects, including the five new railway projects envisaged in the Northern Metropolis Development Strategy.

Meanwhile, the RB will continue to promote I&T application by railway operators for train safety. For example, the RB and the MTRCL are developing an I&T solution using semantic artificial intelligence (AI) and data analytics to initiate predictive maintenance works for railway track systems. The solution also won a silver medal in the International Exhibition of Inventions of Geneva 2022. Another example is the installation of a smart infrastructure monitoring system on trains. Making use of cutting-edge AI, LiDAR and thermal imaging technologies, the system can monitor and detect anomalies such as water leakage, concrete spalling, cracks and loose overhead cables in the infrastructures in tunnels, even when the trains are travelling at a high speed, thereby minimising the possibility of incidents.

The RB will continue to strengthen exchange and cooperation with the Mainland and international railway organisations, in particular on I&T collaboration and personnel exchange.

## 保障公眾安全 Protecting Public Safety

### 七天之內重啟跨境鐵路貨運服務 Seven-day Race to Restart Cross-Boundary Railway Freight Service



在香港第五波嚴峻疫情期間，跨境貨車運輸量大減，為盡快開通更多中港物流渠道，運輸及房屋局（時稱）與內地對口單位聯絡和商議後，決定在七天內重新開通已停運多年的跨境鐵路貨運服務。鐵路科高級工程師楊志悅先生和工程師陳靜文女士帶領由十人組成的團隊與時間競賽，全力部署相關工作，並與港鐵公司通力合作，一起在現場進行有關鐵路安全的測試工作。團隊結果不負眾望，在七天極短時間內完成「不可能的任務」，為恢復鐵路貨運服務做好妥善準備。首班內地貨運列車終於在2022年3月2日運送約50噸防疫抗疫物資抵港，以解燃眉之急。

During the fifth wave of COVID-19, cross-boundary cargo flow almost ground to a halt. To open up more logistics channels between Hong Kong and the Mainland, the then Transport and Housing Bureau (THB) liaised with the Mainland counterparts and, upon discussion, decided to reactivate the long-suspended cross-boundary railway freight service within seven days. Mr Yeung Chi-yuet, Chris, a senior engineer, and Ms Chan Ching-man, Kitty, an engineer, both under the Railways Branch (RB), led a team of ten to race against time to plan and conduct on-site railway safety testing in conjunction with the MTR Corporation Limited (MTRCL). Living up to expectation, the team managed to accomplish the “mission impossible” within an extremely short period of seven days, paving the way comprehensively for the resumption of the railway freight service. Eventually, the first Mainland freight train brought about 50 tonnes of much-needed anti-epidemic supplies to Hong Kong on 2 March 2022.

陳女士說：「獲知行動時，只有一兩天準備，時間非常緊迫。團隊組成後，大家也預備好24小時隨時出動。既要兼顧日常監察港鐵維修的工作，又要做好各種必要的安排以盡快恢復跨境鐵路貨運服務，實在是非常大的挑戰。」

跨境貨運列車停運多年後，現代的貨運列車與當年大不相同，因此重啟跨境貨運服務的準備工作相當繁複。首先，港方需要根據中方確認的列車型號、規格和數據等，對內地來港的貨運列車進行技術評估，以確保內地貨運列車與香港鐵路基礎設施兼容，可以在香港鐵路安全運行。同時，鐵路科要求港鐵公司，除按既定機制進行維修保養工作外，也須在內地貨運列車來港前為軌道進行一系列覆核，包括量度軌距、檢查路軌狀況及轉轍器的運作等。此外，鐵路科也聯同港鐵公司到現場仔細檢查在邊境與羅湖編組站之間約一公里長的路軌，並再三覆核量度數據，以確保內地貨運列車可在香港的鐵路基礎設施上安全行駛。

內地貨運列車到達羅湖編組站後，列車上的貨櫃必須吊運到貨櫃車，以便在本港運送和分派有關物資。然而，羅湖編組站是港鐵停泊列車的場地，設有架空高壓電纜，因此在吊運貨櫃時必須加倍留神，以免因觸碰到高壓電纜而危及吊運人員的安全或影響港鐵的列車服務。有見及此，楊先生要求港鐵必須就吊運工作進行風險評估，並制訂相關緩解措施及應急方案。最終的對策是隔離吊運區域附近的高壓電纜的電力供應，以及在路軌附近安排閒置的列車作安全屏障，防止吊機意外進入軌道及觸發電力事故。

另一項重點工作是監察信號和通訊系統的測試。在貨運列車演練及正式運作的整個過程中，鐵路科都派員到港鐵的青衣控制中心及羅湖編組站密切監察信號系統的運作，以及港鐵公司與內地列車控制中

“The timeframe was very short. We only had a day or two to prepare after being told of the mission. The team was formed immediately and we readied ourselves to work round the clock to make all necessary arrangement for the prompt resumption of the railway freight service, on top of the routine duties of monitoring the MTRCL’s maintenance work. It was a monumental challenge indeed,” Ms Chan said.

The preparation work for the reactivation of the railway freight service was complicated as the current freight trains have been quite different from the previous ones since the railway freight service was suspended years ago. The first task was to conduct technical assessments on the Mainland freight trains designated for the Hong Kong run based on the train models, specifications and data confirmed by the Mainland, so as to ensure the compatibility between the Mainland freights trains and Hong Kong’s railway infrastructure for the Mainland freight trains to operate safely on the railways in Hong Kong. Meanwhile, the RB required the MTRCL to conduct not only maintenance and repair of the tracks in accordance with established mechanisms, but also a series of reviews on the tracks before the Mainland freight trains started their runs to Hong Kong, which included measuring the track gauges, checking the track condition and the integrity of the point switches, etc. The RB and the MTRCL personnel also carried out on-site thorough inspection of the approximately 1-km track between the boundary and the Lo Wu Marshalling Yard, and reviewed various measurement data repeatedly to ensure that the Mainland freight trains could operate safely on the railway infrastructure in Hong Kong.

Once the cargo containers were transported to the Lo Wu Marshalling Yard by the Mainland freight trains, they had to be lifted onto container trucks by cranes for local transportation and distribution of the supplies. However, the Yard was a MTRCL depot for stationing trains and covered with a network of overhead high voltage cables. Extra caution was called for in the lifting of the containers to avoid touching the cables and endangering the crane operators or potentially affecting the MTRCL’s train services. In view of the above, Mr Yeung demanded that the MTRCL should conduct a risk assessment of the crane operation and formulate risk mitigation measures and contingency plans. In the end, the electricity supply to the cables near the craning area was isolated, and the tracks were barricaded by stationary trains to prevent the cranes from straying onto the tracks accidentally and triggering electrical incidents.

Monitoring the testing of the signalling and communication systems was another major task. During the drills and the actual freight train operations, the RB deployed staff to the MTRCL’s Tsing Yi Control Centre and the Lo Wu Marshalling Yard to closely monitor the operation of the signalling system and the communication

心的溝通，確保信號系統運作正常，以及內地的司機能夠按照港鐵公司的安排操控列車在本港的鐵路行駛。

以往內地司機操控列車通過邊境進入香港後，一般的做法是由港鐵的司機登上貨運列車，引領內地的司機在香港的鐵路上行駛。由於疫情管控的關係，港鐵司機不能登車，因此港鐵需安排旗手，在邊境、中途及編組站的指定地點，以旗號向司機指示行走及停車的位置，期間旗手也需目測列車在路軌上行走時是否一切正常。由於內地發車的時間需顧及多重因素，列車未必能夠定時開出，所以港鐵必須安排旗手及其他人員輪候命，鐵路科也會安排相應人員在青衣控制中心及羅湖編組站監察貨運列車和各項鐵路系統的運作。

縱使工作艱鉅，楊先生及團隊成員仍能排除萬難，在七日內完成所有準備工作。在3月1日以空載的內地列車進行實地測試取得理想結果，跨境鐵路貨運服務於翌日正式重啟。

楊先生說：「跨境鐵路貨運服務已停運多年，卻需要在極短的時間內重啟，我感到責任重大。我們快速應變，集合同事做好準備工作，評估風險和制訂各種應對方案，預先與同事和港鐵公司安排處理的方法。當時每日的工作繁重，除監督測試、檢測路軌的情況外，也須參與定期舉行的會議，與局方、其他部門、港鐵公司和內地的單位等保持良好溝通。不過大家都抱着堅定的決心和意志，全力以赴迎難而上，內地相關單位也抱持相同決心，在大家共同努力下，跨境鐵路貨運服務終能如期恢復。在疫情期間能夠為香港出一分力，我感到非常光榮。」

經過這七天的努力，鐵路科與港鐵公司已做好準備，萬一香港日後再遇到跨境貨運困難，也可隨時重啟跨境鐵路貨運服務。同時，鐵路科與港鐵公司也為將來有可能使用內地貨運列車運載禽畜到上水屠房做好必要的準備工作，以應不時之需。

between the MTRCL and the Mainland train control centre to ensure that the signalling system functioned normally and the Mainland drivers operated the train according to the MTRCL’s arrangements on the Hong Kong tracks.

The usual practice in the past was to have an MTRCL driver get on the freight train and guide the Mainland driver to operate on the Hong Kong railway after the Mainland train had entered Hong Kong. However, the MTRCL drivers could not get on the train due to anti-epidemic control arrangements. The MTRCL had to arrange flag signalmen at designated locations at the boundary, the Marshalling Yard and along the tracks, to manually guide the Mainland drivers where to go and where to stop by flags, and perform visual checks to ascertain that the trains were running normally on the tracks. Since the scheduling of the Mainland freight trains was irregular depending on a host of factors, the MTRCL had to put flag signalmen and other staff members on stand-by in shifts. Accordingly, the RB also arranged staff to monitor the freight train operation and the functioning of various railway systems at the Tsing Yi Control Centre and the Lo Wu Marshalling Yard.

Despite the overwhelming challenges, Mr Yeung and his team managed to complete all preparations within seven days against all the odds. Upon the satisfactory trial run of an empty Mainland train operating to Hong Kong on 1 March, the cross-boundary railway freight service was officially reactivated the following day.

“Having to quickly restart the long-suspended cross-boundary railway freight service was an enormous undertaking. We made speedy responses and brought our team together for preparations, risk assessments and formulation of contingency plans, putting all preparation plans in place through working closely with the MTRCL. Every day was packed with lots of things to do, be it monitoring the testing, inspecting the track condition and attending regular meetings to communicate closely with the THB, other government departments, the MTRCL and the Mainland counterparts. That said, we rose to challenges with determination and perseverance and pulled out all the stops for the mission, and our Mainland counterparts were equally determined to make it work. With the concerted effort of all, the cross-boundary railway freight service was put back on track as scheduled. It was an honour to be able to contribute to Hong Kong during the epidemic,” Mr Yeung said.

With the seven-day endeavours, the RB and MTRCL are ready to reactivate the cross-boundary railway freight service anytime should Hong Kong faces cross-boundary logistics bottlenecks again. Meanwhile, the RB and the MTRCL have even put in place the option of transporting livestock from the Mainland to the Sheung Shui Slaughterhouse by using the Mainland freight trains, just in case it is needed.

# 推廣能源效益及節能 Promoting Energy Efficiency and Conservation

## 「強制性能源效益標籤計劃」第四階段即將推出

「強制性能源效益標籤計劃」(強制性標籤計劃)旨在方便市民挑選具能源效益的器具及提升市民對節約能源的意識。強制性標籤計劃首三階段已經全面實施，我們現正準備並即將推行第四階段的計劃。按現行法例規定，有八類家用電氣產品須張貼能源標籤。政府建議在第四階段把發光二極管(LED)燈、氣體煮食爐和即熱式氣熱水爐三類產品納入強制性標籤計劃，並已於2021年3月1日至5月底就有關建議進行為期三個月的公眾諮詢，以及於2021年7月向立法會環境事務委員會提交有關建議供委員討論並取得其支持。我們已在2022年下半年展開相關修例工作，同步修訂《產品能源標籤實務守則》，並已在2022年8月完成業界諮詢。預計強制性標籤計劃第四階段將於2023年第三季起生效，並在15個月寬限期後，於2024年第四季全面實施。

強制性標籤計劃第四階段涵蓋的三類產品佔住宅總能源消耗量約30%，連同首三階段涵蓋的現有八類訂明產品，所有訂明產品共佔住宅總能源消耗量約80%。強制性標籤計劃第四階段全面實施後，每年可協助消費者節省約570太焦耳(若以電力為單位，即約1.58億度電)，相當於每年減少排放約75 350公噸二氧化碳。

## 《建築物能源效益守則》及《能源審核守則》最新版本生效

《建築物能源效益守則》及《能源審核守則》每三年修訂一次，兩份守則於2021年完成檢討，最新版本已於2021年12月31日刊憲，分別會於六個月和九個月的寬限期後全面實施。在新發出的《建築物能源效益守則》2021年版中，屋宇裝備裝置的能源效益標準全面提升，節能效果較2015年版的守則整體提升超過15%，估計到2035年，有關守則每年可為本港建築物節省約47億至53億度電(與2015年相比)，有助於2050年前實現《香港氣候行動藍圖2050》所定下的碳中和目標。

## ROLLING OUT THE FOURTH PHASE OF THE MANDATORY ENERGY EFFICIENCY LABELLING SCHEME SOON

The Mandatory Energy Efficiency Labelling Scheme (MEELS) is aimed at facilitating the selection of energy-efficient appliances of the public and raising public awareness on energy conservation. The first three phases of the MEELS have been fully implemented, and the fourth phase is under preparation and will soon be implemented. Pursuant to the prevailing legislation, eight types of household electrical products are required to be affixed with energy labels. The Government proposes to include three other types of products, namely Light-Emitting Diode (LED) lamps, gas cookers and gas instantaneous water heaters under the fourth phase of the MEELS. A three-month public consultation was launched on the proposal from 1 March 2021 to the end of May 2021, and the proposal was submitted to the Panel on Environmental Affairs of the Legislative Council in July 2021 for members' discussion and endorsement was obtained. We commenced the related legislative amendment exercise in parallel with the revision of the Code of Practice on Energy Labelling of Products in the latter half of 2022, and completed a trade consultation in August 2022. It is anticipated that the fourth phase of the MEELS will be effective from the third quarter of 2023, and will be fully implemented in the fourth quarter of 2024 after a 15-month grace period.

The three types of products covered in the fourth phase of the MEELS account for about 30% of the total residential energy consumption. Together with the eight types of products currently covered in the first three phases of the MEELS, all the prescribed products account for about 80% of the total residential energy consumption. The full implementation of the fourth phase of the MEELS will help consumers annually reduce about 570 terajoules (i.e. around 158 million kilowatt-hours in terms of electricity), which is equivalent to an annual reduction of about 75 350 tonnes of carbon dioxide emissions.

## LATEST EDITIONS OF THE BUILDING ENERGY CODE AND ENERGY AUDIT CODE CAME INTO EFFECT

The Building Energy Code (BEC) and the Energy Audit Code (EAC) are reviewed every three years. Having the reviews completed in 2021, the latest editions of the BEC and EAC were gazetted on 31 December 2021 and will be fully implemented after a grace period of six months and nine months respectively. Under the newly published 2021 edition of the BEC, the energy efficiency standards of building services installations were uplifted comprehensively, with an overall improvement of more than 15% in energy saving as compared with the 2015 edition. It is estimated that by 2035, the BEC will bring about an annual energy saving of about 4.7 billion to 5.3 billion kWh from buildings in Hong Kong (compared with 2015), which will contribute to achieving the target of carbon neutrality as set out in Hong Kong's Climate Action Plan 2050 before 2050.

## 參與制訂《香港氣候行動藍圖2050》

年內我們參與由環境局(時稱)主導的《香港氣候行動藍圖2050》(《行動藍圖》)制訂工作，就節能綠建的部分提供有關減碳策略和行動的意見，例如就探討擴展《建築物能源效益條例》的規管範圍提出多個方案。與環境局商議後，有關方案獲納入《行動藍圖》。《行動藍圖》已於2021年10月公布。我們的長遠工作是協助環境局開展相關研究工作，例如探討更進取地擴展規管範圍至所有高耗能建築物。隨着未來新興產業的發展，例如高耗能數據中心越來越多，我們亦會研究如何提升這類建築物的能源效益標準，確保屋宇裝備裝置的能源效益標準與時並進。我們會就研究所得結果與業界商討及進行諮詢，再敲定相關條例修訂的內容。

為動員社會共同參與和配合節能，政府於《行動藍圖》中提出透過公開能源數據及引入能源基準工具，讓各界比較樓宇的能源消耗表現。我們擬於2022年6月17日推出建築物電力使用指數網上基準工具(網上基準工具)，讓各界比較及檢討建築物全年整體的電力使用表現，以了解有何節能空間，該工具並會提供建築物節能的建議。我們已開展宣傳工作，鼓勵各界和市民善用網上基準工具，並且推行節能減碳工作，積極投入低碳轉型，共同邁向碳中和。

## 重新校驗進度理想

為期七年的重新校驗計劃於2019年推出，於2021/22年度已進入第三個年頭。該計劃的目的是透過為符合計劃條件的政府建築物進行系統性重新校驗，提升建築物的能源效益，從而減低能耗。在計劃實施的三年間，我們為逾160幢樓齡較高的政府建築物進行重新校驗。在下一年度，我們會將更多政府建築物納入計劃，預計進行重新校驗的政府建築物總數會增至約200幢。

在第五波疫情期間，部分計劃進行重新校驗的政府建築物暫時改為抗疫設施或暫時關閉，導致重新校驗的進度略受影響。幸而經重新安排後，我們最終如期為44幢計劃進行重新校驗的政府建築物完成工程。

## INVOLVEMENT IN THE FORMULATION OF HONG KONG'S CLIMATE ACTION PLAN 2050

During the year, we took part in the formulation of Hong Kong's Climate Action Plan 2050 (the Action Plan) spearheaded by the then Environment Bureau (ENB), for which we advised on the carbon reduction strategies and actions in the section about energy saving and green buildings. For example, we explored the possibility of expanding the scope of regulation covered by the Buildings Energy Efficiency Ordinance (BEEO) and proposed various approaches, which have been included in the Action Plan after discussion with ENB. The Action Plan was published in October 2021. Our long-term task is to assist ENB to embark on related studies, such as exploring the possibility of further expanding the scope of regulation of the BEEO to cover all buildings with high energy consumption. In view of the development of emerging industries, such as the increasing number of data centres with high energy demand, we will also look for ways to enhance the energy efficiency standards for such buildings, with a view to ensuring that the energy efficiency standards of building services installations are up to date. We will conduct discussion and consultation with the trade on the study results before finalising the content of the related legislative amendments.

To mobilise the community to take collective action to conserve energy together, the Government set out in the Action Plan the initiatives to release energy data and introduce energy benchmarking tools, so as to facilitate public comparison of building energy consumption performance. We are going to launch our Online Building Based Electricity Utilization Index Benchmarking Tools (Online Benchmarking Tools) on 17 June 2022 to enable users from all walks of life to unveil energy saving opportunities through comparing and reviewing the annual overall electricity utilization performance of buildings, and to provide them with our advice on energy saving in buildings. We have commenced publicity work to encourage different sectors and members of the public to make the most of the Online Benchmarking Tools and to proactively support low-carbon transformation through taking forward energy saving and decarbonisation measures with a view to achieving the target of carbon neutrality.

## RETRO-COMMISSIONING MADE GOOD PROGRESS

The seven-year Retro-commissioning (RCx) programme entered the third year in 2021/22 since its implementation in 2019. The programme is aimed at tuning up building energy efficiency through conducting systematic RCx for government buildings that met the eligibility criteria of the programme, in order to reduce energy consumption. During the implementation of the programme in the past three years, we have been conducting RCx for more than 160 aged government buildings. In the coming year, we will include more government buildings into the programme, taking the estimated total number of government buildings implementing RCx to around 200.

During the fifth wave of the epidemic, as some of the government buildings slated for RCx were temporarily converted for anti-epidemic purposes or closed, the progress of RCx was slightly affected. Fortunately, the planned RCx works in 44 government buildings were eventually completed on schedule after rearrangements.

## 推廣能源效益及節能 Promoting Energy Efficiency and Conservation

### 區域供冷系統新發展

區域供冷系統不單能源效益高，且有助減少碳排放及紓緩熱島效應。位於啟德發展區的區域供冷系統由機電署規劃及建造，總製冷量為462兆瓦，相當於供應65幢30層高商業大廈的製冷量。自2013年2月起，啟德發展區的區域供冷系統陸續為區內多個非住宅物業供冷，於2021/22年度更踏入新里程，開始為區內的私人發展項目供冷，首個項目是南豐集團的商場及甲級寫字樓綜合項目AIRSIDE，項目啟動禮訂於2022年6月16日舉行。

我們已批出洪水橋/廈村、東涌東及古洞北的區域供冷系統的顧問研究合約，當中洪水橋/廈村區域供冷系統的顧問研究合約以新工程合約4的模式批出。新工程合約4的「設計、建造及營運」合約模式，有助提升整體施工質素及控制工程管理的風險。我們由上年度起與英國土木工程師學會合作，率先為機電署人員提供新工程合約4的相關認證課程。首批學員的整體考核成績理想，並取得多項專業認證。

未來，我們會為機電署人員安排新工程合約4方面的恆常培訓及考核，以配合日後所有區域供冷系統工程採用新工程合約4。

我們亦會以新工程合約4批出洪水橋/廈村、東涌東及古洞北的區域供冷系統的「設計、建造及營運」合約。

▼▶ 我們自2021年起與英國土木工程師學會合作，為機電署人員提供新工程合約4的相關認證課程(左圖)。首批參加課程的機電署人員已取得專業認證(右圖)。  
We have been collaborating with the UK Institution of Civil Engineers since 2021 to provide NEC4 accreditation courses for the EMSD staff (left). The first batch of the EMSD staff who attended the courses have received professional certification (right).



### NEW DEVELOPMENT OF DISTRICT COOLING SYSTEMS

District Cooling Systems (DCSs) not only are highly energy efficient but also help to reduce carbon emissions and mitigate heat island effect. The DCS in the Kai Tak Development (KTDCS) planned and built by the EMSD has a total cooling capacity of 462 megawatt of refrigeration (MW<sub>r</sub>), equivalent to the cooling supply for 65 commercial buildings of 30 storeys. Since February 2013, the KTDCS has been progressively providing cooling services for various non-residential buildings in the district. A new milestone was reached in 2021/22 as it began to provide cooling services for private developments in the district, the first project being AIRSIDE, a complex development of the Nan Fung Group comprising a shopping mall and Grade A offices. The launch ceremony of the project is scheduled for 16 June 2022.

We have awarded the consultancy study contracts for the DCSs at Hung Shui Kiu/ Ha Tsuen, Tung Chung East and Kwu Tung North. The consultancy study contract for the Hung Shui Kiu/ Ha Tsuen DCS project was awarded in the form of New Engineering Contract 4 (NEC4). The Design-Build-Operate (DBO) contract under NEC4 can help elevate the overall quality of works and control risks in project management. Starting from last year, we have been collaborating with the UK Institution of Civil Engineers to be among the first to provide NEC4 accreditation courses for the EMSD staff. The first cohort taking the courses achieved good results in general and received various professional certification.

We will arrange regular training and assessment on NEC4 for the EMSD staff in future, with a view to using NEC4 for all DCS projects.

We will also award DBO contracts in the form of NEC4 for the DCSs at Hung Shui Kiu/ Ha Tsuen, Tung Chung East and Kwu Tung North.



### 創建可持續發展未來

年內，機電署多方面的工作都體現「同心互勵，創建未來」的精神。舉例而言，我們負責統籌和支援環境局(時稱)「綠色校園2.0」計劃下的「採電學社」和「智能慳電」兩個項目。「採電學社」旨在為合資格的學校及非政府福利機構安裝小型太陽能發電系統，讓他們可以參與本地兩家電力公司推行的上網電價計劃。「智能慳電」則為合資格的非官立及非牟利中小學提供資金及技術支援，在校內安裝節能裝置，包括變頻式冷氣機、LED燈及實時能源監察系統等。

在2021/22年度，「採電學社」共接獲逾600份申請，「智能慳電」則共接獲300份申請。年內，我們為150家參加「採電學社」的學校及非政府福利機構安裝太陽能發電系統，並預算於2022年底前為超過150家學校提供「智能慳電」項目的服務。



兩個計劃的另一個目的，是提升學生的環保意識。我們與環境局(時稱)和教育局合作，並在諮詢約120位小學老師的意見後，完成編製「採電學社」STEAM(即科學、科技、工程、藝術及數學)小學教材套，預計有關教材套可於2022/23學年起供全港小學使用。教材套充滿互動元素，以生動活潑的方式讓小學生了解可再生能源的應用，加深他們對可再生能源的興趣和認識，進而推廣低碳生活。我們會繼續為中學及幼稚園編製有關可再生能源的STEAM教材套。

另外，我們亦於2021年11月啟動環境局(時稱)為期五年的「綠色社福機構」計劃。這個計劃類似「智能慳電」，我們會協助合資格的非政府福利機構進行能源審核及在該等機構的處所安裝節能裝置，例如能源效益較高的空調和照明設備，並會向負責管理營運設施的團體建議，就日常運作進行例行能源審核，以推動減碳。該計劃會為300個非政府福利機構的處所提供服務，第一年的申請已於2022年3月底截止，共收到逾200份申請。

### BUILDING A SUSTAINABLE FUTURE

During the year, the EMSD demonstrated the spirit of “co-creating a brighter future with one heart and mutual encouragement” in its work in various aspects. For instance, we co-ordinated and supported the Solar Harvest and the Energy Smart schemes, under the Green Schools 2.0 of the then ENB. Solar Harvest aimed at installing small-scale solar energy generation systems for the premises of eligible schools and welfare non-government organisations (NGOs) to enable them to join the Feed-in Tariff (FIT) scheme operated by the two local power companies. Energy Smart offers funding and technical support for eligible non-government and non-profit making primary and secondary schools to install energy-saving installations such as variable-speed air-conditioners, LED lighting and real-time energy monitoring systems in their school premises.

In 2021/22, a total of more than 600 applications for Solar Harvest and 300 applications for Energy Smart were received. During the year, we installed solar energy generation systems for 150 schools and welfare NGOs participating in Solar Harvest, and targeted to provide services under Energy Smart for over 150 schools by the end of 2022.



◀▲ 我們的團隊為一家參與「採電學社」計劃的幼稚園安裝了太陽能發電系統(左圖)，該校是全港首家在天台安裝柔性太陽能板(右圖)的幼稚園。我們運用了黏貼材料進行安裝，避免損害防水層。  
Our team installed a solar energy generation system for a kindergarten participating in Solar Harvest (left). It is the first kindergarten to install flexible solar panels on its rooftop (right). We used adhesive materials for the installation to avoid causing damage to the waterproof layer (right).

Another purpose of the two schemes is to raise students' awareness of environmental protection. We, in collaboration with the then ENB and the Education Bureau and in consultation with about 120 primary school teachers, produced the Solar Harvest STEAM educational kit for primary schools. It is expected that the educational kits will be available for use of all primary schools in Hong Kong in the 2022/23 academic year. The education kit will enable primary students to learn about the application of renewable energy in an interactive and lively way, thereby deepening their interest in and understanding of renewable energy, as well as promoting a low-carbon lifestyle. We will proceed to produce STEAM educational kits on renewable energy for secondary schools and kindergartens.

Besides, we launched the five-year Green Welfare NGOs scheme under the then ENB in November 2021. Similar to Energy Smart, we help eligible welfare NGOs conduct energy audits and put in place energy-saving installations, such as more energy-efficient air-conditioners and lighting, at their premises, as well as advising the organisations responsible for managing the operating facilities to conduct energy audits on daily operation, in order to promote carbon reduction. The scheme aims to provide services at 300 premises of the participating welfare NGOs. Application for the scheme in the first year was closed at the end of March 2022. A total of over 200 applications were received.

# 推廣能源效益及節能 Promoting Energy Efficiency and Conservation

## 區域及國際合作

作為亞太區經濟合作組織(亞太經合組織)能源工作組的中國香港代表，機電署分別出席於2021年6月及10月舉行的能源工作組第61屆及第62屆會議，並在會上分享《行動藍圖》和相關政策的內容。

## REGIONAL AND INTERNATIONAL CO-OPERATION

As the representative of Hong Kong, China in the Asia-Pacific Economic Cooperation (APEC) Energy Working Group (EWG), the EMSD attended the 61st and 62nd EWG meetings in June and October 2021 respectively and shared the content of the Action Plan and related policies.



▲機電署代表中國香港參加亞太經合組織能源工作組分別於2021年6月及10月在網上舉行的第61屆及第62屆會議，並在會上分享《行動藍圖》和相關政策的重點。左圖為機電署副署長/規管服務向與會者闡述要點。右圖為機電署人員在網上參與亞太經合組織能源效益及節能專家小組第57屆會議的情況。  
The EMSD represented Hong Kong, China to attend the 61st and 62nd APEC EWG meetings held online in June and October 2021 respectively, and shared the highlights of the Action Plan and related policies. Left photo shows our Deputy Director/Regulatory Services making a point to the delegates at the meeting. Right photo shows the EMSD's online participation in the 57th meeting of the APEC Expert Group on Energy Efficiency and Conservation.

此外，機電署助理署長/電力及能源效益更於第62屆能源工作組會議上，獲選為2021至2023年的能源工作組副主席；加上機電署一名前助理署長會在2021至2023年繼續代表中國香港擔任能源效益及節能專家小組主席，因此機電署共有兩名代表在亞太經合組織能源工作組擔任領導角色。這不單是對部門的肯定，也有助提升香港在區域內節能工作的影響力。我們更可善用能源工作組會議作為平台，與其他成員經濟體互相交流經驗，藉以宣傳香港的《行動藍圖》及展示我們達成零碳排放的決心。

Furthermore, Assistant Director/Electricity and Energy Efficiency of the EMSD was elected as the Deputy Lead Shepherd of the EWG for session 2021-23 at the 62nd meeting of the EWG. Together with a former Assistant Director of the EMSD who continues to represent Hong Kong, China and serve as Chairman of the Expert Group on Energy Efficiency and Conservation under the APEC for session 2021-23, a total of two representatives from the EMSD take leading roles in the EWG under the APEC, which not only represents recognition of the department, but also expands Hong Kong's influence in regional energy conservation work. We can also use the EWG meeting as a platform for sharing experiences with other APEC economies, with a view to promoting the Action Plan and demonstrating our determination to achieve zero carbon emissions.

亞太經合組織「重新校驗研討會暨培訓」於2022年1月在香港以視像會議方式舉行，共有逾100名來自11個亞太經合組織成員經濟體的代表參與，分享推行重新校驗的經驗。

The APEC Workshop cum Training on RCx was held in Hong Kong via video conference in January 2022. More than 100 representatives from 11 APEC member economies attended the event and shared their experiences in implementing RCx.



◀◀新加坡能源市場管理局應機電署邀請參加2022年1月在網上舉行的「機電工程署研討會2022」，並分享該國的《2030年綠色計劃》和能源轉型經驗。機電署早在2020年10月已與該局簽訂諒解備忘錄，以加強兩地在能源事務方面的合作。At our invitation, the Energy Market Authority (EMA) of Singapore attended the EMSD Symposium 2022 held online in January 2022 and shared its country's 2030 Green Plan and experiences in energy transition. Earlier in October 2020, the EMSD had already signed a Memorandum of Understanding with the EMA to strengthen co-operation on energy-related matters.

繼在2020年10月與新加坡能源市場管理局簽訂諒解備忘錄後，香港和新加坡兩地在提升能源安全和應變能力方面的合作日益加強。在2021年10月，機電署應新加坡能源市場管理局邀請以視頻會議方式參與「2021新加坡國際能源周」。為了互相交流，我們亦邀請新加坡方面以相同方式參與我們於2022年1月舉辦的「機電工程署研討會2022」。會上，新加坡代表分享當地的2030年綠色計劃，以及能源轉型的經驗，例如新加坡政府容許私人機構投資，在政府建築物天台安裝太陽能發電系統，並與政府分攤上網電價的收入，措施對本港具參考價值。

Further to the signing of the Memorandum of Understanding with the Energy Market Authority (EMA) of Singapore in October 2020, Hong Kong and Singapore have been fostering closer co-operation in enhancing energy safety and resilience. On invitation of the EMA, the EMSD attended the Singapore International Energy Week 2021 via video conference in October 2021. In reciprocity, the Singapore authority was invited to attend the EMSD Symposium 2022 in the same way in January 2022. At the symposium, the representatives of Singapore shared their 2030 Green Plan and experiences in energy transition. For example, the Singapore Government allowed its private sector to invest in solar power generation systems installed on rooftops of government buildings, and share the FiT income with the Singapore Government, which offers high reference value to Hong Kong.

此外，機電署與環境局(時稱)及廣東省科學技術協會於2021年10月合辦第二屆「綠色創科日」，推動透過創新科技實現碳中和。「綠色創科日」的實體活動在香港和東莞兩地同步進行，並設網上直播。專家應邀就「綠色轉型」及「低碳城市」兩項議題進行交流，探討如何加快減碳轉型。該項活動是特區政府自《行動藍圖》公布以來政府舉辦的首個綠色創科活動，香港代表在會上分享本港計劃於2050年前達致碳中和的目標，以及有關長遠策略和具體措施。今屆「綠色創科日」吸引約200名來自創科行業、機電業界、大學及公營機構的人士到場參與，超過10萬人次觀看網上直播。活動為內地與香港的專家、學者和業界提供交流平台，讓他們就實現碳中和的創科方案分享見解。

Besides, the EMSD, the then ENB and Guangdong Provincial Association for Science and Technology jointly organised the second Green Innovation and Technology Day in October 2021 to promote the use of innovative technologies for achieving carbon neutrality. The physical event of the Green Innovation and Technology Day was held simultaneously in Hong Kong and Dongguan, with live broadcasting online. Experts, on invitation, exchanged views on two themes, namely "Green Transformation" and "Low-carbon Cities", exploring together ways to expedite the transformation towards decarbonisation. Given that it was the first green innovation and technology (I&T) event organised by the Government after the announcement of the Action Plan, the Hong Kong representatives shared the city's goal of achieving carbon neutrality before 2050, as well as its long-term strategies and relevant measures. The event attracted about 200 participants from the I&T sector, the electrical and mechanical trade, universities and public organisations, and more than 100 000 views on live streaming. It provided an exchange platform for experts, academics and the trades of the Mainland and Hong Kong to share insights on I&T solutions to achieve carbon neutrality.



## 推廣能源效益及節能 Promoting Energy Efficiency and Conservation

### 應用科技提升能源效益

我們引入兩項創科方案，提升政府建築物及設施的能源效益，其中一項是本地初創企業研發的永磁同步馬達磁管式風機。我們會在政府設施推廣及廣泛採用該創科方案。另一項創科方案是適用於數據中心伺服器的液體冷卻系統。該系統把伺服器的電路板浸入導熱但不導電的液體中進行冷卻，可減少數據中心空調系統的用电量。機電署於總部的數據中心試行該系統，結果顯示可節省近三成的用电量。



另外，機電署多個促進能源效益的創科方案在2022年日內瓦國際發明展均獲得獎項，例如「香港太陽輻照圖」（「輻照圖」）取得銀獎，而「綜合太陽能管理系統」則取得銅獎。「輻照圖」通過顯示建築物屋頂的太陽輻照量，讓市民可以初步評估其建築物屋頂的太陽能潛力，以估算每年發電量及預計可賺取的上網電價收入。「綜合太陽能管理系統」則可估算太陽能發電系統的發電量，並及時偵測系統老化或其他可能影響裝置效能的問題。

### USING TECHNOLOGY TO ENHANCE ENERGY EFFICIENCY

We have introduced two I&T solutions for enhancing the energy efficiency of government buildings and facilities. One of them is a permanent magnet synchronous motor fan coil unit developed by a local start-up, and it would be promoted and widely applied in government facilities. The other I&T solution is a liquid cooling system for servers in data centres. By submerging the circuit boards of servers in thermally conductive but electrically insulating liquid, the system can reduce electricity consumption of air conditioning system in data centres. Upon the trial of the system at the data centre in the EMSD Headquarters, the results showed that it could reduce electricity consumption by nearly 30%.

◀ 為提升政府建築物及設施的能源效益，我們試驗了不同的創科方案，包括由本地初創企業研發的「數據中心伺服器沉浸冷卻系統」。該系統把伺服器的電路板浸入導熱但不導電的液體中進行冷卻，可為數據中心節省接近三成的空調系統用电量。

To enhance the energy efficiency of government buildings and facilities, we have tested out different I&T solutions, among which is an immersion cooling system for servers in data centre developed by a local start-up. By submerging the circuit boards of servers in thermally conductive but electrically insulating liquid, the system can reduce the electricity consumption of air conditioning system in data centres by almost 30%.

In addition, a number of I&T solutions introduced by the EMSD to enhance energy efficiency won medals at the International Exhibition of Inventions of Geneva 2022. For example, the Hong Kong Solar Irradiation Map (the Map) was awarded a silver medal and the Integrated Solar Energy Performance Management Toolkit a bronze medal. By showing the solar irradiation of the building rooftops, the Map enables the public to perform a preliminary assessment of the solar energy potential for their building rooftops and estimate the annual power generation as well as the expected FiT income. The Integrated Solar Energy Performance Management Toolkit can estimate the power generation of solar power generation systems and detect ageing or other issues that may diminish performance of the systems in a timely manner.

### 未來工作重點

我們已開展第三次提升強制性標籤計劃下能源效益評級標準的工作，進一步提升冷凍器具、洗衣機及儲水式電熱水器的評級標準。有關能源效益測試標準和能源效益評級的顧問研究，以及相關產品的測試，預計於2022年第四季完成。經諮詢後，新評級標準會在2024年首季生效，並在2025年首季全面實施。

未來我們的另一項工作，是就能源效益標籤計劃與內地跨境合作。機電署已就內地與香港互相認可能源效益標籤計劃，與中國海關總署和中國標準化研究院商討簽立合作備忘錄。經中國標準化研究院及國家市場監督管理總局審議內容後，將簽訂合作備忘錄，以就某些在內地與香港具有對應能源效益標準、評級原則和測試程序的指定產品（包括自願性能源效益標籤計劃所涵蓋的產品種類）的能源標籤要求，設立互認機制。預計互認機制落實後，可讓本港業界以更少的資源，同時符合兩地能源效益標籤計劃的要求。

▶ 機電署團隊就內地與香港互相認可能源效益標籤計劃，與中國海關總署和中國標準化研究院進行線上會議，商討建議中的合作備忘錄細節。互認機制落實後，可讓本港業界以更少的資源，同時符合兩地能源效益標籤計劃的要求。

The EMSD team discussed online with the General Administration of Customs of the People's Republic of China and China National Institute of Standardisation about the details of a proposed MoC on mutual recognition of the energy efficiency labelling schemes in the Mainland and Hong Kong. The mutual recognition mechanism will enable the local trade to meet the requirements of the energy efficiency labelling schemes in both Hong Kong and the Mainland with fewer resources.

### FUTURE DIRECTION

We have embarked on the third upgrading exercise for the energy efficiency grading standards under the MEELS to further uplift the grading standards of refrigerating appliances, washing machines and storage type electric water heaters. The consultancy study on the energy efficiency test standards and energy efficiency grades, as well as the tests on related products, are expected to be completed in the fourth quarter of 2022. After consultation, the new grading standards will take effect from the first quarter of 2024 and will be fully implemented in the first quarter of 2025.

Another task before us is cross-boundary co-operation with the Mainland on energy efficiency labelling schemes. The EMSD has entered into discussion with the General Administration of Customs of the People's Republic of China and China National Institute of Standardisation (CNIS) on the signing of a Memorandum of Co-operation (MoC) for mutual recognition of the energy efficiency labelling schemes of the Mainland and Hong Kong. After the content is reviewed by the CNIS and State Administration for Market Regulation, the MoC will be signed, to establish a mutual recognition mechanism on the energy efficiency labelling requirements of specific products having corresponding energy efficiency standards, grading principles and test procedures (including the types of products covered in the Voluntary Energy Efficiency Labelling Scheme) in the Mainland and Hong Kong. It is estimated that the implementation of the mutual recognition mechanism will enable the local trade to meet the requirements of the energy efficiency labelling schemes in both Hong Kong and the Mainland with fewer resources.



## 推廣能源效益及節能 Promoting Energy Efficiency and Conservation

《行動藍圖》的中期目標是在2035年前把商業樓宇的用電量減少15至20%，長期目標則是在2050年前減少30至40%。修訂《建築物能源效益條例》有助達致碳中和。我們會在2022年進行顧問研究，探討擴大條例的監管範圍以涵蓋更多建築物類型以及縮短能源審核週期的可行性，並鼓勵於進行能源審核後披露更多能源相關資料以提高數據透明度。另外，目前法例並未要求強制實施能源審核中找出的能源管理機會。商業樓宇的業主可按自身的資源，評估是否進行及何時進行所建議的改善措施。我們會檢討目前由業主自發為其建築物進行節能措施的策略，尋求強制實施能源審核中找出的能源管理機會，以及釐定其實施規模。我們的目標是透過加強能源審核及提升數據透明度，促使業主發掘及實施更多能源管理機會，加快市場對建築物節電的參與及倡導更好的環境、社會和管治表現。我們會展開研究及進行諮詢工作，收集持份者意見，繼續朝這方向深入探討。

在區域供冷系統方面，東涌東及古洞北的區域供冷系統建造工程，已於2021/22年展開。此外，區域供冷系統是政府所建議的北部都會區發展策略下的其中一項節能項目。我們已經展開洪水橋/廈村區域供冷系統的籌備工作，並正就在新田/落馬洲發展樞紐、元朗南、中部水域人工島、新界北及文錦渡建造區域供冷系統的可行性研究，進行前期工作。我們正在按發展區域的面積及設施、區內未來科技發展及供冷需求較高的設施(例如數據中心)的估計用電量，規劃各供冷系統的發展期及規模，務求在新發展區的規劃階段融入節能概念，達致發展與環保並行。

The Action Plan set the medium-term goal of reducing electricity consumption of commercial buildings by 15 to 20% by 2035, and the long-term goal of reducing such consumption by 30 to 40% by 2050. Amending the BEEO will help achieve carbon neutrality. We will carry out a consultancy study in 2022 to explore the feasibility of expanding the scope of regulation to cover more building types, shorten the frequency of energy audit, and encourage the disclosure of more energy-related information after energy audit to enhance data transparency. In addition, the current legislation does not require the implementation of energy management opportunities (EMOs) identified in energy audit. Owners of commercial buildings can assess whether and when to implement the proposed improvement measures according to their own resources. We will review the current strategies of allowing owners to implement energy saving measures for their buildings on their own initiative, and seek to mandate the implementation of EMOs identified in the energy audit and determine the scale of implementation. Our goal is to encourage building owners to discover and implement more EMO by strengthening energy audits and enhancing data transparency, so as to accelerate the market participation in buildings energy saving and advocate better environmental, social and governance (ESG) performance. We will embark on the study and conduct consultation to gauge opinions of stakeholders as we continue our exploration in this direction.

For DCSs, the construction works of the DCSs for Tung Chung East and Kwu Tung North have begun in 2021/22. The proposed Northern Metropolis Development Strategy will also feature DCSs as one of the energy saving projects. The preparatory work for the Hung Shui Kiu/Ha Tsuen DCS has begun. Meanwhile, preliminary works for the feasibility studies of the DCSs in the San Tin/Lok Ma Chau Development Node, Yuen Long South, the artificial islands in the Central Waters, New Territories North and Man Kam To are underway. We are planning the development period and scale of each DCS based on the sizes and facilities of the development areas, as well as the future technological development and the estimated power consumption of facilities with higher cooling demand (such as data centres) in the areas, with the aim of achieving development in parallel with environmental protection by incorporating energy conservation concepts in the planning stage.



### 研發創科方案 提升太陽能發電系統效能 Developing an I&T Solution for Maximising Performance of Solar PV Systems

能源效益事務處高級工程師張敏婕女士早前發現，市面上沒有工具可以客觀和科學化地測量太陽能發電系統的發電效能，於是牽頭研發「綜合太陽能管理系統」。

Ms Cheung Man-chit, Jovian, a senior engineer of the Energy Efficiency Office, previously discovered that no device on the market could objectively and scientifically measure the power generation performance of a solar photovoltaic (PV) system. Therefore, she took the lead in developing the Integrated Solar Energy Performance Management Toolkit.

張女士與香港理工大學合作研發創新的「綜合太陽能管理系統」。該管理系統採用人工智能和數位孿生技術，並以附近的太陽能發電系統作參考，估算太陽能發電系統的發電效能，以及預測發電系統需要維修的時間。

該管理系統測量各種影響發電效能的因素，例如陰影、塵埃或雀鳥排泄物在太陽能板上的覆蓋程度，並根據有關數據，提醒太陽能發電設施擁有人清潔太陽能板，讓太陽能板吸收更多的太陽能，達到最佳的發電效能，從而保障設施擁有人獲得最多的上網電價收入。

當管理系統檢測到某一設施需要維修或保養時，會發出提示，建議進行預防性維修的時間。這項功能尤其適用於監控位處較難到達地點的設施，例如浮動太陽能板。

張女士說：「為應對氣候變化，政府積極鼓勵市民安裝太陽能發電系統。如太陽能發電系統可維持優良效能，為設施擁有人帶來較理想的上網電價回報，市民會更積極參與這類可再生能源計劃，最終有助香港實現碳中和的目標。」

「綜合太陽能管理系統」已在香港取得專利，更在2022年日內瓦國際發明展取得銅獎，充分肯定我們的創科成果。

Ms Cheung collaborated with the Hong Kong Polytechnic University to develop the novel Integrated Solar Energy Performance Management Toolkit (iSMS). Leveraging artificial intelligence and digital twin technology while making reference to the performance of nearby solar PV systems, the iSMS estimates the power generation performance of solar PV systems and predicts the timing of necessary system maintenance.

The iSMS measures factors affecting the power generation performance, such as the coverage of shading, dust and bird excrement on a solar panel. Based on the data, the iSMS reminds owners of solar energy generating facilities to clean the solar PV panels in order to harness more solar energy and maximise power generation performance, so that the maximum Feed-in Tariff (FiT) income of the facilities' owners will be secured.

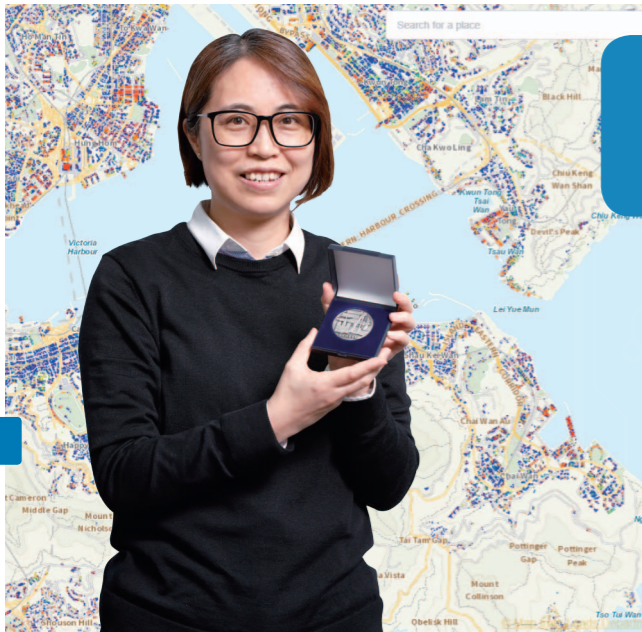
When the iSMS detects that a facility is due for repair or maintenance, it will issue an alert and recommend the timing for preventive maintenance. This function is particularly useful for monitoring facilities at hard-to-reach places, such as floating photovoltaic panels.

"To address climate change, the Government encourages the public to install solar PV systems. If solar PV systems can maintain optimal performance and deliver a better FiT return to facilities' owners, the public will respond more positively to such renewable energy projects. Ultimately, it will help Hong Kong achieve the target of carbon neutrality," Ms Cheung said.

The iSMS is now patented in Hong Kong and have won a bronze medal in the International Exhibition of Inventions of Geneva 2022, exemplifying the recognition for our I&T achievements.

## 推廣能源效益及節能

### Promoting Energy Efficiency and Conservation



#### 估算上網電價回報的創新工具 An Innovative Tool Developed for Estimating FiT Payback

政府引入上網電價計劃，鼓勵私營界別安裝太陽能發電系統。然而，市民在安裝系統前，如何可以估算其建築物天台的太陽能發電潛力及上網電價收入呢？能源效益事務處工程師王珊珊女士統籌研發「香港太陽輻照圖」(「輻照圖」)，為市民進行初步估算提供可靠數據。

The Government introduced the Feed-in Tariff (FiT) Scheme to incentivise the private sector to install solar photovoltaic (PV) systems. However, how can members of the public estimate the solar power generation potential of their building rooftops and the FiT income concerned before installation? To this end, Ms Wong San-san, an engineer of the Energy Efficiency Office, coordinated the development of the Hong Kong Solar Irradiation Map (the Map) to provide reliable data for the public to make preliminary estimation.

「輻照圖」利用土木工程拓展署發布的空載激光遙感測量數據及地政總署提供的「地理資訊地圖」，建立數碼地面模型，並根據香港天文台提供的十年日照量數據，模擬鄰近建築物及地勢等因素對日照的影響，從而計算出全港各幢建築物的天台每年可接收的太陽輻照量，準確度逾九成。

有意裝設太陽能發電系統的市民，可以在「輻照圖」上畫出擬安裝太陽能發電系統的天台範圍。「輻照圖」會自動計算所選範圍的發電容量，以及相應的上網電價收入。市民更可透過「輻照圖」中的回報計算器估算回報期。

「輻照圖」在2022年日內瓦國際發明展取得銀獎，王女士認為得獎原因在於該工具結合了地理、天文及測量等不同範疇的數據，而且是首個能顯示全港建築物天台太陽輻照量的地圖。

王女士說：「目前類似的太陽輻照圖在全球並不多，而且大多沒有計算功能。『香港太陽輻照圖』是我們與香港理工大學合作研發的成果，同時體現了跨部門合作的協同作用。研發期間，我也從其他部門學習到更多知識，獲益良多。」

The Map uses the Airborne Light Detection and Ranging data released by the Civil Engineering and Development Department and the GeoInfo Map provided by the Lands Department to build a digital surface model, and simulates the impact of factors such as buildings nearby and topography on solar irradiation with the aid of the 10-year solar irradiation data provided by the Hong Kong Observatory, so as to calculate the annual solar irradiation received at every building rooftop across the city. Such calculation has an accuracy rate of over 90%.

Those interested in setting up solar PV systems can draw the rooftop area intended for installation of a solar PV system on the Map. The Map will automatically calculate the generation capacity of the selected area and the corresponding FiT income. Members of the public can also use the payback calculator in the Map to obtain an estimation of the payback period.

The Map won a silver medal in the International Exhibition of Inventions of Geneva 2022. Ms Wong believed that the Map stood out because it integrated data from multiple dimensions, including geography, astronomy and surveying, and it was the first map which showed the solar irradiation of all building rooftops across the territory.

"Currently there aren't many similar solar irradiation maps in the world, and most of them do not have calculation functions," Ms Wong said. "The Hong Kong Solar Irradiation Map is the fruit of our research and development efforts in collaboration with the Hong Kong Polytechnic University, as well as an embodiment of the synergy of inter-departmental co-operation. During its development, I have learned a lot from other departments and greatly benefited."



#### 環保教育開新篇： 為小學編製「採電學社」STEAM 教材套 A New Chapter on Conservation Education: Compiling STEAM Educational Kit on Solar Harvest for Primary Schools

為推廣使用可再生能源，機電署不僅透過「採電學社」為合資格的學校安裝太陽能發電系統，更着手編製STEAM教材套，提升學生對科學學習的興趣，並增進他們對可再生能源和應對氣候變化策略的認識。能源效益事務處助理工程師林彤謙先生勇於接受新挑戰，踏出機電工程的舒適圈，投入從未涉足的教材編製工作。

In a bid to promote the use of renewable energy (RE), the EMSD not only helps eligible schools install solar energy generation systems through Solar Harvest, but also compiles a STEAM educational kit to stimulate students' interest in scientific learning and deepen their understanding of RE and strategies regarding climate change. Taking on the new challenge boldly, Mr Lam Tung-him, Alex, an assistant engineer of the Energy Efficiency Office, stepped out of his comfort zone of E&M engineering and committed to the compilation of educational kit, an area that was totally new to him.

林先生統籌並領導香港大學的課程發展團隊，為小學編製首套「採電學社」STEAM教材套，該教材套共有八個主題。期間，林先生與專為編製教材而成立的工作小組緊密溝通，工作小組成員包括環境局、教育局及機電署的代表、學校老師以及顧問。經過嚴謹的編製過程，有關STEAM教材套獲教育局認可為小學課程的教材。

教材套分兩部分，分別供初小和高小使用。兩者均有教師專用材料、學生專用材料、工作紙、學校需要購置用於STEAM活動的材料清單、常見問題及教學影片。教材套內容深入淺出，充滿互動元素。課程每個階段均設有「動手動腦活動」，讓學生在學習相關理論後，製作以太陽能發電的小手作。學生亦會在機電署吉祥物的帶領下，透過虛擬實境參觀太陽能發電設施。

林先生說：「機電署為教材的技術性資料把關，教材亦獲教育局認可為適合小學課程，具權威性。日後，老師可因應學生的程度和教學進度，靈活使用這份高質素、獲認可的教材套授課，無須另覓教材；學生亦可從小由基礎開始認識可再生能源。我覺得這項工作十分有意思。」

預計教材套會於2022/23學年推出，小學老師可隨時瀏覽機電署的「採電學社」網頁，以取得教材套而參加了「採電學社」並成功將太陽能發電系統成功接駁上電網的學校更可以在教材套設有的虛擬實境學習平台進入實時監測系統，讓學生可以即時瀏覽校內太陽能發電系統所生產的電力資料。引入這教材套，為香港的可再生能源教育揭開新一頁。

林先生和其團隊現已開始為中學編製「採電學社」教材套，初中和高中程度會有不同內容，以配合初中科學科及高中物理科課程，並會加入更多技術性資料，以配合中學生的程度。

Mr Lam co-ordinated and led a curriculum development team from the University of Hong Kong to compile for primary schools the first STEAM educational kit, with a total of eight themes, on Solar Harvest. In the process, Mr Lam maintained close communication with the working group, comprising representatives from the ENB, Education Bureau (EDB) and EMSD, as well as school teachers and consultants, formed for the compilation of the teaching materials. Completed in a meticulous compilation process, the STEAM educational kit has been approved by the EDB as teaching materials under the primary school curriculum.

The kit comes in two sets separately for junior and senior primary school levels. Each set comprises materials designed for teachers and students respectively, worksheets, a list of materials to be procured by schools for STEAM activities, frequently asked questions and educational videos. The content is written in simple language and full of interactive elements. At every stage of the curriculum, there are hands-on activities for students to make solar-powered handicrafts after learning the relevant theories. Guided by the EMSD mascots, students will also be taken on virtual reality tours of solar energy generation facilities.

"The EMSD is the gatekeeper of technical information of the teaching materials. Coupled with the approval of the EDB as being suitable for the primary school curriculum, the educational kit is highly authoritative. Upon its launch, teachers can flexibly use the high-quality and approved educational kit for teaching based on students' level and teaching progress, without having to search for other teaching materials. Students can also pick up the knowledge about RE from the basics at a young age. I find this job really meaningful," Mr Lam said.

The educational kit will be introduced in the 2022/23 academic year. Primary school teachers may browse the EMSD webpage on Solar Harvest anytime to access the educational kit. Schools participating in Solar Harvest with solar energy generation systems connected on-grid can access the Real-time Monitoring System through the Virtual Reality learning platform such that the students can browse the electricity generated by schools' solar energy generation systems in real time. The introduction of the education kit will mark a new chapter of RE education in Hong Kong.

Mr Lam and his team has begun the compilation of an education kit on Solar Harvest for secondary schools, with separate content for junior and senior secondary levels to align with the Science curriculum for junior secondary levels, and Physics curriculum for senior secondary levels. More technical information will be included in the kit too to suit the level of secondary students.

# 提升公眾機電安全及 節能意識

## Raising Public Awareness of E&M Safety and Energy Conservation

2021/22年度，我們繼續加強與業界和公眾的溝通和聯繫，並提供適當支援，以提升社會對機電安全及節能的意識。舉例說，我們加快推進規管服務電子化的工作，並在機電署的網站和應用程式增設各種新功能，以助進行規管工作及便利業界使用服務。同時，我們已推出更多方便易用的學習平台，以便業界從業員完成持續進修培訓。此外，我們善用各種線上和線下的平台及進行外展工作，與業界保持緊密聯繫，並繼續在更新各種指引及實務守則的過程中做好諮詢業界的工作。

在機電安全及節能的公眾教育及推廣工作方面，我們通過不同平台及渠道深化工作。除了行之有效的政府電視宣傳片外，我們更廣泛使用社交媒體及多元化的宣傳渠道推廣機電安全及節能的訊息，又善用機電署的吉祥物生動地帶出推廣信息。當疫情緩和時，我們立即重啟外展工作，並舉辦各種有關機電安全和提倡節能的比賽及認可計劃。這些工作的目標是鼓勵兒童及青少年從小培養機電安全及節能的意識和好習慣。

此外，我們繼續與內地對口單位及國際機構保持緊密合作，積極參與地區及國際機電安全及節能組織的活動，分享最佳作業方法。

In 2021/22, we continued to strengthen communication and support to the trade and the public, in order to raise the awareness of electrical and mechanical (E&M) safety and energy conservation in the community. For example, the digitalisation of regulatory services was expedited, with various new functions added to the EMSD website and mobile apps to bring more convenience to regulatory work and trade services. Meanwhile, more convenient learning platforms were introduced to facilitate trade practitioners' completion of continuing professional development (CPD) training. We also strived to maintain close ties with the trade via a variety of online and offline platforms and outreach activities, and continued to conduct trade consultations diligently in the process of updating guidelines and codes of practice (CoPs).

As for the public education and promotion on E&M safety and energy conservation, we intensified our work through different platforms and channels. In addition to the effective TV Announcements in the Public Interest, we made more extensive use of social media and diversified publicity channels to promote the messages about E&M safety and energy conservation, and livened up the promotion with the EMSD mascots. When the epidemic situation eased, we resumed outreach activities immediately and organised competitions and recognition schemes on E&M safety and energy conservation. All these are aimed to encourage the children and youth to develop awareness of and good habits on E&M safety and energy conservation from an early age.

Furthermore, we continued to maintain close co-operation with our Mainland counterparts and international organisations, and actively participated in the activities of regional and international organisations on E&M safety and energy conservation to share best practices.

## 加強與業界的溝通和支援

### 規管服務電子化

為配合政府大力推行公共服務電子化計劃，我們在2022年年初全面提升機電署的網上申請服務，例如由氣體標準事務處負責處理的27種申請表格已全數電子化，業界也樂於採用電子表格。目前，超過三成的住宅式氣體用具的批准申請表經網上遞交。來年，我們會為註冊氣體裝置技工及相關勝任人士推出「數碼機電牌照」服務，更加便利業界和市民。

## STRENGTHENING COMMUNICATION AND SUPPORT TO THE TRADE

### Digitalisation of Regulatory Services

In line with the vigorous implementation of the Electronic Service Delivery Scheme by the Government, we fully enhanced the EMSD's online application services in early 2022. For instance, all 27 application forms handled by the Gas Standards Office (GasSO) were digitalised and the e-Forms were well received by the trade. Currently, more than 30% of the applications for approval of domestic gas appliances were submitted online. In the coming year, we will introduce the "Digital E&M Licences" service for registered gas installers (RGIs) and related competent persons, bringing greater convenience to the trade and the public.

## 電子提交申請服務



◀▲ 為響應政府的「公共服務電子化計劃」，機電署在年內推出多種網上申請服務，包括註冊和續期的電子表格，更便利業界。我們在YouTube頻道播放宣傳短片（左圖），又在社區派發相關單張（右圖），向業界及市民宣傳部門的電子申請服務。

In the year, we rolled out many online application services in support of the Government's Electronic Service Delivery Scheme, including various registration application and renewal e-Forms to provide greater convenience for the trade. We broadcast publicity videos on YouTube (left) and distributed leaflets (right), to promote our electronic application services to the trade and the public.

在機械安全方面，由一般法例部負責管理的23種表格已全數電子化。此外，我們已推出生機電子准用證，並設立網上預約系統，方便申請人預約在簽發升降機復用證前所需的檢查。在這些服務推出後，發出簽發復用證所需的時間平均縮短至三日。同時，我們正加緊研發「升降機及自動梯數碼工作日志」系統，目標是利用區塊鏈技術及雲端儲存模式，統一儲存和管理升降機與自動梯的維修保養記錄，取代紙本記錄。

On mechanical safety, 23 forms managed by the General Legislation Division (GLD) have been fully digitalised. In addition, use permits for lifts in digital format have been launched and an online booking system has been in place for applicants to make appointments for our inspections prior to the issue of resumption permits for lifts. Upon the introduction of the services, the time required for the issue of resumption permits was shortened to three days on average. Meanwhile, the development of the system of Digital Logbook for Lifts and Escalators is going full steam ahead, with a view to achieving integrated storage and management of maintenance records of lifts and escalators through the adoption of blockchain technology and cloud storage, and replacing paper records.

# 提升公眾機電安全及節能意識

## Raising Public Awareness of E&M Safety and Energy Conservation



機電署人員於2021年11月為電業界舉辦的年度「電力規例研討會」上，闡釋各種相關的法例要求。電力法例部亦已推出一站式網上持續專業進修及註冊申請服務平台，進一步加強規管服務數碼化的工作。

Our staff explained various relevant statutory requirements at our annual technical seminar for the electrical trade held in November 2021. The Electricity Legislation Division has also launched a one-stop online platform for Continuing Professional Development and registration application services to further its regulatory service digitalisation work.

在電力安全方面，電力法例部繼上年度把規管服務電子化後，年內再推出一站式網上持續進修及註冊申請服務平台。註冊電業工程人員由完成持續進修培訓、填寫及遞交註冊續申請表格以至付款及領取註冊證明書，都可在網上進行。服務推出後，在本年度由電力法例部負責處理的註冊續申請中，有17%經網上遞交。我們希望透過更廣泛的推廣和教育活動，鼓勵更多業界人士使用這項方便快捷的網上服務。

On electrical safety, the Electricity Legislation Division (ELD) launched a one-stop online platform for CPD and registration application service during the year following the digitalisation of its regulatory services the year before. Through the platform, registered electrical workers (REWs) can complete their CPD training, fill in and submit application forms for registration renewal, effect payment and receive the registration certificates, all digitally. After the service had been launched, 17% of the registration renewal applications handled by the ELD were submitted online this year. We hope to encourage more trade practitioners to use this convenient online service through more extensive promotional and educational activities.

除電子表格外，機電署已在部門的網站和手機應用程式增設更多功能，便利業界。例如氣體標準事務處新增「查期易」網頁，方便石油氣車輛的車主或代理人查詢石油氣車輛燃料缸覆檢日期。他們只需輸入石油氣車輛的車牌號碼或燃料缸號碼，即可查閱燃料缸覆檢到期日等資料。日後我們會增設推送通知功能，向車主或代理人發送覆檢提示。

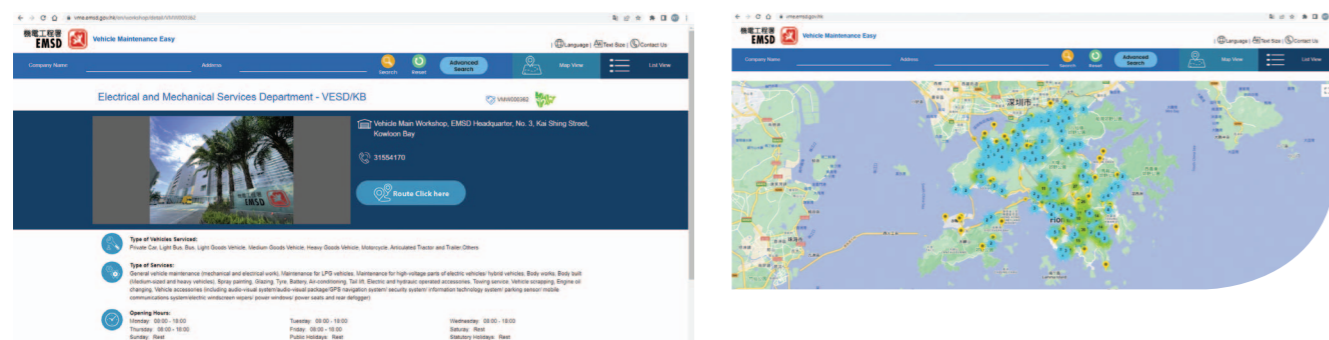
Apart from e-Forms, the EMSD has added functions to its website and mobile apps for the convenience of the trade. For example, the GasSO has introduced the eCheckDate webpage for liquefied petroleum gas (LPG) vehicle owners or agents to check easily the revalidation date of the fuel tanks of their LPG vehicles. They can find out when their fuel tanks have to be revalidated simply by filling in the vehicle registration numbers or the serial numbers of the fuel tanks of their LPG vehicles. A push notification function will be added in future for sending revalidation reminders to vehicle owners or agents.

氣體標準事務處已在機電署流動應用程式E&M Connect增設功能，以便業界查看專用石油氣加氣站的車用石油氣上限價格。

The GasSO has added a function to the E&M Connect mobile app for the trade to check auto-LPG ceiling prices at dedicated LPG filling stations.

我們的網上平台「車輛維修通」，方便市民迅速搜尋所需的車輛維修服務。平台整合了註冊車輛維修工場的地點、維修車種、服務類別和營業時間等，符合搜尋條件的維修工場會即時於地圖上顯示，方便參考。

Our Vehicle Maintenance Easy platform online enables the public to easily search for the vehicle maintenance services they need. The platform consolidates information of registered vehicle maintenance workshops, including locations, vehicles serviced and service types, as well as opening hours. Results which match the search criteria will be promptly displayed on the map for easy reference.



我們已開啓網上「車輛維修通」平台，方便公眾搜尋車輛維修服務。該平台整合了註冊車輛維修工場的地點、工場維修車種、服務類別和營業時間等，而有關地圖也會標示符合搜尋條件的維修工場，以便參考。另外，該平台也會顯示維修工場的註冊到期日，提醒工場負責人按時提交續期申請。

The Vehicle Maintenance Easy platform has been launched to facilitate public search for vehicle maintenance services. The platform consolidated the information of registered vehicle maintenance workshops (VMWs), including their locations, types of vehicle serviced, types of service and opening hours. VMWs fitting the search criteria will be displayed on the map too, for easy reference. In addition, the registration expiry dates of the workshops will also be shown on the platform to remind the persons-in-charge about the timely submission of renewal applications.

我們在2021年6月推出鐵路電子入門網站，以便港鐵公司透過網站向機電署提交有關《鐵路發展策略項目2014》和港鐵小蠔灣車廠發展項目的法定文件，以供審批。我們已積極擴展該電子入門網站的功能。由2022年6月開始，港鐵公司可透過上述網站提交所有有關鐵路路線的文件，以供審批。這個系統可在已審批的圖則和相關文件上自動蓋印，顯示文件的審批狀態。系統新增的自動發送電郵和傳真功能，也可讓港鐵公司即時收到我們的回覆，以提升工作效率。我們會繼續致力提升入門網站的功能，讓安全及保安統籌委員會和軌道安全及保安委員會的成員可透過「智方便」電子平台，查閱文件的審批狀態。

In June 2021, a railway e-portal was launched for the MTR Corporation Limited (MTRCL) to submit statutory documents related to the Railway Development Strategy 2014 and the MTR Siu Ho Wan Depot Development Project through the e-portal for approval. We have actively expanded the functions of the e-portal. Starting from June 2022, the MTRCL can submit documents related to all railway lines through the above e-portal for approval. This system can automatically e-stamp approved drawings and related documents to indicate their approval status, and its new feature of automatically sending emails and faxes has also enables the MTRCL to receive our replies instantly, thus enhancing efficiency. We will continue to proactively enhance the e-portal functions, so that members of the Safety and Security Coordinating Committee and the Trackside Safety and Security Committee can check the approval status of documents through the iAM Smart electronic platform.

能源效益事務處已在機電署流動應用程式E&M Connect加入「香港建築物能源效益註冊計劃」的定期更新資訊，向業界推廣註冊計劃。根據該計劃，如註冊建築物的能源效益表現，較《建築物能源效益條例》的法定要求為佳，相關的資本開支或可享稅務扣除。

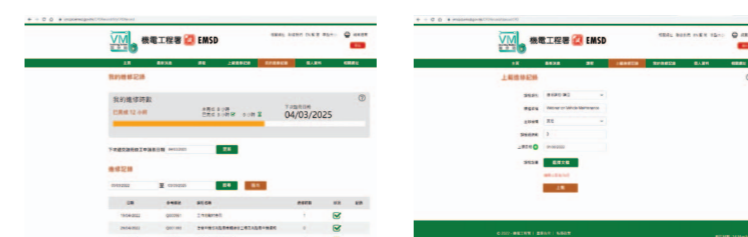
The Energy Efficiency Office (EEO) has included regular updates on the Hong Kong Energy Efficiency Registration Scheme for Buildings in the E&M Connect mobile app to promote the registration scheme to the trade. Under the scheme, if a registered building achieves better energy efficiency performance than the statutory requirements under the Buildings Energy Efficiency Ordinance, the associated capital expenditure may be eligible for tax reduction.

### 便利持續進修

為方便車輛維修技工完成註冊所需的持續進修要求，我們在2022年3月於機電署網站增設「VM加分站」，註冊技工可在同一平台閱讀教材、進行測驗及儲存進修記錄。另外，我們在2021年也繼續舉辦車輛維修網上講座，以便車輛維修技工隨時隨地修讀持續進修課程。同時，我們已在機電署網站增設註冊氣體工程承辦商及註冊氣體裝置技工學習專區，一站式提供各種學習教材、重溫資料、講座及簡介會資訊等，方便業界修讀持續進修課程。

### Facilitating Continuing Professional Development

To facilitate vehicle mechanics' fulfilment of the CPD requirements for registration, a VM Learning Station was established under the EMSD website in March 2022. Registered mechanics can access teaching materials, take quizzes and keep their CPD records on the same platform. In 2021, we also continued to organise webinars on vehicle maintenance for vehicle mechanics to take CPD courses anytime anywhere. Meanwhile, a Learning Corner for Registered Gas Contractors and Registered Gas Installers was added to the EMSD website, providing learning materials, refreshment materials and information of seminars and briefings through a one-stop platform for the trade to take CPD courses conveniently.



機電署網站已增添為註冊車輛維修技工而設的「VM加分站」，以及「註冊氣體工程承辦商及註冊氣體裝置技工學習專區」，成為業界持續進修和網上學習的平台。機電行業的註冊技工現可於平台上閱讀教材、接受測驗及儲存個人進修記錄，並取得培訓課程與講座的資訊。

With the introduction of the VM Learning Station for Registered Vehicle Mechanics and the Learning Corner for Registered Gas Contractors and Registered Gas Installers, the EMSD website has become a platform providing Continuing Professional Development (CPD) and e-learning for the trade. These learning sites now enable the registered practitioners to access teaching materials, take quizzes and keep their CPD records, as well as obtaining information about training courses and seminars.

## 提升公眾機電安全及節能意識 Raising Public Awareness of E&M Safety and Energy Conservation

我們在上年度，已推出專供註冊電業工程人員使用的網上持續進修平台。2021/22年度，在28 000名註冊電業工程人員中，有84%的人員在網上完成法例要求的持續進修培訓，反映這個專設的持續進修平台深受業界歡迎。

### 與業界保持聯繫

疫情期間，市民更廣泛使用靈活方便的線上溝通渠道保持聯繫。有見及此，我們繼續善用各種線上途徑，與業界建立更緊密的聯繫，成效相當理想。

An online CPD platform for REWs had been introduced in the year before. In 2021/22, about 84% of the 28 000 REWs completed their mandatory CPD training online, reflecting that the dedicated CPD platform was well received by the trade.

### Trade Engagement

As the community made more extensive use of the flexible and convenient online communications to stay connected amid the epidemic, we continued to make good use of various online channels to establish closer ties with the trade, and impressive results were achieved.

2021年11月，電力法例部與港九電器工程電業器材職工會及香港電器工程商會，為電業界舉辦年度電力規例研討會，並邀請建造業議會及勞工處的代表參與。研討會共錄得約900名註冊電業工程人員參加。此外，電力法例部為電氣產品業界協會組織、影音及通訊科技產品製造商和供應商、酒店業協會，以及香港工業總會的代表等，舉辦多個業界會議及講座，主題廣泛，包括電氣產品安全規例和國際安全標準的最新發展等。

In November 2021, the ELD organised the annual technical seminar for the electrical trade, jointly with the Hong Kong and Kowloon Electrical Engineering & Appliances Trade Worker's Union and the Hong Kong Electrical Contractors' Association. The ELD also invited representatives of the Construction Industry Council and the Labour Department to attend the seminar, which attracted about 900 REWs to take part in. Besides, the ELD held a number of meetings and seminars for trade associations for electrical products, manufacturers and suppliers of audiovisual and communication technology products, hotel industry associations and representatives of the Federation of Hong Kong Industries. The topics ranged from electrical product safety regulations to the latest developments in international safety standards.



◀ 我們為電業界舉辦的年度「電力規例研討會」已於2021年11月舉行，約有900名註冊電業工程人員參與。我們也為電氣產品業界（包括影音及通訊科技產品的業界），以至酒店業界舉行講座，講解有關電氣產品的最新安全規例和國際安全標準。  
Our annual technical seminar for the electrical trade was held in November 2021, with about 900 Registered Electrical Workers participated. We also held seminars for the electrical product trade, including the trade of audiovisual and communication technology products, and the hotel industry, to give details about the latest electrical product safety regulations and international safety standards.



▲ 我們於2021年12月舉辦氣體安全事項簡介會，吸引了200多位註冊氣體裝置技工及業界人士出席，並同步直播。我們也每月舉辦線上分享會，提升業界對R32輕度易燃雪種的安全意識。

A gas safety briefing was held in December 2021, attended by more than 200 Registered Gas Installers and gas trade professionals, and broadcast online. We also held monthly online sharing sessions on R32 mildly flammable refrigerants to raise the trade's safety awareness of those refrigerants.

氣體標準事務處在年內舉辦了14場線上線下講座及研討會，向業界、物業管理公司、政府部門及公眾等推廣氣體安全及定期安全檢查，其中包括2021年10月在網上舉行的石油氣儲存裝置擁有人聯絡會議，共有50個來自公營及私營機構的裝置擁有人、團體或代表出席。在這些講座及研討會中，我們與參加者分享石油氣儲存裝置的安全、營運及維修保養資訊、最佳做法及經驗。2021年12月，我們又舉辦了實體及線上直播的氣體安全事項簡介會，吸引超過200位註冊氣體裝置技工及業界人士參加，反應踴躍。為提升業界對R32輕度易燃雪種的安全意識，我們每月定期舉辦線上分享會，並在不同的安全及健康講座推廣易燃雪種的安全信息。

During the year, the GasSO held 14 online and offline seminars and forums to promote gas safety and regular safety inspection to the trade, property management companies, government departments and the public. Among the seminars was an online liaison meeting with LPG storage installation owners in October 2021, attended by 50 such owners, groups and representatives from the public and private sectors. In these seminars and forums, we shared information about the safety, operation, maintenance and repair, best practices and experience of LPG storage installations with the participants. In December 2021, we also held a physical and online briefing on gas safety, well attended by more than 200 RGIs and gas trade professionals. To enhance safety awareness of R32 mildly flammable refrigerant in the trade, monthly online sharing sessions were held and safety messages about flammable refrigerants were promoted through various safety and health seminars.

外展宣傳工作可讓我們與業界直接聯繫。年內，氣體標準事務處繼續走訪全港各區（包括九龍城、荃灣、元朗、東區、北區、觀塘、大埔和南區）多家持牌食肆，推廣使用「快速檢查」，以確保氣體裝置安全。來年，我們會繼續與註冊氣體供應公司合作，到訪其他地區，推廣有關計劃。

Outreach promotion enables us to connect directly with the trade. During the year, the GasSO continued to visit a number of licensed restaurants in various districts across the territory, including Kowloon City, Tsuen Wan, Yuen Long, Eastern District, North District, Kwun Tong, Tai Po and Southern District, to promote the use of "Quick Checks" to safeguard the safety of their gas installations. In the coming year, we will continue to collaborate with registered gas supply companies to promote the programme in other districts.

能源效益事務處定期與啟德區域供冷系統用戶舉行會議，透過技術交流和意見分享，提升啟德區域供冷系統的服務質素。最近兩次線上會議分別在2021年6月及2022年1月舉行。至於在其他新發展區的區域供冷系統，我們在2021年5月及2022年1月為業界舉行兩次簡介會，介紹未來的區域供冷系統，以及承辦商競投有關系統的「設計、建造及營運」合約需符合的資格要求等。兩場簡介會共有逾百人參與。另外，「機電工程署研討會2022」已於2022年1月以視像形式舉行。研討會以「共創無限 實現碳中和」為主題，吸引超過1 400位來自本港、內地及海外公私營機構、創科界、機電業界及學術界的人士參與。

The EEO holds regular meetings with the users of the Kai Tak District Cooling System (DCS) to enhance service quality through technical exchanges and sharing of views. The latest two online meetings were held in June 2021 and January 2022 respectively. For the DCSs in other New Development Areas, we held two briefings for the trade in May 2021 and January 2022 to introduce future DCSs and the qualification requirements for contractors bidding the Design-Build-Operate Contracts of the DCSs. The two briefings were attended by over 100 participants in total. In addition, the EMSD Symposium 2022 was held via video conferencing in January 2022. With the theme of CO-innovinity, the symposium attracted more than 1 400 participants from public and private organisations, the innovation and technology (I&T) sector, the E&M sector and the academia in Hong Kong, the Mainland and overseas.

## 提升公眾機電安全及節能意識 Raising Public Awareness of E&M Safety and Energy Conservation

為蒐集持份者對「強性能源效益標籤計劃」第四階段的意見，能源效益事務處已分別就電氣產品及氣體用具成立專責工作小組，成員包括有關業界商會及消費者委員會代表。兩個工作小組在2020年至2021年期間已舉行六次會議，商討新增三類產品（即發光二極管(LED)燈、氣體煮食爐和即熱式氣熱水爐）的涵蓋範圍及相應的評級標準。

年內，一般法例部透過與升降機及自動梯安全諮詢委員會定期舉行的會議，加強與升降機負責人和業界的溝通。此外，鐵路科也在2021年9月與港鐵公司高層舉行實體工作坊，就加強合作、規管鐵路安全的最新發展、創新科技和各種安全審核等課題，分享策略意見，加強溝通和互信。

隨着鐵路網絡擴展和乘客量不斷增加，有關安全的挑戰也隨之而來，同時鐵路設施已達到更換時期，令挑戰更為嚴峻。作為監管機構及創科的堅定推動者，機電署一直與鐵路營運機構、初創企業、學術界及業界合作，探討應用更多創科解決方案，提升鐵路安全及可靠性。

年內，機電署透過機電創科網上平台邀請業界和初創企業提交創科項目。「司機隨身寶」即屬其一。這個監察裝置應用人工智能分析列車司機及路軌情況，有助確保列車在司機人手操控時行車安全。此外，機電署的團隊開發以語義人工進行智能鐵路軌道預測維修工作的方案。這個方案可改良鐵路行業的傳統維修方法，由預防性維修轉變成預測性維修，提升鐵路安全。這兩個項目獲業界一致好評及國際認同。在2022年日內瓦國際發明展中，「司機隨身寶」勇奪金獎，而「語義人工智能鐵路軌道預測維修工作系統」也獲得銀獎。港鐵公司已在選定地點安排試行這兩個方案。

To collect the view of stakeholders on the fourth phase of the Mandatory Energy Efficiency Labelling Scheme, the EEO set up two task forces on electrical appliances and gas appliances respectively. Comprising of representatives of the trade associations concerned and the Consumer Council, the two task forces held six meetings between 2020 and 2021 to discuss the coverage and corresponding grading standards of the three newly included products (i.e. light emitting diode (LED) lamps, gas cookers and gas instantaneous water heaters).

Over the year, the GLD strengthened communication with the trade and responsible persons for lifts and escalators through regular meetings of the Lift and Escalator Safety Advisory Committee. The Railways Branch (RB) also held a physical workshop with the senior management of the MTRCL in September 2021 to share strategic views on topics such as bolstering co-operation, the latest developments in railway safety regulations, I&T applications and safety audits, and strengthen communication and mutual trust.

The expansion and increasing patronage of the railway network have brought about safety challenges, more so with the railway facilities reaching their replacement ages. As a regulator and a staunch promoter of I&T, the EMSD has been co-operating with railway operators, start-ups, academia and the trade to explore the application of more I&T solutions to enhance railway safety and reliability.

During the year, the EMSD invited submissions of I&T projects from the trade and start-ups through our E&M InnoPortal. One such project was the Smart Driver Assistant. Using artificial intelligence (AI) to analyse the condition of the driver and the track, the monitoring device can help ensure train safety when the train is manually controlled by the driver. The EMSD's team also developed a solution using semantic AI for predictive maintenance of railway track system, which advanced the railway industry's practice from traditional preventive maintenance to predictive maintenance, bringing greater railway safety. Both solutions have been well received by the trade and won international acclaim. The Smart Driver Assistant won a gold medal and the Semantic AI for Predictive Maintenance of Railway Track System a silver medal in the International Exhibition of Inventions of Geneva 2022. The MTRCL has already arranged for their trials at selected locations.



◀機電署的「語義人工智能鐵路軌道預測維修工作系統」創科方案於2022年日內瓦國際發明展獲得銀獎，並獲發證書。我們另一創科方案「司機隨身寶」則在該發明展獲得金獎。兩個方案均運用人工智能科技加強鐵路安全，並已於選定的港鐵地點開始試行。

A certificate of silver medal was awarded to our I&T project, Semantic AI for Predictive Maintenance of Railway Track System, in the International Exhibition of Inventions of Geneva 2022. The Smart Driver Assistant, another project from the EMSD, won a gold medal at the event too. Both solutions use AI technology to enhance railway safety and are trialled at selected MTR locations.

建築物管理對提高機電安全及能源效益都十分重要。我們每年為物業管理公司及從業員舉辦「樓宇機電安全及能源效益講座」，闡釋大廈物業管理人員應如何加強電力安全、氣體安全、升降機和自動梯安全等，並建議可提升能源效益及節能的措施。2021年12月舉行的講座以「積極創新利民便民」為主題，內容包括固定電力裝置定期檢測及發電設施維修的法規要求；即將推出的升降機及自動梯數碼工作日志；上網電價及香港太陽能發電系統的最新發展；以及環保雪種安全等，共有138人參與。在2021年5月至8月期間，我們也分別為職業安全健康局、保險公司、香港物業管理公司協會及地產建設商會舉辦線上講座，講解環保雪種的安全使用事宜，以提升有關業界的安全知識。

### 做好業界諮詢工作

年內，機電署各部別在更新及發出多份守則及指引前，都已做好業界及公眾諮詢工作。有關「強性能源效益標籤計劃」第四階段的諮詢工作便是一例。我們用了三個月時間廣泛諮詢公眾，才展開有關修例工作。此外，我們同步就修訂相應的《產品能源標籤實務守則》事宜，展開業界諮詢。至於每三年更新一次的《建築物能源效益守則》及《能源審核守則》，在諮詢技術專責小組，以及經各工作小組詳細審議後，我們才修訂該兩份守則，並於2021年底刊憲。兩份守則分別在2022年7月1日及2022年10月1日生效。

年內，有關機械安全的五份守則，包括《升降機及自動梯設計及構造實務守則》、《升降機工程及自動梯工程實務守則》、《建築工地升降機設計及建造實務守則》、《塔式工作平台設計及建造實務守則》及《機動遊戲機實務守則》，經廣泛諮詢業界及舉辦多場分享會後，已全數完成修訂，並在2021年11月至2022年10期間陸續生效。

年內出版的新指引包括《優良作業指引—石油氣車輛燃料系統維修》，該指引為石油氣車輛維修技工說明石油氣車輛燃料系統維修的基本要求及最佳做法。另一套新出版的指引是《氣體設施設計、操作及維修手冊》，就商用廚房煤氣及石油氣裝置的系統設計及操作，介紹模範做法及創新技術，以進一步提升這些氣體裝置的操作安全。

Building management is important for improving both E&M safety and energy efficiency. Through our annual Property Management Seminar for property management companies and practitioners, we explain how building management personnel can enhance electrical safety, gas safety, lift and escalator safety, and recommend measures to enhance energy efficiency and conservation. The seminar held in December 2021 with the theme of “Benefitting the Public Through Innovation” covered topics such as the statutory requirements of periodic testing of fixed electrical installations and maintenance of generating facilities; the latest developments of the forthcoming Digital Logbook for Lifts and Escalators, Feed-in Tariff and the latest developments regarding solar power generation systems in Hong Kong; and safety of eco-friendly refrigerants. The seminar was attended by 138 participants. Between May to August 2021, we also held a number of webinars on the safe use of eco-friendly refrigerants for the Occupational Safety and Health Council, insurance companies, the Hong Kong Association of Property Management Companies and the Real Estate Developers Association of Hong Kong respectively, to reinforce the safety knowledge of the various industries.

### Thorough Trade Consultations

During the year, thorough trade and public consultations had been conducted before a number of CoPs and guidelines were updated and issued by various EMSD divisions. An example was the fourth phase of the Mandatory Energy Efficiency Labelling Scheme, which underwent an extensive three-month public consultation prior to the amendment of the relevant legislation. Concurrently, trade consultations for the revision of the corresponding CoP on Energy Labelling of Products were also held. As for the Building Energy Code and the Energy Audit Code to be updated once every three years, they were revised and gazetted at the end of 2021 after consultation with the technical task force and detailed deliberations by various working groups. The Codes will be effective on 1 July 2022 and 1 October 2022 respectively.

In the year, all the five CoPs related to mechanical safety were updated after extensive trade consultations and various sharing sessions. These included the CoP on the Design and Construction of Lifts and Escalators, the CoP for Lift Works and Escalator Works, the CoP on the Design and Construction of Builders' Lifts, the CoP on the Design and Construction of Tower Working Platforms, and the CoP for Amusement Rides, all of which took (or will take) effect between November 2021 and October 2022.

New guidelines published during the year included the Best Practices for Maintenance of Fuel System of LPG Vehicles, which outlines the basic requirements and best practices for maintenance of the fuel system of LPG vehicles to LPG vehicle mechanics. Another set of newly published guidelines was the Handbook on Design, Operation and Maintenance of Gas Utilisation Facilities, which introduces model practices and I&T for the system design and operation of town gas and LPG installations in commercial kitchens to further enhance the operational safety of these gas installations.

# 提升公眾機電安全及節能意識

## Raising Public Awareness of E&M Safety and Energy Conservation

### 加強公眾教育及宣傳

過去一年，我們致力在公眾教育及宣傳方面，採用更具創意的策略、方式及渠道，務求接觸不同階層、年齡或文化背景的市民，加強他們對機電安全及節能的意識。

### 與吉祥物互動

機電署兩個吉祥物「機智啤啤」和「智析寶寶」近年出席多個公眾教育及宣傳活動，廣受歡迎，尤其吸引兒童及青少年。在2021年10月舉行的國際環保博覽會上，「機智啤啤」首度公開亮相，宣揚減碳信息。在場學生爭相與它合照。我們亦帶同吉祥物探訪兩家幼稚園，以生動的方式向小孩子宣傳電力安全。吉祥物在場，我們能更有效地向他們灌輸機電安全及節能的觀念。我們亦不時在兩個吉祥物的社交平台專頁，分享有關機電安全和能源效益的帖文。

▶ 機電署兩個吉祥物之一「機智啤啤」到幼稚園推廣電力安全及其他信息，大受學童歡迎。近年我們安排「機智啤啤」參與更多公開活動及外展探訪，為部門與公眾的互動增添活力。

Witty Bear, one of the EMSD's two mascots, was warmly received by children during its visit to a kindergarten to promote electrical safety and other messages. We have stepped up the deployment of Witty Bear in public events and outreach visits to energise our engagement with the public.



### ENHANCING PUBLIC EDUCATION AND PUBLICITY

In the past year, we endeavoured to make the strategies, implementation and channels of public education and promotion more creative, with the aim of reaching out to people from all walks of life and of different ages and cultural backgrounds in order to enhance their awareness of E&M safety and energy conservation.

### Interaction With Mascots

The EMSD's two mascots, Witty Bear and KnowBot, have attended various public education and promotion activities in recent years and were well-received by the public, especially the children and youth. At the ECO Expo Asia held in October 2021, Witty Bear made its first appearance in public to advocate carbon reduction messages. Students at the event vied to take photos with the mascot. We also brought along the mascot on the visits to two kindergartens to promote electrical safety messages to children in a lively way. With the presence of the mascot, we were able to instill the concepts of E&M safety and energy conservation in them more effectively. We also shared relevant posts on these messages on the social media pages of the mascots from time to time.

### 宣傳短片主題鮮明

年內，我們製作並推出了多個主題鮮明的電視宣傳短片。在2021年4月推出的升降機電視宣傳短片，由「機智啤啤」和「智析寶寶」提醒市民如何安全使用升降機。在2021年12月推出的電熱水爐電視宣傳短片，提醒市民安裝電熱水爐時須注意的安全事項，以及必須聘請註冊電業承辦商及水務署規定的指定人士進行安裝的信息。另有三段引人注目的動畫短片，分別推廣在村屋安裝中央石油氣供應系統、勸喻市民切勿通過跨境網購平台購買未經批准的家用氣體爐具，以及提供安全使用露營戶外氣體用具的貼士。我們亦在年內繼續播放有關安全使用輕度易燃雪種家用式冷氣機的電視宣傳短片。

### APIs with Distinctive Themes

During the year, we produced and launched a number of TV Announcements of Public Interest (APIs) with distinctive themes. In the TV API on lifts, which was launched in April 2021, Witty Bear and KnowBot reminded everyone about how to use the lifts safely. The TV API on electric water heaters, launched in December 2021, reminded the public about the safety tips on the installation of electric water heaters and the message that registered electrical contractors and designated persons required by the Water Supplies Department should be hired for carrying out the installation works. There were also three attention-grabbing animations, which respectively promoted the installation of centralised LPG supply systems in village houses, urged the public not to purchase non-approved domestic gas appliances from cross-border online shopping platforms and provided tips on the safe use of outdoor camping gas appliances. We also continued to broadcast the TV API on safe use of mildly flammable refrigerant household air-conditioners in the year.



▲ 我們透過多種宣傳渠道向公眾傳播安全信息，例如在社交平台專頁以活潑的動畫，鼓勵村屋居民安裝中央石油氣供應系統（左圖）。此外，為了照顧不同族裔人士的需要，現時的氣體安全電視宣傳短片和電台信息，均已加配印尼語、印度語、尼泊爾語、泰語及烏爾都語聲帶和字幕，讓不同族裔都能接收安全信息（右圖）。

Multiple channels are used to convey different safety messages to the public, including lively animations on our social media page to promote the installation of centralised LPG supply systems in village houses (left). To ensure that gas safety messages reach people of different ethnic backgrounds, TV and radio APIs on gas safety now have Bahasa Indonesia, Hindi, Nepali, Thai and Urdu soundtracks as well as subtitles (right).

為照顧不同種族的需要，我們特別把氣體安全信息翻譯成印尼語、印度語、尼泊爾語、泰語及烏爾都語在電台廣播，並為電視宣傳短片加配上述不同語言的字幕，務求更有效地向不同種族背景的人士宣傳氣體安全的信息。

Catering to the needs of different races, we specifically translated gas safety messages into Bahasa Indonesia, Hindi, Nepali, Thai and Urdu for radio broadcast and added subtitles in the above languages to TV APIs in order to disseminate gas safety messages to people of different ethnic backgrounds more effectively.



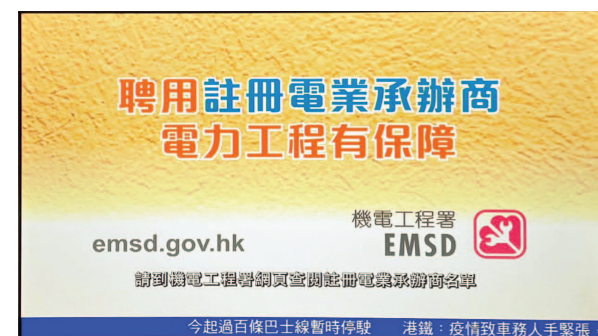
## 提升公眾機電安全及節能意識 Raising Public Awareness of E&M Safety and Energy Conservation

### 宣傳渠道更多元化

隨着數碼媒體日益普及，我們更廣泛利用社交媒體及其他網上宣傳工具，所有電視宣傳短片已上載至機電署的YouTube頻道。在2021年12月至2022年3月期間，我們透過在巴士及電車車身及多個線上平台刊登廣告，宣傳及鼓勵市民優化升降機及自動梯。至於宣傳電力安全方面，除了在港鐵車廂電視及香港鐵路有限公司的流動應用程式上分享電力安全資訊外，我們亦在多個電子商務平台及巴士車身刊登廣告。就宣傳安全使用輕度易燃雪種家用式冷氣機方面，除了巴士車身廣告外，我們亦在YouTube影片插播宣傳短片。至於推廣購買及使用附有「GU」標誌的家用氣體爐具和在村屋安裝中央石油氣供應系統方面，我們製作了動畫短片、宣傳單張、海報和四格漫畫，並在小巴和的士車身刊登廣告，務求多管齊下，加強公眾宣傳教育。另外，強制性能源效益標籤計劃下有關獨立式空調機、抽濕機和慳電膽的能源效益級別新標準已於2021年12月31日全面實施。為了宣傳新標準，除了電視宣傳短片及電台宣傳聲帶外，我們亦安排在港鐵車廂電視播放相關宣傳短片，並在巴士車身及椅背刊登廣告，增加公眾對計劃的認識。

### More Diverse Promotional Channels

As digital media is increasingly popular, we have been using social media and other online publicity tools more extensively, and have uploaded all TV APIs to the YouTube channel of the EMSD. From December 2021 to March 2022, we promoted and encouraged members of the public to carry out modernisation of lifts and escalators by placing advertisements on bus and tram bodies and various online platforms. As for the promotion of electrical safety, apart from sharing electrical safety information on MTR in-train TVs and the mobile application of the MTRCL, we also placed advertisements on various e-commerce platforms and bus bodies. Regarding promotion of the safe use of mildly flammable refrigerant household air-conditioners, other than advertisements on bus bodies, we also inserted APIs in YouTube videos. In relation to promoting the purchase and use of domestic gas appliances with a GU mark and the installation of centralised LPG supply systems in village houses, we produced animation videos, leaflets, posters and four panel comic strips, and placed advertisements on minibus and taxi bodies, aiming to strengthen public publicity and education by adopting a multi-pronged approach. Besides, the new energy efficiency grading standards for single package type room air-conditioners, dehumidifiers and compact fluorescent lamps under the MEELS were fully implemented on 31 December 2021. In order to promote the new standards, apart from TV and radio APIs, we also arranged for the broadcast of the relevant API on MTR in-train TVs and placed advertisements on the bodies and seatbacks of buses to raise public awareness of the Scheme.



▲▶ 我們採用多元化的宣傳工具，包括在公共交通工具投放廣告，例如在港鐵車廂電視放映安全短片（上圖）和在電車車身刊登廣告（右圖）。我們也在小巴和的士車身刊登廣告，並運用Facebook與YouTube等社交媒體進行宣傳，務求社會各階層都接收到安全信息。  
Advertising in public transport is one of our diverse publicity tools. For example, we placed advertisements in MTR in-train TVs (left) and on tram bodies (top). We also advertised on minibus and taxi bodies, in addition to using social media platforms such as Facebook and YouTube in order to reach different sectors of the public.



### 推進外展宣傳和教育工作

外展工作是直接接觸市民的有效宣傳方法。我們在2020年設立有關分間單位電力安全的網頁後，在本年度內展開外展行動，經香港社會服務聯會（社聯）的聯繫，到700個分間單位進行特別檢查，並與住戶分享電力安全須知。在社聯於2021年7月舉辦的研討會上，我們亦與出席研討會的非牟利組織代表分享有關安全資訊。2022年3月，我們舉行線上技術講座，向香港耆康老人福利會的義工介紹電力安全資訊。另外，年內我們亦展開針對酒店業的外展行動，到訪約1 500間持牌酒店和賓館，以提升業界對客房電力安全的意識。

年內，我們繼續鼓勵市民更換老化及沒有「GU」標誌的住宅式氣體用具，並與註冊氣體供應公司合作，加強定期氣體安全檢查。我們亦到訪選定屋苑的物業管理公司進行外展宣傳活動。此外，我們到訪東區、深水埗、荃灣和油尖旺等地區的「三無」大廈，直接向住戶宣傳安全使用瓶裝石油氣。

另外，我們就《建築物能源效益條例》進行定期宣傳。我們在2022年第一季度展開外展宣傳工作，向約300幢坐落於核心商業區的商業建築物的業主、物業管理公司及租戶講解該條例的規定，並鼓勵他們在其建築物實施節能措施，以節約用電。年內我們繼續進行新一輪外展宣傳活動，鼓勵市民採取節能減碳措施，積極投入低碳轉型，共同努力邁向碳中和。

### 比賽及認可計劃

我們通過各項比賽及認可計劃，為公眾和業界確立行業標準，有助業界優化服務。多年來，環境局（時稱）和機電署合辦「全民節能」運動，每年均邀請全港公私營機構簽署《節能約章》和《4T約章》，承諾達到特定的節能水平。2021年分別有2 200和600多家機構簽署了《節能約章2021》和《4T約章》。

氣體安全方面，我們推出「瓶裝石油氣分銷商安全表現評級計劃」，將註冊氣體供應公司旗下的分銷商按表現分為金、銀、銅三個級別。分銷商可在店面展示計劃標誌及評級證書，方便市民識別。年內共有162家分銷商參與計劃，其中60家獲評為金級，29家為銀級，73家為銅級。近年，獲評金級和銀級的分銷商數目持續上升，足見計劃有效提升行業水平。

### Taking Forward Outreach Publicity and Education Work

Outreach is an effective promotional method to reach the public directly. Following the setting up of a webpage on electrical safety of subdivided units in 2020, we conducted outreach activities during the year. With the Hong Kong Council of Social Service (HKCSS) liaising, we carried out special inspections at 700 subdivided units, and during which we also shared electrical safety tips with residents. Furthermore, we shared the safety information with representatives of non-profit organisations in attendance at a seminar organised by the HKCSS in July 2021. In March 2022, we held a technical webinar to introduce electrical safety information to volunteers of the Hong Kong Society for the Aged. During the year, we also launched outreach activities targeting the hotel industry and visited about 1 500 licensed hotels and guesthouses, with a view to raising the industry's awareness of electrical safety in guest rooms.

In the year, we continued to encourage the public to replace aged domestic gas appliances without a GU mark, and collaborated with the RGSCs to step up regular gas safety inspection. We also visited the property management companies of selected housing estates to conduct outreach publicity activities. In addition, we visited "three-nil" buildings in Eastern District, Sham Shui Po, Tsuen Wan, Yau Tsim Mong District and other districts to promote to the residents the safe use of LPG cylinders.

Besides, we have launched regular publicity campaigns on BEEO. We have commenced an outreach publicity campaign in the first quarter of 2022 to explain the BEEO requirements to the owners, property management companies and tenants of around 300 commercial buildings in the core business districts and encourage them to implement energy efficiency measures in their buildings to reduce electricity consumption. During the year, we continued to conduct a new round of outreach publicity activities to encourage the public to actively pursue low-carbon transformation by adopting energy saving and carbon reduction measures, so as to strive towards carbon neutrality.

### Competitions and Recognition Schemes

We established industry standards for the public and the industry through various competitions and recognition schemes, facilitating service enhancement in the industry. Over the years, the then Environment Bureau (ENB) and the EMSD have been co-organising the "Energy Saving for All" campaign under which every year public and private organisations in Hong Kong were invited to sign the Energy Saving Charter and the 4T Charter and pledge to achieve specific goals in energy saving. In 2021, more than 2 200 and 600 institutions signed the Energy Saving Charter 2021 and the 4T Charter respectively.

In respect of gas safety, we launched the LPG Cylinder Distributor Safety Performance Recognition Scheme, under which distributors under the RGSCs were classified into gold, silver or bronze ratings based on their performance. Distributors may display the scheme logo and the rating certificate at their shop fronts for public identification. During the year, a total of 162 distributors participated in the Scheme and among them, 60 received a gold rating, 29 silver and 73 bronze. The number of distributors receiving gold and silver ratings has been on the rise in recent years, indicating the effectiveness of the Scheme in raising industry standards.

## 提升公眾機電安全及節能意識 Raising Public Awareness of E&M Safety and Energy Conservation

我們於2021年10月首度舉辦「車輛維修自願註冊計劃」宣傳短片創作比賽，以別具創意的方式推廣「車輛維修技工自願註冊計劃」及「車輛維修工場自願註冊計劃」。比賽反應熱烈，我們收到來自小學、中學及個人的多個優秀參賽作品。

另一項近年推出的計劃是「優質升降機服務認可計劃」，計劃目的是鼓勵升降機負責人優化其升降機及提升升降機的維修及安全水平，無論業主、業主立案法團及物業管理公司均可申請參加計劃，接受升降機服務表現的評核，繼而取得認可。在2021年，我們共收到140份申請，涉及1 000多部升降機。

### 從小培養機電安全意識和節能習慣

機電安全和能源效益關乎市民一生的福祉，從小培養孩子機電安全意識及節能的良好習慣，非常重要。本年度的新猷之一，是為小學生編製「採電學社」STEAM教材套，以生動活潑的方式，鼓勵學生多用可再生能源，實現低碳生活。我們亦已開始編製中學及幼稚園適用的STEAM教材套。此外，我們在2021年8月向50多位到訪機電署總部的中學物理科老師，介紹我們推動能源效益和可再生能源的工作，讓老師在學校與學生分享相關知識。我們日後會多舉辦同類活動。

多年來，我們的幼稚園外展工作均口碑載道，例如我們的電力安全宣傳活動向來深受幼兒歡迎。年內我們探訪了28家幼稚園，其中兩次更請來「機智啤啤」，以生動有趣的方式，向幼兒傳達電力安全信息。



Our first-ever Promotional Video Competition of Voluntary Registration Scheme for Vehicle Maintenance was held in October 2021 to promote the Voluntary Registration Scheme for Vehicle Mechanics and the Voluntary Registration Scheme for Vehicle Maintenance Workshops with creative means. The competition drew an enthusiastic response and attracted various outstanding entries from primary schools, secondary schools and individuals.

Another scheme launched in recent years is the Quality Lift Service Recognition Scheme, which aims to encourage responsible persons for lifts to modernise their lifts and enhance the maintenance and safety standards of their lifts. Property owners, owners' corporations and property management companies can apply for participation in the scheme and have their lift service performance assessed to gain recognition. In 2021, we received 140 applications, involving more than 1 000 lifts.

### Cultivating E&M Safety Awareness and Energy Conservation Habits from Young Age

E&M safety and energy efficiency can bring lifelong benefits. Therefore, it is important to inculcate awareness of E&M safety and good energy-saving habits in the children from a young age. A new initiative for the year was the production of the Solar Harvest STEAM educational kit for primary school students to encourage them in a lively way to use renewable energy more extensively and lead a low-carbon lifestyle. We have also commenced the production of STEAM educational kits for secondary schools and kindergartens. In addition, we introduced our work in advocating energy efficiency and renewable energy to more than 50 physics teachers of secondary schools visiting the EMSD Headquarters in August 2021, in order that the teachers can share the relevant knowledge with students in school. We will organise more of such activities in the future.

Over the years, our outreach work to kindergartens has received good word of mouth. For example, our electricity safety promotion activities were highly popular with toddlers. During the year, we visited 28 kindergartens, and even brought along Witty Bear on two of the visits to share electrical safety messages with toddlers in a lively and interesting way.



◀◀ 機電署同事與一家參與「採電學社」的學校老師及學生合照，我們協助該校安裝了太陽能發電系統（右圖）。機電署也編製了一套「採電學社」STEAM教材套供小學生使用。學生使用虛擬眼鏡進入學習平台，學習能源效益知識，又砌成太陽能小車。兩項素材均來自教材套（左圖）。

Our colleagues shared a happy moment with the teacher and student of a school participating in Solar Harvest, under which we helped the kindergarten install a solar energy generation system. (right) The EMSD also produced the Solar Harvest STEAM education kit for primary students. The students viewed energy efficiency messages on the learning platform through Virtual Reality Cardboards and assembled small solar cars. Both materials were from the kits. (left)

### 鞏固跨境合作聯繫

#### 加強與內地對口單位的合作

機電署各部別與內地的對口單位多年來合作無間，並不斷在各領域加強合作關係。年內，我們透過與國家海關總署建立的通報機制，向對口單位通報了15款不符合香港安全規格的電氣產品，包括萬能插蘇、拖板、小型電源供應器等，以及六類經內地跨境電商平台輸港的未獲批准燃氣產品，並就各通報個案採取適當的跟進行動。我們又與深圳海關和拱北海關合作，共同構建了輸港石油氣粵港澳大灣區機構合作網上平台，以保障供車輛及氣體爐具使用的石油氣質素。年內，我們亦與北京市城市管理委員會攜手建立燃氣安全監管和管理交流平台，進一步促進北京與香港分享相關經驗。

我們也參與了由廣東省特種設備檢測研究院牽頭的《在用電梯風險評價規程—曳引驅動電梯》的研究工作，該規程為本港及大灣區業界提供參考標準。

2021年10月，我們與環境局（時稱）及廣東省科學技術協會合辦第二屆「綠色創科日」，分享各種實現碳中和的創科方案，吸引超過10萬人次觀看線上直播。我們亦正與廣東省科學院合作研發人工智能機械人，用於檢測石油氣缸車氣缸的內部狀況，以助規管團隊對氣缸進行遙距檢測，減少在密閉空間工作的時間和提升檢測效率。我們會繼續透過線上和線下方式與內地保持聯繫，加強跨境合作，以提升規管成效和促進業界發展。



### REINFORCING CROSS-BOUNDARY CO-OPERATION

#### Enhancing Collaboration with Mainland Counterparts

Over the years, the divisions under the EMSD have been co-operating closely with their Mainland counterparts and deepening the partnership in various areas. During the year, through the reporting mechanism set up with the General Administration of Customs of the People's Republic of China, we notified our Mainland counterparts of 15 models of electrical products that did not comply with local safety requirements, including adapters, extension units and small power supply units, and six types of unapproved gas products imported to Hong Kong through Mainland cross-boundary e-commerce platforms, and took appropriate follow-up actions on the notified cases. We also co-operated with Shenzhen Customs and Gongbei Customs to set up a Greater Bay Area institutional co-operation online platform on LPG supply to Hong Kong, to ensure the quality of LPG for vehicles and gas appliances. During the year, we also collaborated with the Beijing Municipal Commission of Urban Management to set up a communication platform on the regulation and management of gas safety, to further promote the mutual exchange of relevant experiences in Beijing and Hong Kong.

We also took part in the research work in respect of the Rules for Risk Assessment of the Traction Lifts spearheaded by the Guangdong Institute of Special Equipment Inspection and Research. The document provides reference standards for the trade in Hong Kong and the Greater Bay Area.

We held the second Green I&T Day jointly with the then ENB and the Guangdong Provincial Association for Science and Technology in October 2021 to share various I&T solutions for achieving carbon neutrality, attracting more than 100 000 views via live streaming. In collaboration with the Guangdong Academy of Sciences, we are developing an AI robot for inspecting the inner shell condition of the vessels of LPG road tankers. The tool will enable the regulatory team to carry out remote inspection of the vessels, thus reducing the time required for working in confined space and enhancing inspection efficiency. We will continue to work closely with the Mainland through online and offline means and strengthen cross-boundary co-operation, with a view to boosting regulatory effectiveness and promoting trade development.

◀ 來自機電署及其他部門的同事代表政府跨部門碳中和工作小組出席2021年10月在機電署舉辦的第二屆「綠色創科日」。該活動由本署與環境局及廣東省科學技術協會合辦，目的是介紹各種有助實現碳中和的創科方案。

Colleagues from the EMSD and other government departments in representation of the inter-departmental carbon neutrality working group joined the second Green I&T Day at the EMSD in October 2021. The event was jointly organised with the Environment Bureau and the Guangdong Provincial Association for Science and Technology to share I&T solutions for achieving carbon neutrality.

## 提升公眾機電安全及節能意識 Raising Public Awareness of E&M Safety and Energy Conservation

為確保內地與香港之間的鐵路運輸服務安全暢通，機電署和運輸及房屋局（時稱）分別與國家鐵路局簽訂兩份會談紀要，兩份紀要涵蓋有關廣深港高鐵（高鐵）安全監管工作機制事宜及過境鐵路車輛駕駛人員資格管理事宜的合作。機電署與國家鐵路局保持緊密溝通合作，定期舉行會議和進行人員培訓及高鐵香港段鐵路設施綜合安全檢查，以保障過境鐵路服務的營運安全。

### 與國際機構聯繫

在國際聯繫方面，年內機電署兩位高層官員在亞太區經濟合作組織能源工作組擔任領導角色，一位獲選為2021至2023年的能源工作組副主席，另一位在相同年度繼續擔任能源效益及節能專家小組主席。這有助提升香港在亞太區內節能工作的影響力，令人振奮。

在國際上，繼上年度與新加坡能源市場管理局簽訂諒解備忘錄後，年內我們與新加坡能源市場管理局互相參與對方舉辦的活動，包括「2021新加坡國際能源周」和「機電工程署研討會2022」，分享實現碳中和的策略和目標。另外，作為國際鐵路安全議會核心小組成員，機電署參加了核心小組的高層次線上會議，分享以創科方案提升鐵路安全的經驗，並計劃於2022年派員赴西班牙參與國際鐵路安全議會年度會議。此外，我們於2022年1月20及21日以線上形式舉辦亞太經合組織「重新校驗研討會暨培訓」。在是次活動中，逾100名來自11個亞太經合組織成員經濟體的專家和代表雲集，交流有關重新校驗的知識。目前，我們正籌備主辦第71屆國際纜車監管機構會議，但因疫情反覆，該會議已延期至2023年9月舉行。

To ensure safe and smooth operation of railway transport services between the Mainland and Hong Kong, the EMSD and the then Transport and Housing Bureau signed with the National Railway Administration (NRA) two records of meetings on co-operation in respect of the safety regulatory mechanism of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (XRL) and the qualification management of drivers of cross-boundary trains. The EMSD and NRA will maintain close communication and co-operation through regular meetings, personnel training and comprehensive safety inspection of the Hong Kong Section of XRL, to ensure the operational safety of cross-boundary railway services.

### Engagement with International Organisations

In terms of engagement with international organisations, two senior EMSD officials took leading roles in the Energy Working Group (EWG) under the Asia-Pacific Economic Cooperation, one elected as the Deputy Lead Shepherd of the EWG and another continued to serve as Chairman of the Expert Group on Energy Efficiency and Conservation for the session 2021-23. This is encouraging as the influence of Hong Kong in energy conservation work in the Asia-Pacific region will be expanded.

Internationally, after the signing of the Memorandum of Understanding with the Energy Market Authority (EMA) of Singapore in the last year, the EMSD and the EMA participated in events organised by each other, including the Singapore International Energy Week 2021 and the EMSD Symposium 2022, to share strategies and targets for achieving carbon neutrality. Besides, as a member of the Core Group of the International Railway Safety Council (IRSC), the EMSD attended a high-level online meeting to share experience in promoting railway safety with I&T solutions and planned to send representatives to attend the IRSC Annual Conference in Spain in person in 2022. Besides, we hosted the APEC Workshop cum Training on Retro-commissioning (RCx) online on 20 and 21 January 2022, attracting over 100 experts and representatives from 11 APEC member economies to exchange knowledge on RCx. We are currently preparing for the hosting of the 71st International Meeting of Technical Authorities for Cableways, but the meeting has been postponed to September 2023 due to the fluctuating epidemic situation.



▲機電署的「機電青少年大使計劃」深受青年人歡迎。透過這項計劃，他們既能增廣機電安全及能源效益知識，又能參加多姿多采的活動。「機電青少年大使計劃」在Facebook發出帖文，分享成員熱中的網上STEM工作坊（左圖）。創意思維工作坊「智慧生活篇」是該計劃另一項廣受歡迎的活動（右圖）。  
Our E&M Young Ambassador (EMYA) Programme is popular with young people as they can gain much knowledge in E&M safety and energy efficiency and take part in diverse activities through the programme. EMYA posted on Facebook the titbits of online STEM workshops which were highly popular with members (left). The young people participated attentively in the Design Thinking Workshop – Smart Living Chapter, another well-received EMYA activity (right).



### 機電青少年大使計劃寓趣味於學習

過去一年，機電署透過機電青少年大使計劃舉辦一連串嶄新活動，讓年青人發揮創意，培養他們對機電知識的興趣，從而推廣機電安全、能源效益及機電行業的發展。除了一直深受計劃會員歡迎的網上STEM工作坊外，我們推出智慧城市創意思維工作坊，以激發參加者的創新思維。工作坊透過小組互動形式，引導參加者以多角度思考持份者的需要，並提出創新的解決方案。我們亦舉辦「機電知識鬥一番」網上問答比賽，以鼓勵會員增進機電安全相關的知識。受疫情影響，學生提早於2022年3月及4月放暑假，我們在這個突如其來的假期期間推出一系列以碳中和為主題的網上活動，藉此推廣節能減碳，將碳中和概念滲透社區。此外，機電青少年大使計劃的Facebook專頁定期發布專題帖文，以生動有趣的方式推廣機電知識及安全資訊，從而加強宣傳效果及吸引更多公眾關注。

### FUN LEARNING THROUGH THE E&M YOUNG AMBASSADOR PROGRAMME

In the past year, the EMSD held a series of novel activities through the E&M Young Ambassador (EMYA) Programme to unleash young people's creativity and cultivate their interest in E&M knowledge, so as to promote E&M safety, energy efficiency and the development of the E&M industry. In addition to the online STEM workshops which have always been popular with EMYA members, we launched the Smart City Design Thinking Workshops to stimulate creative thinking among participants. Through group interaction, the workshops guided participants to consider the needs of stakeholders from multiple perspectives and come up with innovative solutions. We also held the EMYA Online Quiz Competition 2021 to foster a better understanding of E&M safety among members. When students took an early summer break in March and April 2022 due to the epidemic situation, we launched a series of online activities on carbon neutrality to promote energy conservation and carbon reduction, so as to take the concept of carbon neutrality to the community. Thematic posts were also regularly posted on the Facebook page of the EMYA to promote E&M knowledge and safety information in a lively and interesting manner in order to enhance the publicity impact and capture greater public attention.



◀署長聯同高層管理人員於2021年6月舉行傳媒聚會，展示部門開拓創新科技的研發和應用成果，以及推動機電資產進行數碼化的工作，介紹這些方面如何惠及廣大市民。  
At the media gathering in June 2021, our Director and senior management showcased the EMSD's achievements in promoting I&T development and application as well as the work on fostering digitalisation of E&M assets for the benefit of the community at large.

### 與傳媒聚會

機電署十分重視傳媒關係。我們積極與傳媒聯繫並主動發放部門資訊。最近一次傳媒聚會於2021年6月中舉行，主題為「創新惠民」。署長聯同高層管理人員主持聚會，闡釋機電署作為政府的「創新促成者」，在推動機電業界研發和應用創新科技，以及提倡機電資產數碼化方面的工作。在聚會中，高層管理人員向20多家傳媒機構展示多個在2022年日內瓦國際發明展獲獎的創科項目，並介紹如何應用「建築信息模擬—資產管理」技術進行智慧維修，以及運用「政府物聯通」支援各項智慧城市措施，以提升建築物的管理及維修效率並優化城市管理，惠及廣大市民。

### MEDIA GATHERING

The EMSD attaches great importance to media relations. We engage and proactively share departmental information with the media. The latest media gathering was held in June 2021 with the theme of "Innovation for the Benefits of the Public". The Director of Electrical and Mechanical Services and senior management staff hosted the gathering to expound on the EMSD's work in fostering the development and application of innovative technologies in the E&M trade and advocating E&M asset digitalisation as the Innovation Facilitator of the Government. At the gathering, senior management presented to more than 20 media organisations the I&T projects that won awards at the International Exhibition of Inventions of Geneva 2022, as well as introducing the application of Building Information Modelling – Asset Management in smart maintenance and the Government-Wide IoT Network in supporting various smart city initiatives for improving the efficiency of building management and maintenance and enhancing city management for the benefits of the public.

# 機電工程 營運基金報告

## ELECTRICAL AND MECHANICAL SERVICES TRADING FUND REPORT

### 抱負 VISION

致力提供優質機電工程服務，精益求精，以提升市民的生活質素。

To improve the quality of life for our community through continuous enhancement of our electrical and mechanical engineering services.

### 使命 MISSION

#### 客戶 CUSTOMER

提供優質的工程方案，以滿足客戶的需要。  
Providing quality engineering solutions to satisfy our customers' needs.

#### 員工 STAFF

建立一支卓越的員工隊伍，並維持和諧的工作環境。  
Developing a competent workforce and maintaining a harmonious environment.

#### 部門 ORGANISATION

掌握科技發展和流程改善，以提供更佳服務。  
Keeping pace with technology development and process improvement for service enhancement.

### 信念 VALUES

#### 誠信 INTEGRITY

我們秉持誠信，維持良好道德操守。  
We uphold honesty and integrity to embrace an ethical culture.

#### 出色服務 SERVICE EXCELLENCE

我們提供安全可靠、高效率、具成本效益和優質的服務。  
We provide safe, reliable, efficient, cost-effective and quality services.

#### 關懷 CARING

我們關懷員工、客戶和市民大眾，並重視環保。  
We care for our staff, customers, community and the environment.

#### 以客為本 CUSTOMER FOCUS

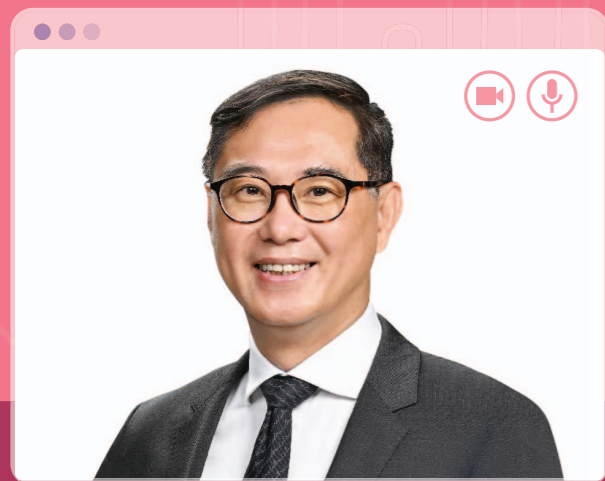
為滿足客戶的各種需要，我們盡心竭力，積極提供工程方案，以贏取客戶的信任和支持。  
We focus on the needs of our customers and provide engineering solutions in a proactive and responsible manner to win their trust and support.

#### 承擔 COMMITMENT

我們言行一致，信守承諾。  
We do what we promise.



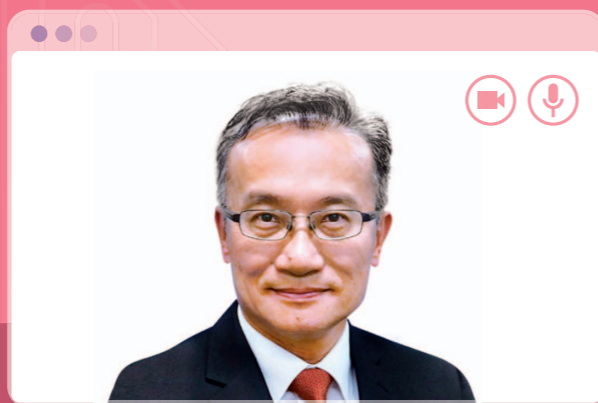
## 常務委員會 Executive Board



### 主席 CHAIRMAN

1 劉俊傑太平紳士  
Mr Lau Chun-kit, Ricky, JP

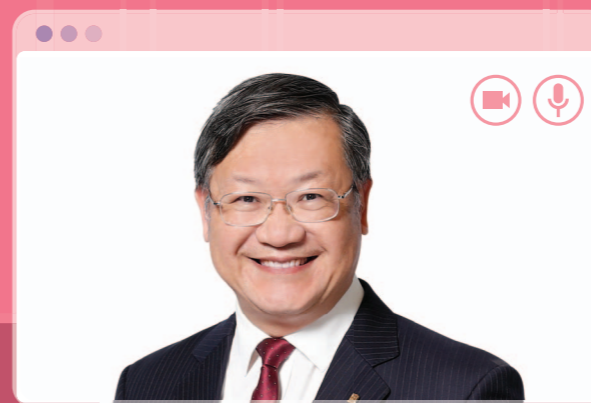
發展局常任秘書長(工務)  
Permanent Secretary for Development (Works)



### 成員 MEMBERS

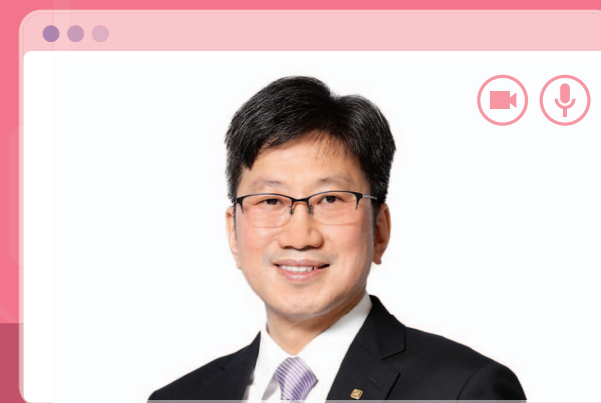
2 周紹喜太平紳士  
Mr Chau Siu-hei, Francis, JP

發展局副秘書長(工務)3  
Deputy Secretary for Development (Works) 3



3 彭耀雄太平紳士  
Mr Pang Yiu-hung, JP

機電工程營運基金總經理  
(機電工程署署長)  
General Manager, EMSTF  
(Director of Electrical and Mechanical Services)



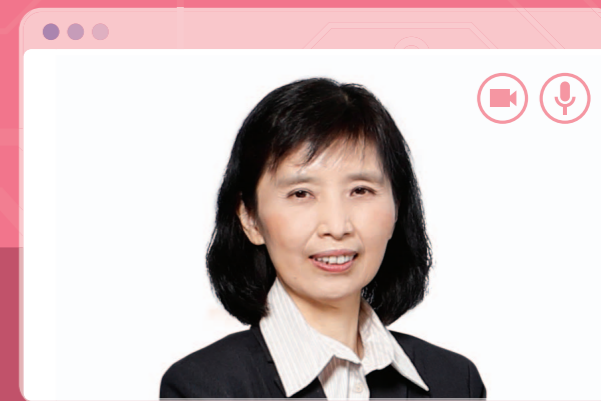
4 張遠芳太平紳士  
Mr Cheung Yuen-fong, JP

機電工程署副署長/營運服務  
Deputy Director/Trading Services, EMSD

### 秘書 SECRETARY

5 韋美珠女士  
Ms Wai Mei-chu, Jenny

署理機電工程署主任秘書  
Departmental Secretary (Acting), EMSD



\* 林世雄太平紳士出任發展局常任秘書長(工務)至2021年10月7日  
Mr Lam Sai-hung, JP was Permanent Secretary for Development (Works) up to 7 October 2021

\* 袁秀明女士出任機電工程署主任秘書至2022年5月17日  
Ms Yuen Sau-ming, Anna was Departmental Secretary, EMSD up to 17 May 2022



## 管理委員會 Management Board

### 主席 CHAIRMAN

1

**彭耀雄太平紳士**  
**Mr Pang Yiu-hung, JP**

機電工程營運基金總經理  
(機電工程署署長)  
General Manager, EMSTF  
(Director of Electrical and  
Mechanical Services)



### 成員 MEMBERS

2

**張遠芳太平紳士**  
**Mr Cheung Yuen-fong, JP**

機電工程署副署長 / 營運服務  
Deputy Director/Trading Services, EMSD

3

**陳嘉聰先生**  
**Mr Chan Ka-chung**

機電工程署助理署長 /1  
Assistant Director/1, EMSD

4

**黃偉光先生**  
**Mr Wong Wai-kwong**

機電工程署助理署長 /2  
Assistant Director/2, EMSD

5

**陳志偉太平紳士**  
**Mr Chan Chi-wai, Richard, JP**

機電工程署助理署長 /3  
Assistant Director/3, EMSD

6

**李慧儀女士**  
**Ms Lee Wai-ye**

機電工程署總庫務會計師 / 財政管理  
Chief Treasury Accountant/  
Financial Management, EMSD

7

**劉志偉先生**  
**Mr Lau Chi-wai, Wilfred**

機電工程署員工關係主任  
Staff Relations Officer, EMSD

### 秘書 SECRETARY

8

**韋美珠女士**  
**Ms Wai Mei-chu, Jenny**

署理機電工程署主任秘書  
Departmental Secretary (Acting), EMSD

\* 袁秀明女士出任機電工程署主任秘書至2022年5月17日  
Ms Yuen Sau-ming, Anna was Departmental Secretary, EMSD up to 17 May 2022

## 業務回顧與前瞻 Operations Review and Outlook

機電工程營運基金於2021/22年度的業務穩健，並有持續增長。總收入增至87.19億港元，較2020/21年度的85.78億港元增長約1.6%。收入回報率則維持於2.9%的穩定水平，符合我們只收回成本的營運原則，讓客戶保留資金，為公共服務創造最大價值。

### 業務亮點

由於同事工作表現卓越，我們成功與所有服務水平協議於2021/22年度屆滿的客戶（例如教育局、司法機構和廉政公署）續簽新協議。我們也透過參與醫院管理局（醫管局）的公開招標，取得三份重要合約，分別為機電、空調及屋宇裝備系統的操作及維修保養服務合約；醫療儀器以及手術室設備的維修保養服務合約，證明營運基金深具競爭力。

年內，多個新場地陸續投入服務，包括香園圍邊境管制站的共用設施、青衣車輛檢驗綜合大樓和屯門兆麟政府綜合大樓，帶來新業務。未來將有多個新政府場地啟用及基建項目工程展開，例如醫管局的兩個十年醫院發展計劃、政府數據中心大樓和入境事務處新總部大樓等，營運基金的業務也會隨之增長。

### 成績與嘉許

在2021年，為慶祝營運基金成立25周年，我們以「同・創・傳・期」為主題，於2021年8月舉行慶典，並邀得政務司司長蒞臨作主禮嘉賓。是次銀禧紀念是個里程碑，不但突顯營運基金已成功蛻變為具競爭力和高瞻遠矚的優質機電工程服務機構，深受客戶支持，也證明了幾代員工的承擔和努力。

此外，在疫情中，員工的滿意度有所提高，令人感到鼓舞。根據最新的2021年員工滿意度調查，以10分為滿分計，員工滿意度指數為7.6分，回應率為50%，兩者均創歷史新高。自2020年疫情開始，我們動員了很多同事執行額外的緊急工作，例如把普通病房及社區設施改裝為負壓設施，為社區疫苗接種中心和「圍封強檢」行動提供支援等。我們相信由於員工在這些工作中能直接幫助市民，並獲得客戶的讚賞，讓他們獲得不少滿足感。

The Electrical and Mechanical Services Trading Fund recorded healthy business and sustained growth in 2021/22. The total revenue rose to HK\$8,719 million, as compared with HK\$8,578 million in 2020/21, representing an increase of about 1.6%. The return on revenue remained stable at 2.9%, which was in line with our cost recovery principle to help client departments retain funding to optimise value for the public.

### OPERATION HIGHLIGHTS

Thanks to our colleagues' excellent work, we have successfully renewed all existing Service Level Agreements due for expiry in 2021/22, such as those with the Education Bureau, Judiciary and Independent Commission Against Corruption. Through open tender, we also won three substantial contracts of the Hospital Authority (HA) for the provision of operation and maintenance services for electrical, mechanical, air-conditioning and building services systems, as well as maintenance services for medical and operating theatre equipment respectively, demonstrating our competitiveness.

This year also saw the commissioning of many new venues, including the common facilities in Heung Yuen Wai Boundary Control Point, the Tsing Yi Vehicle Examination Complex and the Tuen Mun Siu Lun Government Complex, bringing new business. A multitude of forthcoming new government venues and infrastructure projects will be the source of continuous business growth for the EMSTF, notable examples being the HA's two Ten-year Hospital Development Plans, the Government Data Centre Complex and the new Immigration Headquarters.

### ACHIEVEMENTS AND RECOGNITION

We celebrated the EMSTF's 25th anniversary in 2021 under the theme of "Co-innovate and Co-create Our Future", culminating in a ceremony in August 2021 officiated by the Chief Secretary for Administration. The silver jubilee not only marked a milestone in the EMSTF's success in becoming a competitive, high-quality and forward-looking E&M engineering service provider with strong support from its clients, but also testified to the commitment of generations of the EMSTF colleagues.

It is encouraging to note that staff satisfaction was boosted in the epidemic. In the latest 2021 Staff Satisfaction Survey, we got a staff satisfaction level of 7.6 on a scale of 10, with a 50% response rate, both record highs. Many colleagues have been called upon since 2020 to perform additional urgent duties such as converting general wards and community venues into negative pressure facilities, providing support to Community Vaccination Centres and "restriction-testing declaration" (RTD) operations. We believe these tasks have given staff great job satisfaction as they were directly helping the public while earning clients' appreciation.



張遠芳 太平紳士  
Mr Cheung Yuen-fong, JP

機電工程署副署長 / 營運服務  
Deputy Director/Trading Services, EMSD

## 業務回顧與前瞻 Operations Review and Outlook

作為政府的「創新促成者」，機電署很高興再次於年內得見部門多個創新科技（創科）項目傳來捷報，獲得多個獎項，尤其於2022年日內瓦國際發明展榮獲19個獎項，包括五個金獎、13個銀獎及一個銅獎，成績斐然。營運基金的區域數碼監控中心及人工智能平台，則於2021年香港資訊及通訊科技獎榮獲金獎。另外，多個營運基金的創科項目也於「促進機械人科技應用」創新比賽及「2021年城市創科大挑戰」中獲得獎項。

我們在培育人才方面的努力也備受肯定，例如機電署的技術員訓練計劃，便榮獲香港管理專業協會2021年最佳管理培訓及發展獎銀獎，以及四個特別獎。

### 從抗疫工作的領悟和得着

在過去兩年的抗疫工作中，我們獲得許多寶貴的領悟和得着。首先是運用創科別具重要性，無論是運用機械人進行清潔與消毒，或是更複雜的解決方案，例如在全港社區疫苗接種中心使用綜合疫苗冷藏櫃監察系統，確保疫苗儲存於適當溫度，都有助抗疫成效。

其次是抗疫工作令營運基金的員工處事變得更靈活敏捷，協作能力也更強。例如我們為官立學校和出現感染羣組的食肆進行通風評估，提出改善建議，並制訂通風指引供營運者參考，同時也為餐飲處所換氣量或空氣淨化設備工作小組提供意見。我們的團隊更支援客戶，把某些政府場地改裝為社區隔離設施及暫託中心。同事在這些抗疫工作中表現高效幹練，充分發揮團隊合作精神，表現卓越。

其三，是營運基金已逐漸成為一個越見靈活的組織，能有效應對各種意想不到的挑戰，這從同事參與抗疫工作的表現可見一斑。在第五波疫情下，雖然很多同事確診2019冠狀病毒病，但團隊仍然無畏無懼，全情投入各種緊迫的抗疫工作，包括繼續進行醫院改裝工作、參與「圍封強檢」行動及執行其他抗疫任務。近年我們銳意為營運基金推動文化轉變，聚焦提高消息透明度和加快溝通，讓同事能在掌握資訊後作出明智決定。從團隊的表現，可見這文化轉變已見成效。

As the Innovation Facilitator of the Government, we are delighted to report again numerous innovation and technology (I&T) awards garnered during the year, most notable being the I&T projects of the Electrical and Mechanical Services Department winning 19 medals, including five gold, 13 silver and one bronze medals, at the International Exhibition of Inventions of Geneva 2022. Our Regional Digital Control Centre and Artificial Intelligence (AI) Platform project won a gold award in the Hong Kong ICT Awards 2021, while various I&T projects of the EMSTF received awards in the "Leading Towards Robotics Technologies" Innovation Competition and the City I&T Grand Challenge 2021.

Our efforts to nurture talent received recognition too. For example, our Technician Training Scheme has won a silver award and four special awards in the Award for Excellence in Training and Development 2021 organised by the Hong Kong Management Association.

### INSIGHTS FROM FIGHTING THE EPIDEMIC

The anti-epidemic work in the past two years has given us valuable insights. First, we grasped the importance of using I&T, be it the deployment of cleaning and disinfection robots or more sophisticated solutions such as the integrated Fridge Monitoring System at all Community Vaccination Centres to ensure that vaccines are stored at the right temperature.

Second, greater agility and collaboration among the EMSTF staff were achieved amid the anti-epidemic work. A good example was our support to the Government on the ventilation assessment at government schools and dine-in restaurants with cluster outbreaks. We recommended improvement measures, helped draw up ventilation guidelines for industry operators, and provided advice to the Working Group on Air Change or Air Purifiers in Catering Premises. Our team also supported the conversion of some government venues into Community Isolation Facilities and holding centres. The efficiency and team spirit of our staff were admirable.

The third insight is that we are becoming an increasingly agile organisation capable of responding effectively to unforeseen challenges, as demonstrated by our colleagues' performance in anti-epidemic work. During the fifth wave when many staff members were infected with Coronavirus Disease 2019 (COVID-19), our team still worked whole-heartedly on urgent improvement works in hospitals, RTD operations and other anti-epidemic tasks, undaunted by the severe epidemic. The team's performance is a sign of success in our cultural change efforts in recent years, with a focus on promoting greater transparency and faster communication to help staff make informed decisions.

### 第二個五年策略計劃快將完成

2021/22年度是營運基金第二個五年策略計劃實施的第四年，計劃旨在透過「機電數碼化」、「培育卓越團隊」和「科技・創新」三大策略，達成「機電2.0」的目的。年內，我們在落實策略計劃方面有良好進展。

亮點之一，是我們五個部別各自的區域數碼監控中心已全面投入運作，為客戶設施提供各種儀器監控、故障警報、故障回應及能源管理服務。下一個目標是把五個監控中心，整合為一個機電署中央數碼監控中心。我們有部分策略業務單位，更已開始把語義人工智能技術應用於建築物，以提升能源效益。目前我們正與廣東省科學技術協會及廣東省生產力促進中心，探討於粵港澳大灣區聯手成立一個「機電人工智能實驗室」，以進一步研發和推廣該技術。

為培育卓越團隊，在疫情期間，我們繼續與廣州的培訓合作伙伴為機電署見習技術員舉辦線上培訓課程。與此同時，為傳承知識經驗與促進交流，營運基金的特定機電團隊和機電署的部門卓越中心，也舉行了多次交流活動，為員工提供特定技術領域的深入培訓。

至於第三個「科技・創新」策略上，從營運基金近年獲得多個著名創科獎項，以及我們正於政府場地測試各種創科項目，可見在這方面已取得豐碩成果。我們致力與客戶攜手合作，協助他們改善多項公共服務，包括為渠務、懲教及海關服務引入智能項目，以至為學校打造智能教室，運用創科方案加強能源效益。在下一個五年策略計劃中，我們會採納更多創科和智能機電方案，特別是在智慧城市發展和減碳工作方面，讓創科能發揮至關重要的效能。

### SECOND FIVE-YEAR STRATEGIC PLAN NEAR COMPLETION

2021/22 was the fourth year of the implementation of the EMSTF's second Five-year Strategic Plan which aims to achieve "E&M 2.0" with the three strategies of "digitisation of E&M assets", "establishing an excellent work team", and "adoption of I&T". Good progress was made during the year.

A highlight is our five Divisional Regional Digital Control Centres (RDCCs) which have become fully operational with functions in equipment monitoring, alarm and fault response and energy management for client facilities. Our next goal is to integrate these RDCCs into an EMSD Departmental Digital Control Centre. Some Strategic Business Units have also started using semantic AI to optimise energy efficiency in buildings. We are working with the Guangdong Provincial Association for Science and Technology and Guangdong Productivity Centre to explore about jointly setting up a "E&M AI Lab" in the Guangdong-Hong Kong-Macao Greater Bay Area to advance and promote the technology.

To build an excellent work team, we have continued to hold online training programmes for technician trainees jointly with our Guangzhou training partners during the epidemic. Meanwhile, to foster knowledge and experience sharing, the EMSTF's Special Duty Units as well as our Departmental Centres of Excellence have organised sharing sessions to provide advanced training to staff in specific disciplines.

The third strategy about adopting I&T has seen fruitful results, as evidenced by the prestigious technology awards won as well as various projects on trial run in government venues. We endeavoured to collaborate with many clients to help improve their public services, ranging from introducing smart initiatives to drainage, correctional and customs services to setting up smart classrooms equipped with I&T solutions to optimise energy efficiency. Adopting more I&T and smart E&M solutions will be our important line in the next Five-year Strategic Plan, especially in the areas of smart city development and decarbonisation, so that we can capitalise on the essential power of I&T.



## 業務回顧與前瞻 Operations Review and Outlook

### 與客戶、機電業界及社會保持聯繫

營運基金十分重視企業社會責任，我們繼續透過研討會、大型會議及互訪活動與客戶及業界保持聯繫。年內，我們也積極在各種公共關係活動中引入機電署兩個吉祥物「機智啤啤」和「智析寶寶」，並增加使用社交媒體，務使我們與各方的溝通更方便快捷和透明。

與社區保持聯繫方面，我們的親善大使為長者及弱勢社羣提供義工服務，而吉祥物也經常到訪幼稚園和小學進行外展活動。我們在2021年11月參與「樂齡科技博覽暨高峰會」，展示如何在安老院舍運用機械人科技，為長者提供更佳的照顧。

### 2022/23 年度展望

展望2022/23年度，我們會充分利用第二個五年策略計劃的最後一年，實現計劃的所有目標，同時開始制訂第三個五年策略計劃，並就此徵求員工的意見。新的策略計劃將於2023/24年度展開。我們有信心，第二個策略計劃可如期完成，並為第三個策略計劃奠定堅實基礎。

在培育人才和應用創科方面，營運基金會加強與內地及海外合作伙伴的協作，並於2022/23年度推出經優化的技術員訓練計劃，為機電署和業界培養更多年輕新血。

總結去年，我們衷心感謝全體同事盡心服務和客戶投以信任。常務委員會與各決策局一如既往，大力支持我們的工作，各商會及業界伙伴、專業團體、大學和學者，以及培訓與研究機構也一直鼎力襄助，我們謹致謝忱。至於本港、內地及海外的合作伙伴，我們也在此誠摯感謝他們一直以來的支持。我們期望疫情結束後與各方加強協作，建立更緊密的聯繫。

### ENGAGING WITH CLIENTS, E&M TRADE AND COMMUNITY

The EMSTF takes its corporate social responsibilities seriously, as seen in our continued engagement with our clients and trade through seminars, symposium and visits. During the year, we also had our two mascots, Witty Bear and KnowBot actively involved in our engagement activities. Social media were used more often to make communication faster, more effective and transparent.

Our community engagement encompassed volunteer services for the elderly and the needy by our ambassadors, and outreach visits by our mascots to kindergartens and primary schools. We participated in the Gerontech and Innovation Expo cum Summit in November 2021 to showcase the adoption of robotics in residential care homes for the elderly for better care of the elderly.

### OUTLOOK FOR 2022/23

In 2022/23, we shall make the most of the final year in the second Five-year Strategic Plan to attain all goals. We shall also begin formulating the third Five-year Strategic Plan, which will commence in 2023/24, and solicit staff input. We are confident that the current Plan will be completed on time, which will lay a solid foundation for the third Plan.

The EMSTF will foster closer collaboration with our partners in the Mainland and overseas on talent development and I&T application. We will start our newly revitalised Technician Training Scheme in 2022/23, with the aim of nurturing young talent for the Department and the industry.

In summing up, we would like to extend our sincere thanks to all our colleagues for their services and our clients for their trust. The Executive Board and policy bureaux have been most supportive, while the trade associations and partners, professional bodies, universities and academics, and training and research institutions have given us staunch support as always. We owe them a debt of gratitude. Heartfelt appreciation also goes to our co-operation partners in Hong Kong, the Mainland and overseas for their continuous support. We look forward to even closer collaboration once the epidemic is over.

本文是我為年報撰寫的最後一篇業務回顧。我十分榮幸有機會在上世紀80年代加入機電署服務，在1996至1998年及2003至2005年期間在營運基金任職，並再於2016年重返營運基金服務至今。多年來，我有幸能在部門協助香港應對各種挑戰，包括非典型肺炎（嚴重急性呼吸道系統綜合症）和2019冠狀病毒病疫情。我也十分感恩能參與香港引進新技術以提升能源效益的工作，例如推動區域供冷、重新校驗和語義人工智能等技術，為香港的減碳轉型略盡綿力。機電署同寅才華出眾，竭誠服務市民，能與大家共事，我深感榮幸。

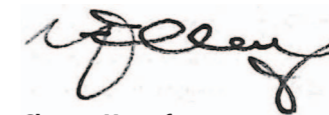
我們期盼來年所有持份者繼續大力支持我們的工作，營運基金在2022/23年度再創佳績。

This column will be my last for this publication. I have been most privileged in having the opportunity to serve in the EMSD since the 1980s and in the EMSTF in 1996 to 1998 and 2003 to 2005, before re-joining it in 2016. Over the years, my work has taken me to help Hong Kong tackle many challenges including SARS (Severe Acute Respiratory Syndrome) and COVID-19. I am also grateful for having played a role in promoting new technologies such as district cooling, retro-commissioning and semantic AI in Hong Kong for greater energy efficiency and decarbonisation and for working with a talented team committed to public services.

With support from all stakeholders, we look forward to another fruitful year in 2022/23.

張遠芳

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## 營運服務 Trading Services

### 齊心抗疫

2019冠狀病毒病第五波疫情在2022年年初爆發，確診個案激增，為本港醫療體系和民生帶來前所未遇的挑戰。我們的策略業務單位無懼挑戰，不遺餘力地為醫院管理局（醫管局）加強醫院病房設施，並協助政府迅速設立社區隔離和治療設施，以應急需。與此同時，我們亦全力投入工作，為客戶的場地做好多項不同的防疫措施，支援政府提升疫苗接種率 and 加強檢測能力，以及為市民提供抗疫物資。

我們的任務之一，是協助醫管局把公立醫院的普通病房改裝成二線負壓隔離病房，包括加裝「流動組合式—高效能空氣微粒子過濾器」及抽氣扇，以應付第五波疫情高峰期每日數以萬計的確診個案所需。我們亦協助醫管局，在亞洲國際博覽館社區治療設施改裝多一個展館，用作收治輕症患者，讓公立醫院可集中照顧病情較重的患者。有關工程與其他四個展館的改裝工程類似，即是在短短一個星期內把展館改裝成負壓隔離病房，以應對不斷上升的病房需求。

第五波疫情下，本港醫院病床、社區隔離和治療設施均嚴重短缺。為緩解這個問題，中華人民共和國中央政府協助香港特別行政區政府興建六個臨時社區隔離設施，即青衣社區隔離設施、新田社區隔離設施、洪水橋社區隔離設施、港珠澳大橋香港口岸人工島社區隔離設施、粉嶺社區隔離設施及元朗潭尾社區隔離設施，合共提供約18 000張床位。期間，我們應相關決策局和部門要求，提供機電技術意見，包括通風系統的感染控制等。在患者入住社區隔離設施的同時，我們為該六個隔離設施開展機電操作和維修服務，並制訂應變計劃，以應對各種緊急情況。



▲ 機電署在興建社區隔離設施期間提供專業意見，並迅速為多個社區隔離設施內的機電設備提供操作及維修保養服務，確保設施能即時投入服務。圖為位於青衣的社區隔離設施。

The EMSD provided professional advice during the construction of CIFs and promptly offered O&M services for E&M equipment in the CIFs, to ensure that they would be put into operation immediately. Pictures show the CIF in Tsing Yi.

### CONCERTED EFFORTS IN FIGHTING THE EPIDEMIC

The fifth wave of the Coronavirus Disease 2019 (COVID-19) epidemic brought an exponential surge in confirmed cases in early 2022 and posed unprecedented challenges to Hong Kong's healthcare system and people's lives. Rising to the challenge, our Strategic Business Units (SBUs) spared no effort in helping the Hospital Authority (HA) enhance hospital ward facilities and the Government set up community isolation and treatment facilities to meet urgent needs. We also carried out full steam ahead a wide range of anti-epidemic measures for our clients at their venues, supported the Government's efforts in boosting the vaccination rate and the testing capacity and delivered relief supplies to the community.

One of our tasks was to assist the HA in converting general wards in public hospitals into second-tier negative pressure isolation wards, which involved installing more Mobile Modular High Efficiency Particulate Air Filter Units and ventilating fans to meet the needs of tens of thousands of daily confirmed cases during the peak of the fifth wave. We also helped the HA convert an additional hall at the AsiaWorld-Expo Community Treatment Facility for confirmed patients with mild symptoms, allowing public hospitals to focus on caring for the more severe cases. The work, similar to that for the four other existing halls, was to convert the hall into negative pressure isolation wards within one week to meet the ever-increasing demand.

To alleviate the acute shortage of hospital beds and community isolation and treatment facilities under the fifth wave, the Central Government of the People's Republic of China assisted the Government of the Hong Kong Special Administrative Region in building six temporary Community Isolation Facilities (CIFs), namely the CIFs at Tsing Yi, San Tin, Hung Shui Kiu, Hong Kong Boundary Crossing Facilities Island of the Hong Kong-Zhuhai-Macau Bridge, Fanling and Tam Mei in Yuen Long, providing a total of about 18 000 beds. Meanwhile, we provided E&M technical advice including infection control of the ventilation systems to the relevant bureaux and departments as requested. In parallel with the admission of patients to the CIFs, we commenced the E&M operation and maintenance (O&M) services for the six CIFs and developed contingency plans to tackle various emergencies.



營運基金為所有社區隔離設施提供機電技術意見和維修服務，亦為中央政府援建全港規模最大的竹篙灣社區隔離設施提供適當支援及進行改善工程，例如安裝抽氣扇和空氣淨化機等，以便客戶部門提高工作效率及減低感染風險。

為配合落馬洲河套區社區隔離設施的興建工程，我們進行電源隔離和電源分流工作。同時，我們亦為現有啟德郵輪碼頭改建為社區隔離設施及啟德社區隔離設施興建工程提供支援。第五波疫情下，安老院舍亦飽受衝擊，啟德社區隔離設施正是接收安老院舍無症狀確診院友的暫託中心。營運基金團隊在短短數天內為該設施設置負壓病房，加裝空氣過濾器，並分別設立清潔區和污染區。為讓周圍的居民安心，我們亦為設施排出的廢氣進行紫外線處理，以符合世界衛生組織標準。

為設立更多社區隔離設施，我們協助政府把皇后山邨和荔景邨等公共屋邨部分樓宇改裝為適合作社區隔離的設施。為防止本地確診者進入內地，我們提供技術支援，協助衛生署、運輸署及政府產業署，在港珠澳大橋香港口岸設立臨時檢測站，為香港跨境貨車司機及出境旅客施行快速核酸檢測。



The EMSTF provided E&M technical advice and maintenance services for the CIFs. We also provided specific support at the Penny's Bay CIF, the largest isolation facility constructed with support from the Central Government, and carried out improvement works such as installing ventilating fans and air purifiers for client departments to enhance their work efficiency and mitigate the risk of infection.

We carried out power isolation work and diversion of power supply to facilitate the construction of the Lok Ma Chau Loop CIF. Likewise, we supported the conversion of Kai Tak Cruise Terminal building into CIF and the construction of the Kai Tak CIF, which functioned as a holding centre for asymptomatic confirmed patients from residential care homes for the elderly (RCHes), which were among the communities worst hit in this wave. Our EMSTF team set up negative pressure wards, installed extra air filters, and created separate clean and contaminated zones at the facility within a few days. To put the surrounding communities at ease, we also ensured that exhaust air was treated with ultraviolet (UV) to comply with the standards of the World Health Organisation.

To set up more CIFs in the community, we assisted the Government in converting several blocks of public housing estates including Queen's Hill Estate and Lai King Estate into facilities suitable for community isolation. To prevent the local infected persons from crossing the border, we provided technical support to the Department of Health (DH), the Transport Department, and the Government Property Agency to set up temporary testing stations for cross-boundary goods vehicle drivers and outbound travellers at the Hong Kong-Zhuhai-Macao Bridge (Hong Kong Port) to administer rapid nucleic acid tests.

◀ 啟德郵輪碼頭於2022年2月改建為社區隔離設施。我們為場地的改建工作提供技術支援，包括在場內鋪設電線及安裝床頭電掣、加裝電熱水爐，以及提供新設廁所和淋浴間所需的機電設備。

The Kai Tak Cruise Terminal was converted into a Community Isolation Facility in February 2022. We provided technical support for the venue setup, including laying cables and installing bedside light switches, adding electric water heaters and providing E&M equipment for new toilet and shower cubicles.



## 營運服務 Trading Services

我們一直致力應用科技協助客戶提升效率，並藉此機會在粉嶺馬適路社區隔離設施試用四足機械人。機械人可載重量達20公斤，並可用四肢輕易上落樓梯、斜坡及在其他地形走動，更能偵測及迴避障礙物，把快速抗原測試包及其他日用品等物資送到隔離房間的門外，減輕員工工作量和降低感染風險。四足機械人深受負責管理該設施的香港警務處歡迎。與此同時，我們在各個社區隔離設施亦廣泛應用傳統機械人，負責消毒及運送物資等工作。

在2022年年初，2019冠狀病毒病確診個案宗數遠遠超出公立醫院負壓病房的供應量，因此當局容許輕症患者（例如只有發燒和咳嗽的患者）居家隔離。有見及此，醫管局在第五波高峰期，把超過20家普通科門診診所改為指定診所，專門診斷和治療這些輕症患者，紓緩他們的徵狀。營運基金提供專業意見，以便進行有關改裝工程。

第五波疫情爆發期間，遺體貯存設施的需求激增，前所未見。衛生署領導跨部門工作小組，在富山公眾殮房和葵涌公眾殮房附近設置冷凍櫃，提供臨時遺體貯存設施。由於兩個公眾殮房附近的戶外地點均缺乏供電設施，營運基金就供電事宜與中華電力有限公司聯絡，並協調安裝臨時供電系統和冷凍櫃的工作。我們亦就改裝冷凍櫃的事宜向衛生署提供意見。兩個臨時貯存設施建成後，合共提供逾4 200個遺體存放格。



Committed to helping clients to enhance efficiency with technologies, we took the opportunity to pilot a quadruped robot at the CIF at Ma Sik Road, Fanling. The robot is capable of carrying up to 20 kilograms of weight and navigating stairs, slopes and other terrains effortlessly with its four limbs. Besides, it can detect and avoid obstacles when delivering supplies, like rapid antigen test kits and other daily necessities, to the door of an isolation room, thus reducing staff workload and infection risk. The robot is much welcomed by the Hong Kong Police Force responsible for manning the facility. Besides that, conventional robots for disinfection and delivery were deployed at various CIFs too.

As confirmed cases of COVID-19 far outnumbered the supply of negative pressure wards at public hospitals in early 2022, patients with mild symptoms such as fever and cough were allowed to quarantine at home. To provide diagnostic and treatment services for these patients to ease their symptoms, the HA set up designated clinics by converting more than 20 general out-patient clinics at the peak of the fifth wave. The EMSTF provided professional advice to support the conversion works.

Amid the fifth wave, there was an unprecedentedly great demand for body storage facilities. The DH led an inter-departmental working group to set up refrigerated containers near the Fu Shan Public Mortuary (FSPM) and the Kwai Chung Public Mortuary (KCPM) to provide temporary body storage facilities. As the outdoor locations near the FSPM and the KCPM lacked power supply, the EMSTF contacted the CLP Power Hong Kong Limited for electricity supply and co-ordinated the installation of a temporary power supply system and freezers. We also advised the DH on how to modify the containers. Upon completion, the two temporary facilities provided over 4 200 storage spaces.

◀▼ 第五波疫情期間，遺體貯存設施的需求激增。機電署聯同其他政府部門加快完成富山公眾殮房重置項目第一期工程（左），並協助在富山公眾殮房增設臨時遺體貯存設施（右），提供額外的遺體存放格。

During the fifth wave of the epidemic, there was an enormous demand for body storage facilities. The EMSD worked with other government departments to accelerate the completion of phase one works of the FSPM reprovisioning project (left) and assisted in the installation of temporary body storage facilities (right) at the FSPM to provide additional body storage spaces.



同時，我們協助衛生署和建築署，加快富山公眾殮房重置項目第一期的測試和校驗工作，由原定2022年第三季提前至2022年3月底交付，提早增加約500個遺體存放格。



Meanwhile, we helped the DH and the Architectural Services Department (ArchSD) accelerate the testing and commissioning of phase one of the FSPM reprovisioning project, so that about 500 additional storage spaces were available ahead of the original delivery schedule from the third quarter of 2022 to late March 2022.

◀▼ 為應付第五波疫情下劇增的火化服務需求，我們加快和合石火葬場兩個新火化爐的測試和校驗工作，確保設施可在2022年年初投入服務。

To cope with the sudden surge in demand for cremation services amid the fifth wave of the epidemic, we expedited the testing and commissioning of two new cremators at the Wo Hop Shek Crematorium to ensure that they can commence services in early 2022.



此外，火化服務的需求亦甚為殷切。自2022年年初開始，所有火葬場已全日24小時運作。我們聯同其他政府部門協助建築署，加快和合石火葬場兩個新火化爐的測試和校驗工作，確保設施可在2022年年初（即提早九個月）投入服務，以便家屬盡早領回先人骨灰，辦理後事。

為遏止病毒傳播，政府動員多個部門在爆發或懷疑爆發的屋苑進行「圍封強檢」行動。約200名機電署同事組成團隊，分別在1月23日及26至28日期間到葵涌邨兩幢大廈支援「圍封強檢」行動，逐家逐戶送上膳食。此外，機電署亦積極參與其他屋苑如博康邨和友愛邨等的「圍封強檢」行動。

There was an enormous demand for cremation services too. All cremators have operated on a round-the-clock basis since early 2022. Together with other government departments, we helped the ArchSD expedite the testing and commissioning of two new cremators at the Wo Hop Shek Crematorium to ensure that they can commence service in early 2022 (i.e. nine months in advance) for bereaved families to collect the cremated ashes of their loved ones as early as possible for funeral services.

To arrest the spread of the virus, the Government mobilised multiple departments to carry out "restriction-testing declaration" (RTD) operations in housing estates with confirmed or suspected outbreaks. A team of about 200 EMSD colleagues supported the RTD operations by delivering hot meals to every household at two blocks in Kwai Chung Estate on 23 and 26 to 28 January respectively. Similar RTD operations with the EMSD's active involvement also took place at other housing estates, such as Pok Hong Estate and Yau Oi Estate.

## 營運服務 Trading Services



▲► 為確保官立學校的室內空氣流通，我們檢查及保養學校的空調和通風系統，以保障學生和教職員的健康。圖為我們的技術人員到九龍塘官立小學進行通風評估。

To ensure proper indoor ventilation at government schools, we carried out inspection and maintenance of their air-conditioning and ventilation systems to safeguard the health of students and school staff. Pictures show our technical staff conducting ventilation assessments at Kowloon Tong Government Primary School.

一如過去兩年，營運基金繼續協助客戶在不同場地進行通風評估，包括日後在需要時可能用作全民強制檢測中心的場地。就此，我們為政制及內地事務局超過600個場地及教育局轄下65家官立學校進行評估。此外，我們亦協助衛生防護中心制訂有關學校、幼稚園及幼兒中心等教育場所的預防傳染病指引。

繼2020/21年度為指定檢疫酒店計劃下的酒店進行通風系統評估後，我們在2021/22年度繼續為該計劃下70多家指定檢疫酒店進行評估，以確保酒店符合衛生防護中心的通風要求，防止病毒輸入。因應隔離設施的需求不斷增加，我們亦協助食物及衛生局（時稱）評估58家擬轉為社區隔離設施的酒店。我們的團隊就每所隔離酒店的通風系統改善工程提供技術意見，以確保有關系統安裝妥當和操作正常，符合食物及衛生局和衛生防護中心的通風要求。在市政場地方面，我們為94個街市、250個公廁、260個垃圾收集站及161間郵政局，進行新一輪通風檢查和消毒工作，並按需要加裝空氣淨化機。



◀◀ 疫情期間，機電署職員為指定檢疫酒店計劃下的酒店檢查通風系統，以確保酒店範圍空氣流通，減低病毒傳播的風險。  
During the epidemic, the EMSD staff inspected the ventilation systems of hotels under the Designated Quarantine Hotel Scheme to ensure good ventilation in the hotel areas and reduce the risk of virus transmission.



As in the past two years, the EMSTF continued to help clients conduct ventilation assessments in different venues, including those with the potential to be used as the Compulsory Universal Testing Centres in the future if necessary. In this connection, we evaluated more than 600 venues for the Constitutional and Mainland Affairs Bureau and 65 government schools for the Education Bureau. We also assisted the Centre for Health Protection (CHP) in formulating guidelines on the prevention of communicable diseases in educational settings, such as schools, kindergartens and childcare centres.

Further to our work in 2020/21 to assess ventilation systems in hotels enlisted under the Designated Quarantine Hotel Scheme, we continued to assess more than 70 hotels under the Scheme during 2021/22 to ensure they met the CHP's ventilation requirements for preventing the importation of COVID-19 cases. In view of the increasing demand for isolation facilities, we also assisted the then Food and Health Bureau (FHB) in assessing 58 hotels proposed to be converted into the CIFs. Our teams provided technical advice on the modification works to ensure the proper installation and functioning of the ventilation systems in the CIF hotels to meet the ventilation requirements of the FHB and CHP. As to municipal venues, we carried out a new round of ventilation checks and disinfection covering 94 markets, 250 public toilets, 260 refuse collection points and 161 post offices, adding air purifiers where necessary.

至於出現感染羣組的食肆，我們協助衛生防護中心和食物環境衛生署進行通風調查，檢查食肆的換氣量是否達到衛生防護中心所訂每小時最少六次的要求。當衛生防護中心着手調查爆疫的住宅大廈、指定檢疫酒店和安老院舍的傳播源頭時，我們亦提供類似協助。

事實上，機電署作為專責研究安老院舍和殘疾人士院舍通風問題的跨部門工作小組成員之一，亦積極參與制訂即時和長遠的改善措施。

為向長者、行動不便或有特殊需要人士提供疫苗接種服務，政府在2022年4月推出全港「疫苗到戶接種服務」。營運基金協助公務員事務局為該服務作好準備，包括迅速提交車輛設計方案，物色兩輛合適的中型客貨車，並進行全面檢查、翻新、改裝、清潔和測試，同時設置車內供電系統，確保外展隊有足夠電力應付全日冷藏疫苗及即場打印疫苗紀錄的工作所需。這兩項工作對「疫苗到戶接種服務」能否順利進行極為重要。



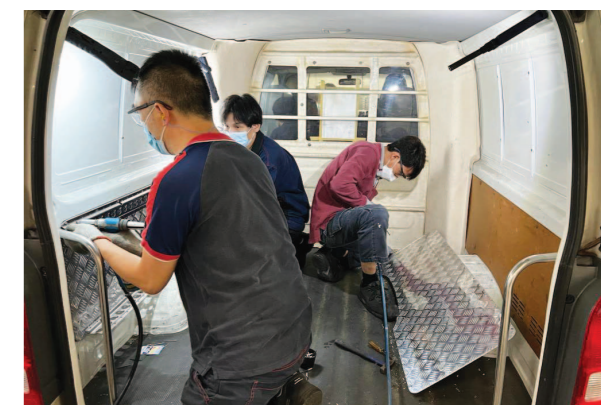
For restaurants with cluster outbreaks, we supported the CHP and the Food and Environmental Hygiene Department in their ventilation investigations by checking whether the restaurants had met the CHP's requirement of having a minimum of six air changes per hour. We also rendered similar support to the CHP for its investigations on the root causes of transmission at various residential blocks, designated quarantine hotels and the RCHes with outbreaks.

Indeed, as a member of the inter-departmental working group looking into ventilation issues at the RCHes and residential care homes for persons with disabilities, the EMSD is heavily involved in the formulation of immediate and longer-term improvement measures.

To provide vaccination to the elderly and persons with impaired mobility or special needs, the Government launched the territory-wide Home Vaccination Service (HVS) in April 2022. To help the Civil Service Bureau prepare for the HVS, the EMSTF promptly put forward the vehicle design proposal, identified two medium vans, carried out comprehensive inspection, refurbishing, modification, cleaning and testing, and set up on-board power supply systems to ensure that the outreach teams will have sufficient power supply for day-long vaccine cooling and on-site printing of vaccination records, both of which are essential to the HVS.

◀◀ 為方便「疫苗到戶接種服務」順利推行，我們迅速把兩輛中型客貨車改裝成為支援接種服務的車輛，並在車廂內設置供電系統和測試其運作。雖然遇上技術困難，我們的團隊在短時間內克服問題，確保供電系統性能穩定，充分展現團隊的專業服務精神。

To facilitate the launch of the Home Vaccination Service, we rapidly refitted two medium vans into supporting vehicles for the service. We also installed on-board power supply systems and tested their operation. Despite encountering technical difficulties, our team overcame the issues within a short time frame and ensured the stability of the power supply systems, demonstrating the professionalism of our team.



## 營運服務 Trading Services

▼機電署總部大樓採用嶄新的非接觸式升降機按鈕技術。該技術運用內置雷射傳感器，發散角度較小，光束較集中，減少干擾附近輸出的其他光束，因此更精準。裝置具備耗電量低的優點，有助延長該設備的使用壽命。A new touchless lift button technology has been adopted at the EMSD Headquarters. The application of built-in laser sensors with a narrow divergence angle can reduce interference with other nearby output beams and achieve better precision. With the advantage of low power consumption, the device's lifespan can be extended.



▲在第五波疫情爆發期間，我們為中央援港的流動核酸檢測車提供緊急維修服務。儘管該檢測車的車型較獨特，並不常見，但我們的團隊仍能迅速找到故障原因，修好車輛，讓車輛盡快恢復正常服務。

During the fifth wave of the epidemic, we provided emergency repair services for the mobile nucleic acid testing vehicle from the Central Government. The model of the testing vehicle was unfamiliar, but our team was able to identify the defect and repair it quickly, so that the vehicle could resume normal services shortly.

為紓緩香港檢測服務供不應求的壓力，中央政府特別派出一輛流動核酸檢測車赴港相助，我們負責提供緊急維修及支援服務。儘管我們從未接觸過有關車輛型號，但團隊憑着豐富經驗，仍能在有需要時迅速完成維修和測試工作，讓流動檢測車得以在短時間內迅速恢復運作，為市民服務。

To ease the pressure on the city's testing services, the Central Government dispatched a mobile nucleic acid testing vehicle to Hong Kong. One of our tasks was to provide emergency repair and support services for the vehicle. Although we had not come across such vehicle model before, our experienced team quickly completed the repair work and testing where necessary, such that it could resume its services for the public within a short period of time.

在第五波疫情爆發的高峰期間，消防處接獲的緊急召喚個案數目急升，因此增派超過100名員工應對激增的需求。我們協助消防處額外租用40台便攜式無線電接收器，確保其無線電通訊系統保持高度可靠。此外，我們為消防處提供專業服務，優化處長指揮室的空調系統。

During the peak of the fifth wave, the Fire Services Department (FSD) saw a rapid rise in emergency calls and deployed over 100 additional staff to cope with the surge in demand. We helped the FSD hire 40 additional portable radio receivers to ensure that its radio communication system continued to be highly reliable. We also provided professional services for the FSD to upscale the air-conditioning systems of its Director's Command Post.

年內，我們各個策略業務單位繼續全力支持客戶抗疫，例如為全港18區的社區疫苗接種中心提供無間斷的機電支援服務，致力確保綜合疫苗冷藏櫃監察系統運作正常，妥善儲存疫苗；在客戶的辦事處和場地應用更多機械人進行清潔、消毒和偵測發燒等工作；試用各類型的非接觸式升降機按鈕，以備日後在所有政府場地適時推出類似設施；為自動梯扶手進行紫外線消毒；為空氣過濾器 and 通風管道進行日常清潔和消毒，以及採購空氣淨化機等。

Throughout the year, our SBUs continued to render their full support to clients in the fight against the virus. Examples included the provision of ongoing E&M support services for the Community Vaccination Centres across 18 districts and efforts in ensuring the normal operation of the integrated Fridge Monitoring System to provide proper vaccine storage. Our work also covered further deployment of robots for cleaning, disinfection and fever screening at client offices and venues, trial of different types of touchless lift buttons for rollout in all government venues as appropriate in the future, UV disinfection for escalator handrails, and sustained efforts to clean and disinfect air filters and air ducts and procure air purifiers.

我們時刻關注公眾需求。在第五波疫情爆發的高峰期間，大量患者在各大醫院急症室外的露天帳篷內等待入院。有見及此，我們迅速為帳篷內的電暖爐提供臨時電源，為患者送暖解困。

Always mindful of the public needs, our team promptly provided temporary power supply for electrical heaters in tents set up outside the Accident and Emergency Departments of major hospitals, bringing warmth and comfort to numerous patients waiting outdoors for admission into the hospitals at the peak of the fifth wave.

作為政府的「創新促成者」，營運基金已成為客戶舉辦線上研討會活動的支援中心，為各部門在提升資訊科技基建和寬頻方面提供技術支援，並協助客戶使用各種視像會議軟件，包括處理軟件使用許可證等事宜。我們總部的互動學習中心和技能發展中心，內設猶如錄播室的資訊科技設施，已成為客戶舉行線上新聞發布會、線上研討會和虛擬活動的熱門場地。

As an Innovation Facilitator for the Government, the EMSTF has become a support hub for clients' webinar activities, providing technical support to enhance their information technology (IT) infrastructure and bandwidth, and facilitating the use of video conferencing software, including handling licensing issues. Indeed, our Interactive Learning Centre and Skill Development Centre at the Headquarters, with their studio-like IT facilities, have become popular venues for clients' online press conferences, webinars and virtual events.

我們竭誠用心服務市民，並會繼續支援政府和客戶部門，協助香港戰勝疫情。

Committed to serving the public with heart, we will continue to support the Government and clients and help Hong Kong emerge from the epidemic.

►年內，我們協助內部及外部客戶舉辦線上研討會，並提供資訊科技支援。在2021年10月舉行的第二屆綠色創科日便是一例。活動中，香港和東莞會場同步直播線上研討會，方便與會者互動交流，分享實現綠色創科的長遠方案。

We hosted webinars and provided information and technology support to both internal and external clients during the year. One of the examples is the second Green I&T Day held in October 2021. During the event, the webinar was broadcast live in Hong Kong and the Dongguan venues, facilitating interactions and sharing of long-term green innovation and technology (I&T) solutions among participants.



▼疫情嚴峻期間，我們在伊利沙伯醫院外臨時搭建的帳篷內安裝暖燈，為在寒冷天氣下等候入院的患者送暖解困。

During the severe epidemic, we installed heater lamps at temporary tents outside the Queen Elizabeth Hospital, bringing warmth and comfort to patients pending admission to the hospital under cold weather.



## 營運服務 Trading Services



### 在疫情下為良好通風把關 Guardians of Good Ventilation amid the Epidemic

因應第五波疫情爆發期間不少食肆出現羣組感染個案，工程師關皓瑜女士(中)帶領團隊，積極檢查有關食肆的通風系統，為客戶部門提供專業意見及支援。

In response to the clusters of infection cases in many restaurants during the outbreak of the fifth wave of the epidemic, Ms Kwan Ho-yu, Lillian (middle), an engineer and her team actively examined the ventilation systems of related restaurants and provided professional advice and support to client departments.

在疫情下，堂食食肆保持良好通風，對於防控感染至關重要。自2019冠狀病毒病疫情爆發以來，本港多間食肆先後出現羣組感染個案，市政工程師關皓瑜女士及督察陳文德先生，一直積極協助政府調查爆發食肆的通風系統，這方面的工作經驗非常豐富。2021年12月底，又一城某中菜館出現羣組感染個案，引發第五波疫情。關女士及她的團隊當時到場檢查食肆的通風系統，並為衛生防護中心和食物環境衛生署提供技術支援。及後，她與團隊也屢次應相關部門的要求，為多家食肆的通風系統進行調查。

關女士表示：「由於每間食肆的通風設計各有不同，而調查工作都很緊急，我們初時遇到不少困難，例如有時找不到鮮風入口的位置。」因此，隊員之間的合作和默契更顯重要。她十分感激同事不辭勞苦，盡力配合，例如督察同事往往需要爬上高處、較接近天花板的位置，拆除積塵的風喉管蓋，團隊才能量度通風系統每小時的換氣量次數。

陳先生是關女士團隊其中一員，自2020年疫情開始爆發以來，已經多次參與通風系統的調查工作，包括量度每小時的換氣量，檢查鮮風量是否足夠，與食肆負責人聯絡，查詢細節，例如食肆內各區的準確面積和布局等。

他說：「我們與食肆負責人一同合作，嘗試重組食客感染病毒的情況。我們在確診患者的座位進行煙霧測試，模擬病毒傳播一刻最可能出現的空氣流動方向，以便衛生防護中心參考。」

此外，關女士和陳先生曾為食肆和安老院舍制訂通風系統指引，供營運者參考。當這些場所按通風調查結果完成所需的改善工程後，也須徵求團隊的意見及由他們再作評估，方可重新開業。

兩人異口同聲表示：「在疫情下，通風問題，特別是對長者來說，可謂生死攸關！為抗疫工作略盡綿力是我們的本份，我們樂意效勞。」

Maintaining good ventilation in dine-in restaurants is crucial for infection prevention and control amid the epidemic. Since the onset of COVID-19, clusters of infection cases have been detected in a number of restaurants in Hong Kong. Ms Kwan Ho-yu, Lillian, an engineer of the Municipal Sector Division and Mr Chan Man-tak, an inspector of the same division, have actively supported the Government's ventilation investigations at restaurants with COVID-19 outbreaks, thus accumulating abundant experience in this area of work. In late December 2021, a cluster of infection cases at a Chinese restaurant in the Festival Walk triggered the fifth wave of the epidemic. Ms Kwan and her team went to the scene to examine the ventilation system of the restaurant and provided technical support to the Centre for Health Protection (CHP) and the Food and Environmental Hygiene Department. She and her team have subsequently been called upon to investigate the ventilation systems at a number of restaurants.

"As each restaurant was different in its ventilation design and the investigation had to be conducted urgently, we encountered numerous difficulties initially, such as being unable to identify the exact location of the fresh air intake," Ms Kwan said. That means teamwork would be more important than ever. She was really grateful for the staunch support rendered by her team members. For example, her inspectorate colleagues usually had to climb up high near the ceiling to remove dust-covered air vent covers for the team to measure air changes per hour (ACH).

Mr Chan, one of Ms Kwan's team members, has participated in numerous investigations of ventilation systems since the epidemic began in 2020. His work included measuring ACH to ascertain if the amount of fresh air was sufficient, and contacting the persons-in-charge of the restaurant for details such as the exact size and configuration of each section of the restaurants.

"Together with the persons-in-charge, we tried to reconstruct the virus transmission scenarios by conducting smoke tests at the seats of the confirmed patients to simulate the most likely airflow patterns during the virus transmission for the CHP's reference," he said.

Ms Kwan and Mr Chan have also helped draw up ventilation guidelines for restaurants and residential care homes for the elderly for operators' reference. When these venues have completed the requisite improvement works based on the ventilation investigation results, input and re-assessment of the team are required prior to their re-opening.

"Ventilation can be a matter of life and death, especially for the elderly, amid the epidemic. It is our duty to join in the fight against the epidemic. We are delighted to be of help," both said in unison.



### 參與圍封強檢行動 關懷與科技並重 Supporting RTD Operations with Heart and Technologies



2022年3月，機電署統籌及帶領「圍封強檢」行動。這些行動必須有通盤計劃和統籌，並需要資訊科技系統支援及物資管理工作的配合。全賴數碼科技部、企業服務部和其他部別以及各政府部門全力支持，通力合作，展現高度的團隊精神，這些聯合行動方能順利完成。

In March 2022, the EMSD co-ordinated and led "restriction-testing declaration" operations, which entailed overall planning and co-ordination, IT system support and logistics management. Thanks to the staunch support and high esprit de corps displayed by our DTD, Corporate Services Division and other divisions, as well as various government departments, these joint operations were carried out smoothly.

2022年年初，營運基金同事紛紛投入本港抗疫工作的重要一環，參與「圍封強檢」行動，共同經歷不少難忘時刻。當時，數碼科技部高級工程師賴震暉先生和陳斯諾先生，以及物料供應分部總物料供應主任吳嘉碧女士，都參與其中。

團隊的首次「圍封強檢」行動，於3月3日至4日在德朗邨德雲樓進行。由於在行動前數天才獲通知，吳女士必須與時間競賽，在極短時間內採購充足物資，包括供同事使用的個人防護裝備、快速抗原測試包，以及派發給目標大廈住戶的中成藥包和罐頭食品。吳女士解釋說：「我們通常備存兩套物資，一套供即將展開的『圍封強檢』行動使用，另一套是備用物資，供下次行動使用。」

賴先生和陳先生憶述在行動中的主要工作：「我們第一天逐戶敲門，通知居民到樓下接受核酸檢測；第二天致電檢測結果呈陽性的居民以作跟進，並查核居民的檢測結果，確保只有持陰性檢測結果的居民方可離開受限區域，以及最終在中午前重開受限區域。」在行動中困難重重，包括數據配對工作的挑戰。由於檢測承辦商只有檢測人士的身份證號碼、手機號碼和參考編號，並未掌握他們屬於哪家住戶等關鍵資料，因此負責同事難以跟進陽性個案。幸好機電署團隊運用豐富的資訊科技專業知識，迅速完成數據配對，使跟進工作得以順利進行。

陳先生說：「儘管行動複雜，並需與多個政府部門不熟悉的人員合作，但同事充分發揮團隊合作精神，順利完成各項艱辛工作，令人鼓舞。」

賴先生補充說：「我們非常感激參與同事的體諒包容，以及居民配合我們的工作。」

數碼科技部總工程師李子傑先生於3月9日至10日的友愛邨「圍封強檢」行動擔任現場副指揮官。他說：「在這次行動中，我們特別提醒檢測承辦商，他們從居民取得的資料並不足，難以跟進陽性個案。」承辦商隨即增加居民必須提供的資料項目，使其後進行的「圍封強檢」行動更具效率。

Early 2022 was memorable for many EMSTF colleagues who participated in the "restriction-testing declaration" (RTD) operations, an important element of Hong Kong's fight against the epidemic. Among the participants were Mr Lai Chun-fai, Alex and Mr Chan Sze-nok, Donald, both senior engineers of the Digitalisation and Technology Division (DTD), and Ms Ng Ka-pik, Cindy, the chief supplies officer of the Supplies Sub-division.

As only a few days' notice was given to the team for its first-ever RTD operation conducted at Tak Ying House in Tak Long Estate on 3 and 4 March, Ms Ng had to race against time to procure adequate supplies within a very short period of time. These included personal protective equipment and rapid antigen test kits for colleagues, as well as Chinese medicine packs and canned food for households in the target building. "We always keep two sets of supplies, one for the immediate RTD operation and the other as stand-by for the next one," Ms Ng explained.

Mr Lai and Mr Chan recalled their key tasks in the operation. "On Day One, we knocked on the door of each household to inform the residents to go downstairs for nucleic acid tests; on Day Two, we called those who tested positive by phone for follow-up, checked whether the residents had already obtained a negative test result before allowing them to leave the restricted area, and re-opened the restricted area by noon finally." Many challenges arose in the operation, one of them was data mapping. The testing contractor only had the identity card, mobile phone and reference numbers of those being tested, but did not have the crucial information such as to which households they belonged, thus making it difficult for the responsible colleagues to follow up on the positive cases. Fortunately, the team was able to draw on the rich information technology (IT) expertise of the EMSD to promptly complete the data mapping, so that follow-up action could be carried out smoothly.

"Given the complex and mammoth operation, and the need to work with unfamiliar staff from different departments, we are glad that working with high team spirit, we got all the difficult tasks done," Mr Chan said.

"We are grateful that our colleagues were so accommodating and that the residents were supportive of our work," Mr Lai added.

Mr Lee Che-kit, the chief engineer of the DTD, led the RTD operation at Yau Oi Estate on 9 and 10 March as the deputy field-commander. "In this operation, we alerted the testing contractor that the information they obtained from the residents was insufficient for following up on the positive cases," he said. The insight prompted the contractor to obtain more information required from the residents, making subsequent RTD operations more efficient.

## 營運服務 Trading Services



### 應對空調系統的挑戰 迅速啟動大型治療中心 Rising to the Air-Conditioning Challenge in Activating Large COVID-19 Treatment Centres Promptly

疫情期間，工程師黃達棠先生帶領團隊，支援改裝亞洲國際博覽館新冠治療中心的通風及空調系統。團隊憑着專業知識及豐富經驗，在極急迫的時間內把相關展館改裝成為負壓病房，順利完成任務。

Amid the epidemic, Mr Wong Tat-tong, Victor, an engineer, led his team to support the re-configuration of the ventilation and air-conditioning system at the Treatment Centre for COVID-19 in the AsiaWorld-Expo. Exerting substantive expertise and experience, the team successfully completed the task of converting related halls into negative pressure wards under a very tight schedule.

在這次疫情中，衛生工程部工程師黃達棠先生全情投入大型治療中心的建設。他在2020年8月開始協助醫院管理局（醫管局）及建築署迅速把亞洲國際博覽館（亞博館）四個展館改裝為具負壓環境的社區治療設施，該設施隨即於同年10月啟用。在2022年年初第五波疫情爆發時，黃先生再次臨危受命，憑藉豐富經驗，在極短時間內把亞博館的場地再改裝成為新冠治療中心，作治療大量確診患者之用。

談到亞博館項目的最大挑戰，黃先生表示來自原有的空調系統。該系統是一套具備貯冰功能的熱蓄能系統，設計原意旨在提高能源效益，但只適用於無需全日24小時運作的場地。由於治療中心日夜不停運作，黃先生的團隊必須改裝系統，以提供全天候空調服務。解決方案是加裝製冷機組，並透過增加空氣處理機組的數目改動空調系統。

當第五波疫情爆發時，黃先生再次協助醫管局改裝另一個展館，以及設置亞博館新冠治療中心，以收治症狀輕微的確診患者，讓公立醫院可集中資源照顧重症病人。他憶述當時的情況：「由於要在非常緊迫的時間內裝設百多套空氣淨化機，我們都一起動手，包括為空氣淨化機剪裁尺寸合適的空氣過濾網等，一直工作到深夜。經過多天連夜趕工，我們終於在限期前完成所有改裝工程。」

亞博館空調系統經改裝後運作良好，為整個治療中心提供負壓環境。然而，黃先生很快發現另一個問題，長者一般對冷空氣較為敏感，經常要求調高溫度，而展館的工作人員則因穿着全套個人防護裝備而喜歡較低的溫度。團隊必須平衡各方的需要，不時微調空調系統。

黃先生精益求精，仍不斷力求改進空調系統。「我們希望研發出一個技術方案，只需簡單按一下按鈕，空調系統即可在熱蓄能系統和全天候運作模式之間快速切換，以應對緊急情況所需。」他表示會繼續努力朝着這個目標邁進。

In this epidemic, Mr Wong Tat-tong, Victor, an engineer of the Health Sector Division, has been dedicated to the establishment of large scale treatment centres. Starting from August 2020, he assisted the Hospital Authority (HA) and Architectural Services Department to swiftly convert four exhibition halls at the AsiaWorld-Expo (AWE) into a community treatment facility with a negative pressure environment, which commenced operation subsequently in October the same year. When the fifth wave of the epidemic broke out in early 2022, Mr Wong was tasked with the urgent work of converting the venue at AWE into a Treatment Centre for COVID-19 for treating a large number of confirmed patients.

Talking about the key challenge in the AWE project, Mr Wong said it was the existing air-conditioning system, which ran on a thermal energy storage system with ice storage features, as it was originally designed to maximise energy efficiency at a venue that did not have to operate 24 hours a day. While the Treatment Centre would operate 24 hours a day, Mr Wong's team had to modify the system to provide round-the-clock air-conditioning. The solution was to add chillers, and re-configure the system by increasing the number of air-handling units.

At the outbreak of the fifth wave of the epidemic, Mr Wong helped the HA again in converting another hall in the AWE and setting up the Treatment Centre for COVID-19 for receiving confirmed patients with mild symptoms, so that public hospitals could focus on taking care of severe cases. "Time was really tight, and more than 100 new air purifiers had to be ready," he recalled the situation then. "We all join the hands-on work, including cutting air filters to the right size for the air purifiers late into the night. After several days of overnight work, all conversion works were eventually completed before the deadline."

The re-configured air-conditioning system worked well and created a negative pressure environment for the entire Treatment Centre, but Mr Wong soon noted another complication. While the elderly, who were sensitive to cold air, often asked to raise the temperature setting, staff working in the halls preferred cooler temperatures as they had full personal protective equipment on. It was important to strike a balance among different needs by fine-tuning the system from time to time.

Striving for excellence, Mr Wong always seeks to improve the air-conditioning system. "We hope to develop a technical solution, which will enable the air-conditioning system to quickly switch between running on a thermal energy storage system and operating on a round-the-clock basis for emergencies, just by tapping a button," Mr Wong indicated he would continue to work towards this goal.



### 科技結合人才 開發疫苗冷藏櫃監察系統 Vaccine Fridge Monitoring System Enabled by Technology and Talent

工程師葉煒堂先生及其團隊積極為社區疫苗接種中心的綜合疫苗冷藏櫃監察系統提供無間斷的電源供應，遙距監察冷藏櫃及疫苗的情況。事實證明，他們致力確保疫苗妥善儲存的工作，卓有成效。

To remotely monitor the medical fridges and vaccines, Mr Yip Wai-tong, Wallace, an engineer, and his team have actively provided uninterrupted power supply for the integrated Fridge Monitoring System at the Community Vaccination Centres. Their effort to safeguard the proper storage of vaccines was proved effective.

2019冠狀病毒疫苗接種計劃（疫苗接種計劃）對本港的抗疫策略至關重要，而營運基金開發的綜合疫苗冷藏櫃監察系統，在疫苗接種計劃中也發揮重要作用。

衛生工程部工程師葉煒堂先生帶領團隊，在2021年初為全港18區所有社區疫苗接種中心（接種中心），設計和安裝綜合疫苗冷藏櫃監察系統。事實證明，該系統可確保2019冠狀病毒疫苗在適當低溫下妥善儲存。

營運基金應衛生防護中心的緊急要求，開發綜合疫苗冷藏櫃監察系統，以配合政府在同年推出疫苗接種計劃。葉先生曾負責把普通病房改裝成二線負壓病房，以及在公立醫院安裝多套「流動組合式」高效能空氣微粒子過濾器。他運用在這些工作所得的經驗，帶領團隊立即展開行動，進行技術開發工作。團隊在考慮實際情況後，決定使用窄頻物聯網技術，監察接種中心存放疫苗的藥用冷藏櫃。換句話說，系統會使用覆蓋率極高的現有流動電話網絡，進行物聯網操作。此外，團隊也積極採納用戶提出的建議或要求（例如每天早上自動編製一份簡明報告等），改進系統的功能。

綜合疫苗冷藏櫃監察系統的設計，旨在監察冷藏櫃的溫度和接種中心的環境溫度和濕度。同時，系統也可偵測接種中心的冷藏櫃、供電系統和其他機電設備是否有故障。所有數據都會透過物聯網技術和傳感器，傳輸到機電署總部的區域數碼監控中心，以及政府總部的區域數碼監控中心儀表板，以便全日24小時進行監察。當系統偵測到異常情況，會即時發送預警短訊，通知負責人員和相關持份者。

葉先生表示：「我們非常認真處理這些預警通知，一定會安排同事親自致電相關負責人員，以確保他們收到預警訊息。」他與同事也曾數次在凌晨時分趕赴中心現場，親自處理供電問題。

葉先生說：「推行綜合疫苗冷藏櫃監察系統的經驗，讓我們深深體會到『技術儲備』和『人才儲備』兩者必須兼備，方能適時推出創新項目。只要你掌握好專業技術，保持積極態度，就有信心迎接挑戰。」

The COVID-19 Vaccination Programme (CVP) is vital to Hong Kong's anti-epidemic strategy and an integrated Fridge Monitoring System (iFMS) developed by the EMSTF also plays a crucial role in the CVP.

Mr Yip Wai-tong, Wallace, an engineer of the Health Sector Division, led a team to design and install the iFMS at all the Community Vaccination Centres (CVCs) in 18 districts across the territory in early 2021. The system was proved successful in ensuring that COVID-19 vaccines are stored safely at proper low temperature.

The iFMS was developed as urgently requested by the Centre for Health Protection to tie in with the Government's plan to launch the CVP in the same year. Leveraging his experience in converting general wards into second-tier negative pressure wards and installing numerous Mobile Modular High Efficiency Particulate Air Filter Units at public hospitals, Mr Yip led his team to spring into action for the development of the system. After considering the actual circumstances, the team decided to use narrow-band Internet of Things (IoT) technology to monitor medical fridges for vaccine storage in the CVCs. In other words, the IoT would operate on existing mobile networks which had a high coverage already. Some suggestions or requests from users, such as auto-generation of a simple report every morning, were promptly accepted to improve the system.

The iFMS is designed to monitor the fridge temperature and the ambient temperature and humidity at the CVC. Meanwhile, it can also detect faults in the fridge, the power supply system and other E&M equipment at the CVCs. Through IoT technology and sensors, all data are transmitted to the Regional Digital Control Centre (RDCC) at the EMSD Headquarters and the RDCC dashboard at the Central Government Offices for round-the-clock monitoring. If any abnormalities are detected, SMS alert messages will be sent to the responsible officers and stakeholders immediately.

"We take these alerts seriously and always arrange colleagues to call the responsible officers in person to ensure that the messages have been got through," Mr Yip said. He and his colleagues have on several occasions rushed to the centres to personally attend to the supply issues on site after midnight.

"One of the insights gained from the iFMS experience is the importance of having both the 'technology reserve' and 'talent reserve' for the timely deployment of innovative projects," Mr Yip said. "With technical expertise and a positive mindset, one will have the confidence to take on challenges."

## 營運服務 Trading Services

### 開展智慧生活之路

2019冠狀病毒病疫情肆虐，各機構及市民紛紛採用創新科技（創科）減低染疫風險，為本港的智慧城市發展帶來新動力。營運基金也善用創科，致力透過各種智慧生活方案，為客戶提供優質服務，範圍涵蓋公共醫療、運輸、市政設施及都市生活的其他層面。

我們的衛生工程團隊在2022年1月獲醫院管理局（醫管局）批出三份為期五年的合約，包括機電、空調及屋宇裝備系統的操作及維修保養服務、醫療儀器的維修保養服務，以及手術室設備的維修保養服務。

此外，衛生工程團隊也在2021年與食物及衛生局（食衛局）（時稱）就興建中的將軍澳中醫醫院簽訂一份為期四年的服務水平協議。服務範圍包括就機電、空調及屋宇裝備裝置提供操作及維修保養技術諮詢服務；就家具及設備和選定醫療儀器的採購事宜提供技術諮詢服務；以及就選定家具及設備提供項目管理服務。這些服務都旨在確保中醫醫院日後能夠順利運作。該醫院預計可在2025年年中起分階段投入服務。



▲ 年內，我們聯同香港生產力促進局合作研發無線護士呼叫系統，讓病人能在病房內離床使用，取代傳統的護士呼叫系統。此外，職員也可透過系統控制台監察護士呼叫裝置的實時狀態及檢測故障，確保系統有效地運作。During the year, the EMSD and the Hong Kong Productivity Council jointly developed a Wireless Nurse Call System, which allows patients' remote use in the wards, replacing the traditional nurse call system. The staff can also monitor the real-time status and detect faults of the nurse call units through the Nurse Call System Controller for effective operation.

### EMBARKING ON THE SMART LIVING JOURNEY

The COVID-19 epidemic has encouraged organisations and the public to use innovation and technology (I&T) to reduce the risk of infection, giving new impetus to the smart city development in Hong Kong. Leveraging I&T, the EMSTF also strived to provide quality services to clients with smart living solutions, covering areas such as public healthcare, transport, municipal facilities and other facets of cosmopolitan living.

In January 2022, our health sector team was awarded three five-year contracts by the Hospital Authority (HA) respectively for the provision of operation and maintenance services for electrical, mechanical, air-conditioning and building services systems; the provision of maintenance services for medical equipment; and the provision of maintenance services for operating theatre equipment.

In 2021, the health sector team also signed a four-year Service Level Agreement with the then Food and Health Bureau (FHB) for the Chinese Medicine Hospital (CMH) under construction in Tseung Kwan O. The scope of works covers the provision of technical advisory services for electrical, mechanical, air-conditioning and building services (EMABS) installations from the operation and maintenance perspectives; technical advisory services for the procurement of furniture and equipment (F&E) items and selected medical equipment; and project management services for selected F&E items. All of these services aim to ensure the smooth operation of the CMH expected to commence service by phases from mid-2025.



▲ 時任行政長官林鄭月娥女士（右三）與時任創新及科技局局長薛永恒先生（左二）在2022年年初就抗疫措施舉行記者會，介紹抗疫科技方案，例如由機電署設計及研發的「流動組合式—高效能空氣微粒子過濾器」，以及室外消毒機械人。Mrs Carrie Lam, the then Chief Executive (3rd right), held a press conference on anti-epidemic measures with Mr Alfred Sit, the then Secretary for Innovation and Technology (2nd left), in early 2022 to introduce anti-epidemic technology solutions, such as the Mobile Modular High Efficiency Particulate Air Filter Units designed and developed by the EMSD, and outdoor disinfection robots.



▲ 我們與香港大學攜手合作，利用人工智能技術優化將軍澳醫院的製冷機系統，有效提升系統在運作過程中的能源效益。

We collaborated with the University of Hong Kong to optimise the chiller system at the Tseung Kwan O Hospital with the adoption of artificial intelligence technology, effectively enhancing the energy efficiency of the system during its operation.



作為一所智慧醫院，中醫醫院會採用多個創科方案，例如送貨機械人等。此外，客戶對機電署研發的智能貨倉也深感興趣。事實證明，智能貨倉可提升機電署總部的倉庫運作效率，也獲頒獎項。智能貨倉極具潛力，日後可支援醫院倉庫的日常運作，提升運作效率。

年內，衛生工程的創科項目進展良好。我們專門為醫院設計的無線護士呼叫系統，不但容易使用，並符合其他有關耗電、訊號和電磁的嚴格要求，而且安裝和測試時也不會對病房運作造成重大影響。同時，我們也正在香港兒童醫院的初生嬰兒深切治療部和新生兒特別護理部，測試經改良的嬰兒標籤追蹤系統，以減少警號誤鳴。經改良的系統配合特別為嬰兒設計的小型腕帶，預計可增強裝置的防誘拐效能，醫院也可把保安人員重新調派到其他重要崗位。另外，我們為衛生署及政府化驗所轄下大部分場地安裝的綜合樓宇管理系統快將竣工。該系統可監控各個場地的機電、空調及屋宇裝備設施，並可運用數據分析技術提升這些設施操作的能源效益。此外，我們已運用人工智能技術優化醫管局部分場地（例如將軍澳醫院等）的製冷機組效能。

As a smart hospital, the CMH will come with many I&T features such as delivery robots. The client is also interested in a Smart Warehouse solution developed by the EMSD, which has been proved successful in enhancing the efficiency of its store operation at the Headquarters and won an award for this. The Smart Warehouse has great potential to support the daily operation of the hospital store and enhance its efficiency in the future.

During the year, I&T projects for the health sector made good progress. A Wireless Nurse Call System was purposely designed for hospitals. The easy-to-use system promises easy deployment and negligible impact to the ward operation during its installation and testing, while fulfilling stringent power, signalling and electromagnetic requirements. The test of an improved Baby Tag Tracking System to reduce false alarms was also underway at the Neonatal Intensive Care Unit and the Special Care Baby Unit of the Hong Kong Children's Hospital. The enhanced system with small wristbands especially designed for babies is expected to bring about better abduction prevention results and enable the redeployment of security guards to other priority areas. In a separate development, the integrated Building Management System (iBMS) for most of the major venues under the Department of Health and the Government Laboratory is near completion. It will monitor the EMABS installations at the venues and improve their operational energy efficiency with data analytics. In addition, artificial intelligence (AI) technology was deployed to optimise chillers in some HA venues such as Tseung Kwan O Hospital.



## 營運服務 Trading Services

我們繼續為食衛局領導的兩個十年醫院發展計劃督導委員會提供專業意見。年內，按上述計劃興建的新公立醫院和社區健康中心工程已進入高峰期，而現有醫院的重建及擴建工程也進行得如火如荼。有見及此，營運基金團隊已加緊為各項工程的機電系統提供專業意見，以確保系統的操作和維修保養可保持水準，以及系統在投入服務後保持高度穩定可靠。

行政長官在2021年《施政報告》中提出北部都會區發展策略，預計本港未來對公共醫療服務的需求會不斷增加，勢將為營運基金帶來新機遇。

《香港智慧城市藍圖2.0》(《藍圖2.0》)所載的六個智慧範疇之一，是「智慧出行」。營運基金一直就「智慧出行」項目，為運輸署及其他客戶提供技術支援，例如營運基金協助運輸署採購新一代停車收費錶系統，全港約9 800個現有以八達通運作的收費錶已於2022年1月更換為新一代停車收費錶，並提供多種新功能，所有收費錶已於安裝當日即時投入服務。

We continued to provide professional advice to the Steering Committee on the two Ten-year Hospital Development Plans (HDPs) led by the then FHB. Under the HDPs, the construction of new public hospitals and community health centres reached a peak, as did the redevelopment and expansion of existing hospitals during the year. In view of the above, the EMSTF team stepped up its efforts in providing professional inputs on their E&M systems, with a view to maintaining the operation and maintenance standards, as well as a high level of serviceability and reliability, upon commissioning.

The Northern Metropolis Development Strategy, introduced in the Chief Executive's 2021 Policy Address, is set to open up new opportunities for the EMSTF as the demand for public healthcare is expected to keep on rising in the future.

One of the six smart areas set out in the Smart City Blueprint for Hong Kong 2.0 (Blueprint 2.0) is Smart Mobility, for which the EMSTF has been providing technical support to the Transport Department (TD) and other clients. A good example is the procurement of New Generation of Parking Meter System for the TD. All 9 800 existing Octopus-card-operated parking meters have been replaced by the new-generation of parking meters in January 2022. The new parking meters support multiple new features and have been launched for public use on the date of installation.



◀ 我們為香港文化博物館增設智能停車場系統，在停車場入口實時顯示可供泊車的車位數目。圖為我們的員工在車位安裝傳感器，以偵測車位是否已被佔用(左下)。

We have installed the Smart Car Park System at the Hong Kong Heritage Museum for real-time display of available parking spaces at the car park entrance. Picture shows our staff installing a sensor at a parking space to detect whether it is occupied (bottom left).



客戶的智能停車場項目也有長足發展，例如民航處總部的智能停車場系統在2021年年中進行升級工程，增設更多先進功能，包括運用數據分析及裝設一個度身設計的網上平台，讓用戶查閱空置泊車位的實時資訊，以便在網上預訂車位。此外，智能停車場系統設有與保安系統相連的車牌辨識系統、經改良的閉路電視監察系統、手機短訊自動廣播系統，以及智能車輛辨別功能，可辨別不同類型的車輛，例如電動車、政府車輛和電單車等，以便作進一步智能管理。

人羣能夠在建築物內隨意行走，暢順流動，對城市生活極為重要。年內，我們提供多項智能方案及優質服務，以促進建築物內人流暢通。舉例而言，由我們團隊研發的兩套方案「智慧升降機巡查機械人」及「智慧升降機人流分析系統」都極具潛力，可廣泛應用於政府及私人建築物。前者可使升降機的運作更平穩順暢，令乘客更感舒適，後者可運用實時數據分析技術，找出人流較少的升降機及升降機大堂，盡量善用升降機的載客量。



◀ 機電工程師李潔珍女士(右)榮獲2021年申訴專員嘉許獎公職人員獎，表揚她勇於承擔，表現卓越。

Ms Lee Kit-chun, Cherry, an electrical and mechanical engineer (right), was awarded the Ombudsman's Award for Officers of Public Organisations in 2021 in recognition of her commitment and outstanding performance.

▲ 2021年年底，我們為立法會換屆選舉提供各項技術支援，例如在超過600個投票站安裝及測試照明、機電和電子設備及發燒偵測系統。

In late 2021, we provided various kinds of technical support to the Legislative Council General Election, including installing and testing the lighting, E&M and electronic equipment and fever screening systems at over 600 polling stations.

我們在升降機和自動梯的服務備受稱許。在兩位榮獲2021年申訴專員嘉許獎公職人員獎的同事中，有一位是負責處理有關西營盤街市自動梯更換工程的公眾諮詢。該位同事因迅速處理查詢而獲得嘉許。

2021年立法會換屆選舉在去年12月19日舉行，過程涉及大量選民、候選人、政黨、團體及其他持份者。我們受選舉事務處委託，除了為選舉提供慣常的機電服務，包括在全港600多個投票及點票站，安裝及測試照明、機電及電子設備和發燒偵測系統外，在選舉日也應用多個創科方案，務求令選舉順利進行。

Smart car parks for clients also saw exciting developments. For instance, the Smart Car Park System at the Civil Aviation Department Headquarters was upgraded in mid-2021 to incorporate more sophisticated features. Among them are the application of data analytics and the provision of a tailor-made web-based portal for users to obtain real-time information on vacant parking spaces for booking online. The Smart Car Park System is also equipped with a licence-plate recognition system linked with the security system, reinforced closed circuit television monitoring system, an automatic SMS broadcasting system and smart classification of car types such as electric vehicles, government vehicles or motorcycles for more intelligent management.

During the year, we also provided smart solutions and quality services for the smooth flow of people in buildings, which is vital to urban life. For example, both our Robotic Lift Examiner and Smart Lift Passenger Flow Analysis solutions have good potential for wide application in government and private buildings. The former facilitates a more comfortable and smooth lift ride, while the latter uses real-time data analytics to identify less congested lifts and lift lobbies to optimise the utilisation of the carrying capacity of lifts.

Our services on lifts and escalators are much appreciated. Among the two colleagues receiving the Ombudsman's Awards 2021 for Officers of Public Organisations, one was recognised for the prompt action in handling public enquiries on escalator replacement projects at the Sai Ying Pun Market.

In the 2021 Legislative Council General Election held on 19 December 2021, lots of voters, candidates, political parties and groups and other stakeholders were involved. We were commissioned by the Registration and Electoral Office to deploy a number of new I&T solutions for the smooth running of the election, in addition to our usual duties to install and test the lighting, E&M and electronic equipment and fever screening systems at over 600 polling-cum-counting stations across the territory.

## 營運服務 Trading Services

由於各投票及點票站的場地布置及相關設備的安裝工作必須在極短時間內完成，我們研發了一套運用物聯網及流動技術的數碼管理系統，實時監察各投票及點票站的安裝工作進度。我們的緊急應變中心也在2021年12月18日至20日期間運作，透過數碼平台監察各個投票站及點票站的工程進度，並在有需要時立即提供支援服務。另外，由於這是香港首次在選舉日使用電子選民登記冊系統派發選票，我們的團隊也加強監察各個政府數據中心的電力系統，確保其雲端網絡運作穩定。

一如我們在前幾年提到，營運基金肩負落實《藍圖2.0》中八個智慧城市項目的重任。部分項目與市民的日常生活息息相關，例如在新界各郊遊熱點及市中心附近進行有關尋找不設收費錶路旁泊車空位的試驗計劃，以便利私家車、旅遊巴士及殘疾人士泊車；推行智慧廁所試驗計劃以改善公共廁所管理；研發智慧捕鼠系統以控制公共街市的鼠患；以及提供行山安全試驗系統，以追蹤急需救援的遠足人士所在位置。這些項目都運用傳感器和物聯網科技，以改善公共服務和生活質素。

展望未來，多個一直由我們提供技術支援或項目管理服務的智慧城市項目，會繼續試行或落實應用。例如運輸署轄下十個現有多層停車場會在2022/23年度推出停車位指引系統、車輛搜尋系統及無票泊車系統，供駕車人士使用。我們也會繼續支援其他「智慧出行」措施，包括透過「香港出行易」流動應用程式，提供綠色專線小巴的實時到站資訊，以及在全港1 300個有蓋巴士站或政府公共運輸交匯處的電子顯示屏分享專營巴士的實時資訊。無論是運輸、醫療、市政及選舉服務或城市生活的其他層面，這些計劃毫無疑問會為市民的智慧城市生活帶來更豐富的體驗。



As the setup time for the polling-cum-counting stations was tight, the EMSTF developed a digital management system, using the Internet of Things (IoT) and mobile technologies to monitor the installation progress in real time. We also operated a special Emergency Response Centre from 18 to 20 December 2021 to monitor the work progress at all polling-cum-counting stations via digital platforms and to provide immediate support services when necessary. As it was the first time that Hong Kong employed an Electronic Poll Register System to distribute ballot papers on the election day, our team stepped up the monitoring of government data centres' power system to ensure the stable operation of their cloud networks.

As reported in the previous years, the EMSTF has taken on eight Smart City projects from the Blueprint 2.0, some of which are closely related to the daily lives of members of the public. These include the trial scheme for checking vacant non-metered on-street parking spaces near outing hotspots and town centres in the New Territories to facilitate parking for private cars, coaches and the disabled; the Smart Toilet Pilot Programme for better management of public toilets, the Smart Mouse Trap System for rodent control in public markets and the trial Hiker Safety System to track the location of distressed hikers in remote areas. A common thread in these projects is the utilisation of sensors and IoT technologies to improve public services and quality of life.

Looking ahead, many Smart City projects for which we have been providing technical support or project management services will continue to be trialled or deployed for use. For example, the Bay Guidance System, Car Searching System and Ticketless Parking System will be launched for motorists in ten existing multi-storey car parks under the TD in 2022/23. We will also continue to support other Smart Mobility initiatives, such as the provision of real-time green minibus arrival information via the app HKeMobility, and the sharing of real-time information of franchised bus on the display panels in 1 300 covered bus stops or government public transport interchanges. No matter in transport, healthcare, municipal and electoral services or other aspects of the city life, programmes like these will undoubtedly enrich our smart living experiences.



◀ 我們在2021年10月為民眾安全服務隊野外定向比賽提供行山安全系統。該系統利用定位技術及「政府物聯網」追蹤參賽者位置，而他們也可透過智能手錶在緊急情況下發送SOS求救訊號。

In October 2021, we provided a Hiker Safety System for the Orienteering Competition held by the Civil Aid Service. Utilising global positioning technology and the Government-Wide IoT Network, the system can track the locations of participants and allow them to send out SOS signals with their smart watches in case of emergency.



### 善用數碼工具支援立法會選舉 Leveraging Digital Tools to Support the LegCo Election

高級工程師袁偉業先生帶領團隊成員在2021年立法會換屆選舉中應用嶄新的創新科技工具，提升工作效率和成效。縱然他們面對重重壓力，仍竭盡所能，準時完成所有任務，讓選舉順利舉行。Mr Yuen Wai-yip, Lobee, a senior engineer, led his team members to deploy new innovation and technology tools in the 2021 LegCo General Election to enhance work efficiency and effectiveness. Despite the immense pressure, they devoted their best efforts and completed all the tasks on time, contributing to the smooth running of the election.

營運基金一直為立法會選舉提供機電支援，例如為投票站提供電力及照明等，在2021年12月19日舉行的新一屆立法會換屆選舉也不例外。綜合工程部高級工程師袁偉業先生帶領團隊為選舉事務處提供相關支援，並為香港的選舉開啟嶄新的數碼時代。

2021年立法會換屆選舉的籌備工作，在2019年區議會選舉後隨即展開。今次立法會選舉創出多個「第一次」，包括首次利用電子選民登記冊系統在693個投票站派發選票；當中620個投票站在晚上11時轉為點票站後，更首次運用視像錄影系統監察點票過程。在12月18日至20日期間，我們在機電署總部設立緊急應變中心，應用由綜合工程部開發的儀表板，為選舉進行全日24小時監察工作。

該儀表板對監察承辦商在選舉前期的各項準備工作特別有效。由於各承辦商必須透過流動裝置報告所負責工程的進度，儀表板上顯示全港各投票站情況的互動地圖資訊會持續更新，讓袁先生及其團隊可實時檢視各投票站的工程進度。此外，團隊也可利用這個系統隨時檢索承辦商的職責和聯絡資料，以便馬上跟進。由於投票站和承辦商數量龐大，在過往單靠承辦商逐一致電報告進度的時代，難以進行適時且有效的全面監督。

袁先生表示，團隊面對的挑戰莫如需要在極短時間內安裝視像錄影系統，監察點票過程。他說：「由於投票站在晚上10時半才關閉，但點票和視像錄影需要能夠在11時正開始，我們只有30分鐘時間安裝錄影系統。」

袁先生認為，團隊的成功全賴同事於過往選舉累積豐富的工作經驗，管理層又大力支持，而且機電署不同部別超過1 600位同事在選舉當日亦提供各種協助。他說：「選舉事務處對儀表板的印象良好。我們會繼續優化系統，並計劃在2023年的區議會選舉和2025年下一屆立法會選舉中，再次運用儀表板和其他創新科技工具。」

The EMSTF has always provided E&M support to Legislative Council (LegCo) elections, for example, through the provision of electricity and lighting at polling stations. The latest LegCo General Election held on 19 December 2021 was no exception. Mr Yuen Wai-yip, Lobee, a senior engineer of the General Engineering Services Division (GESD), led his team to provide relevant support to the Registration and Electoral Office (REO) and opened up a new digital era for holding elections in Hong Kong.

Preparations for the 2021 LegCo General Election began soon after the District Council election in 2019. The efforts were translated into several "firsts" in this LegCo election, including the first-ever use of an Electronic Poll Register System to issue ballot papers at 693 polling stations and the adoption of a video recording system to monitor the counting process from 11:00 p.m., when 620 polling stations were converted to counting stations. We also rolled out a GESD-developed dashboard at the Emergency Response Centre in our headquarters for round-the-clock monitoring for the election from 18 to 20 December.

The dashboard was particularly effective in monitoring the works of contractors in the run-up to the election day. As each contractor was required to report the progress of their designated tasks via mobile devices, the dashboard was continually updated, giving Mr Yuen and his team access to a real-time overview of the progress of works at all polling stations as displayed on an interactive map of Hong Kong. The system also enabled them to readily retrieve the information of the responsibilities of contractors and their contact details for prompt follow-up. Given the large number of polling stations and contractors, this timely and efficient oversight was not possible in the past when progress updates solely relied on telephone calls.

Speaking of the challenges which the team faced, Mr Yuen cited the short period of time allowed to set up the video recording system for monitoring the counting process. "As the polling stations closed at 10:30 p.m., we only had 30 minutes to set up the device, so that video recording could begin at 11:00 p.m. sharp when the counting process commenced," he said.

Mr Yuen attributed the team's success to its rich work experience accumulated from previous elections and strong support from the senior management, as well as over 1 600 colleagues from various divisions of the EMSD who rendered assistance on the election day. "The REO was most impressed with the dashboard, which we plan to deploy with other innovation and technology tools in the District Council election in 2023 and the next LegCo election in 2025 after further refinement," he said.

## 營運服務 Trading Services

### 持續支援基建發展

儘管受2019冠狀病毒病疫情影響，香港在2021/22年度繼續奮力推動公共基建發展。營運基金為客戶多個基建項目提供意見和支援，以及機電維修保養服務。我們的服務涵蓋多個範疇，包括道路與航空交通、邊境管制口岸、公共建築物和設施等。我們也參與多項碳中和計劃，包括協助客戶場地節省能源，以及就保障本港的重要基建進行工程，以免基建受惡劣天氣破壞。

年內的亮點之一，是為運輸署完成中環至半山自動扶梯系統的更新工程。更新工程歷時四年，分階段更換全部共19條自動扶梯及自動人行道，最後一期工程預計於2022年4月竣工。中區至半山行人自動扶梯系統是全世界最長的戶外有蓋自動梯系統，既是獨特的行人運輸工具，也是旅遊景點。自動扶梯及自動人行道更新後，具備最新的節能功能及其他環保設計，令自動扶梯系統煥然一新。



◀ 中環至半山自動扶梯系統的更新工程會在2022年4月完成。鑑於自動扶梯每日的客流量高，更新工程在四年內分階段進行，以盡量減低對市民日常生活的影響。The refurbishment of the Central to Mid-Levels Escalator and Walkway System will be completed in April 2022. Considering the high daily patronage of the escalators, the refurbishment work was carried out in phases over four years in order to minimise its impact on the daily lives of the public.

支援道路基建是我們的工作之一，包括為運輸署定期更換隧道/管制區的交通管制及監察系統。我們於2021年協助運輸署為東區海底隧道及青馬管制區的交通管制及監察系統更換工程進行合約招標；亦參與聘請顧問，以支援香港仔隧道、大老山隧道及獅子山隧道的實地勘察、交通、土木工程及結構工程。

提升基建設施的表現也是我們的工作，例如協助路政署解決中環及灣仔繞道若干隧道路段的火警偵測系統在夏天經常預警誤鳴的問題。我們迅速為客戶重新校準隧道內的線式熱感應控制器，使控制器的設定與環境溫度更為一致，然後進行監察和測試。作出調校後，未有再收到預警誤鳴的報告。

### MAINTAINING MOMENTUM ON INFRASTRUCTURAL SUPPORT

Despite the COVID-19 disruptions, Hong Kong continued to forge ahead with its public infrastructure development programmes in 2021/22, and the EMSTF provided project advice and support as well as E&M maintenance services to clients for numerous infrastructures. Our work covers diverse areas, including road and air transport, boundary control points, and public buildings and facilities. We also play a role in carbon neutrality programmes, including helping client venues save energy, and carrying out works to safeguard the city's critical infrastructures against potential damage brought by adverse weather.

A highlight of the year was the completion of the Central to Mid-Levels Escalator and Walkway System refurbishment project for the Transport Department (TD). The four-year refurbishment project comprised replacement of all 19 escalators and travellers in phases, with the final phase of works planned to be completed in April 2022. Equipped with the latest energy-saving functions and other eco-friendly features, the new escalators and walkways will reinvigorate the unique pedestrian commuter system, which is also the world's longest covered outdoor escalator and a tourist attraction.

Road infrastructural support is another aspect of our work. This includes regular replacement of the Traffic Control and Surveillance Systems (TCSSs) at various tunnels/control areas for the TD. We assisted the client in the contract tendering process for the TCSS replacement projects at Eastern Harbour Crossing and Tsing Ma Control Area during 2021. We also engaged consultants for support in on-site investigation, traffic, civil and structural engineering work at Aberdeen Tunnel, Tate's Cairn Tunnel and Lion Rock Tunnel.

Enhancing the performance of infrastructure facilities is part of our work too. To cite an example, we supported the Highways Department to eliminate frequent false pre-alarms triggered in the fire detection system during summer in certain tunnel sections of the Central-Wan Chai Bypass. We promptly re-calibrated the linear heat detection controller of the tunnel to better align the controller setting with the ambient temperature, and conducted subsequent monitoring and testing. Since then, no false pre-alarms have been reported again.

作為政府的「創新促成者」，我們運用多個創新科技（創科）方案，提升道路和隧道的運作效率，例如在將軍澳隧道試行一套交通分析方案。該方案使用人工智能影像分析演算法，使車輛分類和計算車輛數目高度準確。

另一創科項目於2022年在中環及灣仔繞道進行，我們提供和安裝專為項目設計的物聯網解決方案，利用軟件和硬件配合操作，自動記錄數據、分析隧道風扇的溫度和震動參數。系統配備強力的視像化工具，可於儀表板上顯示各種趨勢和分析概覽，並具有便捷的自動製作報告功能，有助提升隧道運作效率。

多項航空運輸設施也受惠於創科應用。我們在2022年2月為香港海關完成智能運輸機械人試驗計劃。當海關關員在香港國際機場空郵中心辦理貨物清關時，可運用智能機械人抬起及運送重物，盡量減少人手輔助。智能運輸機械人使用光學雷達物體偵測技術和超聲波傳感器，具備「尾隨」功能，能自動跟着前方的人員行走並避開障礙物。

香港國際機場第三條跑道（三跑）現正施工。為支援三跑系統日後的運作，我們協助消防處採購了一系列全新的飛機救援及滅火車，並於2022年年初，派員支援消防處，前往奧地利進行車輛實地測試及驗收工作。



▲ 我們為康城站新公共運輸交匯處各種機電設施，例如照明系統和通風設備等，提供維修保養服務，確保候車市民更感舒適愉快。We provided maintenance services for various E&M facilities at the new Public Transport Interchange at LOHAS Park Station, such as the lighting system and ventilation equipment, to ensure a pleasant environment for members of the public queuing up there.

Taking on our role as the Government's Innovation Facilitator, we deploy innovation and technology (I&T) solutions to optimise the efficient use of roads and tunnels. For instance, we made preparation for the trial of a traffic analytics solution in the Tseung Kwan O Tunnel. The solution uses Artificial Intelligence (AI) Video Analytic Algorithm to enable highly accurate vehicle classification and counting.

In another I&T project conducted at the Central-Wan Chai Bypass in 2022, we supplied and installed a tailor-made Internet of Things solution comprising software and devices that work together to automate data logging and analysis of temperature and vibration parameters of tunnel ventilation fans. With powerful visualisation tools which enable trends and profiles to be displayed on a dashboard, as well as time-saving automated report generation function, the solution helps improve tunnel operation efficiency.

I&T applications benefit numerous air transport facilities too. We have completed a trial project on the Smart Porter for the Customs and Excise Department in February 2022. The robot can lift and convey heavy objects with minimum human assistance during cargo customs clearance in the Air Mail Centre at the Hong Kong International Airport (HKIA). Using Light Detection And Ranging (LiDAR) technology and ultrasound sensors, the Smart Porter has a "follow me" feature that enables it to follow a walking officer and automatically avoid obstacles.

To support the future operation of the Three-runway System currently under construction at HKIA, we helped the Fire Services Department (FSD) procure a new fleet of Aircraft Rescue and Firefighting vehicles and supported FSD in on-site testing and acceptance of the vehicles in Austria in early 2022.

▼ 香港海關委託機電署為香港國際機場的空郵中心引入智能運輸機械人。該機械人可在貨物清關時協助抬起及運送重物，並具備「尾隨」功能，能自動跟隨職員行走。

The Customs and Excise Department entrusted the EMSD to introduce a Smart Porter, which can help lift and convey heavy objects during cargo customs clearance at the Air Mail Centre of the Hong Kong International Airport. Equipped with a "follow-me" feature, the Porter can also follow a walking officer automatically.



## 營運服務 Trading Services

▼機電署計劃在2022年稍後時間向業界發出《建築信息模擬—資產管理標準及指引》第三版，以推廣「建築信息模擬—資產管理」系統的應用。

The EMSD planned to issue the Building Information Modelling for Asset Management (BIM-AM) Standards and Guidelines Version 3.0 to the trade later in 2022, so as to promote the application of the BIM-AM system.



▲機電署積極支援西九龍總區最高指揮中心進行系統提升工程，該工程為期15個月。工程竣工後，警務處的指揮和運作效能大大提升。經提升效能的指揮中心於2021年11月舉行啟用典禮。

The EMSD actively supported the Kowloon West Regional Higher Command in its 15-month system renovation project. Upon its completion, the command capability and operational efficiency of the HKPF have been greatly enhanced. The opening ceremony of the renovated Higher Command was held in November 2021.

近年，營運基金積極推動客戶在其設施的機電維修保養方面，廣泛應用「建築信息模擬—資產管理」技術。在2021/22年度，我們為民航處總部天線場完成資產資料數碼化的工程，並採用「建築信息模擬—資產管理」精簡版來構建資產信息模型。我們會繼續與民航處探討將「建築信息模擬—資產管理」系統及資產數碼化擴展至其總部。

EMSTF has spearheaded the wider use of Building Information Modelling-Asset Management (BIM-AM) technology in E&M maintenance at client facilities for several years. During 2021/22, we completed the digitalisation of asset information for the antenna farm building of the Civil Aviation Department (CAD) Headquarters, using BIM-AM Lite, which is a simpler version of BIM, to construct asset information models. We will continue to explore with the CAD to extend the BIM-AM system and asset digitalisation to its Headquarters.

政府建築物及其設施既是本港的城市基建，也是政府賴以提供各項公共服務不可或缺的基礎。我們支援紀律部隊，近月為香港警務處（警務處）完成了兩大項目，其一為西九龍總區最高指揮中心的提升工程。該工程歷時15個月，涉及重整指揮中心的設計、提升數碼網絡基礎設施、整合多媒體管理能力，以及為指揮中心的防衛系統提供一站式控制平台方案。

Government buildings and their facilities are part of the city's infrastructure, without which the provision of many public services would not be possible. In support of our disciplined forces, we completed two large projects for the Hong Kong Police Force (HKPF) in recent months. One of the projects was the renovation of the Kowloon West Regional Higher Command. The 15-month project covered restructuring the layout of the regional headquarters, upgrading its digital network infrastructure, integrating multimedia management capabilities and providing a one-stop control platform solution for the defence system of the building.

另一個項目是為警務處採購一批高性能電單車，這些電單車已於2021年10月正式投入服務。新電單車比舊型號的更高效能，更安全可靠，而且設有可調校新型風擋，加速更穩定。新型號電單車亦十分環保，引擎排放標準更高於環境保護署的規定。

The other project was the procurement of a fleet of high-performance motorcycles for the HKPF. The new motorcycles, which commenced service in October 2021, are more efficient, more reliable and safer than the old models, with stable acceleration and new adjustable windscreens. Came with a higher engine emission standard than that required by the Environmental Protection Department, they are also more eco-friendly.

此外，我們也在極短的時間內為警務處完成了多項迫切的工程，包括為新成立的國家安全處設立有關辦事處及最高指揮中心，該等設施務必在2021年7月1日前投入服務。至於警務處為期三年的保安提升計劃也取得良好進展，並將於2022/23年度完成。我們的工作是為警務處轄下多個場地進行加強保安工程和其他改善措施，包括優化升降機工程及節能計劃等。

Furthermore, we completed numerous urgent works for the HKPF within a very tight time frame, including setting up the offices and a Higher Command Centre for the newly established National Security Department, which had to be ready for operation by 1 July 2021. We also made good progress for the HKPF's three-year Security Enhancement Programme, which is to be completed in 2022/23. Our role is to implement security enhancements and other improvement measures at Police venues, including lift modernisation works and energy-saving programmes.



▲警務處委託機電署統籌新型電單車的採購工作。與舊型號相比，新型電單車的效能更高，更安全可靠。The EMSD was entrusted by the HKPF to co-ordinate the procurement of new model of motorcycles. Comparing with the old model, the new motorcycles are more efficient, more reliable and safer.



▲警務處處長蕭澤頤先生（左）感謝我們為警隊提供高性能的電單車。Mr Siu Chak-ye, Raymond (left), Commissioner of Police, thanked the EMSD for providing high-performance motorcycles to the Force.



◀▲年內，我們接管兩個新紀律部隊宿舍機電設施的維修保養工作。該兩個宿舍即消防處百勝角已婚人員宿舍及粉嶺芬園已婚初級警務人員宿舍。

During the year, we took over the maintenance services for the E&M facilities at two new disciplined services quarters, namely the Fire Services Department Pak Shing Kok Married Quarters and Junior Police Officers Married Quarters at Fan Garden, Fanling.

我們於2021/22年度順利承接了兩個新建紀律部隊宿舍的機電維修保養服務，涉及約1 800個居住單位及相關公用地方。我們已計劃於未來五個財政年度，承接另外五個新建紀律部隊宿舍的機電服務，涉及共約1 400個居住單位。

We smoothly took up the E&M maintenance services of two new disciplined services quarters, which comprise a total of about 1 800 flats with associated communal areas, in 2021/22. We have already scheduled to take up five more new disciplined forces quarters with about 1 400 flats in the coming five fiscal years.

## 營運服務 Trading Services

我們也為警務處承辦創新項目，例如安裝測速器，用以測量被鎖押的電動滑板車和其他電動可移動工具的潛在速度，以檢控違法使用者。該測速器也稱為「電動可移動工具『機•警』速度測試儀」，以自動機械裝置配合機械臂模擬測試人員的四肢，控制電動可移動工具的加速、減速及剎車動作，取代人手測試。由於無需耗費人力資源進行路面測試，因此可降低測速工作的成本並節省時間，也更安全和更高效。

過去一年，我們為政府建築物進行的工作獲得多個本港、區域及國際獎項。舉例一個名為「善用創新科技邁向淨零2050—金鐘道政府合署」的綠色項目，在建築物的水冷式製冷機組採用新一代環保雪種R-514A，把能源消耗量減少約33%。該項目榮獲美國採暖、製冷與空調工程師學會(ASHRAE)香港分會，頒發本地商業建築及現有建築校驗組別2021年科技大獎，並獲得ASHRAE第十三區區域級別大賽亞軍；及後再下一城，於ASHRAE學會級別大賽商業建築及現有建築校驗組別獲得特別嘉許，贏得國際級讚譽。

此外，西九龍政府合署獲得英國特許屋宇裝備工程師學會香港分會頒授2021年度項目大獎(公用建築)。由於我們負責大樓的營運及維修，因此機電署與建築署共同獲得這項殊榮。這幢新建成的大樓採用多項可持續設計元素和嶄新創科技術(例如建築語義人工智能技術)，能源效益表現優異，因而獲得嘉許。

We also undertook innovative projects for the HKPF, for example the installation of a speed tester to help determine the potential speed of impounded electric scooters and a variety of other electric mobility devices (EMD). The testing of EMD is required for prosecution for illegal use of EMD. Namely the Electric Mobility Device Smart Speed Tester, the speed tester is an automatic mechanical installation using robotic arms to simulate a person's limbs in controlling the acceleration, deceleration and braking movements of an EMD, thus substituting manual testing of the EMD's speed. No longer necessary to commit resources to manual testing, using the speed tester reduces costs, saves time and improves safety and efficiency.

Our work for government buildings has won local, regional and global awards over the past year. A good example is a green project namely "Advancing Net Zero 2050 with Innovative Technologies – Queensway Government Offices", which deployed new-generation environment-friendly refrigerant R-514A for the building's water-cooled chillers, saving about 33% of energy consumption. The project won the ASHRAE Hong Kong Chapter Technology Award 2021 on a local level under the Commercial Buildings-Existing Building Commissioning (EBCx) category. It also won second place in the same Technology Award at regional level in ASHRAE Region XIII, while earning an Honourable Mention under the Commercial Buildings-EBCx category of the ASHRAE Technology Award – Society Level, which is a global recognition.

Furthermore, the West Kowloon Government Offices won the CIBSE (Chartered Institution of Building Services Engineers) Hong Kong Awards 2021 – Project of the Year Award – Public Use Buildings. As the operation and maintenance agent for the building, the EMSD received the award jointly with the Architectural Services Department. The new building was recognised for achieving outstanding energy-efficiency performance through the adoption of various sustainable design features and cutting-edge I&T, such as building semantic AI technology.

香港致力於2050年前實現碳中和。為實現此目標，政府成立了氣候變化及碳中和督導委員會，成員包括來自不同政府部門的代表。機電署作為成員之一，成立了小組專門負責協調督導委員會的工作，例如為客戶重要基建的機電裝置抵禦氣候變化的能力進行檢討，以及實施各種應對改善工程，使設施能承受更頻密來襲的超級颱風及其他氣候變化現象。我們還為客戶提供有關重要基建應急和更換計劃的技術意見。

事實上，營運基金一直透過能源審核與碳審計，為客戶場地落實各種能源管理機會，協助客戶減少碳排放。例如，在2022/23年年度末，我們會完成為期三年的審計項目，即為約250幢政府建築物進行能源審核和落實能源管理機會。這是實踐政府於2019年提出的「綠色能源目標」措施之一，目標是以2018/19年度為基準，並在2020/21至2024/25年度期間，跟基準年相若的運作情況下，把能源表現提高6%。

減緩氣候變化和減碳工作並不限於建築物，還涉及營運基金多方面的工作，例如車輛服務。為協助上述督導委員會落實政府政策，在本港推廣使用電動車，我們不斷尋找最節省能源、二氧化碳排放量為零或極低的電動車型號。年內，我們為客戶採購了69輛小型電動車和10輛大型電動轎車，並提供電動車所需的維修保養服務和專業支援。

展望未來，減碳是充滿機遇的重點工作。我們期望能探索新方法，協助客戶和政府應對氣候變化。

Hong Kong aims to achieve carbon neutrality by 2050. Government efforts towards this goal include setting up a Steering Committee on Climate Change and Carbon Neutrality, with representatives from different government departments. As a member, the EMSD has set up a team to co-ordinate our work for the Steering Committee, such as reviewing and implementing measures to enhance the resilience of E&M installations in clients' critical infrastructure (CI) vulnerable to the impact of climate change, including more frequent super typhoons. We also provide technical advice for clients' CI emergency and replacement plans.

Indeed, EMSTF has long been helping clients to decarbonise by conducting energy audits and carbon audits and by implementing measures to realise various energy management opportunities (EMOs) at their venues. By the end of 2022/23, for example, we will have completed a three-year programme to carry out audits and implement measures to realise EMOs for about 250 government buildings. It is part of the Government's effort to meet the "Green Energy Target" promulgated in 2019 to improve its energy performance by 6% from 2020/21 to 2024/25, under comparable operating conditions in 2018/19 as the baseline.

Climate change mitigation and decarbonisation work are not limited to buildings, but also involve many aspects of the EMSTF services, such as services related to vehicles. To assist the Steering Committee in its support for the Government's policy to promote the use of electric vehicles (EVs) in Hong Kong, we are always on the lookout for the most fuel-efficient EV models with zero or low carbon emissions. During the year, we procured for clients 69 small EVs and 10 large EV saloons and also provided the necessary EV maintenance services and professional support.

Looking ahead, decarbonation is an exciting area of work, and we look forward to exploring new ways to help clients and the Government combat climate change.

▶▶ 我們一直協助客戶部門搜羅及採購新款車輛，並提供專業的技術支援服務。(左)零碳排放的新電動車有助改善路邊空氣質素。(右)低地台垃圾收集車方便司機上落車，減輕勞損風險，該車輛加大的擋風玻璃也可擴闊司機視野，加強駕駛安全。

We have been assisting client departments in sourcing and procuring new vehicles and providing professional technical support services. (Left) The new electric vehicle with zero carbon emission can improve roadside air quality. (Right) The low-entry driver cab type refuse collection vehicle allows drivers to get on and off the vehicle easily, reducing the risk of strain injury. Its enlarged windshield also provides the driver with a wider vision for better driving safety.



▲ 機電署、香港綠色建築議會和冷水機組設備供應商憑藉金鐘道政府合署冷水機組更換項目參與美國採暖、製冷與空調工程師學會2021年科技大獎，榮獲香港分會冠軍及區域級別(包括九個亞洲國家/地區)亞軍，以及獲學會級別(全球性)的特別嘉許。金鐘道政府合署是首幢政府大樓採用全球暖化潛能較低的雪種，此項舉措可大幅減少溫室氣體排放及節省耗電量。

The EMSD, the Hong Kong Green Building Council, and the supplier of chiller equipment were awarded the ASHRAE Technology Award 2021, including Hong Kong Chapter – First Place Winner and Regional Level (involve nine Asian countries/regions) – Second Place Winner; and Society Level (global) – Honourable Mention, for the Queensway Government Offices (QGO) chillers replacement project. The QGO was the first government building to use a refrigerant with low global warming potential, which can greatly reduce greenhouse gas emissions and energy consumption.

## 營運服務 Trading Services



### 翻新世界級自動扶梯 以民為本休戚與共 Refurbishing World-class Escalator with a Big Heart

在更新工程期間，工程師何振滔先生致力與市民大眾保持良好溝通。他耐心解答市民查詢，嚴謹監察及跟進工程進度，務求盡量減低工程對市民日常生活造成的影響。

During the refurbishment works, Mr Ho Chun-to, James, an engineer, was committed to maintaining good communication with members of the public. He handled public enquiries with patience and closely monitored and followed up on the works progress, with a view to minimising the impact on the daily lives of the public.

中環至半山自動扶梯系統（扶梯系統）全長800米，是全球最長的戶外有蓋自動梯。在2018年，扶梯系統進行更新工程。由於當時扶梯系統的全數19條自動扶梯和自動行人道均已超過其使用年期，故必須全部更換。更新工程為期四年，分11個階段進行，預期於2022年4月竣工，屆時扶梯系統會全面重新開放予公眾使用。

邊境及運輸工程部工程師何振滔先生於2020年1月加入負責扶梯系統更新工程的團隊，其時工程已進行了兩年。何先生與團隊就進行工程，積極與是次項目的客戶部門運輸署，以及民政事務總署、香港警務處等其他政府部門協調，以應對各種挑戰。例如工程團體須確保工程不會影響扶梯系統現有上蓋。此外，由於扶梯系統沿途的街道相當狹窄，團隊既要安排貨車吊機進行吊運工作，又要盡量避免阻礙交通和行人，增加了工程的難度。另外，項目還需要獲得區內社羣的支持，包括有不同文化背景各類居民與商戶等。

為使項目能順利進行，團隊每天在相關路段封路一小時進行更換工程，務求減輕交通方面的影響。有一次，有病重長者乘車前往求醫因封路不能通過，另一次有車輛載着情況危急的寵物經過相關路段時受阻。基於市民的緊急需求，團隊兩次都立即重開路段放行。此外，在2021年年初，渠務署臨時要求緊急進入封路路段的一個沙井，採集地下水樣本，以進行新冠病毒檢測，工程人員亦即時配合，安排讓該署人員進入。何先生表示：「從這些例子可見項目團隊靈活應變，面對各種特殊情況善於適應變通，以關愛精神照顧市民和社區所需。」

由於團隊規劃周詳，而且辛勤工作，因臨時開路而損失的時間，並未使工程有重大延誤。何先生更表示透過這個項目累積了不少處理公眾查詢和投訴的經驗，處事變得更有耐性，應付未來類似的挑戰游刃有餘。回顧落實項目的過程，他非常感謝團隊的支持和社區的包容。

The 800-metre Central to Mid-Levels Escalator and Walkway System (the System) is the longest covered outdoor escalator in the world. In 2018, the System underwent refurbishment works. As the service life of all the 19 escalators and walkways of the System had been expired then, all of them had to be replaced. The four-year refurbishment works were carried out in 11 phases. It is expected that all the works will be completed and the System fully re-opened by April 2022 for public use.

Two years into the project, Mr Ho Chun-to, James, an engineer of the Boundary Crossing Facilities and Transport Services Division, joined the team responsible for the refurbishment of the System in January 2020. Mr Ho and the team actively co-ordinated with the Transport Department, the project client, as well as other government departments, including the Home Affairs Department and Hong Kong Police Force, to tackle myriad challenges. For example, the team had to ensure that the works will not affect the existing canopies of the System. Moreover, the narrow streets along the System added difficulties to the works, as truck-mounted cranes needed to be deployed for lifting operations while disruption to vehicle and pedestrian traffic had to be minimised. In addition, the team had to solicit support from the local community, composing of different residents and commercial tenants with diverse cultural background.

To facilitate smooth implementation of the project, the team adopted the approach of closing relevant road sections for an hour every day for replacement works, with an aim to minimising the traffic impacts. On one occasion, a seriously ill elderly person on a car going to seek medical treatment could not continue the way due to the road closure; on another occasion, a car carrying a pet in critical condition was obstructed. On both occasions, the team immediately re-opened the closed road section to cater for the urgent need. In another instance in early 2021, when the Drainage Services Department put in a last-minute request for urgent access to a manhole in a closed road section to take underground sewage samples for COVID-19 testing, our staff also made arrangements at once to allow the officers concerned to enter the area. "These examples show our flexibility and adaptability in various situations with caring attitude with regard to the needs of the community," Mr Ho said.

With careful planning and hard work, the time lost for temporary road re-opening did not cause any major delay in the project. Mr Ho also said that working on the project, he gained much experience in handling public enquiries and complaints, and has become more patient, enabling him to overcome similar challenges with ease in the future. Looking back at the implementation of the project, he would like to thank his team for their support and the community for its forbearance.



### 不一樣的旅程： 遠赴奧地利測試飛機救援及滅火車 An Unusual Trip: Flying to Austria for Testing Aircraft Rescue and Firefighting Vehicles

黃宇康先生（右二）及其團隊於2022年年初遠赴奧地利，協助消防處進行飛機救援及滅火車的測試及校驗工作。旅程期間障礙重重，當地天氣惡劣，而且受疫情影響，團隊的行程被打亂，儘管如此，團隊仍排除萬難，確保車輛如期交付。

Mr Wong Yu-hong, Simon (2nd right) and his team flew to Austria in early 2022 to support the FSD in testing and commissioning the ARFF vehicles. The trip was full of obstacles with severe weather in Austria and disruptions to the team's itinerary due to the epidemic. Nevertheless, the team managed to overcome all difficulties and ensured that the vehicles were delivered on time.

香港國際機場第三條跑道將配備一支擁有14輛先進飛機救援及滅火車的全新救援車隊。保安及車輛工程部工程師黃宇康先生負責採購有關車輛。他具備豐富的車輛採購經驗，是次採購的各個階段，由招標至測試和校驗新車隊，他都全力參與。

由於所採購的部分飛機救援及滅火車在奧地利林茨市生產，該些車輛的設備檢查和性能現場測試需在當地進行，以便即場查找問題並安排迅速修正問題。有見及此，黃先生率領三名機電署同事，聯同消防處代表組成團隊，前往林茨市測試並接收其中九輛新車。

團隊於2022年1月在嚴冬中抵達位於林茨市的車廠。他們在當地逗留了共22天，並分成兩組工作，每組有兩名機電署和兩名消防處同事。

黃先生說：「廠方在附近租了一個小型飛行區，讓我們進行駕駛性能測試。我們在飛行區工作了整整兩天，當時氣溫僅為攝氏零下五度左右，還不時下雪，地面結霜。」車輛測試一般不會在歐洲冬季進行，但由於該批飛機救援及滅火車必須在2022年5月前付運到港，以預留充足時間在第三條跑道於7月開通前，在香港國際機場進行最後測試，因此作出這個特別安排。

這次行程的另一個挑戰是香港為應對新冠疫情而實施的嚴格入境航班管控措施。黃先生憶述：「就在旅程即將結束之際，我們在維也納機場的登機閘口被截停，並獲告知回港航班須熔断14天。」幸而團隊得到在香港的機電署同事協助安排，在滯留兩天後終於離開奧地利。團隊抵港後隨即接受14天酒店隔離。

這次不平凡的旅程給黃先生帶來新領悟。整個海外行程的策劃及執行固然困難重重，而最後航班熔断更為旅程增添挑戰。儘管如此，團隊面對困難及危機時仍表現冷靜和專業，他為此感到欣慰。這次旅程也讓他從飛機救援及滅火技術方面擴闊眼界。他現正與消防處探索使用混能或電動車作為消防和救援車輛是否可行。

A new fleet of 14 advanced Aircraft Rescue and Firefighting (ARFF) vehicles will be deployed at the third runway of the Hong Kong International Airport (HKIA). Mr Wong Yu-hong, Simon, an engineer in the Security and Vehicle Services Division, was responsible for the procurement of the relevant vehicles. Experienced in vehicle procurement, he participated in every stage of the procurement exercise, from tendering to testing and commissioning of the new fleet.

Since some of the ARFF vehicles procured were manufactured in Linz, Austria, equipment checks and on-site performance tests had to be conducted there for the identification of any defects and prompt rectification. In view of this, Mr Wong led three colleagues from the EMSD to form a team with the representatives of the Fire Services Department (FSD), to fly to Linz for testing and receiving nine of the new vehicles.

The team arrived at the production plant in Linz in January 2022, in the depths of the Austrian winter. They stayed for a total of 22 days, working in two groups, each with two EMSD and two FSD colleagues.

"The plant rented a small airfield nearby for us to conduct the driving performance tests. We spent two full days working at the airfield under the temperatures of about -5°C, with snow and ground frost from time to time," Mr Wong said. Testing of vehicles is usually avoided in European winters. Nevertheless, as the ARFF vehicles needed to be delivered to Hong Kong by May 2022, in order to allow sufficient time for final testing at HKIA before the third runway opened in July.

Another challenge during the trip was the strict inbound flight control measures implemented in Hong Kong in response to the epidemic. "As the trip was drawing to the end, we were stopped at the boarding gate at Vienna Airport and were told that flights to Hong Kong had been suspended for 14 days," Mr Wong recalled. Fortunately, with the help of EMSD colleagues in Hong Kong, the team finally left Austria after being stranded for two days. Upon arrival in Hong Kong, the team immediately underwent 14 days of hotel quarantine.

From this unusual trip, Mr Wong has drawn insights. The planning and execution of the entire overseas trip was undoubtedly difficult and the flight suspension in the end posed further challenges to the trip. Nevertheless, he was grateful that the team had been calm and professional in the face of difficulties and crises. The trip also broadened his horizons in ARFF technologies, and he is now exploring with the FSD the potential of using hybrid or electric vehicles as firefighting and rescue vehicles.

## 營運服務 Trading Services

### 應用智能方案提升客戶的運作

創新科技(創科)對營運基金極為重要,我們借助各種創科方案,提升客戶的運作,使之變得更具智慧效能和效益。我們大部分的工程服務都已採用各種創科和數碼化工具。這些方案可加快智慧城市及基建發展的步伐,成效有目共睹,更可提升客戶後勤運作的效率和可持續性。

去年11月,我們榮獲2021建造業議會數碼化大獎機構類別(客戶)金獎,表揚我們致力應用嶄新科技和數碼化工具,提升客戶的運作。獲獎給予我們莫大鼓勵,也肯定我們與客戶、業界、本港和內地的策略伙伴及其他持份者攜手踏上數碼化之旅,共同開發,共同創造的努力成果。

年內,我們也獲得多個其他本地獎項,例如我們的「智慧城市管理—區域數碼監控中心和人工智能平台」項目,在2021年香港資訊及通訊科技獎的商業方案(大數據及開放數據應用)組別中榮獲金獎。另一個為長者及殘疾人士開發的人工智能升降機監察系統項目,也在創新科技署主辦的「2021年城市創科大挑戰」中贏得創新獎。房屋署等潛在客戶對這個升降機監察項目感興趣,並參與測試應用。



▲我們在2021年香港資訊及通訊科技獎的商業方案(大數據及開放數據應用)組別中榮獲金獎,以表揚機電署在推動資訊及通訊科技發展所付出的努力。We were granted the Smart Business (Big Data and Open Data Applications) Gold Award in the Hong Kong ICT Awards 2021 in recognition of the EMSD's efforts in promoting ICT development.

### ENHANCING OPERATIONS OF OUR CLIENTS WITH SMART SOLUTIONS

Innovation and technology (I&T) are vital for the EMSTF to make the operations of our clients smarter and more efficient. Various I&T and digitalisation tools have now permeated most aspects of our engineering services. Not only can they provide solutions to expedite smart city and infrastructure developments with notable results, but they also enhance the efficiency and sustainability of the back-end operations of our clients.

In recognition of our commitment to improving the operations of our clients with the adoption of new technologies and digitalisation tools, we received the Gold Award in the Organisation (Client) category of the Construction Digitalisation Award 2021 of the Construction Industry Council (CIC) last November. The award is a great encouragement to us and a recognition of our achievement since we embarked on our digitalisation journey in collaboration with our clients, the trade, strategic partners and other stakeholders in Hong Kong and the Mainland.

During the year, we also won a number of other local awards, such as the Smart Business (Big Data and Open Data Applications) Gold Award in the Hong Kong ICT (Information and Communications Technology) Awards 2021 for our project of "Smart City Management – Regional Digital Control Centre and Artificial Intelligence (AI) Platform". Another project, AI lift monitoring system developed for the elderly and persons with disabilities, won the Innovation Award in the City I&T Grand Challenge 2021 organised by the Innovation and Technology Commission. The potential clients such as the Housing Department was interested in the lift monitoring project and participated in testing the application.



▲機電署致力為客戶應用嶄新科技和數碼化工具,為我們贏得2021建造業議會數碼化大獎機構類別(客戶)金獎。The EMSD won the Gold Award at the CIC Construction Digitalisation Award 2021 in the category of Organisation (Client) for the adoption of new technologies and digitalisation tools for our clients.

機電署的創科實力非凡,再次揚威海外。機電署繼2021年在日內瓦國際發明展榮獲八個獎項後,於2022年再次在同一賽事贏得19個獎項,包括五個金獎,得獎項目分別為「智能升降機移動監測裝置」、「智能數碼自動梯監測系統」、「智慧升降機巡查機械人」、「智能鍋爐維護機械人」及「司機隨身寶」。此外,我們贏得13個銀獎和一個銅獎,表揚我們為清潔、消毒和培訓工作等開發的各種機械人項目;用於監測和分析架空纜車、鐵路軌道、升降機人流、地下公共設施、火化流程、消防員健康和懲教院所在囚人士狀況等的各種系統;以及可優化太陽能發電量和性能等的項目,不勝枚舉。

一如預期,機械人技術在客戶運作上扮演的角色愈來愈重要。年內,營運基金的項目於2021年7月在政府資訊科技總監辦公室舉辦的「促進機械人科技應用」創新比賽中,榮獲大獎、二獎及三項優異獎。「探索運用機器人技術執行及提升清潔廁所馬桶的智能公共服務」項目勇奪大獎,而「人工智能和機器人技術在智能倉庫中的應用」項目則贏得二獎。

我們的區域數碼監控中心和人工智能平台,現已覆蓋衛生署和政府化驗所轄下大部分主要場地,以及醫院管理局(醫管局)一些重要的機電系統。此外,我們更廣泛應用人工智能,例如與香港大學合作,利用人工智能和大數據分析技術作為數據挖掘的演算法,為醫管局訂制混合型預測運作監控策略,以優化將軍澳醫院、瑪麗醫院和醫管局總部的製冷機組性能。至於醫院的重要機電設施,例如淡水冷卻塔等,我們已透過區域數碼監控中心實時監察其操作表現,以盡量減低退伍軍人病的傳播風險。

▼機電署再放光芒,揚威海外,在2022年日內瓦國際發明展勇奪五項金獎、13項銀獎及一項銅獎,合共19個獎項。The EMSD won international acclaim with a total of 19 awards, including five golds, 13 silvers and one bronze in the International Exhibition of Inventions of Geneva 2022, shining once again across the globe.



Winning 19 medals at the International Exhibition of Inventions of Geneva 2022 after winning eight in the same event in 2021, the EMSD once again proved its I&T strengths on a global level. We won five gold medals for an Intelligent Elevator Movement Surveillance Device, an Intelligent Digital Escalator Monitoring System, a Robotic Lift Examiner, a Smart Boiler Servicing Robot and a Smart Driver Assistant for the Automated People Mover. We also brought home 13 silver medals and one bronze medal in recognition of our projects for a variety of robots for cleaning, disinfection and training; diverse monitoring and analytics systems for aerial ropeways, railway tracks, lift passenger flow, underground utilities, cremation, the health of firefighters, and the wellbeing of persons in custody (PICs) in correctional institutions; and tools for optimising solar energy generation and its performance, to name a few.

As expected, robotics plays an increasingly important role in the operations of our clients. During the year, the EMSTF projects won the grand award, the first runner-up and three merit awards in the "Leading Towards Robotics Technologies" Innovation Competition of the Office of the Government Chief Information Officer in July 2021. The grand award went to the Robotics-enabled Public Services on Toilet Bowl Cleaning Application and the first runner-up award was garnered by the Application of Artificial Intelligence and Robotics Technologies for Smart Warehouse.

Our Regional Digital Control Centres (RDCCs) and AI platform have now covered most of the major venues under the Department of Health and the Government Laboratory and some critical E&M systems in the Hospital Authority (HA). AI has been put into wider use too. An example is our joint project with the University of Hong Kong, which employed AI as the data mining algorithm with big data analysis in formulating a hybrid predictive operational control strategy for the HA to optimise the performance of chiller plants at Tseung Kwan O Hospital, Queen Mary Hospital and HA Headquarters. As for the critical E&M facilities such as fresh water cooling towers in hospitals, we have monitored their operational performance in real time through the RDCCs to minimise the risk of the legionnaire's disease.



▲機電署團隊在2021年7月獲頒「促進機械人科技應用」創新比賽大獎,得獎項目為「探索運用機器人技術執行及提升清潔廁所馬桶的智能公共服務」。該比賽旨在把機械人技術與公共服務接軌。

In July 2021, the EMSD team was presented with the grand award for the Robotics-enabled Public Services on Toilet Bowl Cleaning Application in the "Leading Towards Robotics Technologies" Innovation Competition, which aims to connect public services with the adoption of robotics technologies.

## 營運服務 Trading Services

我們在公眾街市也使用各種人工智能監測系統，包括具備人工智能和攝錄機的自動梯監察系統，監察承辦商的維修保養工作。

過往，人工智能並未能識別自動梯乘客在梯上跌倒的真正原因，但這項功能對我們制訂適當的改善措施十分重要。為解決這個問題，同事提出創新構思，聘用特技演員，模仿乘客在自動梯上因暈倒、不適、設備故障或其他原因而跌倒的動作，並攝錄這些動作，然後把錄像輸入人工智能系統的機器學習模型，藉此提升人工智能系統的分析能力。經改善的人工智能自動梯監察系統已在黃大仙大成街街市試用，效果良好。



AI-enabled monitoring systems are also used in public markets. These include an escalator monitoring system with AI and cameras to monitor the maintenance work of contractors.

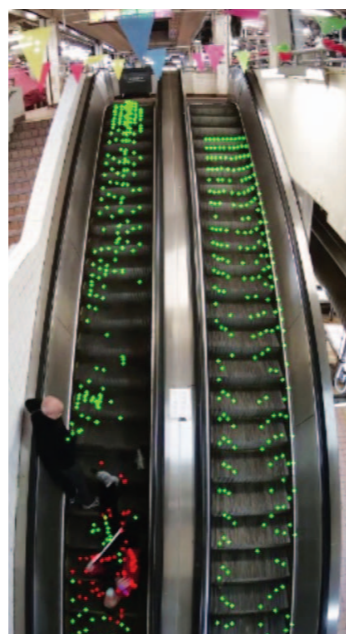
In the past, AI could not identify the exact cause of a passenger falling on an escalator, which however is important for us to formulate appropriate improvement measures. To tackle the issue, our colleagues came up with the idea of hiring stunt performers to imitate the movements of a person falling due to fainting, illness, equipment failure or other reasons. These movements were recorded on video and fed into the machine learning model of the AI system to enhance its analytical power. The enhanced AI escalator monitoring system has been piloted at the Tai Shing Street Market in Wong Tai Sin with good results.

◀ 我們與香港城市大學合作，為香港海防博物館開發智能電掣房。智能電掣房利用無線傳感器和遙距監測技術收集數據，有助我們掌握電氣裝置的狀況。

We collaborated with the City University of Hong Kong to develop a Smart Switch Room for the Hong Kong Museum of Coastal Defence. The Smart Switch Room uses wireless sensors and remote monitoring technology to collect data, helping us to gauge the condition of the electrical installations.

▶ 我們為大成街街市研發自動梯監察系統，該系統採用人工智能科技，並透過機器學習改良，不但可監察承辦商的工作，更可偵測多種不同的事故情況，並通知我們有關事件，同時錄影事發經過，方便職員查看。

We have developed an escalator monitoring system for the Tai Shing Street Market. With the adoption of AI technology and enhancement through machine learning, the system can monitor not only the work of contractors but also various incidents. It will notify us of incidents and capture the course of incidents for inspection by staff.



此外，創科可支援文化場地的運作。以香港海防博物館為例，營運基金近年與香港城市大學合作開發智能電掣房，使用傳感器和遙距監測技術，收集電掣房狀況的數據，以改善維修保養工作。我們的最終目標，是開發一套資產健康指數系統，以評估該博物館各電氣裝置的狀況。

在現今的數碼年代，客戶對支援藝術及文化活動的「藝術科技」需求不斷增加。我們的團隊正積極接受有關舞台電腦燈光運作的培訓，為即將啟用的東九文化中心作好準備。至於康樂及文化事務署轄下的虛擬電競場地，我們已為該署的「運動科技」試點項目提供支援，日後該署或會委託我們承辦相關的維修保養業務。為監察各市政、康樂及文化場地承辦商的工作表現，我們由2021年7月開始試用名為「Hearts」的流動應用程式，目標是在全港18區的相關場地使用這個應用程式，以監察和提升承辦商的工作表現。

I&T solutions also support operations at cultural venues. Taking the Hong Kong Museum of Coastal Defence as an example, the EMSTF has been working with the City University of Hong Kong in recent years to develop a Smart Switch Room, using sensors and remote monitoring technology to gather data about the condition of switch rooms for better maintenance. Our ultimate goal is to develop an asset health index to gauge the condition of electrical installations at the museum.

In this digital age, demands for "ArtTech" to support arts and cultural activities have kept on rising. Our team has been receiving training on the operation of the computerised stage lighting for the forthcoming opening of the East Kowloon Cultural Centre. As for the virtual gaming venues under the Leisure and Cultural Services Department, we have provided support for its "SportsTech" pilot projects, which may bring us maintenance opportunities in the future. To monitor the performance of contractors at various municipal, recreational and cultural venues, a mobile app namely "Hearts" has been piloted since July 2021. The goal is to roll out the app for use in relevant venues across the 18 districts in order to monitor and enhance the performance of contractors.

至於新政府場地的操作及維修保養方面，我們已開始為長沙灣庫務大樓的測試及校驗工作提供技術意見。新大樓日後不但供庫務署使用，也是1823服務中心的辦公地點，該中心會為市民提供24小時一站式查詢服務。此外，我們已為屯門小欖綜合康復服務大樓的測試及校驗工作提供支援。該大樓會提供150個住宿名額和560個日間護理名額，於2022年年底會交由營運基金負責操作及維修保養服務。

政府各部門對創科和數碼化支援服務的需求殷切，我們也竭盡所能，滿足客戶所需。例如政府資訊科技總監辦公室轄下的長沙灣政府數據中心大樓是政府首個特設的第三級數據中心，也是營運基金服務組合中首個第三級數據中心。該中心預計可在2022年投入服務。

入境事務處位於將軍澳的新總部大樓由動工至今，營運基金一直為該處提供技術支援。現時在灣仔的總部，以及分布在各區的辦事處和設施會重置於新總部。

As for the operation and maintenance (O&M) of new government venues, we have been providing technical advice for the testing and commissioning (T&C) of the Treasury Building in Cheung Sha Wan. The new building will not only serve the Treasury, but also house the 1823 Call Centre to provide one-stop round-the-clock public enquiry service. We also supported the T&C work for the Siu Lam Integrated Rehabilitation Services Complex in Tuen Mun, which will provide 150 residential and 560 day care places. The facility will be handed over to us for O&M services in late 2022.

We are dedicated to meeting the strong demands of various government departments for I&T and digitalisation support too. For example, the Government Data Centre Complex under the Office of the Government Chief Information Officer at Cheung Sha Wan is the first purpose-built Tier III data centre of the Government and the first Tier III data centre in the EMSTF's service portfolio. The Government Data Centre is scheduled to commence operation in 2022.

Furthermore, we have been providing technical support to the new Immigration Headquarters in Tseung Kwan O since it commenced construction. The existing Headquarters in Wan Chai, as well as other offices and facilities currently located in various districts, will be reprovisioned at the new Headquarters.



▲▶ 機電署為長沙灣庫務大樓的機電系統及設備進行測試及校驗工作，確保大樓正式落成後各客戶部門能順利投入運作，服務市民。

The EMSD tested and commissioned the E&M system and equipment for the Treasury Building in Cheung Sha Wan to ensure that client departments can commence their services to the public smoothly upon its practical completion.





## 營運服務 Trading Services

新總部會提供多種不同的公共服務，例如簽發護照、簽證、身份證，以及辦理出生和婚姻登記。由於預計使用者眾多，我們致力應用各種創科方案，提升客戶的運作，使之變得更具智慧效能和效益，以配合有關公共服務的需求不斷增加。

我們在此重點項目的主要工作，是從技術及保養維修角度提供專業意見。具體工作包括審閱技術設計、審核有關方面呈交的文件、現場協調各方的工作，以及測試和校驗各種電子系統。作為政府的「創新促成者」，我們也積極向客戶建議和落實各種先進的創科方案。

「智慧監獄」是懲教署和營運基金合作進行的項目。兩者攜手開發和試驗多個創科方案，以提高懲教院所的運作效率和改善在囚人士的福祉。例如「非接觸式在囚人士生命體徵檢測系統」運用雷達技術，監測保護房間內的在囚人士的生命徵象。這個方案在2022年日內瓦國際發明展榮獲銀獎。另一例子是影像分析及監察系統，運用以骨架為參考基礎的演算法和閉路電視偵測在囚人士的異常行為，以策安全。這個方案也榮獲「香港工程師學會創意獎2021」（青年會員組）優異證書（組別II）。

值得一提的是，香港第一所智慧監獄大潭峽懲教所，已於2021年5月正式啟用。該院所運用嶄新科技提升運作效率，為在囚人士提供更安全和穩妥的羈押環境。



▲ 懲教署積極與機電署合作，在大潭峽懲教所建設本港首個智慧監獄，並於2021年5月舉行啟用典禮。我們協助懲教署應用多個創科系統，包括影像分析及監察系統、在囚人士電子儲物櫃系統及綜合智能通訊系統，提升懲教院所的保安水平和運作效率。

The CSD actively collaborated with the EMSD to build the first Smart Prison in Hong Kong at the Tai Tam Gap Correctional Institution and its launching ceremony was held in May 2021. We assisted the CSD in employing various I&T systems, including the Video Analytic Monitoring System, the E-locker System for PICs and the Integrated Intelligent Communication System, to enhance the security and operational efficiency of correctional institutions.

The new Headquarters will provide a wide spectrum of public services, such as issue of passports, visas and identity cards, and registration of births and marriages. As high visitor patronage is expected, we strive to make the operation of our client even smarter and more efficient with I&T solutions, so as to meet the ever-increasing demand of its public services.

Our main role in this signature project was to provide professional advice from technical and maintenance perspectives. Our specific work included reviewing technical designs, vetting submissions, site co-ordination and T&C of various electronics systems. Fulfilling our role as the Innovation Facilitator of the Government, we also proposed and implemented various state-of-the-art I&T solutions for the client.

The Smart Prison is a project jointly undertaken by the Correctional Services Department (CSD) and the EMSTF. Together, we have developed and piloted a number of I&T solutions to enhance operational efficiency of correctional institutions and improve the wellbeing of PICs. One example is the Contactless Inmate Health Monitoring System in Prison, which can monitor the vital signs of PICs in protected rooms with radar technology. This solution won a silver medal at the International Exhibition of Inventions of Geneva 2022. Another example is the Video Analytic Monitoring System, which can detect any abnormal behaviours of PICs for safety sake, with a skeleton-based algorithm and closed circuit television cameras. This solution won a Certificate of Merit (Category II) in the Hong Kong Institution of Engineers (HKIE) Innovation Award 2021 (Young Member Group) too.

It is noteworthy that Hong Kong's first Smart Prison, Tai Tam Gap Correctional Institution, was officially launched in May 2021. The facility uses new technologies to enhance its operational efficiency, thereby providing a safer and more secure custodial environment for PICs.



我們為渠務署開發的「智慧渠務—防洪監察系統」，是另一個為市民服務卻又較鮮為人知的創科項目。由於項目非常成功，我們曾在香港工程師學會舉辦的智能生活國際會議上發表文章，分享團隊設計系統和在全港各處設置超過200個監測點的經驗。監測點與保障公眾生命及財產的防洪監察流程全面結合，而防洪監察正是渠務署的重要業務之一。此外，我們為渠務署監測家居污水中2019冠狀病毒含量的工作提供支援，也備受該署讚賞。事實證明，污水監測找出病毒傳播源頭和遏止病毒在社區傳播方面，非常奏效。

我們與渠務署、水務署和香港中文大學合作，共同開發一套新的地下渠道無線通訊系統，該系統運用「政府物聯網」，並採用通常在衛星通訊使用的四臂螺旋天線，妥善解決渠蓋令訊號減弱的問題。新設備耗電量低，無需經常更換電池，因此也可降低管理成本。新系統在雨水排水道及食水管道系統的水浸黑點均適用，令客戶更加滿意。

在創新技術方面，由廣東省科學技術協會與機電工程署聯合舉辦的「國際建築機電人工智能大挑戰」，是機電署在2021/22年度內的一項重要活動。這個跨越地域界限的創科活動在2021年8月展開，內容豐富，包括國際論壇、工作坊和比賽，各項活動都聚焦於把人工智能應用在屋宇裝備方面。



The Smart Drainage – Flood Monitoring System developed for the Drainage Services Department (DSD) is another behind-the-scenes I&T project for the public. The project is so successful that our team has delivered a relevant paper at the International Conference on Smart Living organised by the HKIE. In the paper, we share our experience in the design of the system and setting-up of over 200 flood monitoring points across the territory, all fully integrated into the process of flood monitoring in protecting public lives and property, which is one of the DSD's core business processes. In addition, our support to the DSD for its sewage surveillance work to monitor the viral loads of COVID-19 in domestic sewage has been well received too. The sewage surveillance has proved highly effective in locating the sources of transmission and containing the spread of the virus in the community.

In collaboration with the DSD, the Water Supplies Department and the Chinese University of Hong Kong, we developed a new wireless communication system for underground drains with the application of Government-Wide Internet of Things Network (GWIN) and Quadrifilar Helix Antenna generally deployed for satellite communication, which has solved the problem of signal blockage of manhole covers. The new device consumes much less power and requires less frequent replacement of battery, thus lowering the management cost too. The new system is applicable to flooding blackspots both in stormwater drainage and freshwater piping systems, further increasing the satisfaction of our client.

On innovative technologies, a milestone event in 2021/22 was the Global AI Challenge for Building E&M Facilities jointly organised by the Guangdong Provincial Association for Science and Technology and the EMSD. Launched in August 2021, the cross-regional innovative event was rich in content, with a technical conference, a workshop and a competition, all focusing on the application of AI in the building services installations.

◀ 機電署與香港中文大學合作，研發嶄新的地下渠道無線通訊系統，並取得專利。此方案應用四臂螺旋天線及「政府物聯網」，有助解決渠蓋令訊號減弱的問題，使客戶能更有效地監測地下排水系統。

The EMSD and the Chinese University of Hong Kong jointly developed a new patented wireless communication system for underground drains. With the application of Quadrifilar Helix Antenna and the GWIN, this solution can help solve the signal blockage caused by manhole covers, thus ensuring more effective monitoring of the underground drainage system by clients.



## 營運服務 Trading Services

國際論壇在2021年10月舉行，歡迎世界各地的研究人員、學生和初創企業等參加，最終吸引約2 300名參加者和25位頂尖專家出席會議。隨後舉行的人工智能大挑戰，也收到來自十個地區超過120個隊伍的參賽作品。參賽隊伍須開發一個語義人工智能模型，用以預測一幢商業大樓的製冷負荷需求。這些活動為與會者提供獨一無二的機會，讓參加者、行業領袖、創新者和研究人員分享和交流創新構思，共同推動應用人工智能技術的工作，為世界帶來正面影響。

我們預計，以下三類創科方案的需求會與日俱增：一是容易按客戶需要訂造的機械人，用於清潔、巡邏和派送等工作；二是節能和減省人力的機電設備方案；三是遙距監測和控制各種機電系統的方案。為滿足客戶在這些創科範疇的需求，我們會繼續提升營運基金的軟件開發和大數據應用能力，並與學術界和初創企業加強合作。

Open to researchers, students and start-ups around the world, the technical conference in October 2021 attracted some 2 300 participants and 25 leading experts. The subsequent AI competition received entries from more than 120 teams in ten regions, and the participating teams were required to develop a semantic AI model to predict the cooling demand of a commercial building. These activities presented a unique opportunity for the participants, industry leaders, innovators and researchers to share and exchange ideas, and promote the application of AI technology for making a positive impact to the world.

We envisage ever-increasing demands for the following three types of I&T solutions: easily customised robots for various cleaning, patrol and delivery duties; solutions for E&M equipment to save energy and reduce manpower; and solutions for remote monitoring and control of diverse E&M systems. To satisfy the needs of our clients in these areas, we will continue to sharpen our capabilities in software development and big data application, and collaborate further with academia and start-ups.



◀ 2021年下半年，機電署與廣東省科學技術協會合辦全球首個最大規模的「國際建築機電人工智能大挑戰」。活動內容豐富，包括國際論壇（下圖）、人工智能大賽和工作坊。

In the second half of 2021, the EMSD jointly held the world's first and largest Global AI Challenge for Building E&M Facilities with the Guangdong Provincial Association for Science and Technology. Rich in content, the event included a technical conference (bottom), an AI competition and a workshop.



► 疫情期間，我們為客戶引入嶄新的消毒機械人。機械人會自動進行消毒工作，可減輕清潔員工的工作量和降低感染風險。

During the epidemic, we introduced a new disinfection robot to our clients. The robot can carry out disinfection automatically, thus reducing the workload and infection risk of cleansing staff.



### 人工智能火化 推動行業發展 When AI Meets Cremation: A Drive for Taking the Industry Forward

工程師張立鴻先生（左二）、助理工程師馮鎮國先生（右二）與團隊研發一套獲獎的「人工智能優化火化流程系統」。該系統利用影像分析及人工智能技術，優化各火化時段，減少所需時間及燃料消耗。

Mr Cheung Lap-hung (2nd left), an engineer, Mr Fung Chun-kuo (2nd right), an assistant engineer and the team have developed an award-winning AI Based Image Analytic and Control System for Cremation Process which uses image analytics and AI technology to optimise each cremation session, thus reducing the time required and fuel consumption.

數碼化和人工智能兩者為許多行業帶來變革，但火葬業屬於傳統行業，加上部分人覺得忌諱，因此業界要採用數碼科技和人工智能，殊非易事，絕對是挑戰。儘管如此，市政工程師張立鴻先生認為，數碼化不但可提升效率，也可騰出人手處理緊急維修及保養，從而加以善用員工的專業知識，因此火化服務理應朝着數碼化的路向發展。

有見及此，他提出「人工智能優化火化流程系統」或稱為「智能火化」的解決方案，該系統更榮獲2022年日內瓦國際發明展銀獎。

張先生說：「在整個系統的開發過程中，我們十分感謝客戶食物環境衛生署和前線員工的鼎力支持。」我們正在和合石火葬場共六個火化爐試驗該系統，並計劃在2023年年底正式啟用。

訓練人工智能模型是落實方案的關鍵，也是最耗時和最昂貴的環節。我們除了為每個火化爐安裝攝錄機，收集足夠操作數據及火化狀況作影像分析外，還須經驗豐富的前線人員觀察每節長約兩小時的火化過程，並提供意見回饋，以不斷提升人工智能模型的效能和穩定性。整個開發過程中需要重複多次「訓練」，以優化人工智能系統。

張先生解釋說：「為增強員工的信心，我們設置『智能火化』儀表板，實時顯示各種操作參數，讓員工親眼看到人工智能系統如何模擬和操控火化過程的全部四個階段。」儀表板具體證明人工智能勝任工作，令員工對該系統的信心大增。另外，如果該系統出現問題，員工也可隨時介入處理，足見操作人員仍能為火化工作增值。該系統已取得專利，團隊現正開發「智能火化」系統2.0版本，未來或會在其他火葬場應用。

張先生總結道：「我們欣喜傳統行業正在改變，採納新科技及創新意念。」在開發過程中，其中一間德國火化爐製造商洞悉人工智能應用的潛在優勢，並已對其火化爐的設計作出重大改變，在新建項目中將攝錄機配置定為標準功能規格。

While digitalisation and artificial intelligence (AI) have brought transformational changes in many industries, it remains challenging for the cremation trade to adopt the two since cremation is a traditional business and perceived by some as a taboo subject. Even so, Mr Cheung Lap-hung, an engineer of the Municipal Sector Division, believes that digitalisation is the right path for cremation services because it not only enhances the work efficiency but also releases staff to take on emergency repairs and maintenance, putting their expertise to better use.

He, therefore, has put forward a solution called the AI Based Image Analytic and Control System for Cremation Process or i-Cremation, which won a silver medal at the International Exhibition of Inventions of Geneva 2022.

"We must thank our client the Food and Environmental Hygiene Department and our frontline staff for their support throughout the development process," Mr Cheung said. The system is being piloted at six cremators at the Wo Hop Shek Crematorium and scheduled to be launched officially by the end of 2023.

Training the AI model is the key. It is also the most time-consuming and costly part of the deployment process. Apart from installing a video camera in each cremator to capture sufficient operational data and cremation status for image analytics, experienced frontline staff must also observe the entire cremation process, which takes about two hours, and provide feedbacks to continuously improve the performance and stability of the AI model. This "training" process has been repeated many times to enhance the AI in the development.

"To enhance staff confidence, we set up a dashboard showing the various real-time operational parameters of i-Cremation in action. Our staff can see for themselves how the AI system simulates and controls all four stages of the cremation process," he explained. The dashboard has boosted staff confidence as it shows vividly that AI can do the job competently. Furthermore, if anything goes wrong, staff can intervene anytime, demonstrating that human operators still can add value to the cremation work. The team is working on a 2.0 version of the patented i-Cremation, which may be deployed at other crematoria in future.

"We are very delighted to see the changes of this traditional industry by adopting new technologies and innovative ideas," Mr Cheung concluded. During the development of our project, one of the existing German manufacturers has seen the potential benefit of AI application and has already made an important change in their original cremator design to add video cameras as a standard feature in new projects.

# 企業管理 Corporate Stewardship

2021/22年度，各個企業單位繼續支持營運基金發揮政府「創新促成者」的角色，推動香港進一步的智慧及環保城市發展，並致力實現企業目標，「透過與不同持份者的伙伴關係，創造公眾價值及改善社會」。儘管2019冠狀病毒病不斷帶來各種挑戰，我們仍繼續努力為各個策略業務單位、機電業界、機電署同事及廣大市民提供支援，助力營運基金向前邁進，踏上新征途。

## 支援客戶和機電業界

### 防疫抗疫措施

我們的業務持續計劃書讓部門在整段疫情期間能繼續維持核心運作，並提供必要的客戶服務，效益有目共睹。業務持續計劃書現已更新至第23版，所載的各項指引和感染控制措施已適時調整，以應對2022年年初第五波疫情爆發時確診個案激增的情況。

我們繼續確保所有策略業務單位的個人防護裝備和其他防疫物資供應充足，並採用消毒機械人等創新科技(創科)方案支援抗疫。其他措施包括加強機電署總部大樓的保安和進入大樓所須遵守的規定、在受影響的辦公室範圍進行深層清潔、規定員工和訪客必須使用「安心出行」流動應用程式，以及進入總部大樓和外設辦事處的員工必須出示疫苗通行證等，旨在盡量減低員工和訪客的染疫風險。

▼職員和訪客在進入機電署總部大樓及外設辦事處前，必須掃描「安心出行」二維碼，並出示「疫苗通行證」或「特別通行證」。Staff and visitors were required to scan the "LeaveHomeSafe" QR code and produce their Vaccine Passes or Special Passes before being allowed to enter the EMSD Headquarters and its outstations.



During 2021/22, our corporate units continued to support the EMSTF in its role as the Government's Innovation Facilitator, promoting the development of Hong Kong into a smarter and greener city while pursuing the corporate goal of "creating public value for community betterment through partnership with different stakeholders". Our continued support to all Strategic Business Units (SBUs), the E&M trade, colleagues and the community has helped the EMSTF forge ahead on its new journey, notwithstanding the ongoing challenge of the Coronavirus Disease 2019 (COVID-19) epidemic.

## SUPPORTING THE CLIENTS AND E&M TRADE

### Anti-epidemic Measures

Our Business Continuity Plan has proved valuable in maintaining the Department's core operations and essential client services throughout the epidemic. Now its 23rd version includes timely adjustments to the guidelines and infection control measures for us to cope with the sudden surge of confirmed cases in the fifth wave of the epidemic which started in early 2022.

We continued to ensure the provision of adequate personal protective equipment (PPE) and other anti-epidemic supplies for all SBUs, and provide relevant support by innovation and technology (I&T) solutions such as disinfection robots. Other measures included enhanced security and admission requirements for our headquarters, deep cleaning of affected office areas, mandatory use of the "LeaveHomeSafe" mobile app for staff and visitors as well as a mandatory requirement for staff entering the headquarters and outstation offices to present their Vaccine Passes, all aimed to minimise the risk of infection for staff and visitors.















▲►我們除了加強機電署總部大樓的定期清潔工作外，亦安排在受影響的辦公區域進行消毒，以及在公用地方及設施噴灑抗病毒殺菌塗層，為同事提供清潔和安全的工作環境。

In addition to stepping up our regular cleaning efforts, we arranged disinfection of the affected office areas and spraying of antimicrobial coating for the common areas and facilities in the EMSD Headquarters to provide a clean and safe working environment for colleagues.



## 2021/22 財政年度關鍵績效指標成績及表現承諾

## Key Performance Indicator Results and Performance Pledges in Financial Year 2021/22

 <p><b>員工建議計劃書<sup>1</sup> (份)</b> <b>Staff Suggestion Proposal<sup>1</sup> (no.)</b></p> <p>目標 75 成績 131 Target Result</p>	 <p><b>客戶滿意指數 [以8分為滿分計]</b> <b>Customer Satisfaction Index [on an 8-point scale]</b></p> <p>目標 6.6 成績 6.83<sup>2</sup> Target Result</p>
<p>以每月客戶意見調查結果為基礎的客戶滿意度百分比 (%)</p> <p><b>Percentage of Satisfaction Level Based on Monthly Customer Feedback (%)</b></p> <p>目標 99 成績 99.95 Target Result</p> 	<p>違反法例次數 (宗)</p> <p><b>Statutory Non-compliance (no.)</b></p> <p>目標 0 成績 0 Target Result</p> 
<p>新業務及業務增長 (百萬元)</p> <p><b>New Business and Growth of Business (\$M)</b></p> <p>目標 513.4 成績 632.3 Target Result</p> 	<p>每千名營運基金員工須呈報的累積意外宗數 (以每千名員工計算)</p> <p><b>Accumulated Reportable Accidents per 1 000 EMSTF Staff (no. per 1 000 staff)</b></p> <p>目標 5.0<sup>3</sup> 成績 3.37 Target Result</p> 
 <p>營運基金員工的訓練日數 (每名員工接受訓練的日數)</p> <p><b>Training Days of the EMSTF Staff (no. of training days per staff member)</b></p> <p>目標 4.5 成績 4.86 Target Result</p>	<p>年內續訂服務水平協議的百分比 (%)</p> <p><b>Percentage of Service Level Agreement (SLA) Renewed during the Year (%)</b></p> <p>目標 95 成績 100 Target Result</p> 
<p>員工滿意指數<sup>1</sup> [以10分為滿分計]</p> <p><b>Staff Satisfaction Rating<sup>1</sup> [on a 10-point scale]</b></p> <p>目標 6.8 成績 7.6<sup>4</sup> Target Result</p> 	<p>達到服務水平協議所訂表現目標的百分比 (%)</p> <p><b>Percentage of SLA Service Performance Target Compliance (%)</b></p> <p>目標 99 成績 100 Target Result</p> 
<p>耗電量<sup>1</sup> (千瓦小時)</p> <p>[機電署總部大樓、企業數據中心及各策略業務單位的主要場地]</p> <p><b>Electricity Consumption<sup>1</sup> (kWh)</b> [EMSD Headquarters Building, Corporate Data Centre and all SBUs Major Venues]</p> <p>目標 8 775 617 成績 9 292 508<sup>5</sup> Target Result</p> 	<p>收入回報率 (%)</p> <p><b>Return on Revenue (%)</b></p> <p>目標 2.7 成績 2.9 Target Result</p> 

<sup>1</sup> 此項目適用於機電工程署整個部門，其他項目只適用於機電工程營運基金。

<sup>2</sup> 數字為2020年的調查結果。下一次調查將於2022年進行。

<sup>3</sup> 此為警戒水平，並非目標。

<sup>4</sup> 數字為2021年的調查結果。

<sup>5</sup> 企業數據中心擴展新的資訊科技系統，以及抗疫措施帶來額外的工作時數，導致耗電量上升。

<sup>1</sup> This item applies to the EMSD as a whole. Other items apply to the EMSTF only.

<sup>2</sup> Results are derived from the survey conducted in 2020. The next survey will be conducted in 2022.

<sup>3</sup> This is an alert level, not a target.

<sup>4</sup> Results are derived from the survey conducted in 2021.

<sup>5</sup> The increase of electricity consumption was due to the new information technology system expansion in the Corporate Data Centre and the additional working hours for anti-epidemic measures.

## 企業管理 Corporate Stewardship



◀同事積極參與疫苗接種計劃，透過在機電署外展疫苗接種日及以團體預約形式到社區疫苗接種中心接種疫苗，協助築起保護屏障，保障自己、家人和同事的健康。

Colleagues actively participated in the vaccination programme by receiving vaccination on the EMSD Outreach Vaccination Day and through group appointments at Community Vaccination Centres to help build a protective barrier and safeguard their own health as well as that of their families and co-workers.

接種疫苗是控制感染的關鍵。我們響應政府的「全城起動 快打疫苗」運動，積極鼓勵所有員工和他們的家屬接種疫苗，並由公務員事務局安排外展疫苗接種服務，於2021年7月16日到總部大樓為超過200位同事和他們的家屬接種疫苗。此外，我們亦為員工和他們的家屬安排團體預約，便利他們於2021年8月到社區疫苗接種中心接種疫苗。

營運基金在疫情期間能一直為客戶提供服務，從無間斷，有賴以上措施，更重要是全體同事無懼挑戰，堅守崗位，竭誠盡心付出。

### 竭誠盡心服務市民

第五波疫情爆發期間，政府須在全港各區多個指明「受限區域」內的住宅樓宇進行「圍封強檢」行動。2022年1月，我們在短時間內動員多位同事為「圍封強檢」行動提供支援，初期負責前線工作，例如為葵涌邨居民派送膳食。其後，我們調動數百名員工到多個地點領導和參與「圍封強檢」行動，工作主要包括協助居民登記、登門家訪、回覆查詢，以及向居民送遞和派發物資等。我們確保所有參與行動的同事都穿戴全套個人防護裝備和配戴N95口罩，並在同事重返工作崗位前和行動後一周內為他們提供免費檢測。

隨着第五波疫情升溫，政府動員數百名的士司機組成專屬的士車隊，為確診者提供往返指定診所及其住處的免費接送服務，以便他們接受治療。我們在短短不足兩天時間內設立預約專屬車隊服務熱線，迅速完成所有電話系統的配置、人手安排，並制訂

Vaccination is the key to infection control. In response to the Government's "Early Vaccination for All" campaign, we encouraged staff and their families to get vaccinated and arranged an outreach vaccination service through the Civil Service Bureau (CSB), with more than 200 colleagues and their family members vaccinated at our headquarters on 16 July 2021. We also facilitated staff and their families to get vaccinated at the Community Vaccination Centres in August 2021 through group bookings.

Thanks to all of these measures, and more importantly the dedication and devotion of colleagues, we were able to provide uninterrupted EMSTF services to clients amid the COVID-19 outbreak.

### Devoted to Serving the Public

The fifth wave of the epidemic has necessitated "restriction-testing declaration" (RTD) operations to be carried out in residential buildings within numerous specified "restricted areas" across the territory. In January 2022, we mobilised colleagues at short notice to support these operations, initially undertaking frontline tasks such as delivering hot meals to residents in Kwai Chung Estate. Since then, hundreds of our colleagues have been deployed at many locations to lead or participate in the RTD operations. Our tasks mainly included assisting residents in registration, conducting home visits, answering enquiries and delivering and distributing supplies to residents. We ensured that all colleagues taking part in these operations wore full PPE and N95 masks and had access to free testing before returning to work and within the week after their operations.

As the fifth wave of the epidemic escalated, the Government mobilised hundreds of taxi drivers to set up a designated taxi fleet to provide patients with free transport services between their residences and the designated clinics for medical treatment. We set up a hotline for booking designated taxis in less than two days, promptly completing all telephone system configuration, manpower arrangements and

來電處理指引等，使熱線得以在2022年2月中投入服務。專屬車隊約半數的預約都是通過熱線服務安排。

為了鼓勵更多長者接種新冠疫苗，政府在2022年3月底推出「疫苗到戶接種服務」。我們為公務員事務局物色合適的中型客貨車進行翻新，並安裝車內供電系統，確保外展醫療團隊到全港各區提供疫苗接種服務時，有足夠電力以應付全日打印疫苗接種紀錄和冷藏疫苗等運作所需。



機電署各個個別及單位的同事在這次疫情危機中，無懼挑戰，通力合作，充分發揮「以民為本」的服務精神全力支援抗疫，其中24名同事（包括借調至其他工務部門的員工）更獲頒2021年行政長官公共服務獎狀，表揚他們在防疫抗疫中出色的工作表現。

獲獎員工的抗疫工作範圍甚廣，包括為多個感染控制和檢疫中心迅速安裝、測試和進行調校機電設施；為社區檢測中心和社區疫苗接種中心設置機電系統；檢查餐廳食肆、安老院舍和其他爆發羣組個案場所的通風系統；以及在制訂換氣指引方面提供技術支援等，建樹良多，不勝枚舉。我們能夠為市民服務並獲得肯定，深感榮幸。

▶機電署24位員工獲頒行政長官公共服務獎，表揚他們過去一年應對2019冠狀病毒疫情及相關工作的貢獻。24 EMSD staff received the Chief Executive's Commendation for Government/Public Service, in recognition of their efforts and contribution in the fight against the COVID-19 epidemic and related work in the past year.

drawing up call handling guidelines for the hotline to commence operation in mid-February 2022. About half of designated taxi bookings have been made through the hotline service.

To encourage more elderly people to get vaccinated, the Government introduced the Home Vaccination Service in late March 2022. We identified and refurbished suitable medium vans for the CSB. We also provided on-board power supply systems to ensure that the outreach medical teams will have sufficient power supply for printing vaccination records and storing vaccines in medical refrigerators during day-long field operation throughout the territory.

◀在第五波疫情中，機電署積極參與抗疫工作，帶領團隊負責葵涌邨膳食送暖行動，並多次在指明「受限區域」內進行「圍封強檢」行動，協助受影響的居民，務求在社區及早遏制病毒傳播，在疫境中與市民並肩同行。

In the fifth wave of the epidemic, the EMSD actively participated in anti-epidemic work by leading a team to deliver hot meals to residents of Kwai Chung Estate, and carrying out various "restriction-testing declaration" operations in the specified "restricted areas". We assisted residents who were affected by the operations and walked hand in hand with the public, with a view to the early containment of the virus in the community.

Staying true to the EMSD's spirit of supporting the community in times of crisis, our colleagues in all divisions and units have exerted undaunted efforts in carrying out anti-epidemic duties with great dedication and teamwork. A total of 24 EMSD staff, including those seconded to other works departments, were awarded the Chief Executive's Commendation for Government/Public Service 2021 in recognition of their outstanding performance in the fight against COVID-19.

The awardees' contribution was diverse, including the speedy construction, testing and commissioning of E&M facilities in various infection control and quarantine centres; setting up E&M systems at Community Testing Centres and Community Vaccination Centres; checking ventilation systems in restaurants, residential care homes for the elderly and other venues with outbreaks; and providing technical support in drawing up air change guidelines, just to name a few. We are honoured by the recognition and glad to be of service.



## 企業管理 Corporate Stewardship

### 支援機電業界的措施

儘管受疫情影響，我們仍積極舉辦各項活動以支援承辦商和機電同業，包括在2021年6月至2022年3月期間舉行四場機電署承辦商研討會，以及在2021年6月與建造業議會和香港機電工程師聯合辦機電裝備合成法研討會，向機電業界推廣使用創新的機電裝備合成法技術。研討會以實體和線上形式進行，業界反應熱烈。

另一重要業界活動是機電工程署研討會。今年的研討會於2022年1月在線上舉行，以「共創無限 實現碳中和」(CO-innovinity)為主題，當中包含碳中和(Carbon Net-Zero)、創新(Innovation)和無限機遇(Infinite opportunities)的寓意。研討會吸引超過1 400名來自本地、內地和海外政府部門、公營機構、創科業界、機電業界和學術界人士參加，共同探討促進碳中和及合作創新的方法。

為慶祝營運基金成立25周年，我們於2021年8月舉行「機電工程營運基金25周年紀念典禮」，時任政務司司長李家超先生更蒞臨主持啟動儀式。典禮及誌慶活動以「同・創・傳・期」為主題。總部大樓的「機電創科廊」亦於同日正式開幕，向業界及市民展示機電署的創科項目。

在紀念典禮上，「國際建築機電人工智能大挑戰」揭開序幕，活動旨在推動於既有建築物機電系統上應用語義人工智能。「大挑戰」成功吸引了超過2 000名

### Initiatives for Supporting the E&M Trade

Despite disruption caused by the epidemic, we continued to organise various events to support our contractors and the E&M trade, including four sessions of the EMSD Contractors Forum held from June 2021 to March 2022, as well as the MultiTrade integrated Mechanical, Electrical and Plumbing (MiMEP) Forum co-organised with the Construction Industry Council and the Hong Kong Federation of Electrical and Mechanical Contractors in June 2021 to promote the use of innovative MiMEP technologies in the E&M trade. Both forums in physical and online formats were well-received by the trade.

Another major trade event was the EMSD Symposium held online in January 2022. Inspired by Carbon Net-Zero, Innovation and Infinite opportunities, the symposium of this year took "CO-innovinity" as its theme and attracted over 1 400 participants from local, Mainland and overseas government departments, public organisations, the I&T sector, the E&M trade and academia to explore ways to promote carbon neutrality and collaboration in innovation.

To celebrate our silver jubilee, we held the EMSTF 25th Anniversary Commemorative Ceremony in August 2021, which was officiated by Mr John Lee, the then Chief Secretary for Administration. The theme of the ceremony and related celebrations was "Co-innovate and Co-create Our Future". The day also marked the official opening of the E&M InnoFoyer, a gallery at our headquarters, to showcase our I&T projects to the trade and the public.

The Global AI Challenge for Building E&M Facilities was also launched during the anniversary ceremony, aiming to promote the application of semantic artificial intelligence (AI) in existing E&M systems of buildings. Over 2 000 participants



◀ 2021年7月，機電署與香港機電業推廣工作小組在教育及職業博覽中舉辦機電業博覽2021，藉此向年輕一代推廣機電行業。

In July 2021, the EMSD and the Hong Kong Electrical and Mechanical Trade Promotion Working Group held the Electrical and Mechanical Expo 2021 in the Education & Careers Expo to promote the industry to the younger generation.

▼ 機電工程營運基金25周年紀念典禮已於2021年8月順利舉行，主題為「同・創・傳・期」。時任政務司司長李家超先生(左六)主持啟動儀式。

The EMSTF 25th Anniversary Commemorative Ceremony was successfully held in August 2021 under the theme of "Co-innovate and Co-create Our Future". Mr John Lee, the then Chief Secretary for Administration (6th left) officiated at the ceremony.



▶ 機電署與廣州市人力資源和社會保障局促成並派員見證職業訓練局、中華電力有限公司與廣州市工貿技師學院簽訂《穗港電業工程人才培養合作備忘錄》。該備忘錄旨在加強穗港兩地人才共融與發展。

The EMSD and the Guangzhou Municipal Human Resources and Social Security Bureau facilitated and sent representatives to witness the signing of the Memorandum of Co-operation on the Training of Electrical Engineering Talent in Hong Kong and Guangzhou by the Vocational Training Council, the CLP Power Hong Kong Limited and the Guangzhou Industry and Trade Technician College. The memorandum aimed to strengthen the integration and development of talent in Guangzhou and Hong Kong.

來自世界各地的科研人員、學生、初創公司和企業等親身到場或在線上參加技術交流研討會，全球更有120多支團隊報名參加人工智能大賽。參加者反應熱烈，活動大獲成功，正好體現了學術界和業界人士共享共創探討建築機電人工智能的發展。

年內，我們繼續努力協助機電業界吸引更多年輕新血投身機電行業。2021年7月，我們再次參加教育及職業博覽，在博覽會現場舉辦機電業博覽2021。此外，為歡迎剛剛加入機電業的年輕生力軍，我們與香港機電業推廣工作小組於2021年11月再次合辦「機電・啟航2021」迎新典禮，當日有數百名朝氣蓬勃、來自香港各大機電機構的新晉見習技術員出席，非常熱鬧。

儘管疫情持續，我們與廣州市人力資源和社會保障局繼續合作，按合作備忘錄舉辦各項活動，包括為部門的見習技術員提供跨境線上培訓。2021年，廣州市技師學院、廣州市工貿技師學院、廣州市交通技師學院及廣州市機電技師學院為我們提供五個線上培訓課程，內容有關電氣、空調、屋宇裝備及車輛維修，每個課程為約20名見習技術員提供培訓。

機電署在推動跨境培訓方面取得突破，促成中華電力有限公司(中電)、職業訓練局(職訓局)及廣州市工貿技師學院合辦培訓課程，讓香港機電從業員可考取內地「特種作業操作證(高壓電工證)」，以便日後在大灣區工作。中電、職訓局及廣州市工貿技師學院已於2021年10月以線上形式簽署合作備忘錄，有關課程將於2022年7月開課。

◀ 機電署與廣州市人力資源和社會保障局簽訂多份合作備忘錄，與廣州市多個技師學院合作，為見習技術員舉辦線上培訓課程，讓他們在疫情期間仍可繼續學習。

The EMSD signed a number of memoranda of co-operation with the Guangzhou Municipal Human Resources and Social Security Bureau and co-organised online training programmes with various technician colleges in Guangzhou for technician trainees to continue their studies during the epidemic.



including researchers, students, start-up companies, and corporations from worldwide joined the physical or online technical conference while more than 120 teams from around the world enrolled in the AI contest. The inaugural event was successfully held and has aroused enthusiastic responses from the academics and the trade to share and to co-innovate on the development of AI for the building E&M sector.

Our efforts to help the E&M trade attract more young talent continued in 2021 by holding an on-site Electrical and Mechanical Expo 2021 again in the Education & Careers Expo in July 2021. For young people who had recently joined the E&M industry, we co-organised with the Hong Kong Electrical and Mechanical Trade Promotion Working Group the "E&M GO! 2021!" Orientation Ceremony in November 2021 to welcome them on board. The ceremony was well attended by hundreds of enthusiastic new technician trainees (TTs) from major E&M organisations in Hong Kong.

Despite the epidemic, we have continued our cross-border online training for TTs, a joint initiative under our Memorandum of Co-operation (MoC) with the Guangzhou Municipal Human Resources and Social Security Bureau. In 2021, the Guangzhou Technician College, the Guangzhou Industry and Trade Technician College (GITTC), the Guangzhou Communications Technician Institute and the Guangzhou Electromechanical Technician College delivered five online training programmes in electrical, air-conditioning, building services and vehicle trades, each taking about 20 TTs.

The EMSD has also achieved a breakthrough in the promotion of cross-border training by facilitating the co-organisation of a joint training programme by the CLP Power Hong Kong Limited (CLP Power), Vocational Training Council (VTC) and GITTC. The programme equipped trade practitioners in Hong Kong to pursue a licence for electrical work on high voltage installations on the Mainland, enabling them to work in the Greater Bay Area in the future. An MoC was signed online by the CLP Power, VTC and GITTC in October 2021. The class will be commenced in July 2022.

## 企業管理 Corporate Stewardship

### 利用創科改善內部流程和提高效率

各個企業單位的創科項目亦取得良好進展，並屢獲殊榮，智能貨倉項目就是一例。智能貨倉是結合自動導引車、機械人操作、貨倉管理和電子儲物櫃的四合一創科方案。我們的倉庫配備移動式貨架，配送過程自動化，真正實現智能貨倉的理念。整個流程（由提交取件表格到收取貨件）全面自動化和電腦化，貨件到達電子儲物櫃後，系統會自動發出短訊通知用戶提貨。自智能貨倉於2021年5月投入運作以來，我們貨倉的儲存量和運作效率已見提高。

智能貨倉由構思至完成只需短短一年時間，堪稱政府公營部門改革的典範。該項目於2021年7月在政府資訊科技總監辦公室舉辦的「促進機械人科技應用」創新比賽中亦榮獲二獎。

另一創科項目智慧標書系統，旨在讓策略業務單位透過一站式程序編製標準招標文件，從而提高招標文件的質素和招標工作的效率。智慧標書系統在2021年7月1日推出，可自動為同事提供多種標準招標文件。為優化系統，我們於同年12月進行用戶體驗調查，蒐集同事的意見，並與他們分享調查結果。同事建議的各種改善措施已於2022年納入智慧標書系統內。

為配合政府的「智慧出行」措施，我們於2022年2月在總部大樓推出「智能停車場管理系統」試驗計劃。項目運用傳感器和「政府物聯網」蒐集的數據，讓申領「外勤行車津貼」的員工透過智能預約系統流動

▼▶(左)機電署智能貨倉團隊獲時任創新及科技局局長薛永恒先生(左三)頒發「促進機械人科技應用」創新比賽的二獎。(右)機電署總部大樓的綜合智能貨倉。  
(Left) The EMSD Smart Warehouse team received the first runner-up award in the “Leading Towards Robotics Technologies” Innovation Competition from Mr Alfred Sit, the then Secretary for Innovation and Technology (3rd left). (Right) Integrated Smart Warehouse in the EMSD Headquarters.



### Improving Internal Processes and Boosting Efficiency by I&T

Meanwhile, I&T projects of our corporate units have made good progress and won accolades. An example is the Smart Warehouse project, a four-in-one I&T solution integrating automatic guided vehicles, robot control, warehouse management and e-locker systems. With moveable shelves for automatic delivery, our warehouse is now truly intelligent. The entire process starting from order submission to item collection has been fully automated and computerised, and users will be notified of parcel arrival in the e-locker for pickup via an SMS message. Since the Smart Warehouse came into operation in May 2021, our storage capacity and efficiency has been enhanced.

Conceived and completed within only a year, the Smart Warehouse is a fine example of the Government's public sector reform. It also finished the first runner-up in the “Leading Towards Robotics Technologies” Innovation Competition organised by the Office of the Government Chief Information Officer in July 2021.

Another I&T project, the Smart Tender Document System (STDS), aims to enhance the quality of tender documents and the efficiency of the tendering process by enabling SBUs to compile standard tender documents in one step. Launched on 1 July 2021, the STDS can generate various types of standard tender documents automatically. A user experience survey was held in December 2021 to collect colleagues' feedback for system improvement and the survey results were shared with them. Improvement measures arising from colleagues' comments were incorporated into the STDS in 2022.

To support the Government's Smart Mobility initiative, a trial scheme on the Smart Car Park System was launched at our headquarters in February 2022. By making use of data gathered from sensors and the Government-Wide Internet of Things Network (GWIN), the project enables staff claiming duty mileage allowance (DMA)



▲ 年內，我們在機電署總部大樓推行「智能停車場管理系統」試驗計劃，靈活整合泊車位的安排及裝設泊車位傳感器，利便司機尋找空置的泊車位，增加泊車位的使用率。計劃所得的經驗及成效將有助進一步推動智慧城市發展及促進「智慧出行」。

During the year, a pilot scheme on the Smart Car Park System was launched in the EMSD Headquarters to facilitate drivers' identification of vacant parking spaces and increase the utilisation rate through flexible integration of parking spaces and installation of car park sensors. The experience and results gained from the scheme would help further promote smart city development and foster Smart Mobility.

應用程式，查閱總部大樓70個可供申領「外勤行車津貼」泊車位的實時佔用情況，以減省他們尋找空置泊車位所需的時間。此外，項目亦提高泊車位的使用率和改善用戶體驗。我們會與其他政府部門分享推行試驗計劃的經驗和心得。

機電署第三屆「Inno@E&M 創新科技挑戰賽」於2021年9月展開。這個一年一度的部門內部比賽，旨在鼓勵員工提出有助機電署和其他政府部門運作的創科項目構思，得獎作品可獲部門撥款資助，以實踐構思。今屆比賽的技術主題為「5G及政府物聯網」、「區塊鏈」和「碳中和」。

為提升總部大樓的設施管理和用戶體驗，我們決定由2022年開始，將總部大樓的物業管理服務（包括清潔、園藝、保安、蟲害防治和小型建築維修工程）外判。此舉旨在通過聘用專業的綜合管理服務，讓我們能集中資源處理物管工作，並發揮協同效應。由於物色和聘用承辦商需時，我們於2021年6月推出「維修易」作為臨時的服務改善措施。

「維修易」服務有三名客戶服務主任，負責作為部門員工與建築工程承辦商駐場維修人員之間的溝通橋樑。當總部大樓設施發生故障時，同事可透過WhatsApp、電話熱線、電郵或E&M Connect流動應用程式通知客戶服務主任，後者會立即要求維修人員進行搶修，並盡快向相關同事報告復修進度。有關服務深受同事歡迎，並大幅提升維修工作的效率和用戶體驗。

to obtain real-time information on the 70 parking spaces allocated for DMA via a Smart Reservation System mobile app, thus saving their time for looking for a vacant space. The project also enhances the utilisation of parking spaces and improves user experience. Experience and insights gained from the trial scheme will be shared with other government departments.

We kick-started the EMSD's 3rd Inno@E&M Challenge in September 2021. The annual internal competition aims to encourage our staff to submit I&T project ideas which can benefit the EMSD and other government departments, and funding support will be provided for the implementation of the winning entries. The technical themes of the competition in the year were “5G and GWIN”, “Blockchain” and “Carbon Neutrality”.

To enhance our facility management and user experience, we decided to outsource the property management services, including cleaning, gardening, security, pest control and minor building maintenance, of our headquarters from 2022 onwards. The move aims to focus our resources and create synergy by employing integrated professional management services. As the outsourcing procurement took time, an “Easy Repair” service was introduced in June 2021 as an interim service improvement measure.

Under the “Easy Repair” service, three customer service officers acted as a bridge between our staff and the on-site maintenance personnel from a building works contractor. Any fault reports on the facilities of our headquarters can easily be made to the customer service officers via WhatsApp, a telephone hotline, email and the E&M Connect mobile app. The customer service officers will alert the maintenance staff immediately for appropriate action and provide prompt feedback to the colleagues concerned about the rectification progress. The service was well received by colleagues and has greatly enhanced maintenance efficiency and user experience.

## 企業管理 Corporate Stewardship



▲▶ 2021年員工滿意度調查的回應率高達50%，而整體員工滿意度指數為7.6分(以10分為滿分)，兩者均創歷史新高。調查進行期間，我們舉辦了多場實地宣傳工作，以提升回應率。In the 2021 Staff Satisfaction Survey, the EMSD achieved record-high results with a response rate of as high as 50% and an overall staff satisfaction rating of 7.6 out of 10. During the survey period, a number of on-site promotions were conducted to boost the response rate.



### 關懷員工

#### 員工滿意度指數創紀錄新高

在最新的2021員工滿意度調查中，以10分為滿分計，員工滿意度指數為7.6分，回應率為50%，兩者均創歷史新高。事實上，機電署已從多方面改善2021員工滿意度調查的問卷設計和調查方法，包括縮短問卷長度，方便員工作答，並設置攤位讓員工在現場完成問卷，從而提高回應率。近年來，我們根據以往多次員工滿意度調查的結果和相關建議，推出各項措施提高員工滿意度，成效顯著。

#### 疫情下保障員工健康福祉

我們繼續在總部大樓和所有外設辦事處推行多項防疫措施，例如確保充足的防疫物資供應、落實在家工作安排、鼓勵及安排員工及早接種疫苗等。為協助同事改善工作與生活平衡以及管理壓力，我們繼續提供由非政府組織運作的個人輔導熱線服務，還舉辦了八場關於精神、情緒和身體健康的線上研討會，有超過1 500位同事參加。



▶ 同事積極參與機電署舉辦的各種戶外活動，從上山到下山，讓身心得以舒展，強健體魄，紓緩工作及生活壓力。Colleagues participated actively in various outdoor activities organised by the EMSD, exercising from the mountains to the sea, to achieve physical and mental relaxation, improve physical health and relieve stress from work and daily life.

### CARING FOR STAFF

#### Record High Staff Satisfaction Rating

In the latest 2021 Staff Satisfaction Survey (SSS), the EMSD achieved record-high results with a satisfaction rating of 7.6 on a scale of 10 and a response rate of 50%. In fact, the EMSD had improved the design of questionnaire and methodology of the 2021 SSS in various ways, including shortening the questionnaire to make it easier to complete and setting up booths to enable staff to complete the questionnaires on-site, which boosted the response rate. Measures taken to raise staff satisfaction in recent years based on survey findings and suggestions from previous SSSs have proved effective too.

#### Safeguarding the Health and Wellbeing of Staff under COVID-19

We continued to implement various anti-epidemic measures at the headquarters and all outstation offices, such as ensuring the adequacy of anti-epidemic supplies, implementing the work-from-home arrangements, encouraging and arranging for staff to get vaccinated early. To help colleagues improve work-life balance and manage stress, we continued to provide personal counselling hotline service operated by non-governmental organisations (NGOs) and also held eight webinars on mental, emotional and physical health, which were attended by over 1 500 participants.

◀ 機電署員工康樂會四位代表參加首屆機電工程署員工康樂會與政府資訊科技專業人員協會友誼電競足球比賽，眾多同事到場為他們打氣，充分展現團隊精神。

Four representatives of the EMSD Staff Club participated in the first FIFA e-sports competition between the EMSD Staff Club and the Government Information Technology Professionals Association. In a show of strong solidarity, a number of colleagues cheered them up on-site.



### 舉辦精彩活動推動員工參與

隨着疫情於2021年下半年有所緩和，我們舉辦了更多員工活動，包括智析「耕」活動。活動有約50名同事參加，他們在總部大樓露天廣場的水耕種植花園，學習運用深水種植法栽種植物。另外我們也舉辦了「電競比賽機電足智盃2.0」，四名優勝者更出線參加首屆機電工程署員工康樂會與政府資訊科技專業人員協會的友誼電競足球比賽。

我們還參加多項體育賽事，包括「愛跑·河上鄉」、乒乓球、籃球和羽毛球比賽，以及「北區室內賽艇錦標賽」。我們又為同事舉辦跑步和龍舟訓練班，潛水和獨木舟課程，網球、保齡球和羽毛球同樂日，以及機電網球友誼賽。同時，我們在疫情反彈期間舉辦「機電喜動2.0」虛擬運動挑戰項目，以及繼續每月舉行深受同事歡迎的「同您ZOOM—ZOOM」線上講座系列，內容更多姿多采，包括有關健康、飲食、運動、生活文化、藝術、園藝和音樂治療等方面的不同主題。

去年推出的「[員]來關你事」項目大受歡迎，有見及此，我們繼續為員工提供有關機電署改善工作流程和其他相關事宜的最新資訊。我們繼續為各部別進行翻新工程，為總部大樓的設施噴灑抗病毒殺菌塗層，並在總部大樓及外設辦事處安裝高效空氣淨化機。此外，我們把總部大樓的35扇門更換為自動門，改善15個無障礙洗手間的通道，方便員工和訪客使用。



### Vibrant Activities for Promoting Staff Engagement

As the epidemic eased in the latter half of 2021, more staff activities were organised, including a hydroponic planting event, which brought around 50 colleagues to the hydroponic garden at our headquarters piazza to learn how to grow plants using deep-water planting methods. In addition, we organised an e-sports soccer competition that took four winners to the first e-sports tournament between the EMSD Staff Club and the Government Information Technology Professionals Association.

We also participated in a variety of sports events, including the Lifewire Run, a table tennis, a basketball and a badminton tournament, and the North District indoor rowing competition. We also organised running and dragon boat trainings, diving and canoeing classes, tennis, bowling and badminton fun days, as well as a tennis tournament for our colleagues. Meanwhile, we launched the "E&M Move 2.0" virtual sports challenge events during the rebound of the epidemic and continued to hold our very popular monthly webinar series "ZOOM with You", covering more topics in health, diet, sports, lifestyle, arts, gardening and music therapy, among others.

Having regard to the success of the "All You Need to Know!" project in the past year, we continued to update staff on EMSD's workflow improvements and other relevant matters. We continued to carry out refurbishment works at various Divisions, sprayed the facilities in headquarters with an antimicrobial coating and installed high-efficiency air purifiers at the headquarters and outstation offices. We also replaced 35 doors at our headquarters with automatic doors, improving access to 15 barrier-free lavatories for the convenience of our staff and visitors.



▲ 最受歡迎的線上活動「同您ZOOM—ZOOM」系列主題趨向多元化，涵蓋飲食、生活文化、音樂、運動、藝術及園藝等，讓同事保持身心健康。The themes of the most popular "ZOOM with You" online series become more diversified, covering diet, lifestyle, music, sports, arts, gardening, etc., to help colleagues maintain physical and mental health.

◀ 在2021年下半年疫情緩和，我們為同事舉辦多項活動，例如水耕種植和「聖誕環保家居DIY比賽」等，讓他們輕鬆一下。

When the epidemic eased in the second half of 2021, activities such as hydroponic planting and a DIY competition on eco-friendly decoration for Christmas were organised for colleagues to chill out.

## 企業管理 Corporate Stewardship



▲ 為促進同事進行技術交流及鼓勵良性互動，我們根據同事瀏覽及使用網頁的習慣，逐步優化「知識羣體網站」網頁。To facilitate technical exchanges and encourage constructive interaction among colleagues, the webpage of Knowledge Community Portal was enhanced progressively having regard to the browsing and usage habits of the staff.

▼ 機電署三位同事盡忠職守，以竭誠專業的態度服務市民，在2021年獲頒公務員事務局局長嘉許狀。Three EMSD colleagues were awarded the Secretary for the Civil Service's Commendation in 2021 in recognition of their dedication in serving the community with professionalism and perseverance.



知識管理能讓員工緊貼技術和專業知識的最新發展，也能培養部門人員重視知識分享的文化，其重要性無容置疑。我們優化「知識羣體網站」，使瀏覽網頁、登記參加活動、擷取知識和創建新網頁以分享資訊等程序更快捷方便，從而鼓勵同事增加互動交流。

Knowledge management is important to ensuring that our staff keep up with the latest development in technical and professional knowledge and foster a culture of knowledge sharing. We have revamped the Knowledge Community Portal to make browsing, event registration, access to knowledge and the creation of new webpages for information sharing much faster and more user-friendly, thus encouraging more interaction among colleagues.

年內，我們也在內部傳訊活動中加入機電署兩個吉祥物「機智啤啤」和「智析寶寶」，加強與員工之間的溝通，例如舉辦「機智啤啤」聖誕服飾設計大賽，深受同事歡迎。

During the year, we also integrated the EMSD's two mascots, Witty Bear and KnowBot, into our internal communications to better engage the staff. An example was a competition to design a Christmas outfit for Witty Bear, which many colleagues enjoyed.

### 部門內外的獎項

我們一年一度的「品質及安全日」於2021年11月舉行，演講嘉賓就智能工地安全和「建築信息模擬—資產管理」分享真知灼見，大會也向員工團隊頒發獎項，表揚其項目對提升部門工作質素、職業安全 and 健康作出的貢獻。

### Internal and External Awards

Our annual Quality and Safety Day was held in November 2021, with speakers sharing their insights into smart site safety and Building Information Modelling-Asset Management. Prizes were presented to staff teams to recognise projects that contributed to the improvement in the EMSD's performance in quality, occupational safety and health at work.

年內，我們的同事也贏得多個部門以外的獎項。除了機電署24位同事投入抗疫工作貢獻良多，榮獲行政長官公共服務獎狀之外，另有三位同事憑着卓越表現獲頒公務員事務局局長嘉許狀。此外，兩位同事表現出色，獲頒申訴專員嘉許獎。

During the year, our colleagues also received many external awards. In addition to 24 EMSD colleagues who were awarded the Chief Executive's Commendation for Government/Public Service for their significant contribution to the anti-epidemic work, three colleagues were honoured with the Secretary for the Civil Service's Commendation Award for their excellent performance. Moreover, two colleagues received the Ombudsman's Awards for their outstanding work.

機電署在培育人才方面的努力也備受肯定。我們的技術員訓練計劃「SPARK計劃」獲香港管理專業協會頒發2021年最佳管理培訓及發展獎「培訓及發展計劃獎項」銀獎，以及四項特別獎，分別為職涯發展特別獎、未來技能發展特別獎、未來人才發展特別獎，以及業界最喜愛培訓及發展項目。

The EMSD's efforts to nurture talent received recognition too. Our Technician Training Scheme, namely SPARK Programme, has won the silver award in the Campaign Awards category and four special awards, namely Excellence in Career Development, Excellence in Future Skills Development, Excellence in Future Talent Development and HR Professionals' Favourite Campaign, in the Award for Excellence in Training and Development 2021 organised by the Hong Kong Management Association.

機電署三名見習技術員早前在世界技能大賽香港區代表選拔賽「電氣安裝」項目中獲得頭三名次，成功出線代表香港參加於2021年12月在線上舉行的第11屆穗港澳青年技能競賽。在該賽事中勝出的選手接受進一步訓練後，會繼續代表香港參加2022年11月在奧地利舉行的世界技能大賽2022（特別版）。至於同樣來自機電署，在「空調及製冷」項目總決賽中勝出的選手，在接受進一步訓練後，也會代表香港在10月往德國出戰賽事。

Three EMSD technician trainees who had earlier taken the top three prizes in the WorldSkills Hong Kong Competition in the Electrical Installations trade, represented Hong Kong to compete in the 11th Guangzhou/Hong Kong/Macao/Chengdu Youth Skills Competition held online in December 2021. The winner will go on to represent Hong Kong at the WorldSkills Competition 2022 (Special Edition) to be held in Austria in November 2022 after further training. The finalist in the Refrigeration and Air Conditioning trade, also from EMSD, will represent Hong Kong to compete in the WorldSkills Competition in Germany in October too after further training.

我們亦贏得其他獎項，包括發展局與建造業議會合辦的第27屆公德地盤嘉許計劃金獎、銀獎及兩項優異獎。我們也參與建造業議會舉辦的「生命第一」安全推廣活動，展現部門對工地安全的領導方針和承擔，並獲得最積極參與業主獎。

Other accolades included a Gold Award, a Silver Award and two Merit Awards in the 27th Considerate Contractors Site Award Scheme jointly organised by the Development Bureau and Construction Industry Council (CIC). We also participated in CIC's "Life First" Safety Promotional Campaign, demonstrating the EMSD's leadership and commitment to site safety, and received the Most Engaging Client award.



▲ 機電署的技術員訓練計劃「SPARK計劃」榮獲香港管理專業協會頒發2021年最佳管理培訓及發展獎銀獎及四項特別獎，以表揚機電署為培育專業機電人員及提升市民生活質素所付出的努力。The EMSD's Technician Training Scheme, namely SPARK Programme, received a silver award and four special awards in the Award for Excellence in Training and Development 2021 organised by the Hong Kong Management Association in recognition of its commitment to nurturing E&M professionals and improving the quality of life of the public.





## 企業管理 Corporate Stewardship

### 社區參與扶助貧困

#### 支援長者

機電署一直秉持優良傳統，參與義工服務，幫助社會上的弱勢社羣。我們最新於2021年12月推出「機電扶老樂安心」計劃，由部門員工康樂會與多個機電業界組織和非政府機構聯合舉辦。該計劃安排義工為弱勢長者提供電力安全檢查和維修服務。員工康樂會負責統籌工作，機電業界組織提供資源和人力支援，非政府機構則轉介個案。

### COMMUNITY ENGAGEMENT AND HELPING THE NEEDY

#### Supporting the Elderly

The EMSD has a good tradition of providing voluntary community services to help the underprivileged groups in society. The latest example is our "Caring E&M Services for the Elderly" programme launched in December 2021, which was a joint initiative between the EMSD Staff Club and various E&M trade organisations and NGOs. Under the programme, volunteers were arranged to provide electrical safety inspection and maintenance services for the underprivileged elderly. The EMSD Staff Club was responsible for the co-ordination of the programme, with resources and manpower support provided by the E&M trade organisations and cases referred by NGOs.



▲醫院管理局行政總裁高拔陸醫生(左四)、機電署署長彭耀雄先生(右四)，以及機電署管理團隊在2021年11月一同出席「樂齡科技博覽暨高峰會」。Dr Ko Pat-sing, Chief Executive of the Hospital Authority (4th left), Mr Pang Yiu-hung, Director of Electrical and Mechanical Services (4th right), and the EMSD senior management attended the Gerontech and Innovation Expo cum Summit in November 2021.



▲機電署同事向來賓介紹便利長者日常生活的創科展品。Our colleague introduced to visitors various I&T exhibits that can bring convenience to the daily lives of the elderly.

我們也提倡樂齡科技，並支持其研發與應用工作，讓本港的長者活得更安康。機電署於去年11月參加由政府與香港社會服務聯會合辦的「樂齡科技博覽暨高峰會2021」，並於博覽會上展示如何應用機械人技術，在安老院舍進行物資派送和清潔工作，以減少員工的工作負擔和染疫風險。

We also advocate and support the development and use of gerontechnologies to enable healthy aging for the elderly in Hong Kong. The EMSD participated in the Gerontech and Innovation Expo cum Summit 2021 jointly organised by the Government and the Hong Kong Council of Social Service last November. At the Expo, we showcased the application of robotics in performing delivery and cleaning duties in residential care homes for the elderly to reduce staff workload and the risk of infection.

#### 關心社會

年內，我們繼續推行「好人好事嘉許計劃」，以推廣互相關愛和彼此欣賞的文化，肯定社會服務的價值。根據該計劃，熱心服務社會員工可獲提名及嘉許。2021/22年度共有11項「好人好事」入圍。

#### Reaching Out to the Community

We continued to implement our "Good People, Good Deeds Commendation Scheme" in the year with the aim to foster a culture of care and appreciation and to recognise the value of social service. Under the Scheme, staff were nominated and awarded for their dedicated service to the community. Eleven entries were shortlisted in the 2021/22 contest.

▶「機智啤啤」除了現身機電署總部探訪同事外，亦參與學校講座、展覽活動等外展活動，以提升公眾的機電安全意識，以及加深市民對機電署的認識和印象。

Apart from visiting colleagues at the EMSD Headquarters, Witty Bear also participated in other outreach activities such as school talks, exhibitions and events to promote the E&M safety awareness of the general public, as well as enhancing their understanding and impression of the EMSD.



◀機電署吉祥物「機智啤啤」和「智析寶寶」通過社交平台、線上及戶外宣傳活動，加強與公眾的互動，有效推廣各種機電小知識。「機智啤啤」Facebook和Instagram專頁(@emswittybear)至今已吸引逾11 000人追蹤最新動態。Witty Bear and KnowBot, the mascots of the EMSD, have strengthened the engagement with the general public through their social media platforms, online and other outdoor promotional activities, in which E&M knowledge and tips were effectively promoted. The Facebook and Instagram pages of Witty Bear (@emswittybear) have now attracted more than 11 000 followers.

我們的兩個吉祥物「機智啤啤」和「智析寶寶」首次在社交媒體Facebook和Instagram亮相，協助向公眾宣傳機電署的訊息，增加我們與市民的互動。此外，我們委派「機智啤啤」參與外展計劃，包括出席學校講座、展覽和活動等。我們的吉祥物年內已造訪多間幼稚園及小學，向年輕一代宣傳機電安全及能源效益。

Our two mascots, Witty Bear and KnowBot, debuted on the social media, including Facebook and Instagram, helping to share the EMSD's messages with the public, and strengthening our engagement with the community. In addition, we have deployed Witty Bear to participate in outreach programmes such as school talks, exhibitions and events. Our mascot made visits to various kindergartens and primary schools during the year to promote E&M safety and energy efficiency to the younger generation.

其他社區服務方面，我們的義工參加建造業運動及義工計劃下的「建造業海岸清潔日2021」，同事及其親友在2021年7月一個周末前往大嶼山大浪灣清潔海灘。我們亦於2021年12月在中電愛跳舞計劃下舉辦一場跳舞活動，義工透過跳舞推廣節約能源，同時亦讓中電為有需要的人提供電費資助。另外，在2022年1月至2月期間，同事在公餘時間抽空編織了超過75條圍巾和冷帽捐贈給長者，在寒冬下送暖。

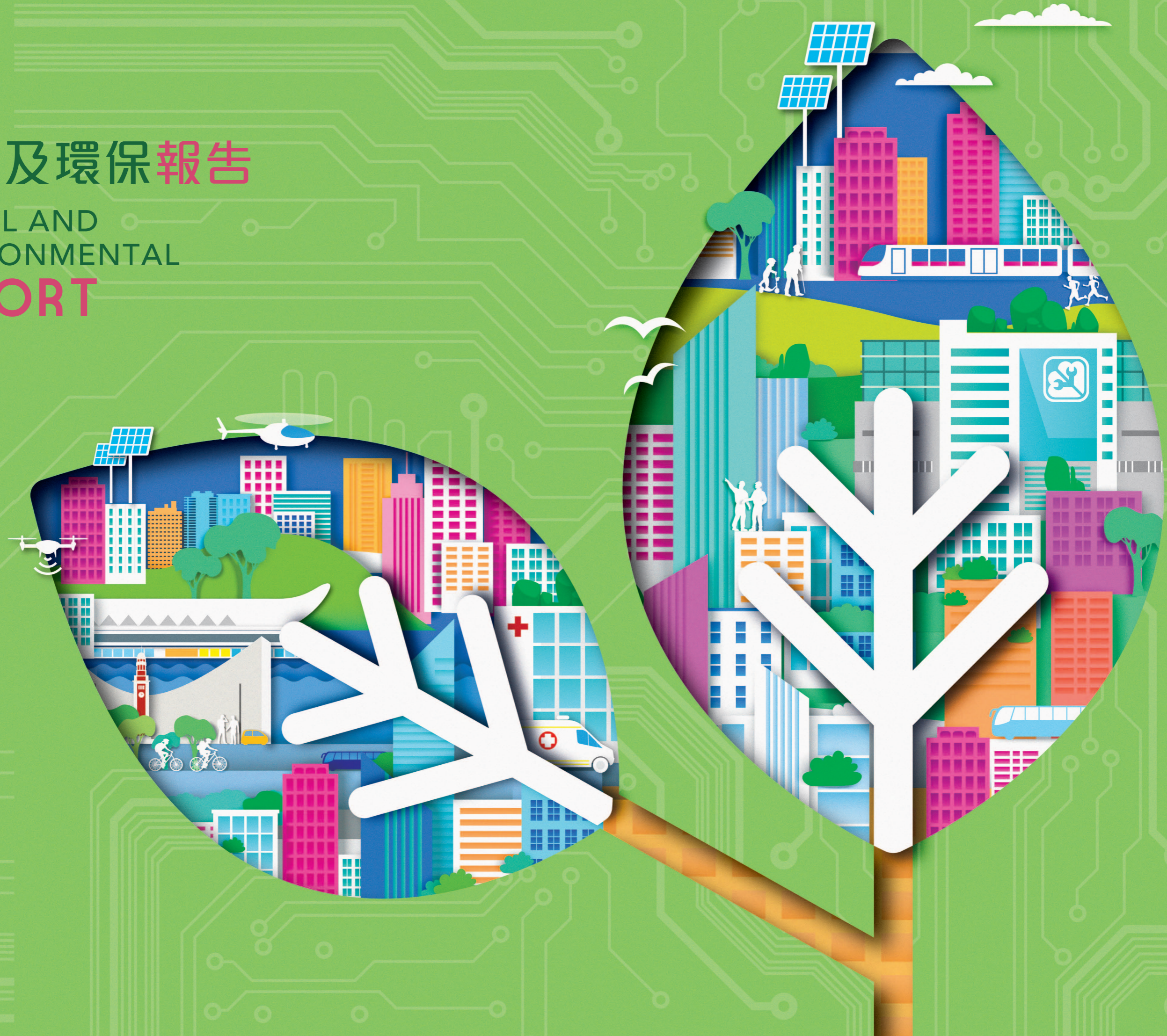
For other community services, our volunteers participated in the Construction Industry Shoreline Clean-up Day 2021 under the Construction Industry Sports & Volunteering Programme, where colleagues and their families and friends cleaned up the beach at Tai Long Wan on Lantau Island on a weekend in July 2021. We also organised a dancing session under the CLP We Love Dance programme in December 2021, where our volunteers promoted energy saving through dancing, and at the same time, allowed CLP Power to provide electricity subsidies to people in need. Furthermore, between January and February 2022, colleagues contributed their own time and knitted over 75 scarves and hats for donation to the elderly, bringing them warmth during the cold winter days.

待疫情進一步緩和，我們的義工團隊會恢復其他社會服務，繼續為市民服務。

Once the epidemic further eases, our volunteers will resume other community services to serve the public once again.

# 社會及環保報告

## SOCIAL AND ENVIRONMENTAL REPORT



# 關於本報告

## About this Report

### 匯報原則

機電工程署(機電署)持續每年發表社會及環保報告，向持份者匯報部門最新的可持續發展績效。本社會及環保報告2021/22(本報告)披露及概述機電署於年內致力推行的環境和社會措施以及工作成果。

本報告根據全球報告倡議組織發布的2021年全球報告倡議組織標準編寫，並參照環境保護署的《環保報告指引—管制人員適用》和聯合國可持續發展目標。機電署依循利益相關者包容性、可持續發展背景、實質性及完整性的報告原則，界定了本報告的內容，同時確保報告的準確性、平衡性、清晰度、可比性、可靠性和時效性，以維持報告質素。

相關的全球報告倡議組織和可持續發展目標的指標及對照的本報告章節已載於第198頁的**全球報告倡議組織內容索引—基礎**，並附有其他適用的補充資料。為確保本報告的準確性、可靠性及公信力，機電署已委託獨立第三方核實本報告。**獨立保證意見聲明書**已載於第225–226頁。

本報告已通過全球報告倡議組織的「實質性議題審核」，確定當中的全球報告倡議組織內容索引闡述清晰，2-1至2-5、3-1及3-2披露議題的參照索引與本報告內文的相應章節一致。

### 報告範圍

本報告載述機電署於2021/22財政年度(由2021年4月1日至2022年3月31日)在可持續發展方面的主要工作成果，內容涵蓋年內各項可持續發展措施及計劃的資料和主要數據。除另外說明，本報告中所有數據均為部門於知悉範圍內所整合的標準化實際數字，所有財務數據的金額均以港元為單位。

機電署轄下設有規管服務及營運服務兩大服務範疇，後者亦稱為機電工程營運基金(營運基金)。於匯報期內，機電署的權責關係、規模、架構或供應鏈均無重大變化。

### REPORTING PRINCIPLES

To share our latest sustainability performance with stakeholders, the Electrical and Mechanical Services Department (EMSD) continues to publish its Social and Environmental Report annually. This Social and Environmental Report 2021/22 (hereafter “this Report”) discloses and highlights our commitments and achievements in creating value for the environment and community during the year.

This Report has been produced in accordance with the GRI Standards 2021 published by the Global Reporting Initiative (GRI), and taking reference from A Guide to Environmental Reporting for Controlling Officers published by the Environmental Protection Department and the United Nations Sustainable Development Goals (SDGs). When defining the content of this Report, the EMSD has followed the reporting principles of Stakeholder Inclusiveness, Sustainability Context, Materiality and Completeness. The EMSD has also observed the principles of Accuracy, Balance, Clarity, Comparability, Reliability and Timeliness, to achieve high reporting quality.

Please refer to the **GRI Content Index** on page 198 to provide a cross-reference of relevant GRI Standards and SDGs indicators that correspond to various sections of this Report, supplemented by further information where applicable. In order to ensure the accuracy, reliability and credibility of this Report, the EMSD has engaged a third party to provide independent assurance of this Report. Please refer to the **Independent Assurance Opinion Statement** on page 225–226.

In addition, this Report has been reviewed by the GRI Content Index-Essentials Service to confirm that the enclosed GRI Content Index is clearly presented and the references for Disclosures 2-1 to 2-5, 3-1 and 3-2 align with appropriate sections in this Report.

### REPORTING SCOPE

This Report covers major sustainability achievements of the EMSD by providing descriptions and key statistics of the EMSD’s sustainability initiatives and programmes in progress during the fiscal year 2021/22 (from 1 April 2021 to 31 March 2022). All data in this Report are standardised and presented in absolute figures to the best of our knowledge unless otherwise stated. All financial data are presented in Hong Kong Dollars unless otherwise specified.

Regulatory Services and Trading Services are two functional units of the EMSD. The latter is known as the Electrical and Mechanical Services Trading Fund (EMSTF). There were no major changes in the EMSD’s departmental ownership, size, structure or supply chain during the reporting period.

### 重要議題及邊界

為確保報告範圍符合全球報告倡議組織標準，機電署一如既往舉行持份者參與活動，以助編製本報告。我們希望透徹了解持份者對機電署運作及服務的關注度和期望，因此廣泛蒐集持份者對於本署可持續發展工作的反饋並進行重要性評估，然後界定環境、社會及經濟範疇下重要議題的優先次序。

機電署近年識別了多個主要持份者組別並邀請他們參與諮詢，包括員工、客戶、承辦商/供應商、學術團體、業界及專業團體。我們自2014/15年度開始，每年聘請獨立外界顧問就編製可持續發展報告進行多類持份者參與活動，以聽取和闡釋各方的意見。2022年4月，我們透過問卷調查諮詢了員工代表及多個專業團體。

### MATERIAL TOPICS AND BOUNDARIES

To scope reporting content according to requirements of the GRI Standards, the EMSD continued to organise stakeholder engagement activities for developing this Report. It is crucial to understand stakeholders’ interests and expectations regarding to the EMSD’s operations and services. By collecting feedback from stakeholders on our sustainability efforts and conducting materiality assessment, we are able to prioritise material topics in environmental, social and economic areas.

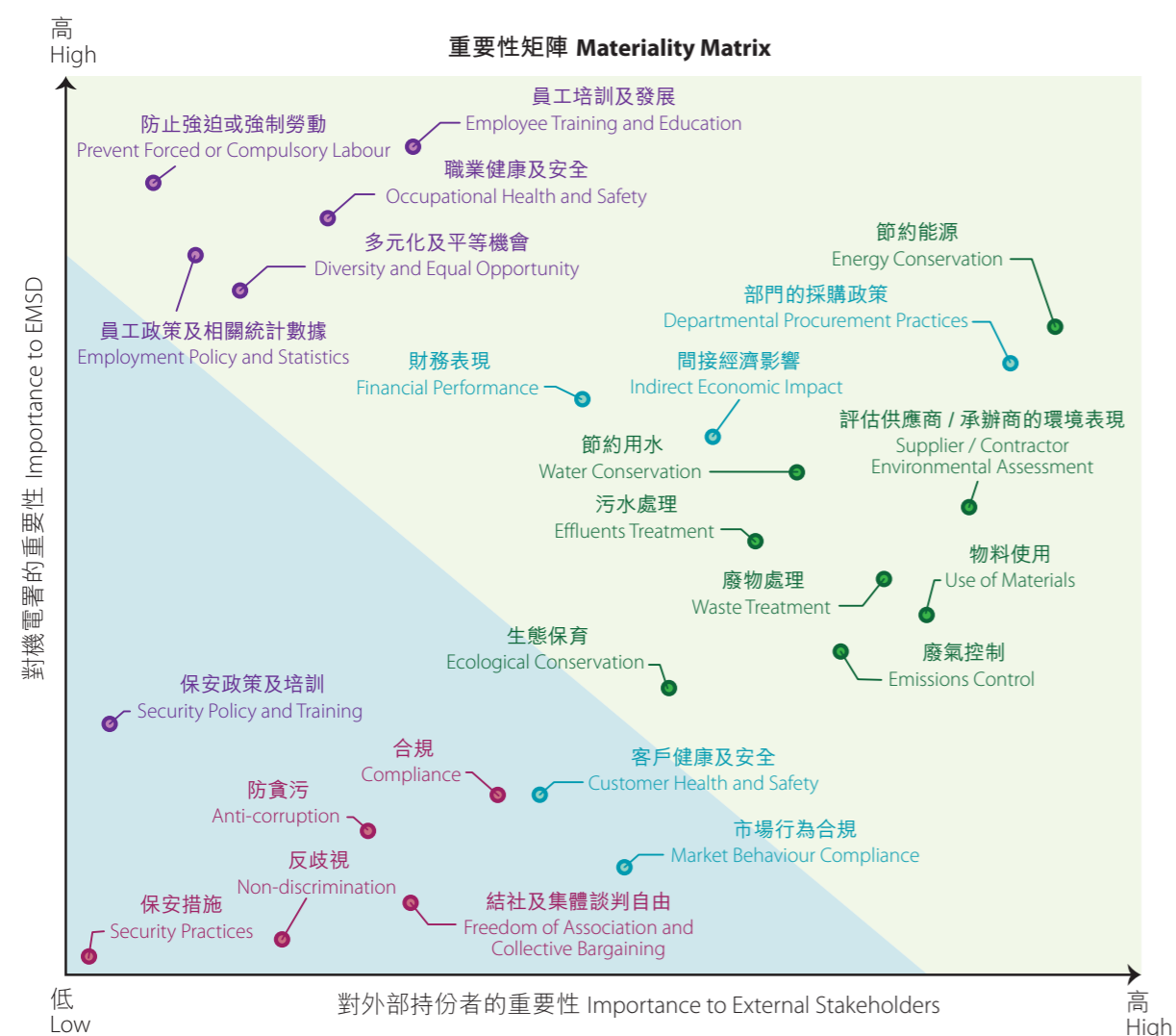
The EMSD has identified and engaged a number of key stakeholder groups, such as our staff, clients, contractors/suppliers, academia, trades, and professional associations, in recent years. Since 2014/15, an independent external consultant has been appointed by the EMSD to conduct annual stakeholder engagement activities for sustainability reporting to gauge and elucidate opinions across the board. In April 2022, a survey was conducted to invite input from staff representatives and professional associations.



# 關於本報告 About this Report

以下的重要性矩陣列出本報告的重要性評估結果，並概述我們選出的24個可持續發展議題的總體關注度、重要性和意義，以供持份者參考。最相關或重要的議題置於分界線的右上角。如下表所列，本報告共識別出16項重要議題。

The materiality assessment results for this Report are summarised in the following materiality matrix, which provides an overview of the collective interest, importance and significance of 24 selected sustainability topics to our stakeholders. The most relevant or material topics are located in the upper right corner above the cut-off line. Out of these topics, we have identified 16 material topics in total, as listed in the table below.



## 重要議題及涵蓋邊界 Material Topics and Corresponding Boundaries

環境 ENVIRONMENTAL			
生態保育 Ecological Conservation	節約能源 Energy Conservation	污水處理 Effluents Treatment	廢物處理 Waste Treatment
廢氣控制 Emissions Control	節約用水 Water Conservation	評估供應商/ 承辦商的環境表現 Supplier/Contractor Environmental Assessment	物料使用 Use of Materials
經濟 ECONOMIC			
財務表現 Financial Performance	部門的採購政策 Departmental Procurement Practices	間接經濟影響 Indirect Economic Impact	
社會 SOCIAL			
員工培訓及發展 Employee Training and Education	多元化及平等機會 Diversity and Equal Opportunity	員工政策及相關統計數據 Employment Policy and Statistics	職業健康及安全 Occupational Health and Safety
防止強迫或強制勞動 Prevent Forced or Compulsory Labour			

✓ 機電署的運作 Operations of the EMSD    ✓ 主要供應商的運作 Operations of our Major Suppliers

歡迎讀者於機電署網站閱覽或下載本報告，並就我們的運作、可持續發展方面的成效、報告內容和方式提出意見及建議，您的寶貴意見有助我們持續改進。如有任何查詢或意見發表，請透過電郵與我們聯絡：ccsd@emsd.gov.hk。

We welcome readers to view or download this Report on the EMSD website. Feedback from readers is valuable for us to continue improving our operations, sustainability performance, reporting content and approach. If you have any enquiries or comments, please contact us at ccsd@emsd.gov.hk.

# 環保及社會概覽

## Environmental and Social Highlights

### 環保成效概覽

#### ENVIRONMENTAL PERFORMANCE HIGHLIGHTS

訂立綠色能源目標，在2020/21至2024/25年度提升能源表現6%  
Green Energy Target of improving energy performance from 2020/21 to 2024/25 by 6%  
(以2018/19年度為基準)  
(2018/19 as baseline)

2021/22年度機電署建築物及其基礎設施能源表現提升  
Improving Energy Performance of EMSD Buildings and Infrastructure Facilities in 2021/22

2.6%



啟德區域供冷系統於2021/22年度節省  
Kai Tak District Cooling System Saves



138

百萬千瓦小時電力  
million kWh of electricity in 2021/22



實施淡水冷卻塔系統每年可節省  
Implementation of Fresh Water Cooling Towers Saves

24.57

百萬千瓦小時電力  
million kWh of electricity per year

機電署建築物於2021/22年度產生的可再生能源  
EMSD Buildings Generated Renewable Energy in 2021/22



~175 000

千瓦小時  
kWh

↑~22.3%

(以2018/19年度的~143 000 千瓦小時為基準)  
(~143 000 kWh in the baseline year 2018/19)

採購環保產品  
Procuring Green Products

佔2020/21年度採購總額逾16.2%  
Over 16.2% of the total purchase volume in 2020/21

超過  
Over

48.4%

佔2021/22年度採購總額  
of the total purchase volume in 2021/22



碳粉及噴墨盒購買和耗用量  
Toner and Inkjet Cartridge Purchases and Consumption

2021/22年度(目標5 249個)  
2021/22 (Target 5 249 no.)



實際用量  
Actual

4 705

個  
no.



用水量  
Water Consumption

2020/21年度(16 177 立方米)  
2020/21 (16 177 m<sup>3</sup>)



2021/22年度用水量  
Water consumption in 2021/22

14 703

立方米  
m<sup>3</sup>

私家車汽油用量  
Gasoline Consumption for Private Vehicles

2021/22年度(目標322 199公升)  
2021/22 (Target 322 199 litre)



實際用量  
Actual

258 801

公升  
litre



### 社會成效概覽

#### SOCIAL PERFORMANCE HIGHLIGHTS



連續第八年榮獲香港社會服務聯會頒發  
「同心展關懷」標誌  
Awarded the **Caring Organisation**  
Logo by the Hong Kong Council of Social Service for the eighth consecutive year



簽署《精神健康職場約章》，  
營造促進精神健康友善的工作環境  
Signed the **Mental Health Workplace Charter** to promote a mental health-friendly workplace



繼續參與《有能者·聘之約章》及共融機構嘉許計劃，  
提倡聘用有特殊需要的人士  
Continued to join the **Talent-Wise Employment Charter** and **Inclusive Organisations Recognition Scheme** to promote employment with special needs

致力實現「零意外」目標  
Strive to Achieve "Zero Accidents"



- 死亡率：0 (員工及承辦商)  
Rate of fatalities: 0 (employees & contractors)
- 嚴重工傷率：0.03 (員工)；0 (承辦商)  
Rate of high-consequence work-related injuries: 0.03 (employees), 0 (contractors)
- 工傷率：0.37 (員工)；0.26 (承辦商)  
Rate of recordable work-related injuries: 0.37 (employees), 0.26 (contractors)



培訓時數  
由138 808小時(2020/21年度)增至  
Training Hours  
increased from  
138 808 hours (2020/21) to

141 047

小時  
hours  
(2021/22)

本署的技術員訓練計劃榮獲香港管理專業協會2021年最佳管理培訓及發展獎銀獎和四個特別獎  
Received a **Silver Award for Excellence in Training and Development 2021** for our Technician Training Scheme, and four special awards, from Hong Kong Management Association (HKMA)



在義工項目合共錄得  
Contributed a total of

302

小時義工服務時數  
man-hours in volunteering projects



機電署年報榮獲  
Our Annual Report was Bestowed with

第36屆ARC國際年報大獎  
The 36th International Annual Report Competition (ARC) Awards  
美國通訊專業聯盟「2021 Vision Awards」  
League of American Communications Professionals (LACP) 2021 Vision Awards  
香港管理專業協會2022年「最佳年報獎」  
2022 HKMA Best Annual Reports Awards



# 可持續發展管理方針

## Sustainability Management Approach

### 管理方針

氣候變化對我們的環境及社會構成重大風險。面對氣候挑戰，機電署致力在日常營運和決策過程中提升可持續性、環境及社會三方面的表現。除了嚴格遵守相關的社會及環境法律和規例，我們也全力推行部門的環境、安全及健康政策。我們努力識別和管理與可持續發展相關的風險，並會盡量減低潛在的負面影響和開拓新機遇，同時廣開渠道，與各界持份者保持聯繫溝通。為優化可持續發展策略及政策，我們不斷尋求有效的解決方案配合政府的倡議，同時緊貼國際趨勢，務求與全球同步前進。

### MANAGEMENT APPROACH

Climate change represents a major risk to our environment and community. The EMSD is committed to enhancing the sustainability, environmental and social aspects of our operations and decision-making process. In addition to strict compliance with applicable social and environmental laws and regulations, we make earnest effort to take forward our environmental, safety and health policies. We strive to identify and manage sustainability-related risks, minimise potential adverse impacts, and explore new opportunities, as well as providing a range of communication channels to maintain close dialogue with our stakeholders. In order to improve our sustainability strategies and policies, we continue to find solutions to respond to government initiatives while better aligning with international trends.

### 在本港及全球推動可持續發展進程

香港一直積極參與全球應對氣候變化的國際倡議，政府已承諾於2050年前實現碳中和。為此，香港正朝着減碳目標努力，以2005年為基準年，在2035年前把碳排放量減半。此外，政府也決心在2020/21至2024/25年度的五年內改善能源表現，目標是在相同的運作條件下比2018/19基準年度的水平提高6%。為促進政府實踐改善能源表現及邁向碳中和的目標，機電署一直悉力優化香港的能源管理規管架構，與此同時為廣大持份者提供協助，包括各界機構和個人，從而創造協同優勢，一起實現共同目標，推進能源效益及減少碳排放。

### Contributing to Local and Global Sustainability Agenda

Hong Kong has been an active participant in global efforts to combat climate change and the Government has pledged to achieve carbon neutrality before 2050. As such, Hong Kong is approaching the target of reducing carbon emissions by 50 percent before 2035 as compared with the 2005 baseline level. The Government is committed to improving energy performance by 6% for the five-year period from 2020/21 to 2024/25, under comparable operating conditions in the 2018/19 baseline. Fully supporting the Government's target of improving energy performance and moving towards carbon neutrality, the EMSD has been applying itself continuously to enhance Hong Kong's regulatory energy management framework, while actively assisting different stakeholders, including organisations and individuals, to promote synergy and common effort towards our shared goal of improving energy efficiency and reducing carbon emissions.

我們以聯合國可持續發展目標作指引，讓本署的可持續發展措施與全球可持續發展進程步伐一致。在17項聯合國可持續發展目標當中，我們識別了八項與我們營運最相關的目標。右頁簡述我們促進這八項目標的貢獻。

Mapping to the United Nations Sustainable Development Goals (SDGs), we align our sustainability initiatives to the global sustainable development agenda. Out of the 17 SDGs, we have identified eight SDGs most relevant to our operations. An outline of how we have contributed to these eight SDGs is presented on the right page.



### 相關聯合國可持續發展目標 RELEVANT SDGS

### 機電署於2021/22年度的貢獻 CONTRIBUTIONS BY THE EMSD IN 2021/22

#### 環境層面 Environmental Aspect



- 針對《香港氣候行動藍圖2050》擬定工作計劃。  
Drew up working plan in response to Hong Kong's Climate Action Plan 2050.
- 定期檢討及實施相關法例、政策、計劃和其他措施，支持香港減碳量。  
Regularly reviewed and implemented relevant legislation, policies, schemes and other initiatives to support carbon reduction in Hong Kong.
- 發布可再生能源和能源效益技術指引及指南供業界參考。  
Issued technical guidelines and guidance notes on renewable energy and energy efficiency for the industry.
- 2021/22年度利用太陽能發電板產生174 933千瓦小時電力。  
Generated 174 933 kWh of electricity with solar photovoltaic panels in 2021/22.
- 2021/22年度採購物資總額中約48.4%為環保產品。  
Green products accounted for approximately 48.4% of total procurement in 2021/22.

詳情請參閱環保成效章節  
Please refer to **Environmental Performance** for details

#### 社會層面 Social Aspect



- 在疫情期間加倍關懷員工的身心健康。  
Stepped up staff wellbeing and health support during the epidemic.
- 繼續透過舉辦一系列培訓課程及計劃推廣職業安全與健康。  
Continued to promote occupational safety and health through a series of training and schemes.
- 促進專業發展及為機電業培育新血。  
Nurtured professional growth and attracted new blood for the E&M industry.
- 參與《有能者·聘之約章》及共融機構嘉許計劃。  
Participated in the Talent-Wise Employment Charter and Inclusive Organisations Recognition Scheme.

詳情請參閱社會成效章節  
Please refer to **Social Performance** for details

# 可持續發展管理方針 Sustainability Management Approach

## 機電署服務的持續發展方針

### 規管服務

本署規管服務團隊的職責範圍涵蓋多種規管及公共教育工作，要旨是保障香港的機電安全和促進能源效益。規管服務經常為公眾及業界舉辦技術工作坊、論壇、研討會和會議，推廣良好作業，倡導各行各業提高能源效益，此外並會向政府提供專業意見和技術指導，以及建議立法和發布各類指引。

### 營運服務

我們的營運服務團隊竭誠為客戶及業界提供優質完備的專業機電服務，範圍涵蓋機電設施的操作、維修保養、工程策劃和顧問服務。我們不斷引入最先進的技術及創新方案，以助客戶持續改善營運場所的能源表現。

### 管理可持續發展相關風險

機電署採取防患於未然的宗旨，我們廣泛推行措施，藉此預防或緩減負面影響，同時不斷尋找改進空間，支持可持續發展。本署已擬備企業及業務計劃，界定與可持續發展相關的風險和機遇，此外亦設有監管機制完善管理風險。我們定期為客戶的機電系統安排預防性檢查和維修保養，並會提供安全可靠的工程方案，滿足他們的需要。

### 持份者的參與

我們每年也藉着不同活動與各界持份者溝通，透過這類平台蒐集意見，據此檢討可持續發展議題的優先次序，作出明智的決策和部署行動，準備周全地迎接可持續發展路上的新挑戰。我們促進持份者參與的主要渠道表列於右頁。

此外，機電署已委託外間的獨立顧問監察持份者參與年度社會及環保報告的流程，有關活動有助我們界定機電署社會及環保報告的優先重要議題。

## Sustainability and our Services

### Regulatory Services

Our Regulatory Services team is responsible for various regulatory and public education tasks to ensure electrical and mechanical (E&M) safety and promote energy efficiency in Hong Kong. Through organising technical workshops, forums, seminars and conferences for the public and industry, the team strives to improve energy efficiency by promoting industry best practices among various sectors. In addition, it provides professional advice and technical expertise to the Government and introduces legislation and guidelines.

### Trading Services

Our Trading Services team provides professional, comprehensive and quality E&M engineering services to our clients and the industry. These services cover operation, maintenance, project management and consultancy on E&M facilities. Leveraging on state-of-the-art technologies and innovative solutions, the team helps clients to continuously improve the energy performance of their premises.

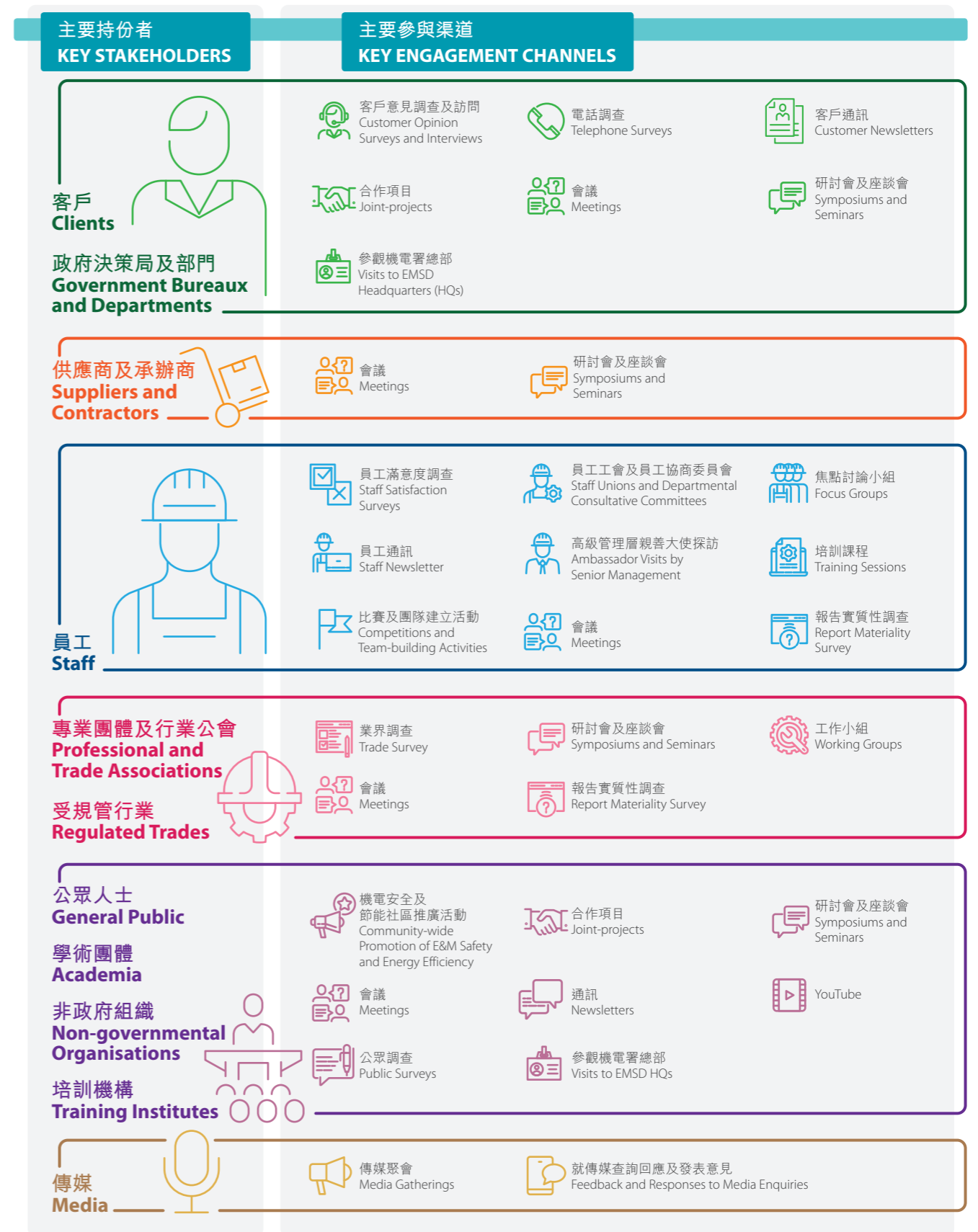
## Managing Sustainability-related Risks

The EMSD widely adopts a risk-based precautionary approach to prevent or reduce undesired effects and to achieve continuous improvement for sustainable development. The EMSD determines sustainability-related risks and opportunities in the Corporate and Business Plan, and develops a control mechanism for effective risk management. To satisfy our clients' demand for safe and reliable engineering solutions, we carry out preventive inspection and maintenance regularly.

## STAKEHOLDER ENGAGEMENT

We engage a wide range of stakeholders through different activities annually. These platforms allow us to review the priorities of sustainability topics and provide guidance for us to make informed decisions and actions to prepare for future sustainability challenges. The table on the right page lists some major channels that have been used for stakeholder engagement.

In addition, the EMSD has appointed an independent external consultant to oversee the stakeholder engagement process for annual Social and Environmental Reports (SERs). These activities aim to prioritise the most relevant material topics to be included in the EMSD SERs.



## 可持續發展管理方針 Sustainability Management Approach

### 聯繫我們的客戶

我們矢志善盡責任，為大眾提供優質的工程服務方案。為此，我們不斷加強與客戶溝通合作，並委託獨立市場研究公司每兩年進行一次客戶意見調查，以創造更愜意的客戶體驗。我們於2020年進行的最新調查，整體客戶滿意指數為6.83分（以8分為滿分）。

除此之外，我們也運用「顧客為本電子平台」與客戶分享數據，讓他們了解本署的工作進度。電子平台可優化現行的工作管理系統及改善流程，從而提高委派工作和追蹤工作進度的效率及透明度。

為提升服務質素及向客戶提供數碼化機電工程方案，我們積極應用創新科技（創科）。機電署研發的「政府物聯網」和區域數碼監控中心，具有實時監察及控制功能，可提高機電設備的運作效率和環境表現。本署推動數碼化不遺餘力，我們的工作獲得業界嘉許認可，例如本署榮獲2021建造業議會數碼化大獎機構類別（客戶）金獎。

年內我們安排公眾和多個政府部門的團體參觀機電署總部，以展示我們對最新的創科理念的應用。在參觀期間，來賓可了解機電署的創新項目，例如「智能停車場管理系統」和綜合式智能貨倉。我們亦舉辦「機電署創科專區創科之旅」，向公眾介紹機電署近年在推動香港創科發展方面擔當積極角色。

► 香港警務處團體於2021年7月參觀機電署總部。  
The Hong Kong Police Force group visited the EMSD HQs in July 2021.



### Engaging our Clients

Delivering on our mission to provide quality engineering solutions, we have continued to strengthen communication and collaboration with all clients. We have appointed an independent market research company to conduct a Customer Opinion Survey (COS) every two years to provide input for enhancing customer experience. The latest COS was completed in 2020 and the overall Customer Satisfaction Index was 6.83 out of 8.

In addition, we take advantage of the Customer Centric e-Platform (CCeP) to keep clients informed of our work progress. The CCeP aims to upgrade the current job management system and improve processes, so that job assignment and progress tracking will become more efficient and transparent to clients.

The EMSD proactively applies innovative technologies to enhance service quality and provides clients with digitised E&M engineering solutions. The Government-Wide Internet of Things Network and Regional Digital Control Centre, developed by the EMSD, enhance operational efficiency and environmental performance of E&M equipment through real-time monitoring and controls. Our efforts in digitisation are recognised by the industry. For instance, we received the Gold Award at the Construction Industry Council Construction Digitalisation Award 2021 in the Organisation (Client) category.

We arrange visits to the EMSD Headquarters (HQs) for the public and government departments to showcase our application of innovation and technology (I&T) ideas. During the visit, guests can learn about our innovative projects, such as Smart Car Park System and Integrated Smart Warehouse. InnoTours@EMSD E&M InnoZone are also open to the public to communicate the active role played by the EMSD in promoting I&T development in Hong Kong in recent years.

### 管理我們的供應鏈

本署所有提供機電服務以及與機電安裝、操作及維修相關零部件、設備和服務的承辦商和供應商均須達到我們嚴格的安全及品質規定。我們依從公開及公平的程序甄選承辦商和供應商，並定期檢討他們的表現，確保他們遵行所有關於守法合規、產品質素標準、職業健康與安全、商業操守和環境管理的規定，此外並會向承辦商和供應商闡述關於職業健康與安全的政策及指引。

### Managing our Supply Chain

We have stringent safety and quality requirements for contractors and suppliers who provide E&M services as well as parts or equipment and services related to E&M installation, operation and maintenance. The selection process for contractors and suppliers is conducted in an open and fair manner. We review the performance of contractors regularly and ensure that they meet all applicable requirements for legal compliance, product quality standards, occupational health and safety, business conduct and environmental management. We also share EMSD's policies and guidelines on occupational health and safety with our contractors and suppliers.

#### 管理供應鏈的環境及社會層面

#### MANAGING THE ENVIRONMENTAL AND SOCIAL ASPECTS OF OUR SUPPLY CHAIN



#### 環境層面 Environmental Aspect

- 規定承辦商和供應商嚴格履行合約訂明的環保規定。  
To require contractors and suppliers to place great emphasis on environmental requirements in contracts.
- 要求承辦商和供應商符合ISO 14001環境管理系統認證標準。  
To request contractors and suppliers to be ISO 14001 Environmental Management System certified.
- 鼓勵供應商提供環保產品。  
To encourage suppliers to provide environmentally friendly products.
- 保存環保產品供應商資料在本署數據庫以供日後採購時評選。  
To keep information of suppliers offering sustainable products in our database for future procurement consideration.
- 納入環保採購指引促進供應商採購環保物料及產品。  
To incorporate green procurement guidelines for suppliers to source green materials and products.



#### 社會層面 Social Aspect

- 所有適用招標項目必須符合ISO 9001品質管理系統證書的要求。  
To include the requirement of compliance with ISO 9001 Quality Management Certification in all applicable tenders.
- 為承辦商提供安全指引以實現機電署「零意外」的目標。  
To instruct contractors to achieve our "Zero Accidents" target by providing safety guidelines.
- 定期檢討和監察承辦商的安全表現。  
To regularly review and monitor contractors' safety performance.



## 可持續發展管理方針 Sustainability Management Approach

打造香港成為綠色智慧城市一直是我們的優先要務之一，所以我們一直鼓勵與我們合作的承辦商和供應商應用創新意念或先進科技。這些業務伙伴可以在我們的「機電創科網上平台」分享他們最新引入的產品與技術，透過互通共享推陳出新。

►「機電創科網上平台」連結：<https://inno.emsd.gov.hk/tc/home/>  
Link for E&M InnoPortal: <https://inno.emsd.gov.hk/en/home/>

Making Hong Kong a greener and smarter city has always been one of our priorities. We always encourage contractors and suppliers that work with us to introduce innovative ideas or advanced technologies. Our E&M InnoPortal is a technical platform for these partners to share their latest products and technologies.



為確保供應鏈全面達到高水平的職業健康與安全標準，我們擬備了多套承辦商安全指引，倡導承辦商作業時竭盡所能實現「零意外」，同時充分考慮工人、鄰里及環境的福祉。我們很高興本署的努力備受肯定，年內在公德地盤嘉許計劃奪得多個獎項。

We have prepared safety guidelines for contractors to ensure a high level of occupational health and safety throughout the supply chain. At work, our contractors make best endeavours to achieve "Zero Accidents" while demonstrating great consideration for workers, neighbours and the environment. We are pleased to say that our efforts are well-recognised, as shown by several awards we have received under the Considerate Contractors Site Award Scheme.



▲機電署負責監督的四份工程合約於第27屆公德地盤嘉許計劃分別奪得金獎、銀獎及兩項優異獎，足以證明我們努力促進承辦商的職業安全和健康表現卓有成效。In the 27th Considerate Contractors Site Award Scheme, four contracts supervised by the EMSD were commended with a gold award, a silver award and two merit awards. These testify to our accomplishment in enhancing the occupational safety and health performance of contractors.

## 可持續發展認證及嘉許

我們嚴格遵守所有相關的環境及社會規例，並貫徹實施關於品質、安全和健康的工作及環境政策。機電署建立了綜合管理系統，該系統結合ISO 9001:2015品質管理系統、ISO 14001:2015環境管理系統、ISO 45001:2018職業健康與安全管理系統、ISO 37001:2016反賄賂管理系統和ISO 13485:2016醫療器材品質管理系統，周密完備。

於匯報期內，我們榮獲以下多個專業組織及機構頒發的獎項，表揚我們對促進機電專業人員和業界持續發展作出貢獻。

2021年10月，機電署榮獲美國能源工程師學會頒發亞太區年度創新能源項目獎，表彰本署透過「採電學社」項目推廣可再生能源的傑出表現。該項目免費協助多間學校和社福界非政府機構安裝太陽能發電系統，這些系統預計每年可產生逾200萬千瓦小時電力。

►美國能源工程師學會亞太區年度創新能源項目獎

Innovative Energy Project of the Year Award for the Asia-Pacific Rim region by the Association of Energy Engineers



機電署與建築署在西九龍政府合署項目引入多種新穎的建築方案，例如建築信息模擬技術及機電裝備合成法，並應用建築語義人工智能和大數據分析技術，全面優化建築物的能源效益。該項目榮獲英國特許屋宇裝備工程師學會香港分會頒授2021年度項目大獎(公用建築)。

## SUSTAINABILITY CERTIFICATIONS AND RECOGNITIONS

We strictly comply with relevant environmental and social regulations, as well as adhering to our work and environment policies on quality, safety and health. We have put in place an Integrated Management System that incorporates the requirements of ISO 9001:2015 Quality Management System, ISO 14001:2015 Environmental Management System, ISO 45001:2018 Occupational Health and Safety Management Systems, ISO 37001:2016 Anti-bribery Management Systems and ISO 13485:2016 Medical Devices – Quality Management System.

We are honoured to have received a number of awards during the reporting period from the following professional bodies and organisations, in recognition of our efforts towards the sustainable development of E&M professionals and the industry.

In October 2021, the EMSD received the Innovative Energy Project of the Year Award for the Asia-Pacific Rim region from the Association of Energy Engineers, recognising our outstanding performance in promoting the development of renewable energy through the Solar Harvest scheme. The scheme has helped schools and welfare non-governmental organisations to install solar energy generation systems for free. These installed systems are estimated to generate more than 2 million kilowatt-hours (kWh) of electricity each year.

For the project of West Kowloon Government Offices, the EMSD and the Architectural Services Department utilised a wide range of construction methods, such as Building Information Modelling technology and MultiTrade integrated approach for Mechanical, Electrical and Plumbing works, as well as applying building semantic artificial intelligence and big data analytic technology, which work together to optimise energy efficiency of the buildings. The project was the winner of the CIBSE Hong Kong Awards 2021 – Project of the Year Award – Public Use Building presented by the Chartered Institution of Building Services Engineers (CIBSE) Hong Kong Region.

## 可持續發展管理方針 Sustainability Management Approach

機電署銳意創新，善用先進工程知識提高公共服務的質素。於匯報年度，本署憑着「影像分析監測系統—非正常行為的偵測」奪得香港工程師學會創意獎（青年會員組）2021組別II—創新應用的優異獎，又一次證明我們的創科發展取得令人鼓舞的成果。

The EMSD strives to apply innovative engineering knowledge to enhance public services quality. In the Hong Kong Institution of Engineers (HKIE) Innovation Award 2021 (Young Member Group), the EMSD was granted a Certificate of Merit in the Category II – An Innovative Application of Engineering Theories for Video Analytics Monitoring System for Abnormal Behaviours Detection, which exemplified our encouraging achievements in innovation and technology.



◀ 香港工程師學會創意獎2021  
HKIE Innovation Award 2021

人才是機電業界持續發展的基石，因此我們積極舉辦各類培訓計劃及課程，為業界培育新血。機電署的技術員訓練計劃獲香港管理專業協會頒發2021年最佳管理培訓及發展獎銀獎，以及四個特別獎項，分別為職涯發展特別獎、未來人才發展特別獎、未來技能發展特別獎和業界最喜愛培訓及發展項目。

Nurturing talent is vital for the sustainable development of the industry. Actively organising different training programmes and courses, the EMSD received the silver award for Excellence in Training and Development 2021 for its Technician Training Scheme, as well as four special awards, including Excellence in Career Development, Excellence in Future Talent Development, Excellence in Future Skills Development, and HR Professionals' Favourite Campaign, presented by the Hong Kong Management Association.

▶ 2021年最佳管理培訓及發展獎  
Award for Excellence in Training and Development 2021



機電署多年來均發表年報，公開披露我們的營運及財務活動，報告也屢獲殊榮。年內，我們秉持公開、獨立和公平規範編製的《機電工程署二零二零至二一年年報》分別奪得第36屆ARC國際年報大獎「主席函件：政府機構及辦公室」組別銀獎和「非牟利機構（印刷版年報）：政府機構及辦公室」組別銅獎，而我們在2020/21年度的《社會及環保報告》則獲「綠色/環保年報」組別銀獎。ARC國際年報大獎是權威的嘉獎計劃，旨在評選全球最優秀的年報，樹立崇高標準。

The EMSD has been publishing Annual Reports to disclose our operations and financial activities to the public over the past years. Adhering to the criteria on openness, independence and fairness, the Electrical and Mechanical Services Department Annual Report 2020/21 won the 36th International Annual Report Competition (ARC) silver and bronze awards in the "Chairman's/President's Letter: Government Agencies & Offices" and "Non-Profit Organisation (Print A.R.): Government Agencies & Offices" categories respectively. Also, our Social and Environmental Report 2020/21 clinched the silver award in the "Green/Environmentally Sound Annual Report" category. The globally recognised ARC Awards provide a platform for the highest standards in the annual report industry.



除此之外，《機電工程署二零二零至二一年年報》亦在美國通訊專業聯盟「2021 Vision Awards」勇奪殊榮，獲頒發年報鉅金獎及可持續發展報告金獎。美國通訊專業聯盟定期舉辦年報比賽，選出報告業界的卓越典範和表揚傳訊表現傑出的機構。

In addition, the EMSD Annual Report 2020/21 garnered the platinum award – Annual Report and gold award – Sustainability Report at the League of American Communications Professionals (LACP) 2021 Vision Awards. LACP hosts the regular competitions to identify best-in-class practices within the profession and recognise organisations that demonstrate exemplary communications capabilities in reporting.

《機電工程署二零二零至二一年年報》並於香港管理專業協會2022年「最佳年報獎」中奪得「非牟利及慈善機構」類別最優秀新參賽年報獎，以及獲頒發「環境、社會及管治資料報告卓越獎」。香港管理專業協會每年舉辦的「最佳年報獎」旨在嘉許機構製作適時、內容詳實和精心編製的年報，表揚傑出的報告書。

The EMSD Annual Report 2020/21 was also named Best New Entry in the Non-Profit Making and Charitable Organisations Category and awarded Certificate of Excellence in Environmental, Social and Governance Reporting in the 2022 Hong Kong Management Association (HKMA) Best Annual Reports Awards. HKMA organises the annual competition to recognise the publication of timely, accurate, informative, well-presented annual reports and exemplary achievement in producing such reports.

# 環保成效 Environmental Performance



機電署全力推動香港蛻變成爲更環保和更可持續發展的城市，凝聚實力緩解氣候變化的衝擊，與此同時，我們採取所有可行的措施，提高能源效益，盡量減少工作場所的資源耗用。

The EMSD is committed to transforming Hong Kong into a greener and more sustainable city to stave off climate change adversities. We also take every possible measure to enhance energy efficiency and minimise the use of resources in the workplace.

## 成就可持續發展城市

香港若要轉型成爲可持續發展的智慧城市，能源效益是重要一環。為推動香港的綠色進程，機電署竭力實現《香港都市節能藍圖2015~2025+》所訂的減少能源強度目標。我們定期檢討各相關條例、政策、計劃及其他倡議，務求完善監管能源消耗和提高公眾的節能意識，此外亦不斷發掘各類可減少碳排放及耗用資源的節能措施和創新技術。

## TRANSFORMING TO A SUSTAINABLE CITY

Energy efficiency is vital for building a sustainable and smart city. To facilitate Hong Kong's transformation into a sustainable city, the EMSD strives to meet energy intensity reduction targets set out in the Energy Saving Plan for Hong Kong's Built Environment 2015~2025+. We regularly review ordinances, policies, schemes and other initiatives to regulate energy use and promote public awareness. In addition, we continue to explore different energy-saving measures and innovative technologies to reduce carbon emissions and minimise resource consumption.

### 《建築物能源效益條例》

2012年9月開始實施的《建築物能源效益條例》旨在規管全港建築物的能源效益。該條例下的《建築物能源效益守則》及《能源審核守則》就屋宇裝備裝置和能源審核的合規事宜提供技術指引。

### Buildings Energy Efficiency Ordinance

The Buildings Energy Efficiency Ordinance (BEEO) has been effective since September 2012 to regulate energy efficiency of buildings in our city. Under the BEEO, the Building Energy Code (BEC) and Energy Audit Code (EAC) provide technical guidance on the compliance with statutory requirements regarding building services installations and energy audit.

2021年12月31日，我們發布最新版（2021版）的《屋宇裝備裝置能源效益實務守則》（《建築物能源效益守則》）和《建築物能源審核實務守則》（《能源審核守則》），前者於2022年7月1日適用於新建建築物，後者則於2022年10月1日適用於現有建築物。

New editions (2021 Editions) of the Code of Practice for Energy Efficiency of Building Services Installation (BEC 2021) and the Code of Practice for Building Energy Audit (EAC 2021) were published on 31 December 2021. BEC 2021 and EAC 2021 will apply to newly constructed buildings from 1 July 2022 and to existing buildings from 1 October 2022 respectively.

《建築物能源效益守則》2021年版的能源效益標準較2015年版高逾15%。若以2015年為基準，估計到了2035年全港建築物每年可節省47億至53億千瓦小時電力。至於《能源審核守則》2021年版則制訂更嚴格的能源審核技術要求。

BEC 2021 uplifts the energy efficiency standards with an improvement of more than 15% as compared with the 2015 edition. By 2035, the estimated annual energy saving from all buildings in Hong Kong is expected to reach 4.7 billion to 5.3 billion kWh comparing with the 2015 base year. Meanwhile, EAC 2021 imposes more stringent requirements on the technical aspects of energy audit.



▲《建築物能源效益條例》里程碑  
BEEO Milestone

### 「強制性能源效益標籤計劃」

我們於2009年透過《能源效益（產品標籤）條例》推行「強制性能源效益標籤計劃」第一階段，規定所有訂明產品供應時須貼上能源標籤以展示其能源效益等級，為消費者提供產品的相關能源效益資訊，鼓勵他們選購高能源效益產品。

### Mandatory Energy Efficiency Labelling Scheme

In 2009, we introduced the initial phase of the Mandatory Energy Efficiency Labelling Scheme (MEELS) through the Energy Efficiency (Labelling of Products) Ordinance. It aims to require all prescribed products to be supplied with energy labels to show their energy efficiency grading, so as to provide consumers with information on energy-efficient products and encourage them to choose products with high energy efficiency.

「強制性能源效益標籤計劃」最新制訂的獨立式空調機（窗口機）、抽濕機和慳電膽的新能源效益評級標準，已於2021年12月31日全面實施。新要求既可鼓勵供應商提供更多高能源效益產品型號，亦方便消費者選購高能源效益產品。

New energy efficiency grading standards for single package type room air-conditioners, dehumidifiers and compact fluorescent lamps under MEELS had been fully implemented by 31 December 2021. The new requirements encourage suppliers to introduce more energy-efficient models and help consumers select energy-efficient products.

### 區域供冷系統

人口密集的市區空調用電需求強大，區域供冷系統能解決問題。區域供冷系統可為一個地區多座建築物供冷，被視為高能源效益的供冷方案，啟德發展區便是一例。一般而言，區域供冷系統較獨立安裝在個別建築物上的傳統中央空調系統可節省20%至35%耗電量，碳排放也相應減少。機電署總部大樓自2013年開始使用啟德區域供冷系統服務，於2021/22年度估計合共節省約1.38億千瓦小時電力，相等於每年減少96 500公噸碳排放。

### District Cooling System

To address the issue of high electricity demand from air-conditioning in densely populated urban areas, such as the Kai Tak Development, the District Cooling System (DCS) is considered an energy-efficient way to supply cooling for multiple buildings within a local area. In general, a DCS can save 20% to 35% of electricity consumption as compared with conventional central air-conditioning systems separately installed in individual buildings, thus reducing carbon emissions. For the EMSD Headquarters Building, the Kai Tak DCS came into operation from 2013. The total estimated electricity savings in the year 2021/22 amounted to about 138 million kWh, which is equivalent to reducing 96 500 tonnes of carbon emissions per annum.

年內，機電署的區域供冷系統項目在環境局（時稱）支持下跨進新里程碑。新增區域供冷系統項目可為啟德發展區額外提供178兆瓦製冷量，提升了現有南廠和北廠的供冷能力。該系統全面投入服務後，估計每年可節省高達5 300萬千瓦小時電力，相當於每年減少約37 000公噸碳排放。

EMSD's DCS project moved a step further with the support of the then Environment Bureau to provide additional cooling capacity of 178 megawatt of refrigeration for the Kai Tak Development, bolstering the cooling capacity of the existing North and South DCS Plants. Upon full utilisation, the additional DCS project is estimated to save up to 53 million kWh of electricity a year, representing an annual reduction of about 37 000 tonnes of carbon emissions.

# 環保成效 Environmental Performance

## 淡水冷卻塔

有見淡水冷卻的能源效益比氣冷式空調系統高，碳排放亦較低，機電署推行淡水冷卻塔計劃，提倡非住宅樓宇廣泛應用淡水冷卻塔的空調系統。截至2022年3月，我們共接獲38宗申請並批准安裝40個淡水冷卻塔<sup>1</sup>。水冷式空調系統的耗電量預計比氣冷式空調系統低約20%。據估計，香港成功推展淡水冷卻塔系統後，每年約可減少2 457萬千瓦小時電力，相等於減少17 196公噸碳排放。

## Fresh Water Cooling Towers

Fresh water cooling has higher energy efficiency and lower carbon emission than an air-cooled air-conditioning system. As such, the EMSD has launched the Fresh Water Cooling Towers (FWCTs) Scheme to advocate wider adoption of FWCT in non-domestic buildings. By March 2022, a total of 38 FWCT applications were received and 40 FWCTs<sup>1</sup> were approved for installation. Water-cooled air-conditioning systems are expected to consume about 20% less electricity than air-cooled air-conditioning systems. It is estimated that the successful implementation of FWCTs in Hong Kong can save approximately 24.57 million kWh of electricity per year, equivalent to about 17 196 tonnes of carbon emission reduction.

## 重新校驗現有建築物

重新校驗協助評估現有樓宇的節能表現，從而探索節能的可行性，以減低能源成本及改善室內環境。為使重新校驗的工作順利推行，我們擬備了《重新校驗技術指引》，以闡述整個流程，並舉辦一系列培訓及發展課程，培育更多重新校驗專業人才和從業員，確保有充足資源推展計劃。

## Retro-commissioning of Existing Buildings

Retro-commissioning (RCx) helps evaluate an existing building's energy performance by exploring energy-saving opportunities to reduce energy costs and improve the indoor environment. To facilitate successful implementation of RCx, we introduced the Technical Guidelines on RCx to articulate the whole procedure. In addition, a series of professional training and development programmes are provided to increase the supply of RCx professionals and practitioners, and thus ensure sufficient resources for successful implementation.

## 提倡廣泛使用可再生能源

機電署一直配合政府在香港發展可再生能源的政策，積極鼓勵各界廣泛使用可再生能源。我們發布多份相關技術指引和指南，同時建立「香港可再生能源網」，透過網上平台發布最新的可再生能源實用資訊，增進公眾對可再生能源技術的認識。

## Promoting the Wider Use of Renewable Energy

The EMSD is advocating the wider adoption of renewable energy (RE) by following the Government's policy on RE development in Hong Kong. Apart from issuing technical guidelines and guidance notes, we have established the HK RE Net, an online portal that provides useful and latest information on RE and enhances public understanding of RE technologies.

技術合作是達致可再生能源普及化的重要要素。為促進這方面的協作，環境局（時稱）、機電署與廣東省科學技術協會舉辦第二屆綠色創科日，為專家、學術界及業界提供交流平台，共同研究各類創科方案，攜手推動節能和可再生能源。

Technological collaboration is also critical for driving the adoption of renewable energy. The then Environment Bureau, the EMSD and the Guangdong Provincial Association for Science and Technology organised the second Green Innovation and Technology (I&T) Day to provide a platform for experts, academia and the trade to exchange I&T solutions for promoting energy conservation and renewable energy.

▼ 2021年10月21日舉行的綠色創科日  
Green I&T Day on 21 October 2021



▲ 「香港可再生能源網」  
The HK RE Net  
<https://re.emsd.gov.hk/>

<sup>1</sup> 每宗淡水冷卻塔申請可能涉及一個或多個淡水冷卻塔。  
Each FWCT application may involve one or more than one cooling tower(s).

## 締造更環保的工作環境

機電署嚴格實施ISO 14001:2015環境管理系統，廣泛推行各種環保計劃，並且定期檢討我們的環保成效。機電署透過日常運作的環保措施縮減碳足印，致力營造可持續發展的工作環境，同時全面遵守相關的環保法規，因此於匯報年度並無任何不遵行環境監管規例的個案。

## CREATING A SUSTAINABLE WORKPLACE

Through strictly implementing the ISO 14001:2015 Environmental Management System, we have been pursuing a wide range of environmental programmes and monitoring our environmental performance regularly. Environmental-friendly measures are applied during daily operations to minimise our carbon footprint for a sustainable workplace. By the same token, we fully comply with applicable environmental laws and regulations, so there were no cases of regulatory non-compliance on environmental aspects during the reporting year.

## 減少能耗及碳排放

為響應政府實踐新的綠色能源目標，我們積極監察有關工作的進展，並不斷開拓更多提升能源表現的途徑。政府已訂立的綠色能源目標是以2018/19年度為基準，在2020/21至2024/25年度的五年期間把能源表現提高6%。涵蓋範圍廣及所有政府建築及其基礎設施的電力和其他形式的能源，以至可再生能源的貢獻亦計算在內。在匯報年度，我們的建築及其基礎設施比2018/19年度的能源表現提高約2.6%。

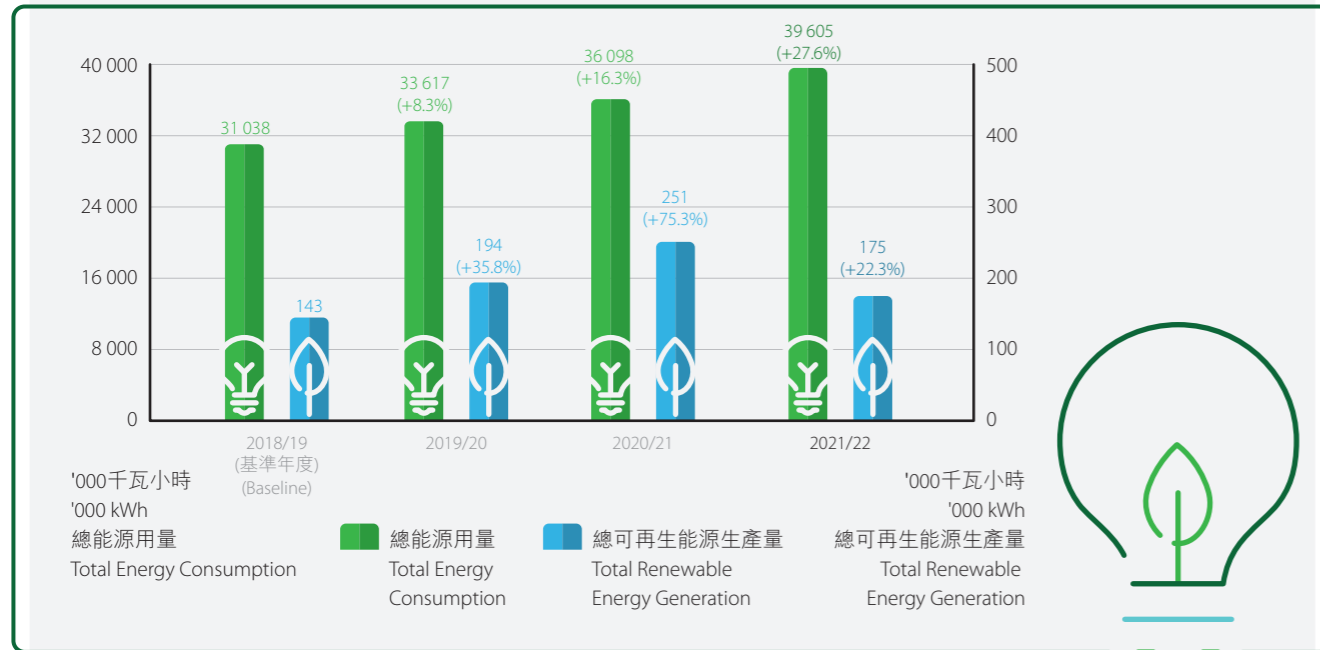
## Reduction on Energy Uses and Carbon Emissions

We have actively reviewed the progress to date and continued to explore energy performance improvement opportunities to achieve the Government's new Green Energy Target. The Government has set a Green Energy Target of improving energy performance by 6% in the five-year period from 2020/21 to 2024/25, using 2018/19 as the baseline year. This target covers electricity, other forms of energy in government buildings and its infrastructure facilities, as well as contribution of renewable energy. During the reporting period, energy performance of our buildings and infrastructure facilities was up about 2.6% on 2018/19.

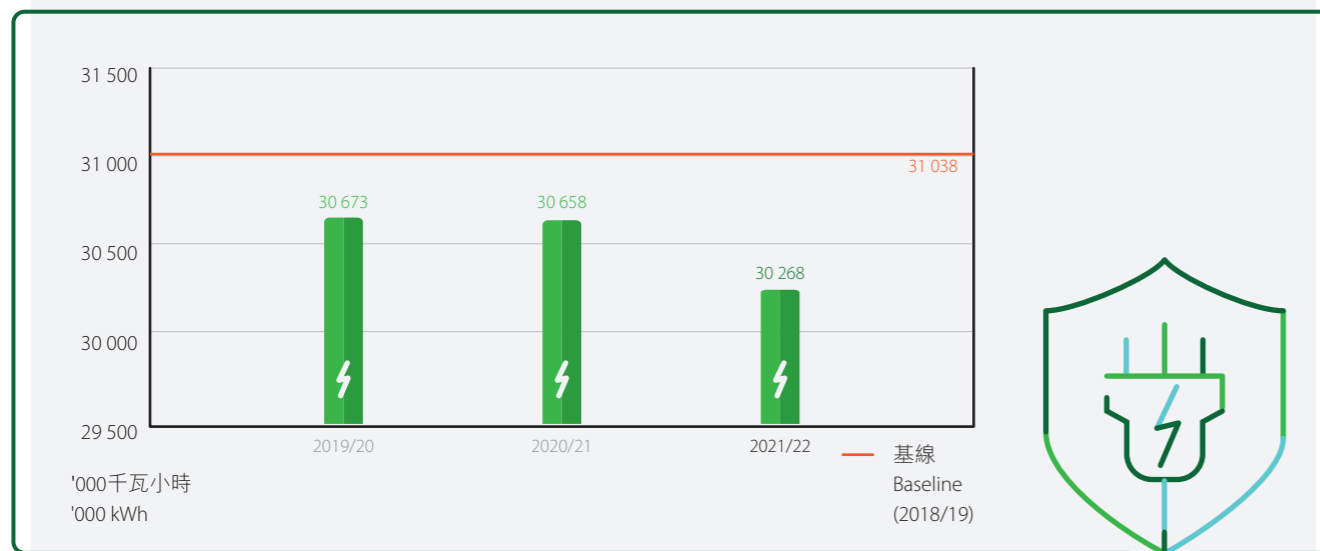


# 環保成效 Environmental Performance

## 能源表現 ENERGY PERFORMANCE



## 於相若運作情況下的總能源用量<sup>2</sup> TOTAL ENERGY CONSUMPTION UNDER COMPARABLE OPERATING CONDITIONS<sup>2</sup>

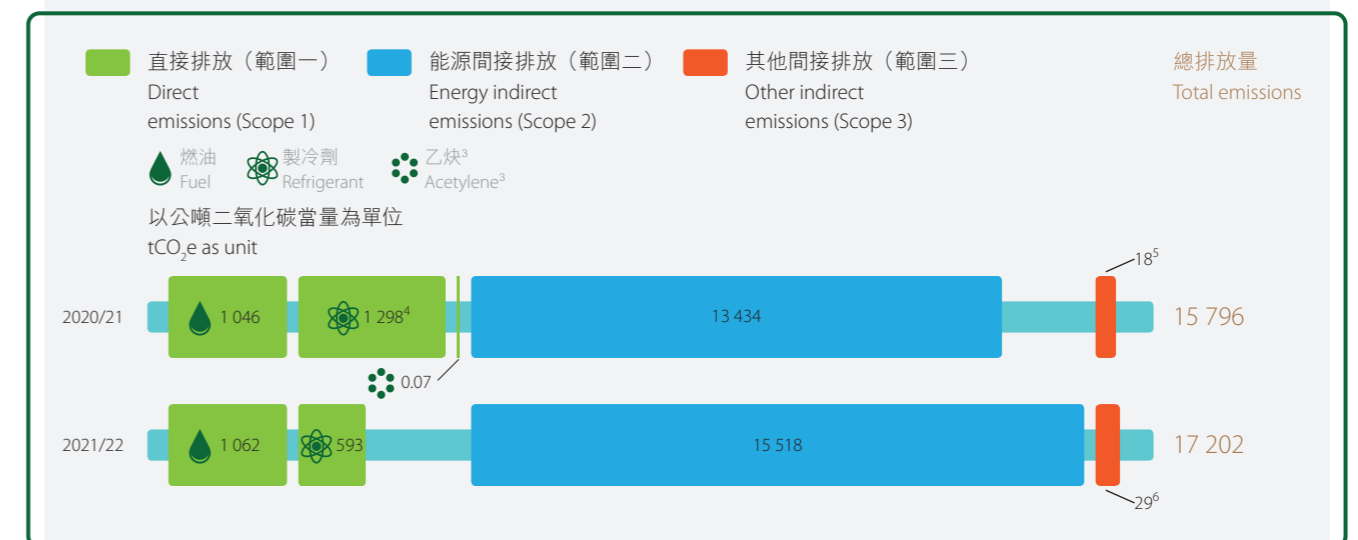


<sup>2</sup> 此計算比較於2018/19至2021/22年度仍然運作的營運單位能源用量的改變。  
The calculation compares the energy consumption changes of operating units that were still in operation from 2018/19 to 2021/22.

機電署的溫室氣體排放主要源於車輛及發電機的燃油和製冷劑(範圍一)、外購電力(範圍二)及其他例如處置廢紙和公務旅行(範圍三)。本匯報年度的溫室氣體排放總量約為17 202公噸二氧化碳當量，強度為每位員工2.90公噸二氧化碳當量。2020/21年度及2021/22年度的碳排放成分已列於下表。

Sources of our main greenhouse gas (GHG) emissions include fuel consumption of vehicles and generators as well as refrigerant consumption (Scope 1), purchased electricity consumption (Scope 2), and others, such as waste paper disposal and business travelling (Scope 3). Total GHG emissions during the reporting year were approximately 17 202 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e), with an intensity of 2.90 tCO<sub>2</sub>e per employee. Below is the composition of the EMSD's carbon footprint in 2020/21 and 2021/22.

## 2020/21年度至2021/22年度溫室氣體排放概覽 GHG EMISSIONS PROFILE 2020/21 TO 2021/22



我們鼓勵使用電動車和其他新能源運輸工具，以助運輸部門實現零碳排放。於匯報年度，機電署轄下共有198部車輛，其中包括17部電動車及5部混合動力車輛。

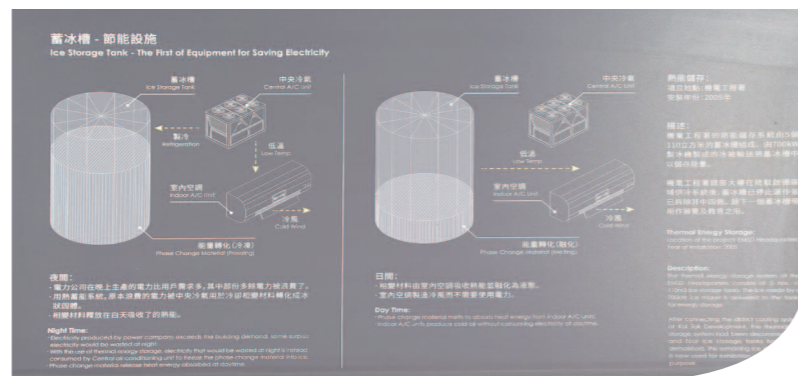
We encourage the adoption of electric vehicles (EVs) and other modes of new energy transport which can help the transport sector achieve zero carbon emissions. During the reporting period, we operated a fleet of 198 vehicles, consisting of 17 EVs and 5 hybrid vehicles.

<sup>3</sup> 參考《香港中小企業碳審計工具箱》(由香港大學及香港城市大學發布)。  
Made reference to the Carbon Audit Toolkit for Small and Medium Enterprises in Hong Kong (by The University of Hong Kong and City University of Hong Kong).  
<sup>4</sup> 2020/21年度製冷劑數據經審查後新增其溫室氣體排放。  
In 2020/21, refrigerant consumption was available after data review and the associated GHG emission was newly included.  
<sup>5</sup> 數據包括2020/21年度處置廢紙及公務旅行。  
The figure includes waste paper disposal and business travelling in 2020/21.  
<sup>6</sup> 數據包括2021/22年度處置廢紙、公務旅行、處理食水和污水時耗用的電力。  
The figure includes waste paper disposal, business travelling, electricity used for fresh water and sewage processing.

## 環保成效 Environmental Performance

除此之外，我們轄下建築物也積極節約用電藉以減碳。本署總部大樓的空調系統已連接區域供冷系統，大大減少冷凍量耗能。機電署總部接駁區域供冷系統後，原有的空調熱蓄能系統已停用。我們更將系統的蓄冰槽和周邊範圍改造成為展覽區，向公眾介紹系統的技術、運作原理和背景資料。

We place high importance on saving electricity in our buildings for decarbonisation. As such, our headquarters (HQs) building is designed with a DCS-linked air-conditioning system to reduce cooling energy consumption. Upon connecting to the DCS, the original thermal energy storage system that provided air-conditioning at the EMSD HQs ceased operation. The EMSD has modified the system's ice storage tank and surrounding areas into an exhibition area where public visitors can learn about the technology, operation and background of the system.



蓄冰槽展覽區  
Exhibition area of the ice storage tank

為繼續推廣天然可再生能源，本署總部大樓露天廣場增設了多項太陽能裝置，包括於天篷安裝建材一體型太陽能發電系統和太陽能樹燈飾。此外，大樓地下的「機電創科廊」也對外開放，展示與市民日常生活息息相關的得獎機電創科項目，向公眾介紹如何善用創科應用方案，締造安全節能的智慧型生活環境。

In order to further promote natural renewable resources, solar energy fixtures, including building integrated photovoltaics on the canopy and solar tree lighting, were installed in the outdoor piazza. Meanwhile, E&M InnoFoyer of the HQs building is open to the public. It showcases an array of award-winning E&M related I&T projects that are closely associated with everyday life. Visitors can learn how I&T applications help create a safe and energy-efficient smart living environment.

### 環保採購及減廢

本署採用 ISO 14001:2015 環境管理系統甄選負責任的供應商，同時要求獲選的供應商遵守所有相關環境法規，只要情況適用和可行，我們都會在採購指引納入環保規定。我們亦會參照環境保護署訂立的環保規格選購合適的環保物料及產品。

### Green Procurement and Waste Avoidance

We have applied the ISO 14001:2015 Environmental Management System to select responsible suppliers, and require our selected suppliers to comply with applicable environmental laws and regulations. Our procurement guidelines are embedded with environmental requirements wherever applicable and available. Also, we source green materials and products based on green specifications published by the Environmental Protection Department.

於匯報年度，機電署供應商名冊新增了117間供應商，註冊供應商總數為541間，期內本署斥資10.31億港元採購物資，當中環保產品為數4.99億港元（佔總採購金額48.4%以上）。

During the reporting year, 117 new suppliers added to the EMSD Suppliers List, making a total of 541 registered suppliers. Our total purchase volume for the same period came to HK\$1,031 million, of which HK\$499 million (over 48.4%) was spent on green products.

機電署轄下所有營運活動均注重環保，我們採取所有合理可行的措施，全力節約資源、減少產生廢物和防控污染。本署辦公室及工場的廢物均遵循機電署的內部環保措施收集和處理。

The EMSD is committed to taking all reasonable and practicable steps to conserve resources, minimise the generation of waste and prevent pollution in each and every one of our business operation processes. We follow internal environmental procedures to collect and dispose of waste from offices and workshops.

於匯報年度，我們共採購28 826令再造紙，並將有害廢物、無害廢物及回收物料分類，交由合格承辦商妥善處置。年內我們購買或耗用2 443個碳粉盒，2 262個碳粉盒妥善棄置或由承辦商回收。

During the reporting period, we purchased a total of 28 826 reams of recycled paper. We separated hazardous waste, non-hazardous waste and recyclables for proper disposal by qualified contractors. The EMSD bought 2 443 toner cartridges, and 2 262 toner cartridges were collected for properly disposed or handled by contractors.

### 管理水資源

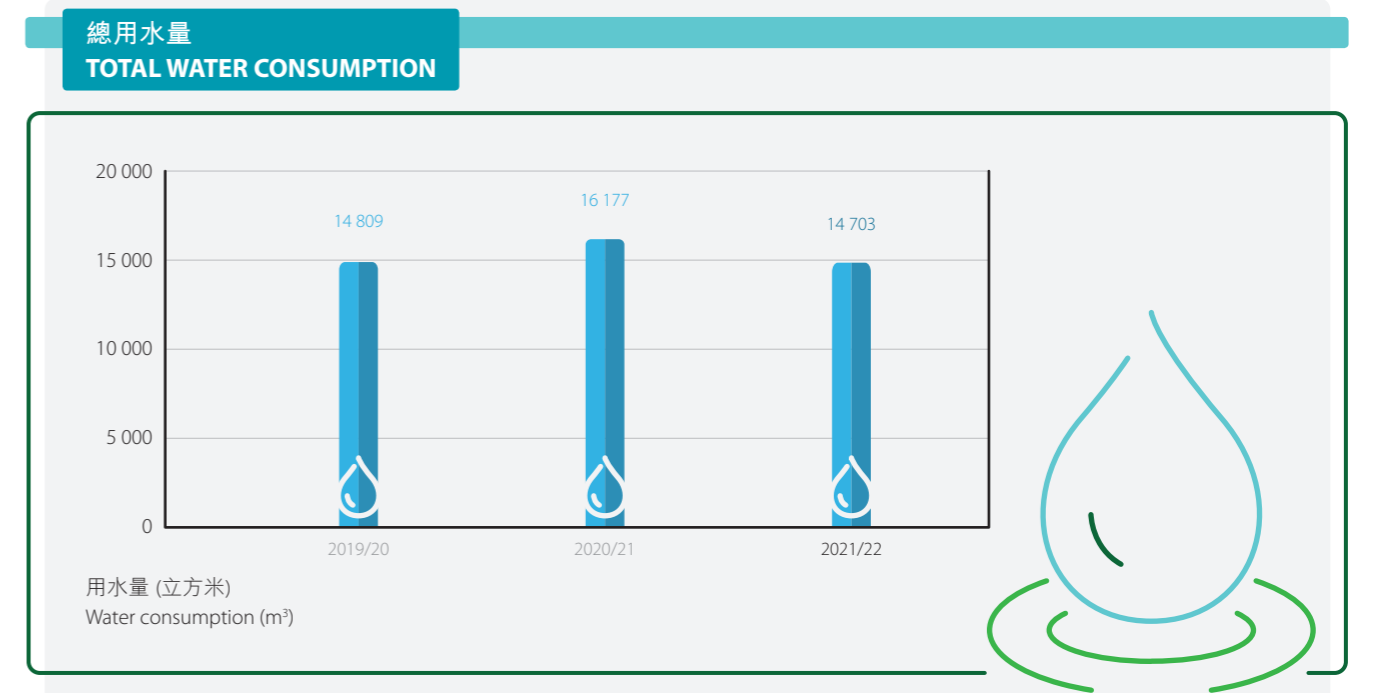
面對全球氣候變化的重大考驗，我們致力實踐可持續性和可靠水資源的遠大願景。為此，我們採取積極主動的態度管理水資源，我們裝設了雨水回用系統，在天台採集雨水作灌溉或洗車用途，另亦為廁所的水龍頭安裝節約用水的水龍頭傳感器，減少日常洗手的用水量。

### Water Management

Pursuing a visionary goal of water sustainability and reliability in the face of climate change, we have taken a proactive approach to water management. We installed a rainwater collection system to collect rainwater from the roof for irrigation or car washing. In addition, we have retrofitted water-saving and sensor type water taps in toilets to reduce water use for hand-washing.

機電署一直定期監察用水量和收集用水數據，下表列出過去三年的用水量。

Water consumption is monitored regularly at the EMSD and consumption data are collected periodically. Data for the last three years are shown in the following table.



# 社會成效 Social Performance



我們深明作為政府部門及牽頭的機電工程服務供應商，機電署擔當獨特而重要的角色。我們矢志在社區和工作環境善盡社會責任，因此一直藉着專業知識與技能貢獻社會及培育機電業新血，對轄下員工關愛支持。於匯報年度，機電署連續第八年榮獲香港社會服務聯會頒發「同心展關懷」標誌，表揚我們面向社會，積極履行企業責任。

We appreciate our unique role both as a government body and a leading E&M engineering service provider. To fulfil our social responsibilities in the community and at the workplace, we continue to contribute our professional expertise to serve society, cultivate talent for the E&M industry and care for our staff. In this reporting year, the EMSD was honoured to be awarded the Caring Organisation Logo by the Hong Kong Council of Social Service (HKCSS) for the eighth consecutive year, in recognition of our commitment to socially responsible citizenship.

◀連續五年或以上獲香港社會服務聯會頒發「同心展關懷」標誌  
The 5 Years Plus Caring Organisation Logo awarded by HKCSS



## 以專業睿智服務社會

機電署在促進機電安全及能源應用範疇上盡心盡力，與此同時亦不斷改進本署的專業機電服務，為大眾創造優質的都市生活。我們發揮牽頭作用，提供多元化的機電裝置顧問與監管服務，範圍涵蓋機電安全、氣體安全、鐵路安全以至能源效益和機電公用設施監察等。

### 提升業界技能

本署善盡提升業界技能的責任，樂於與業界分享專業知識，並經常與業界主要成員聯繫溝通。於匯報年度，我們分別舉辦各類展覽、技術研討會、講座、論壇和工作坊，讓機電同業分享良好作業方式，藉此強化業界的技能以服務社會。年內的活動主題眾多，其中包括但不限於機電工程服務、能源效益、綠色作業、創新科技及職業健康安全等。

## CONTRIBUTING PROFESSIONAL EXPERTISE TO SERVE OUR SOCIETY

The EMSD applies itself continually to enhance E&M safety and energy utilisation, while promoting the quality of city life through continuous enhancement of our E&M services. The EMSD takes a lead role to provide comprehensive advisory and regulatory services for E&M installations, including E&M safety, gas safety, railway safety, energy efficiency and utilities monitoring.

### Enhancing Industry Capabilities

In order to enhance industry capabilities, the EMSD shoulders the responsibility of sharing professional knowledge within the industry and arranging mutual communication with key industry players. During the reporting year, various exhibitions, technical seminars, symposiums, forums and workshops were organised for the industry to promote and exchange best practices and to strengthen our competence to serve the community. The themes of these events include but not limited to E&M engineering services, energy efficiency, green operation, innovation and technology (I&T), and occupational health and safety.

### 機電業博覽2021

機電署聯同香港機電業推廣工作小組各機構成員在機電業博覽2021合辦一系列研討會，並透過展覽攤位和講座向年青人介紹機電業不同領域的最新就業、培訓及進修資訊。

### Electrical and Mechanical Expo 2021

The EMSD, together with members of various organisations of the Hong Kong Electrical and Mechanical Trade Promotion Working Group, co-hosted a series of seminars at the Electrical and Mechanical (E&M) Expo 2021. Latest information on career prospects as well as training and study opportunities in various E&M fields was offered to young people through exhibition booths and talks.



▲2021年7月15日至18日舉行的機電業博覽2021  
E&M Expo 2021 held from 15 to 18 July 2021

### 國際環保博覽2021 Eco Expo Asia 2021 held from 27 to 30 October 2021



### 國際環保博覽2021

機電署參與第16屆國際環保博覽，分享我們推廣能源效益及節能的工作與成果。展覽攤位介紹本署三個主要類別的措施，包括節能綠建、綠色基建及綠色創科。機電署參與國際環保博覽，突顯政府堅決達成碳中和目標，矢志為香港創造健康宜居的環境，實現可持續發展。

### Eco Expo Asia 2021

The EMSD set up a booth at the 16th Eco Expo Asia to share and promote the Department's initiatives and achievements in energy efficiency and energy saving, under three major categories: Energy Saving and Green Buildings, Green Infrastructure, and Green Innovation and Technologies. The EMSD's presence also demonstrated the Government's determination towards the goal of carbon neutrality and creating a healthy, livable and sustainable environment for Hong Kong.

### 專業培訓

我們在專業培訓方面一向不遺餘力，經常舉辦各類會議及研討會，為機電專業開拓機遇。我們主辦的機電工程研討會2022正是一例，是次研討會以「共創無限 實現碳中和」為主題，參加者以視像形式參與集思廣益，並透過線上展覽區分享有關智慧城市、人工智能及低碳能源的創新方案和研發成果。

年內我們亦舉辦機電裝備合成法研討會，向建築界推廣「建造業2.0」，藉此優化業界的可持續性和長遠發展前景。多位建築專業人士應邀在會上分享他們應用機電裝備合成法的個案及經驗，以助提高香港機電業的專業水平。

### Training for our Professionals

We leave no stone unturned in empowering our professionals, opening up opportunities through all kinds of conferences and seminars. For example, we hosted the EMSD Symposium 2022 under the theme "CO-innovity" via video conferencing to promote carbon neutrality and collaboration in innovation. Participants shared innovative solutions and research and development deliverables in various fields, such as smart city, artificial intelligence (AI) and low-carbon energy, through online exhibition zones.

In addition, the MultiTrade integrated Mechanical, Electrical and Plumbing (MiMEP) Forum was held to promote "Construction 2.0" to enhance the construction industry's sustainability and long-term growth. Industry professionals were invited to share their application cases and experience to raise professional standards of the E&M industry in Hong Kong.

# 社會成效 Social Performance

## 智慧城市發展

我們依循《香港智慧城市藍圖2.0》及《香港氣候行動藍圖2050》的願景，全力支持政府的政策，促進香港發展成為智慧城市。我們已在各類機電服務引入創新及智能科技，向業界展示如何應用科技取得理想成效。

## Smart City Development

Embracing the vision of Smart City Blueprint for Hong Kong 2.0 and Hong Kong's Climate Action Plan 2050, the EMSD actively supports the Government's policy of developing Hong Kong into a smart city. We have incorporated innovative and smart technology in our services to demonstrate the successful implementation of technology to the industry.

### 2021/22 年度智能機電服務概覽 HIGHLIGHTS OF SMART E&M SERVICES IN 2021/22

#### 5G 5G@EMSD

機電署總部大樓應用 5G 技術第一階段已於 2021 年 6 月圓滿結束，今後會採用更多 5G 功能優化服務。  
First phase of 5G application was completed at the EMSD Headquarters Building in June 2021. More 5G features will be applied to optimise our services.

#### 「智能停車場管理系統」試驗計劃 Smart Car Park System Pilot Scheme

機電署總部大樓裝設實時空置車位監察系統，分析車位的使用情況，與各政府部門分享經驗和成效。  
A real-time vacant parking space monitoring system was installed at the EMSD Headquarters Building to analyse the utilisation of parking spaces and to share the experience and results with other government departments.

#### 香港第一所智慧監獄 Hong Kong's First Smart Prison

機電署聯同懲教署就數十項創科方案進行概念驗證試驗，香港第一所智慧監獄已於 2021 年 5 月啟用。  
The EMSD conducted proof-of-concept trials for dozens of I&T solutions with the Correctional Services Department, and commissioned Hong Kong's first Smart Prison in May 2021.

#### 綜合智能貨倉 Integrated Smart Warehouse

機電署利用創科方案建造設有自動化貨物處理程序的智能貨倉，項目在「促進機械人科技應用」創新比賽榮獲二獎殊榮。  
The EMSD leveraged I&T solutions to construct a smart warehouse with an automated stock handling process which won the first runner-up award in the "Leading Towards Robotics Technologies" Innovation Competition.

#### 綜合樓宇管理系統 The Integrated Building Management System (iBMS)

現有系統使用開放式通訊標準協定 BACnet，提高大數據分析的可靠度和效率，並可改善樓宇數據結構。  
A non-proprietary standard communication protocol BACnet was adopted into the existing systems to conduct big data analysis more reliably and efficiently, as well as improving the structure of building data.

#### 智慧廁所系統 Smart Toilet System

機電署、食物環境衛生署及康樂及文化事務署推出採用物聯網技術的智慧廁所試驗計劃，在試點公廁安裝傳感器收集數據進行分析，旨在改善廁所管理效率和服務質素。  
The EMSD, the Food and Environmental Hygiene Department, and the Leisure and Cultural Services Department launched a smart toilet pilot programme based on the Internet of Things technology. Sensors were deployed in public toilets to collect data for analysis to improve toilet management efficiency and service quality.

## 更新業界監管規例

機電署定期檢討和更新監管規例，務求推動機電業持續改善，同時保障工人及公眾的安全。於匯報年度，本署修訂了下列規例：

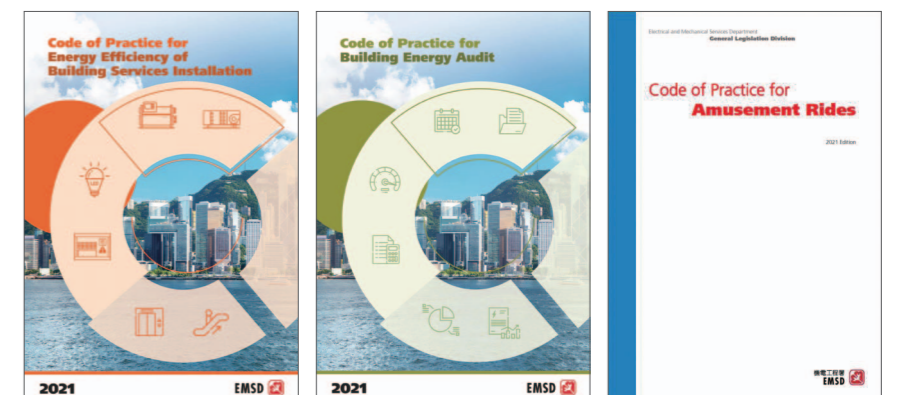
- (1) 《屋宇裝備裝置能源效益實務守則》(《建築物能源效益守則》2021 年版)；
- (2) 《建築物能源審核實務守則》(《能源審核守則》2021 年版)；及
- (3) 《機動遊戲機實務守則》(2021 年版)。

## Updating Industrial Regulations

The EMSD regularly reviews and revamps regulations to facilitate continuous improvement of the E&M industry and to ensure the safety of workers and the public. During the reporting year, the EMSD revised the following regulations:

- (1) the Code of Practice for Energy Efficiency of Building Services Installation (the Building Energy Code 2021);
- (2) the Code of Practice for Building Energy Audit (the Energy Audit Code 2021); and
- (3) the Code of Practice for Amusement Rides (2021 Edition).

►《屋宇裝備裝置能源效益實務守則》(2021 年版)(左)、《建築物能源審核實務守則》(2021 年版)(中)、《機動遊戲機實務守則》(2021 年版)(右)  
Code of Practice for Energy Efficiency of Building Services Installation (2021 Edition) (left), Code of Practice for Building Energy Audit (2021 Edition) (middle), Code of Practice for Amusement Rides (2021 Edition) (right)



## 培育機電業人才

我們冀盼吸引及培育有意投身機電業的專業人才，因此經常籌備各式各樣的推廣活動和計劃，向年青人、機電從業員及市民推廣機電服務和分享專業機電知識。

## CULTIVATING TALENTS FOR THE E&M INDUSTRY

With a view to attract and develop potential professionals for the E&M industry, the EMSD continues to provide a wide range of promotional activities and programmes for youngsters, practitioners and the public to introduce E&M services and share E&M professional knowledge.

### 「機電 • 啟航 2021」迎新典禮

年內我們舉辦「機電 • 啟航」迎新典禮，歡迎年輕學員投身機電行業。政府鼓勵年輕學員把握每個工作和學習的機遇，發揮創新思維，促進機電業應用創新科技。目前樓宇安全及復修工程甚多，業界對擁有專業知識和綜合技能的機電專才需求殷切。

### "E&M GO! 2021" Orientation Ceremony

The "E&M GO!" Orientation Ceremony welcomed young trainees to the E&M industry. In the ceremony, the Government encouraged young trainees to grasp every opportunity for working and learning, and use their creative thinking to drive the application of innovative technology in the industry. There is huge demand for E&M talents equipped with professional knowledge and skillsets to support building safety and rehabilitation works.



▲ 2021 年 11 月 22 日舉行的「機電 • 啟航 2021」迎新典禮  
"E&M GO! 2021" Orientation Ceremony held on 22 November 2021



# 社會成效 Social Performance

## 第11屆穗港澳蓉青年技能競賽



為迎接第11屆穗港澳蓉青年技能競賽，機電署積極為參賽同事備戰，提供強化培訓，確保他們的技能及心理質素都達到最高水平。三位香港代表肩負重任，他們必須在指定時限內精準完成布線和電氣設備安裝。

## 11th Guangzhou/Hong Kong/Macao/Chengdu Youth Skills Competition

Making good preparation for the 11th Guangzhou/Hong Kong/Macao/Chengdu Youth Skills Competition (GHMCYSC), the EMSD provided intensive training to our contestants to enhance their skills and psychological capabilities. As the representatives of Hong Kong, three contestants were required to complete the wiring and installation of electrical equipment precisely within the specified time frame.

▲ 2021年12月14日至19日舉行的第11屆穗港澳蓉青年技能競賽  
11th GHMCYSC held from 14 to 19 December 2021

## 公眾及業界參與活動

除了上述活動，本匯報年度機電署還舉辦了多項其他公眾和業界參與活動：

## PUBLIC AND TRADE ENGAGEMENT ACTIVITIES

In addition to the above events, the EMSD also held a number of public and trade engagement activities during the reporting year.

### 2021/22 年度的公眾及業界參與活動

### PUBLIC AND TRADE ENGAGEMENT ACTIVITIES IN 2021/22



#### 車輛維修自願註冊計劃 Voluntary Registration Schemes for Vehicle Maintenance

- 在2021年5月、8月、11月及2022年2月出版《RVM通訊》。  
Published the RVM Newsletter in May, August, November 2021 and February 2022.
- 舉辦九個線上及一個文書版持續專業進修問答比賽，共有4 581人參加。  
Organised nine online and one paper-based format Continuing Professional Development (CPD) quizzes which attracted 4 581 participants.
- 2021年12月18日舉辦車輛維修技術持續專業進修線上講座，共有711人參加。  
Held a CPD webinar on vehicle maintenance technology on 18 December 2021 with 711 participants.
- 聯同車輛維修技術諮詢委員會協辦「車輛維修自願註冊計劃」宣傳短片創作比賽，讓學生及公眾參與。  
Co-organised the Voluntary Registration Scheme for Vehicle Maintenance Promotional Video Competition jointly with the Vehicle Maintenance Technical Advisory Committee for students and the public to participate.



#### 電力規例 Electricity Regulation

- 協辦年度電力規例技術研討會2021，近900人在線上參與。  
Co-organised Annual Technical Seminar 2021 on Electricity Regulation, attracting nearly 900 attendees online.



#### 氣體安全 Gas Safety

- 氣體安全諮詢委員會舉行第51次及52次會議。  
Held the 51st and 52nd meetings of the Gas Safety Advisory Committee.
- 為飲食業、居民、物業管理員、工程承辦商、建築工人、註冊氣體工程承辦商、註冊氣體裝置技工、勝任人士、R32家用空調機技術員和保險業界舉辦32場講座及研討會。  
Conducted 32 safety talks and seminars for the catering industry, residents, property management staff, works contractors, construction workers, registered gas contractors, registered gas installers, competent persons, R32 household air-conditioner technicians and insurance trade.
- 出版兩期《氣體快訊》供氣體業參考。  
Published two issues of the Gas Safety Bulletin for the gas trade.



#### 《重新校驗技術指引》 Technical Guidelines on Retro-commissioning

- 為各界機構舉辦18場技術指引簡報會和分享會。  
Delivered 18 presentations and sharing sessions on the technical guidelines to various organisations.



#### 能源效益 Energy

- 舉辦62場外展講座及安排87次機電署總部教育徑實體/虛擬參觀活動，招待1 103名來自不同機構和學校的訪客。  
Organised 62 outreach talks and 87 physical/virtual visits to the Education Path at the EMSD Headquarters for 1 103 visitors from different organisations and schools.
- 舉行33個有關「強制性能源效益標籤計劃」的學校展覽。  
Conducted 33 school exhibitions on the Mandatory Energy Efficiency Labelling Scheme.



#### 升降機及自動梯安全、 機動遊戲機安全及架空 纜車安全 Lifts and Escalators Safety, Amusement Rides Safety and Aerial Ropeways Safety

- 繼續聯同市區重建局推行「優化升降機資助計劃」，為業主提供財務資助和專業支援，優化舊式升降機。  
Continued to work with the Urban Renewal Authority to implement the Lift Modernisation Subsidy Scheme to provide financial subsidy and professional support to needy owners for modernisation of aged lifts.
- 在升降機暫停服務期間提供外展社會支援服務協助大廈業主，當中特別關注僅有一部升降機的樓宇。  
Assisted building owners during suspension of lift service by provision of outreach social support services, especially for buildings served by only one lift.
- 舉辦22場「升降機和自動梯管理及負責人職責」的線上講座，共有約1 450名相關負責人員參加。  
Organised 22 webinars on Lift/Escalator Management and Responsible Person's Duties, which were attended by about 1 450 responsible personnel.
- 與職業訓練局合辦資歷架構第五級的升降機工人(電梯大師)專業文憑課程。  
Teamed up with the Vocational Training Council to formulate a professional diploma course of the Hong Kong Qualifications Framework Level 5 for lift workers (Lift Master).



#### 義工服務 Voluntary Services

- 本署員工完成六個義工項目，合共錄得302小時義工服務時數。  
Completed six volunteering projects by our staff who contributed a total of 302 man-hours.

# 社會成效 Social Performance

## 關懷員工

機電署非常珍惜員工對實踐可持續發展作出的重大貢獻，我們根據政府的公務員聘用條款及非公務員合約僱員計劃保障員工的福利，只要員工符合《公務員事務規例》及公務員事務局通告和通函列明的資格，便可享有一系列醫療及牙科護理福利。除此之外，機電署員工如計劃組織家庭或增添家庭成員，我們也無任關懷，我們希望員工追求事業成就的同時也可照顧家庭和子女，而給予員工適當的育嬰假是重要措施之一。

我們也十分關注員工的身心健康，因此特設員工熱線，提供心理支援服務，並持續簽署《精神健康職場約章》，致力營造理想的工作環境，保障員工的心理健康。

## 員工統計

截至2022年3月，機電署共有5 924名員工（2020/21年度：6 038名），包括全職、常任制及合約制員工，年內並無聘用兼職員工。本匯報年度的新入職率及離職率分別為9.3%及8.9%。

## CARING FOR OUR STAFF

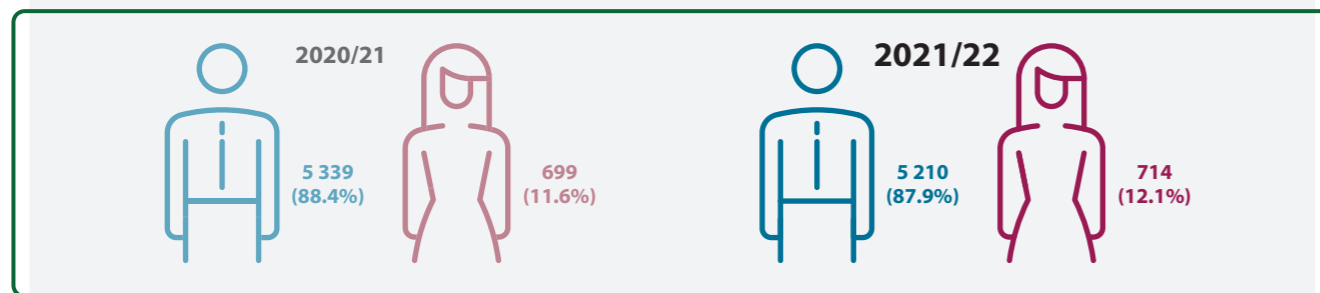
The EMSD highly appreciates the important contributions of employees towards our quest for sustainability development. Various medical and dental benefits are provided based on our staff's employment terms under the Government's Civil Service and the Non-Civil Service Contract Staff Schemes, as long as they meet eligibility criteria set out in the Civil Service Regulations and the Civil Service Bureau Circulars and Circular Memoranda. Meanwhile, the EMSD supports staff members who start or grow their families. We want our colleagues to strive for career success while being able to take care of their families and children. Providing appropriate levels of parental leave is a key.

Mental health of our staff is also very important, therefore, the EMSD provides psychological support through a designated hotline. In addition, we remain a signatory of the Mental Health Workplace Charter to promote a mental health-friendly workplace.

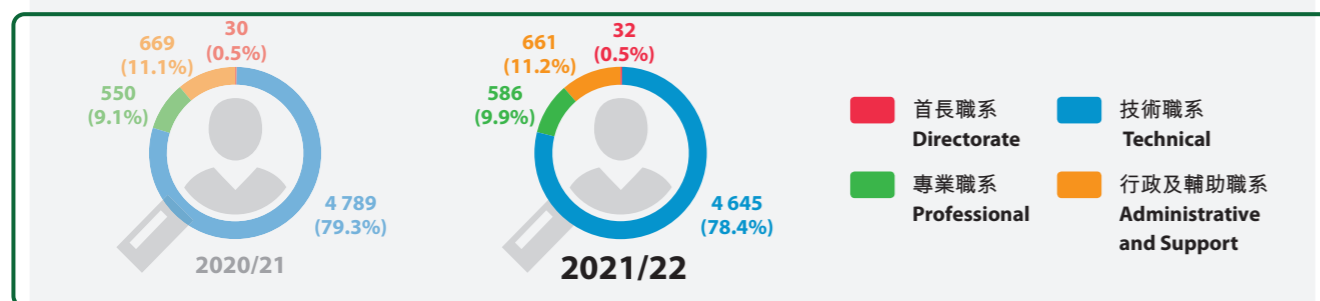
## Staff Statistics

As at March 2022, the EMSD had a workforce of 5 924 staff members (2020/21: 6 038 staff members), including full-time, permanent and contract employees. No part-time staff was recorded during the same period. In this reporting year, the new employee hire rate and turnover rate were 9.3% and 8.9% respectively.

### 按性別劃分 BREAKDOWN BY GENDER



### 按職系劃分 BREAKDOWN BY GRADE



## 多元化與平等機會

機電署矢志為轄下團隊營造多元共融的工作環境，提供適當的支援，並確保所有員工均享有公平及公正的待遇，絕不容許出現任何形式的歧視、騷擾和誹謗行為。為推動有特殊需要的人士就業，我們繼續參與《有能者・聘之約章》及共融機構嘉許計劃。

尊重人權和工作間權利是本署機構文化的重要環節，我們致力保障人權，嚴禁聘用強迫或強制性勞工。本匯報年度並無發現任何本署的營運和供應商違反關於童工或強迫勞工的法規，亦無任何涉及歧視的事件。

## 職業安全與健康

機電署日常營運時刻也確保職業安全與健康（職安健）達到最高水平。我們在機電工程營運基金的綜合管理系統下設立職安健管理系統，專責規劃、實施、評估和持續改善職安健措施與成效。我們執行機電工程時嚴格遵守機電署的安全與健康政策。

除此之外，我們的綜合管理系統已實施ISO 45001:2018 職業健康及安全管理系統，透過此最新國際標準確保員工和承辦商的作業安全與健康。我們採取積極主動的態度管理職安健相關事宜，特別成立了職安健策導委員會，牽頭統籌及監察本署營運上的職安健表現，另設立部別職安健委員會，加強溝通和提倡促進工作間安全與健康的作業方法。

## Diversity and Equal Opportunities

The EMSD is dedicated to creating a diversified and supportive working environment where every staff member is treated fairly and equally. We have no tolerance for any form of discrimination, harassment and vilification in the workplace. To promote employment with special needs, we continue to join the Talent-Wise Employment Charter and Inclusive Organisations Recognition Scheme.

Our culture is embedded with respect for human rights and workplace rights so we are committed to protecting human rights and have zero tolerance for forced or compulsory labour. During the reporting year, no breach of laws and regulations related to child or forced labour, or any incidents of discrimination, were identified across EMSD's operations and at any of our suppliers.

## Occupational Safety and Health

The EMSD always ensures a high standard of occupational safety and health (OSH) at our operations. An OSH management system has been formed as part of our Integrated Management System (IMS) for the EMSTF to govern the planning, implementation, evaluation and continuous improvement of OSH practices and performances. We strictly follow the EMSD Safety and Health Policy when delivering our E&M services.

Also, we apply the latest international standard of ISO 45001:2018 certified Occupational Health and Safety Management Systems in our IMS to promote workplace safety and health of our staff and contractors. To manage OSH related matters proactively, we set up the Steering Committee on OSH to play a leading role in overseeing and monitoring OSH performance across our operations, while the Divisional Occupational Safety and Health Committees (DivOSHCs) have been set up to strengthen communication and promotion of workplace safety and health practices.



# 社會成效 Social Performance

## 管理職安健風險和事故

為確保可盡早理順職安健風險，機電署已擬備《系統程序手冊》，以助識別任何與工作相關的危害和按照職安健管理系統進行風險評估。每個策略業務單位各自根據其業務性質進行風險評估和編製相關的工作指令，以盡量避免出現職安健危害及緩解潛在影響。機電署並為員工提供必要的個人保護裝備和器材，盡量避免工業意外發生。

一旦出現職安健事故，員工應立即停止執行職務並向直屬上級報告。此類事件由組別安全督導員或部別安全主任負責調查事件成因，並會回應所有合理查詢，防止報告事件的員工遭報復。

員工時刻均須確保工作環境安全，若有疑問應諮詢上級。職安健策導委員會和部別職安健委員會定期舉行會議，檢討內部措施及評估職安健表現。我們並會不時舉行內部審核，持續優化職安健管理系統。

## 推廣職安健意識及鼓勵參與

機電署舉辦多種不同活動，一方面提高員工和承辦商的安全意識，另一方面提供必要培訓，讓他們掌握處理職安健事件的技能。活動包括研討會、比賽及安全培訓班，例如強制性基本安全訓練、安全督導員培訓和一般職安健培訓。與此同時，我們也透過數碼平台向全體員工傳遞安全訊息，包括但不限於部門內聯網、內部刊物及電郵等，另亦制訂承辦商的職安健規定。

## OSH Risk and Incident Management

To address occupational risks at an early stage, the EMSD has formulated a System Procedure Manual to identify work-related hazards and conduct risk assessment under our OSH management system. Each Strategic Business Unit undertakes individual risk assessment based on its specific business nature, and develops relevant work instructions to minimise OSH hazards and mitigate potential impacts. Our staff members are equipped with necessary personal protective equipment and gear to minimise occupational injuries.

In the event of any OSH incident, staff members should stop all duties and report to their immediate supervisor. Sectional Safety Supervisor or the Safety Officer of the division is responsible to investigate the causes of incidents and respond to all reasonable enquiries to protect staff from reprisal.

Employees should always ensure their working environment is safe and seek their supervisors' advice if in doubt. Regular meetings are held to review internal measures and evaluate OSH performance by the Steering Committee on OSH and DivOSHCs. In addition, internal audits are carried out periodically to drive continuous improvement of our OSH management system.

## OSH Awareness and Participation

The EMSD has organised different activities, to strengthen safety awareness of our staff and contractors, and to train them for necessary skills to handle OSH incidents. The activities include seminars, competitions and safety training sessions, such as Mandatory Basic Safety Training, Safety Supervisor Training and General OSH Training. Our safety messages are distributed to all staff members by digital channels, including but not limited to the department intranet, internal publications and emails. OSH requirements are also in place for contractors.

## 培訓及發展

機電署繼續致力建立強大的團隊，確保員工對工作感到滿意，做事積極有幹勁，擁有適切的技能。我們提供各類培訓和發展活動，讓員工掌握必要技能，緊貼相關機電範疇的最新發展。廣泛的培訓主題包括建築信息模擬技術、人工智能、數碼化、智慧城市、創科應用、5G及其他資訊科技相關課題、職業安全與健康、結構化管理人員發展培訓課程及行政人員發展培訓課程、員工操守及誠信、國情及基本法研習班以及其他職業和通識培訓。

隨着 2021/22 年度上半年疫情緩和，大部分面授培訓均已恢復或以混合模式授課，以鼓勵機電署同事積極進修，我們同時也提倡採用線上培訓活動。本匯報年度按性別和按職系劃分的平均培訓時數<sup>7</sup>如下：

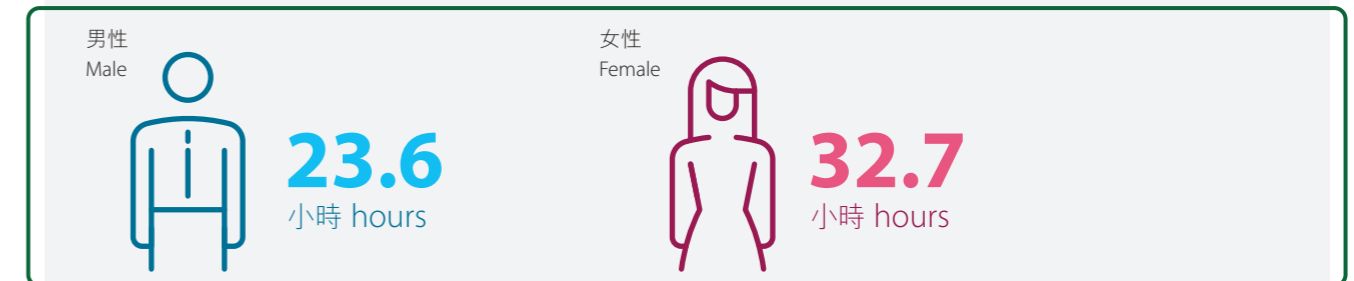
## Training and Development

The EMSD remains committed to developing a satisfied, motivated and competent workforce. Training and development activities are provided to equip our staff with necessary competencies and keep them abreast of latest developments in their relevant fields. These include various training activities on Building Information Modelling, AI, digitalisation, smart city, I&T applications, 5G and other information technology-related topics, occupational safety and health, structured management development programmes and executive development programmes, conduct and integrity, national studies and Basic Law as well as other vocational and generic training programmes.

As the epidemic situation improved during the first half of 2021/22, most face-to-face trainings were resumed and/or conducted in hybrid mode, so as to keep EMSD staff motivated for learning. At the same time, we also encouraged the adoption of online training activities. Average training hours<sup>7</sup> by gender and grade during the reporting year are as follows:

### 2021/22 年度按性別劃分的平均培訓時數

#### AVERAGE TRAINING HOURS BY GENDER IN 2021/22



### 2021/22 年度按職系劃分的平均培訓時數

#### AVERAGE TRAINING HOURS BY GRADE IN 2021/22



<sup>7</sup> 平均培訓時數是按員工培訓日數乘以每日培訓小時數(6小時)再除以員工年末總人數計算。  
Average training hours were calculated by multiplying the employee training days and the training hours (6 hours) per day, and then divided it by the total number of employees at the year-end.

### 安全培訓 SAFETY TRAINING

- 強制性基本安全訓練  
Mandatory Basic Safety Training
- 一般職安健培訓  
General OSH Training
- 安全督導員培訓  
Safety Supervisor Training
- 研討會  
Seminars
- 比賽  
Competitions

### 承辦商研討會 The EMSD Contractors Forum

推廣最新的安全標準和相關措施。Promoting the latest safety standards and relevant measures.

### 政府合約 Government Contract

《工地安全特別規格》訂明承辦商必須為工地工人提供必要的安全培訓。Stipulating in Particular Specifications on Site Safety that contractors must provide necessary safety training for their site workers.

內部員工  
Internal Staff

承辦商  
Contractors

# 社會成效 Social Performance

## 員工溝通

機電署十分重視員工的意見及建議，深明此乃持續提升營運效率的關鍵。我們設有多種渠道促進內部溝通：

### 委員會及工會 Committees and Unions



我們設有四個部門協商委員會和五個部別協商委員會，作為員工與管理層之間的交流平台，藉此加強內部溝通。員工亦可加入機電署11個部門工會及員工組織，向部門/政府表達意見和關注議題。

To further enhance internal communication, we have established four departmental consultative committees and five divisional consultative committees to provide platforms for view exchange between staff and management. Also, our staff are free to join the 11 staff unions and associations to express their views and concerns to the Department/Government.

### 2021年員工滿意度調查 2021 Staff Satisfaction Survey



2021年的整體員工滿意度指數為7.6分（以10分為滿分計），較2019年分數（6.8分）上升11.8%，更創下歷史新高。

The overall staff satisfaction rating in 2021 was 7.6 (on a 10-point scale), an increase of 11.8% compared to the staff satisfaction rating in 2019 (6.8) and a record high.

### 員工投訴程序 Staff Complaints Procedure



為確保員工的投訴得到妥善處理，本署設有正式的員工投訴程序，同事可舉報任何不當待遇和表達不滿。

To ensure proper handling of staff complaints, the Staff Complaints Procedure is a mechanism that allows colleagues to report any mistreatment and dissatisfaction.

## Staff Communication

We cherish our staff members' opinions and suggestions for continuous improvement on operation efficiency in the EMSD. Therefore, we provide various channels for our internal communication as listed below:

### 會議及分享會 Meetings and Sharings



管理人員透過不同渠道定期與員工會面，包括但不限於每年的署長簡報會、親善大使探訪和出席部門協商委員會及工會會議，向員工講述機電署的最新動向和意念。只要情況許可，機電署推出新措施之前會透過員工關係組或簡報會/工作坊諮詢員工，聽取同事的意見。

The management would meet staff on a regular basis, including but not limited to annual DEMS Briefing, ambassador visits, meetings with departmental consultative committees and staff unions. Staff are informed of the EMSD's latest developments and ideas are shared. The EMSD would, as far as possible, conduct staff consultation before launching new practices via the Staff Relations Unit or briefings/workshops to gauge advice from staff.

### 「好人好事嘉許計劃」 "Good People, Good Deeds Commendation Scheme"



本計劃旨在激勵員工實踐機電署的目標，共建勇於創新、高效、專業和精誠致志的團隊，同心服務社會。

The programme inspires our staff to attain the EMSD's goals and build a creative, efficient, professional and dedicated team to serve the community.

## 員工的福祉

機電署非常重視員工的福祉，在疫情下尤其關注。年內我們推出多項新措施助同事保持身心健康。

機電署積極鼓勵員工盡快接種疫苗抗疫情。為確保前線人員接種疫苗而非單靠定期檢測，我們為同事提供外展疫苗接種服務和疫苗假期等。

## Staff Wellbeing

At the EMSD, our people's overall wellbeing is top priority. Especially during epidemic times, we took additional measures to help our staff stay well both physically and mentally.

The EMSD does its utmost to encourage and facilitate staff to get vaccinated as soon as possible to fight Coronavirus Disease 2019. Efforts towards this end include ensuring frontline government employees are vaccinated instead of taking regular testing, outreach vaccination service, vaccination leave, etc.



◀ 宣傳接種疫苗  
Promotion of vaccination

機電署員工康樂會於2021年6月及7月舉辦水耕種植活動，邀請園藝師提供關於水耕的專業技術支援。辛勞耕耘終於獲得收成，為參與活動的「農夫」們帶來無比喜悅和滿足感。鑑於反應熱烈，日後我們會再次舉行同類活動，讓更多同事有機會體驗水耕的樂趣。

The EMSD Staff Club organised a hydroponic planting event in June and July 2021. A horticulturalist was invited to provide all-round professional technical support on hydroponic planting to staff. The harvest earned by hard work and loving care brought great joy and satisfaction to all who participated. In view of the overwhelming positive feedback, the event will be held again in the future so more colleagues can enjoy the fun of hydroponic planting.

▶ 水耕種植慶豐收  
Celebrating the harvest of hydroponic planting



# 全球報告倡議組織內容索引

## GRI Content Index



機電工程署根據全球報告倡議組織標準編製本報告，匯報期為2021年4月1日至2022年3月31日。對於本報告的英文版，全球報告倡議組織確認本報告按「一般披露」2-1至2-5、3-1及3-2的位置。

The Electrical and Mechanical Services Department has reported in accordance with the GRI Standards for the period from 1 April 2021 to 31 March 2022. For the Content Index – Essentials Service, GRI Services reviewed that the GRI content index is clearly presented and the references for Disclosures 2-1 to 2-5, 3-1 and 3-2 align with appropriate sections in the body of this Report. The service was performed on the English version of this Report.

可持續發展報告標準 GRI Standards	一般披露 General Disclosures	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance
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**GRI 1: 基礎 2021**  
**GRI 1: Foundation 2021**

**GRI 2: 一般披露 2021**  
**GRI 2: General Disclosures 2021**

**機構簡介及報告方式**  
**The organisation and its reporting practices**

<b>2-1</b>	組織詳細資訊 Organisational details	* 機電工程署(機電署)屬於中華人民共和國香港特別行政區政府的一部分，位於香港九龍啟成街3號，營運地點只限香港。 * The Electrical and Mechanical Services Department (EMSD) is part of the Government of the Hong Kong Special Administrative Region (HKSAR) of the People's Republic of China. It is located in 3 Kai Shing Street, Kowloon, Hong Kong and location of operations is in Hong Kong only.	-	✓
<b>2-2</b>	機構可持續報導包含的單位 Entities included in the organisation's sustainability reporting	關於本報告 About this Report	P. 162-165	✓
<b>2-3</b>	匯報期、頻率及聯絡點 Reporting period, frequency and contact point	關於本報告 About this Report	P. 162-165	✓
<b>2-4</b>	重疊信息 Restatements of information	* 上年度報告的統計資料摘要中，以下資料作出更正： * In the Summary of Statistics of this Report last year, the following information is restated: 1. 2018/19年度、2019/20年度及2020/21年度因購買電力使用總量涵蓋範圍新增機電署轄下和區域供冷系統設施，以符合國際報告機制。因此，其2018/19年度數據從11 850 000千瓦小時(42 658千兆焦耳)更正為30 895 000千瓦小時(111 223千兆焦耳)，2019/20年度數據從12 239 000千瓦小時(44 059千兆焦耳)更正為33 423 000千瓦小時(120 321千兆焦耳)，而2020/21年度數據從12 315 000千瓦小時(44 334千兆焦耳)更正為35 847 000千瓦小時(129 049千兆焦耳)。 The coverage of total purchased electricity consumption added the infrastructures of the EMSD and District Cooling System to align with international reporting mechanism in 2018/19, 2019/20, 2020/21. Therefore, that of 2018/19 was changed from 11 850 000 kWh (42 658 GJ) to 30 895 000 kWh (111 223 GJ), that of 2019/20 was changed from 12 239 000 kWh (44 059 GJ) to 33 423 000 kWh (120 321 GJ), while that of 2020/21 was changed from 12 315 000 kWh (44 334 GJ) to 35 847 000 kWh (129 049 GJ).	P. 217	✓

可持續發展報告標準 GRI Standards	一般披露 General Disclosures	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance
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<b>2-5</b>	外部認證 External assurance	關於本報告 About this Report  獨立保證意見聲明書 Independent Assurance Opinion Statement	P. 162   P. 225-226	✓
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2019/20年度及2020/21年度相應的購買電力使用強度分別從2 137千瓦小時/員工更正為5 837千瓦小時/員工，及2 040千瓦小時/員工更正為5 937千瓦小時/員工；  
The corresponding purchased electricity consumption intensities for 2019/20 and 2020/21 were revised from 2 137 kWh/employee to 5 837 kWh/employee, 2 040 kWh/employee to 5 937 kWh/employee, respectively;

2. 2019/20年度及2020/21年度能源間接溫室氣體排放(範圍二)分別從6 188公噸二氧化碳當量更正為16 877公噸二氧化碳當量及從4 634公噸二氧化碳當量更正為13 434公噸二氧化碳當量。2019/20年度及2020/21年度總溫室氣體排放因此分別從7 462公噸二氧化碳當量更正為18 151公噸二氧化碳當量和6 996公噸二氧化碳當量更正為15 796公噸二氧化碳當量；  
The energy indirect GHG emissions (Scope 2) in 2019/20 and 2020/21 were revised from 6 188 tCO<sub>2</sub>e to 16 877 tCO<sub>2</sub>e and 4 634 tCO<sub>2</sub>e to 13 434 tCO<sub>2</sub>e, respectively. The total GHG emissions in 2019/20 and 2020/21 were therefore revised from 7 462 tCO<sub>2</sub>e to 18 151 tCO<sub>2</sub>e and 6 996 tCO<sub>2</sub>e to 15 796 tCO<sub>2</sub>e, respectively;

3. 2018/19年度、2019/20年度及2020/21年度的能源用量在相若運作情況下分別從11 993 000千瓦小時更正為31 038 000千瓦小時、從12 064 000千瓦小時更正為30 673 000千瓦小時和從11 981 000千瓦小時更正為30 658 000千瓦小時；  
Energy consumption under comparable operating conditions in 2018/19, 2019/20 and 2020/21 were revised from 11 993 000 kWh to 31 038 000 kWh, 12 064 000 kWh to 30 673 000 kWh and 11 981 000 kWh to 30 658 000 kWh, respectively;

4. 2020/21年度用水量因應水錶評估審核後從16 743立方米更正為16 177立方米。  
Water consumption data in 2020/21 was revised from 16 743 m<sup>3</sup> to 16 177 m<sup>3</sup> after water meter evaluation.

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可持續發展報告標準 GRI Standards	一般披露 General Disclosures	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance
<b>業務活動及員工 Activities and workers</b>				
<b>2-6</b>	業務活動、價值鏈及其他業務關係 Activities, value chain and other business relationships	部門簡介及架構 Organisational Profile and Structure  * 機電工程署聘請了2,531名供應商，他們大多負責提供機電安裝、運作及保養相關的配件/設備及服務。 * There are 2,531 suppliers engaged by the EMSD. They are mainly involved in provision of parts/equipment and services related to E&M installation, operation and maintenance.  * 超過99%供應商位於香港。機電工程署和他們有合約形式、以活動為基礎及以項目為基礎的業務關係。 大約80個下游單位屬於政府部門。機電工程署和他們有長期、合約形式及以項目為基礎的業務關係。 * More than 99% of suppliers are located in Hong Kong. EMSD has the contractual, event-based and project-based business relationships with them.  Approximately 80 downstream entities come from the government departments. EMSD has long-term, contractual and project-based relationship with them.	封面內頁 Inner page of Cover	✓
<b>2-7</b>	僱員 Employees	社會成效 Social Performance  統計資料摘要 Summary of Statistics	P. 192  P. 220-221	✓
<b>2-8</b>	非僱員的員工 Workers who are not employees	社會成效 Social Performance  統計資料摘要 Summary of Statistics	P. 192  P. 220-221	✓

可持續發展報告標準 GRI Standards	一般披露 General Disclosures	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance
<b>管治 Governance</b>				
<b>2-9</b>	管治結構及組成 Governance structure and composition	我們的管理層 Our Management  * 我們的管治結構及組成載於： <a href="https://www.emsd.gov.hk/tc/about_us/our_organisation/">https://www.emsd.gov.hk/tc/about_us/our_organisation/</a> * Our governance structure and composition are listed on our website at: <a href="https://www.emsd.gov.hk/en/about_us/our_organisation/">https://www.emsd.gov.hk/en/about_us/our_organisation/</a>  * 我們的品質、環境及生產力策導委員會及職安健策導委員會負責經濟、環境和社會議題的決策。 * Our Quality, Environmental & Productivity Steering Committee and Steering Committee on OSH are responsible for decision-making on economic, environmental and social topics.	P. 12-13, 16-17, 102-105	✓
<b>2-10</b>	最高治理單位的提名與遴選 Nomination and selection of the highest governance body	* 作為政府部門的機電工程署，最高治理單位的提名與遴選是由公務員敘用委員會負責。公務員敘用委員會是獨立的法定機構，負責涉及中層及高層公務員職位的聘用及晉升事宜（司法機構及警隊的紀律職系人員除外），均須徵詢委員會的意見。當局如擬修改適用於公務員職位的聘任程序，須諮詢委員會，委員會亦可主動提出修改建議。公務員敘用委員會詳細資訊載於： <a href="https://www.psc.gov.hk/">https://www.psc.gov.hk/</a> * Since EMSD is a government department, nomination and selection of the highest governance body is responsible by the Public Service Commission. Public Service Commission is an independent statutory body for appointment or promotion of government officers to some middle and senior ranking posts, excluding the judiciary and the disciplined ranks of the Hong Kong Police Force. The Commission is also consulted on changes in appointment procedures applicable to civil service posts at all ranks and may initiate proposals for change. Details of the Public Service Commission is provided on the website at: <a href="https://www.psc.gov.hk/">https://www.psc.gov.hk/</a>	-	✓
<b>2-11</b>	最高治理單位的主席 Chair of the highest governance body	我們的管理層 Our Management  * 我們的高層管理人員載於： <a href="https://www.emsd.gov.hk/tc/about_us/our_organisation/">https://www.emsd.gov.hk/tc/about_us/our_organisation/</a> * Our senior management is listed on our website at: <a href="https://www.emsd.gov.hk/en/about_us/our_organisation/">https://www.emsd.gov.hk/en/about_us/our_organisation/</a>	P. 12-13, 16-17, 102-105	✓

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2-12	最高治理單位於監督影響管理的角色 Role of the highest governance body in overseeing the management of impacts	我們的管理層 Our Management	P.12-13, 16-17, 102-105	✔
		可持續發展管理方針 Sustainability Management Approach	P.168-177	
		* 我們的高級管理層於監督影響管理的角色載於： <a href="https://www.emsd.gov.hk/tc/about_us/our_organisation/">https://www.emsd.gov.hk/tc/about_us/our_organisation/</a>		
		* The role of our senior management in overseeing the management of impacts is listed on our website at: <a href="https://www.emsd.gov.hk/en/about_us/our_organisation/">https://www.emsd.gov.hk/en/about_us/our_organisation/</a>		
2-13	為管理影響的責任授權 Delegation of responsibility for managing impacts	我們的管理層 Our Management	P.12-13, 16-17, 102-105	✔
		可持續發展管理方針 Sustainability Management Approach	P.168-177	
		* 我們管理影響的責任授權載於： <a href="https://www.emsd.gov.hk/tc/about_us/our_organisation/">https://www.emsd.gov.hk/tc/about_us/our_organisation/</a>		
		* Our delegation of responsibility for managing impacts is listed on our website at: <a href="https://www.emsd.gov.hk/en/about_us/our_organisation/">https://www.emsd.gov.hk/en/about_us/our_organisation/</a>		
		* 我們的高級管理層參與了品質、環境及生產力策導委員會以及內部環保採購工作小組。機電署的助理署長負責監督機構內部的可持續發展議題。		
		* Our senior management staff participates in Quality, Environmental & Productivity Steering Committee and internal working group on green procurement. Assistant Directors of the EMSD are appointed to oversee sustainability issues within the organisation.		
2-14	最高治理單位於可持續報告的角色 Role of the highest governance body in sustainability reporting	我們的管理層 Our Management	P.12-13, 16-17, 102-105	✔
		可持續發展管理方針 Sustainability Management Approach	P.168-177	
		* 我們的高級管理層於可持續報告的角色載於： <a href="https://www.emsd.gov.hk/tc/about_us/our_organisation/">https://www.emsd.gov.hk/tc/about_us/our_organisation/</a>		
		* The role of our senior management in sustainability reporting is listed on our website at: <a href="https://www.emsd.gov.hk/en/about_us/our_organisation/">https://www.emsd.gov.hk/en/about_us/our_organisation/</a>		
2-15	利益衝突 Conflicts of interest	* 作為政府部門的機電工程署，利益衝突指引載於： <a href="https://www.csb.gov.hk/tc_chi/admin/conduct/137.html">https://www.csb.gov.hk/tc_chi/admin/conduct/137.html</a>	-	✔
		* EMSD acts as a government department and the guideline on conflict of interest is listed on the website at: <a href="https://www.csb.gov.hk/english/admin/conduct/137.html">https://www.csb.gov.hk/english/admin/conduct/137.html</a>		

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2-16	溝通關鍵重大事件 Communication of critical concerns	可持續發展管理方針 Sustainability Management Approach	P.170-172	✔
		社會成效 Social Performance	P.190-191	
		* 作為政府部門的機電工程署，利益衝突指引載於： <a href="https://www.csb.gov.hk/tc_chi/admin/conduct/137.html">https://www.csb.gov.hk/tc_chi/admin/conduct/137.html</a>		
		* EMSD acts as a government department and the guideline on conflict of interest is listed on the website at: <a href="https://www.csb.gov.hk/english/admin/conduct/137.html">https://www.csb.gov.hk/english/admin/conduct/137.html</a>		
2-17	最高治理單位的群體智識 Collective knowledge of the highest governance body	環保成效 Environmental Performance	P.178-185	✔
		社會成效 Social Performance	P.186-197	
2-18	最高治理單位的績效評估 Evaluation of the performance of the highest governance body	* 作為政府部門的機電工程署，工作表現管理制度詳情載於： <a href="https://www.csb.gov.hk/tc_chi/admin/pm/173.html">https://www.csb.gov.hk/tc_chi/admin/pm/173.html</a>	-	✔
		* EMSD acts as a government department and the details of performance management system are listed on the website at: <a href="https://www.csb.gov.hk/english/admin/pm/173.html">https://www.csb.gov.hk/english/admin/pm/173.html</a>		
2-19	薪酬政策 Remuneration policies	* 作為政府部門的機電工程署，薪酬政策載於： <a href="https://www.csb.gov.hk/tc_chi/admin/pay/38.html">https://www.csb.gov.hk/tc_chi/admin/pay/38.html</a>	-	✔
		* EMSD acts as a government department and the pay policy is listed on the website at: <a href="https://www.csb.gov.hk/english/admin/pay/38.html">https://www.csb.gov.hk/english/admin/pay/38.html</a>		
2-20	薪酬決定流程 Process to determine remuneration	* 作為政府部門的機電工程署，年度薪酬調整載於： <a href="https://www.csb.gov.hk/tc_chi/admin/pay/55.html">https://www.csb.gov.hk/tc_chi/admin/pay/55.html</a>	-	✔
		* EMSD acts as a government department and the annual pay adjustment mechanism is listed on the website at: <a href="https://www.csb.gov.hk/english/admin/pay/55.html">https://www.csb.gov.hk/english/admin/pay/55.html</a>		
2-21	年度總薪酬比率 Annual total compensation ratio	* 作為政府部門的機電工程署，總薪級表載於： <a href="https://www.csb.gov.hk/tc_chi/admin/pay/42.html">https://www.csb.gov.hk/tc_chi/admin/pay/42.html</a>	-	✔
		* EMSD acts as a government department and the master pay scale is listed on the website at: <a href="https://www.csb.gov.hk/english/admin/pay/42.html">https://www.csb.gov.hk/english/admin/pay/42.html</a>		
2-22	可持續發展策略的聲明 Statement on sustainable development strategy	* 我們的企業政策：環保政策載於： <a href="https://www.emsd.gov.hk/tc/about_us/corporate_policies/environment/index.html">https://www.emsd.gov.hk/tc/about_us/corporate_policies/environment/index.html</a>	-	✔
		* Our corporate policies for the environment is shown on our website at: <a href="https://www.emsd.gov.hk/en/about_us/corporate_policies/environment/index.html">https://www.emsd.gov.hk/en/about_us/corporate_policies/environment/index.html</a>		

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<b>策略、政策及實務</b> Strategy, policies and practices				
2-23	政策承諾 Policy commitments	抱負 Vision	P. 15, 100	✔
		使命 Mission	P. 15, 100	
		信念 Values	P. 15, 100	
		可持續發展管理方針 Sustainability Management Approach	P. 168-177	
		環保成效 Environmental Performance	P.178-185	
		社會成效 Social Performance	P. 186-197	
		* 我們的企業政策載於： <a href="https://www.emsd.gov.hk/tc/about_us/corporate_policies/index.html">https://www.emsd.gov.hk/tc/about_us/corporate_policies/index.html</a> * Our corporate policies are shown on our website at: <a href="https://www.emsd.gov.hk/en/about_us/corporate_policies/index.html">https://www.emsd.gov.hk/en/about_us/corporate_policies/index.html</a>		
2-24	嵌入政策承諾 Embedding policy commitments	可持續發展管理方針 Sustainability Management Approach	P. 168, 173	✔
		環保成效 Environmental Performance	P. 178-181	
		社會成效 Social Performance	P. 188-191	
		* 我們的企業政策載於： <a href="https://www.emsd.gov.hk/tc/about_us/corporate_policies/index.html">https://www.emsd.gov.hk/tc/about_us/corporate_policies/index.html</a> * Our corporate policies are shown on our website at: <a href="https://www.emsd.gov.hk/en/about_us/corporate_policies/index.html">https://www.emsd.gov.hk/en/about_us/corporate_policies/index.html</a>		
2-25	補救負面衝擊的程序 Processes to remediate negative impacts	抱負 Vision	P. 15, 100	✔
		使命 Mission	P. 15, 100	
		信念 Values	P. 15, 100	
		可持續發展管理方針 Sustainability Management Approach	P. 170	
		社會成效 Social Performance	P. 196	
		* 我們的企業政策載於： <a href="https://www.emsd.gov.hk/tc/about_us/corporate_policies/index.html">https://www.emsd.gov.hk/tc/about_us/corporate_policies/index.html</a> * Our corporate policies are shown on our website at: <a href="https://www.emsd.gov.hk/en/about_us/corporate_policies/index.html">https://www.emsd.gov.hk/en/about_us/corporate_policies/index.html</a>		
		* 我們現行及計劃中的促進種族平等措施載於： <a href="https://www.emsd.gov.hk/tc/about_us/promotion_of_racial_equality/index.html">https://www.emsd.gov.hk/tc/about_us/promotion_of_racial_equality/index.html</a> * Our existing and planned measures on the promotion of racial equality are shown on our website at: <a href="https://www.emsd.gov.hk/en/about_us/promotion_of_racial_equality/index.html">https://www.emsd.gov.hk/en/about_us/promotion_of_racial_equality/index.html</a>		

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2-26	尋求建議和提出顧慮的機制 Mechanisms for seeking advice and raising concerns	社會成效 Social Performance	P. 196	✔
2-27	遵守法律及法規 Compliance with laws and regulations	社會成效 Social Performance	P. 175	✔
		* 在2021/22年度，我們並無因為違反相關法律或規例而被懲處任何大額罰款或非金錢制裁。 * In 2021/22, we were not subject to significant fines or non-monetary sanctions for non-compliance with laws or regulations.		
2-28	機構參與的協會的會員資格 Membership associations	* 機電工程署屬於以下協會的成員： 1) 保障資料主任聯會 2) 歐洲標準委員會 3) 綠十字會 4) 香港職業安全衛生協會 5) 英國燃氣專業學會 6) 國際纜車監管機構會議 7) 國際鐵路安全議會 * The EMSD holds membership in the following associations: 1) Data Protection Officers' Club 2) European Committee for Standardisation 3) Green Cross Group 4) Hong Kong Occupational Safety and Health Association 5) Institution of Gas Engineers and Managers 6) Internationale Tagung der Technischen Aufsichtsbehörden (International Meeting of Technical Authorities for Cableways) 7) International Railway Safety Council	-	✔
<b>持份者參與</b> Stakeholder Engagement				
2-29	引入持份者參與的方針 Approach to stakeholder engagement	關於本報告 About this Report	P. 163	✔
		可持續發展管理方針 Sustainability Management Approach	P. 170-171	
2-30	集體談判協議 Collective bargaining agreements	* 共有11個機電工程署工會由員工以自願性質參與，另有九個員工協商委員會代表不同職系及職級的機電工程署員工就員工福利與部門溝通。全體的員工(100%)都受集體談判協議的保障。 * There are 11 EMSD staff unions which can be joined on voluntary basis. There are also nine departmental consultative committees who are representatives of all grades and ranks of the EMSD staff to liaise with the Department for the wellbeing of the staff. All of our employees (100%) are covered by collective bargaining agreements.	-	✔



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## GRI Content Index

可持續發展報告標準 GRI Standards	特定議題標準 Topic-specific Standards	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance	
<b>GRI 3: 重要議題 2021</b> GRI 3: Material Topics 2021					
<b>GRI 3: 重要議題 2021</b> GRI 3: Material Topics 2021	3-1	重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 163	✓
		可持續發展管理方針 Sustainability Management Approach		P. 171	
	3-2	重要議題清單 List of material topics	關於本報告 About this Report	P. 164-165	✓
		可持續發展管理方針 Sustainability Management Approach		P. 171	
	3-3	重要議題的管理 Management of material topics	可持續發展管理方針 Sustainability Management Approach	P. 164-165	✓

### 經濟 Economic

經濟成效 (財務表現) Economic Performance (Financial Performance)					
<b>GRI 3: 重要議題 2021</b> GRI 3: Material Topics 2021	3-1	重要議題決定的流程 Process to determine material topics	機電工程署二零二一至二二年年報 EMSD Annual Report 2021/22	P. 106-111	✓
	3-2	重要議題清單 List of material topics	關於本報告 About this Report	P. 164-165	
	3-3	重要議題的管理 Management of material topics			
<b>GRI 201: 經濟績效 2016</b> GRI 201: Economic Performance 2016	201-1	機構所產生及分配的直接經濟價值 Direct economic value generated and distributed	機電工程署二零二一至二二年年報 EMSD Annual Report 2021/22	P. 106-111	✓
	201-2	氣候變遷所產生的財務影響及其他風險與機會 Financial implications and other risks and opportunities due to climate change	環保成效 Environmental Performance	P. 179-180	✓
	201-3	定義福利計劃義務與其他退休計劃 Defined benefit plan obligations and other retirement plans	* 作為政府部門的機電工程署，退休政策載於： <a href="https://www.csb.gov.hk/tc_chi/admin/retirement/183.html">https://www.csb.gov.hk/tc_chi/admin/retirement/183.html</a> * EMSD acts as a government department and the retirement policy is listed on the website at: <a href="https://www.csb.gov.hk/english/admin/retirement/183.html">https://www.csb.gov.hk/english/admin/retirement/183.html</a>	-	✓
	201-4	取自政府之財務補助 Financial assistance received from government	* 不適用於機電工程署的日常營運。 * Not applicable to the EMSD's operations.	-	✓



可持續發展報告標準 GRI Standards	特定議題標準 Topic-specific Standards	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance	
<b>間接經濟影響</b> Indirect Economic Impacts					
<b>GRI 3: 重要議題 2021</b> GRI 3: Material Topics 2021	3-1	重要議題決定的流程 Process to determine material topics	機電工程署二零二一至二二年年報 EMSD Annual Report 2021/22	P. 18-25, 106-111	✓
	3-2	重要議題清單 List of material topics	關於本報告 About this Report	P. 164-165	
	3-3	重要議題的管理 Management of material topics			
<b>GRI 203: 間接經濟影響 2016</b> GRI 203: Indirect Economic Impacts 2016	203-1	基礎設施投資與支援性服務 Infrastructure investments and services supported	機電工程署二零二一至二二年年報 EMSD Annual Report 2021/22	P. 18-25, 106-111	✓
	203-2	重大間接經濟影響 Significant indirect economic impacts	社會成效 Social Performance	P. 190-191	✓



採購實務 Procurement Practices					
<b>GRI 3: 重要議題 2021</b> GRI 3: Material Topics 2021	3-1	重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	3-2	重要議題清單 List of material topics	可持續發展管理方針 Sustainability Management Approach	P. 172-173	
	3-3	重要議題的管理 Management of material topics	環保成效 Environmental Performance	P. 184-185	
<b>GRI 204: 採購實務 2016</b> GRI 204: Procurement Practices 2016	204-1	本地供應商採購的支出比例 Proportion of spending on local suppliers	* 物料供應分部的服務及產品主要購自本地(即指香港)供應商/承辦商或分銷商。香港以外的供應商於2021/22年度只佔大約3.18%。 * Acquisition of services and goods handled by Supplies sub-division are mainly from local (i.e. Hong Kong) suppliers/contractors or local agents. Suppliers outside Hong Kong only take up around 3.18% in 2021/22.	-	✓

### 環境 Environmental

物料 Materials					
<b>GRI 3: 重要議題 2021</b> GRI 3: Material Topics 2021	3-1	重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	3-2	重要議題清單 List of material topics	環保成效 Environmental Performance	P. 184-185	
	3-3	重要議題的管理 Management of material topics			
<b>GRI 301: 物料 2016</b> GRI 301: Materials 2016	301-1	所採用原材料的重量或體積 Materials used by weight or volume	統計資料摘要 Summary of Statistics	P. 218	✓
	301-2	使用回收再利用的物料 Recycled input materials used	* 不適用於機電工程署的日常營運。 * Not applicable to the EMSD's operations.	-	✓
	301-3	回收產品及其包材 Reclaimed products and their packaging materials	* 不適用於機電工程署的日常營運。 * Not applicable to the EMSD's operations.	-	✓



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<b>能源</b> Energy				
<b>GRI 3: 重要議題 2021</b> GRI 3: Material Topics 2021	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	環保成效 Environmental Performance	P. 178-185	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 302: 能源 2016</b> GRI 302: Energy 2016	<b>302-1</b> 機構內部的能源消耗量 Energy consumption within the organisation	環保成效 Environmental Performance 統計資料摘要 Summary of Statistics	P. 169 P. 217	✓
	<b>302-2</b> 機構外部的能源消耗量 Energy consumption outside of the organisation	* 不適用於機電工程署的日常營運。 * Not applicable to the EMSD's operations.	-	✓
	<b>302-3</b> 能源強度 Energy intensity	環保成效 Environmental Performance	P. 181-182	✓
		統計資料摘要 Summary of Statistics	P. 217	
	<b>302-4</b> 減少能源的消耗 Reduction of energy consumption	環保成效 Environmental Performance	P. 181-182	✓
<b>302-5</b> 降低產品和服務的能源需求 Reductions in energy requirements of products and services	* 不適用於機電工程署的日常營運。 * Not applicable to the EMSD's operations.	-	✓	



可持續發展報告標準 GRI Standards	特定議題標準 Topic-specific Standards	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance
<b>水與污水</b> Water and Effluents				
<b>GRI 3: 重要議題 2021</b> GRI 3: Material Topics 2021	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	環保成效 Environmental Performance	P. 185	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 303: 水資源與污水 2018</b> GRI 303: Water and Effluents 2018	<b>303-1</b> 水資源共享的處理 Interactions with water as a shared resources	環保成效 Environmental Performance	P. 185	✓
	<b>303-2</b> 排水管理及影響 Management of water discharge-related impacts	環保成效 Environmental Performance	P. 185	✓
	<b>303-3</b> 取水量 Water withdrawal	* 機電工程署的用水主要來自水務署管理的供水來源。按來源細分用水量的披露方法，例如地表水、地下水等，並不適用。 * The water consumed by the EMSD's operations comes from the sources managed by Water Supplies Department. Disclosure on the breakdown of water withdrawn by source, e.g. surface water, groundwater, etc. is considered to be not applicable.	-	✓
	<b>303-4</b> 排水量 Water discharge	環保成效 Environmental Performance	P. 185	✓
		統計資料摘要 Summary of Statistics	P. 217	
<b>303-5</b> 耗水量 Water consumption	環保成效 Environmental Performance 統計資料摘要 Summary of Statistics	P. 185 P. 217	✓	



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可持續發展報告標準 GRI Standards	特定議題標準 Topic-specific Standards	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance
<b>生物多樣性 (生態保育)</b> <b>Biodiversity (Ecological Conservation)</b>				
<b>GRI 3: 重要議題 2021</b> <b>GRI 3: Material Topics 2021</b>	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	環保成效 Environmental Performance	P. 181	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 304: 生物多樣性 2016</b> <b>GRI 304: Biodiversity 2016</b>	<b>304-1</b> 機構所擁有、租賃、管理的營運地點或其鄰近地區位於環境保護區或區外的具有重要生物多樣性價值的地區或其毗鄰地區 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	* 機構所擁有、租賃、管理的營運地點均不在環境保護區或區外的具有重要生物多樣性價值的地區或其毗鄰地區。 * No operation sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.	-	✓
	<b>304-2</b> 業務活動、產品及服務，對生物多樣性方面的顯著影響 Significant impacts of activities, products and services on biodiversity			
	<b>304-3</b> 受保護或復育的棲息地 Habitats protected or restored			
	<b>304-4</b> 受營運影響的棲息地中，已被列入IUCN紅色名錄及國家保育名錄的物種 IUCN Red List species and national conservation list species with habitats in areas affected by operations			

可持續發展報告標準 GRI Standards	特定議題標準 Topic-specific Standards	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance
<b>排放物</b> <b>Emissions</b>				
<b>GRI 3: 重要議題 2021</b> <b>GRI 3: Material Topics 2021</b>	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	環保成效 Environmental Performance	P. 183	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 305: 排放 2016</b> <b>GRI 305: Emissions 2016</b>	<b>305-1</b> 直接溫室氣體排放 (範圍一) Direct (Scope 1) GHG emissions	環保成效 Environmental Performance 統計資料摘要 Summary of Statistics	P. 183 P. 217	✓
	<b>305-2</b> 能源間接溫室氣體排放 (範圍二) Energy indirect (Scope 2) GHG emissions	環保成效 Environmental Performance 統計資料摘要 Summary of Statistics	P. 183 P. 217	✓
	<b>305-3</b> 其他間接溫室氣體排放 (範圍三) Other indirect (Scope 3) GHG emissions	環保成效 Environmental Performance 統計資料摘要 Summary of Statistics	P. 183 P. 217	✓
	<b>305-4</b> 溫室氣體排放密集度 GHG emissions intensity	環保成效 Environmental Performance 統計資料摘要 Summary of Statistics	P. 183 P. 217	✓
	<b>305-5</b> 溫室氣體減排量 Reduction of GHG emissions	環保成效 Environmental Performance	P. 183	✓
	<b>305-6</b> 破壞臭氧層物質的排放 Emissions of ozone-depleting substances (ODS)	環保成效 Environmental Performance 統計資料摘要 Summary of Statistics	P. 183 P. 217	✓
	<b>305-7</b> 氮氧化物 (NOx)、硫氧化物 (SOx) 及其他重大的氣體排放 Nitrogen Oxides (NOx), Sulfur Oxides (SOx), and other significant air emissions	統計資料摘要 Summary of Statistics	P. 219	✓



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<b>廢物 Waste</b>				
<b>GRI 3: 重要議題 2021 GRI 3: Material Topics 2021</b>	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	環保成效 Environmental Performance	P. 184-185	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 306: 廢棄物 2020 GRI 306: Waste 2020</b>	<b>306-1</b> 廢棄物的產生與廢棄物相關的重大影響 Waste generation and significant waste-related impacts	環保成效 Environmental Performance	P. 184-185	✓
	<b>306-2</b> 廢棄物相關的重大影響管理 Management of significant waste-related impacts	環保成效 Environmental Performance	P. 184-185	✓
	<b>306-3</b> 產生的廢棄物 Waste generated	環保成效 Environmental Performance	P. 184-185	✓
		統計資料摘要 Summary of Statistics	P. 219	
	<b>306-4</b> 廢棄物的處置移轉 Waste diverted from disposal	環保成效 Environmental Performance	P. 184-185	✓
統計資料摘要 Summary of Statistics		P. 219		
<b>306-5</b> 廢棄物的直接處置 Waste directed to disposal	環保成效 Environmental Performance	P. 184-185	✓	
	統計資料摘要 Summary of Statistics	P. 219		
<b>評估供應商/承辦商的環境表現 Supplier Environmental Assessment</b>				
<b>GRI 3: 重要議題 2021 GRI 3: Material Topics 2021</b>	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	環保成效 Environmental Performance	P. 184-185	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 308: 供應商環境評估 2016 GRI 308: Supplier Environmental Assessment 2016</b>	<b>308-1</b> 按照環境準則篩選的新供應商 New suppliers that were screened using environmental criteria	環保成效 Environmental Performance	P. 173, 185	✓
	<b>308-2</b> 供應鏈對環境的負面影響，以及所採取的行動 Negative environmental impacts in the supply chain and actions taken	* 在2021/22年度，機電署新增了117間用環保標準篩選的環保產品供應商，合共有541間在環保供應商名單上。 * In 2021/22, the updated EMSD Suppliers List contained newly added 117 suppliers who are able to provide environment-friendly products complying with our green specifications, making up a total number of 541 environment-friendly suppliers on our suppliers list.		



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可持續發展報告標準 GRI Standards	特定議題標準 Topic-specific Standards	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance
<b>社會 Social</b>				
<b>僱員關係 Employment</b>				
<b>GRI 3: 重要議題 2021 GRI 3: Material Topics 2021</b>	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	社會成效 Social Performance	P. 192	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 401: 僱傭 2016 GRI 401: Employment 2016</b>	<b>401-1</b> 新入職員工及員工離職率 New employee hires and employee turnover	社會成效 Social Performance	P. 192	✓
		統計資料摘要 Summary of Statistics	P. 220-221	
	<b>401-2</b> 不提供予臨時或兼職員工的全職員工福利 Benefits provided to full-time employees that are not provided to temporary or part-time employees	* 公務員及非公務員僱員如符合相關規定及守則要求，均享有醫療及牙醫服務、教育津貼、年假及旅費、房屋津貼等。 * Employees appointed on civil service and non-civil service terms are entitled with medical and dental services, education allowance, leave and passage, housing benefit, etc. if they meet the eligibility criteria as stipulated in the relevant rules and regulations.	P. 192	✓
<b>401-3</b> 育嬰假 Parental leave	統計資料摘要 Summary of Statistics	P. 224	✓	



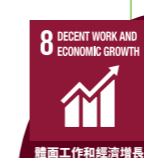
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<b>職業健康及安全 Occupational Health and Safety</b>				
<b>GRI 3: 重要議題 2021 GRI 3: Material Topics 2021</b>	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	社會成效 Social Performance	P. 193-195	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 403: 職業健康與安全 2018 GRI 403: Occupational Health and Safety 2018</b>	<b>403-1</b> 職業健康與安全管理體系 Occupational health and safety management system	社會成效 Social Performance	P. 173, 193	✓
	<b>403-2</b> 危險辨識、風險管理及事故調查 Hazard identification, risk management, and incident investigation	社會成效 Social Performance	P. 194	✓
	<b>403-3</b> 職業健康服務 Occupational health services	社會成效 Social Performance	P. 194	✓
	<b>403-4</b> 員工參與、諮詢及溝通有關職業健康及安全的事宜 Worker participation, consultation, and communication on occupational health and safety	社會成效 Social Performance  * 部別職安健委員會及職安健策導委員會代表規管及營運服務，即是機電署的全體員工。部別職安健委員會每三個月開會一次，而職安健策導委員會每三至六個月開會一次。 * Both Regulatory and Trading Services of the EMSD, which represented the whole workforce of the EMSD, represented by the Divisional Occupational Safety and Health Committees and Steering Committee on Occupational Safety and Health. The Divisional Occupational Safety and Health Committees meet every three months, while Steering Committee on Occupational Safety and Health meets every three to six months.	P. 193	✓
	<b>403-5</b> 員工職業健康及安全培訓 Worker training on occupational health and safety	社會成效 Social Performance	P. 194-195	✓
	<b>403-6</b> 促進員工健康 Promotion of worker health	可持續發展管理方針 Sustainability Management Approach  社會成效 Social Performance	P. 170  P. 192, 194	✓
	<b>403-7</b> 預防和減輕與業務關係直接相關的職業健康和安全影響 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	社會成效 Social Performance	P. 194	✓
	<b>403-8</b> 職業安全衛生管理系統所涵蓋之工作者 Workers covered by an occupation health and safety management system	* 不適用於機電工程署的日常營運。 * Not applicable to the EMSD's operations.	-	✓
	<b>403-9</b> 因工受傷 Work-related injuries	社會成效 Social Performance  統計資料摘要 Summary of Statistics	P. 194  P. 222	✓
	<b>403-10</b> 職業病 Work-related ill health	社會成效 Social Performance  統計資料摘要 Summary of Statistics	P. 194  P. 222	✓



可持續發展報告標準 GRI Standards	特定議題標準 Topic-specific Standards	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance
<b>培訓與教育 Training and Education</b>				
<b>GRI 3: 重要議題 2021 GRI 3: Material Topics 2021</b>	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	社會成效 Social Performance	P. 194-195	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 404: 培訓與教育 2016 GRI 404: Training and Education 2016</b>	<b>404-1</b> 每名員工每年接受培訓的平均小時數 Average hours of training per year per employee	社會成效 Social Performance  統計資料摘要 Summary of Statistics	P. 195  P. 223	✓
	<b>404-2</b> 提升員工職能及過渡協助方案 Programmes for upgrading employee skills and transition assistance programmes	社會成效 Social Performance  * 公務員退休後，仍可享用香港特別行政區政府提供的多種福利及服務。 <a href="https://www.csb.gov.hk/tc_chi/pension/16.html">https://www.csb.gov.hk/tc_chi/pension/16.html</a> * Officers who have retired from the civil service can still enjoy a wide range of benefits and services provided by the Government of the HKSAR. <a href="https://www.csb.gov.hk/english/pension/16.html">https://www.csb.gov.hk/english/pension/16.html</a>	P. 194-195	✓
	<b>404-3</b> 定期接受成效及職業發展評估的員工百分比 Percentage of employees receiving regular performance and career development reviews	* 報告期內，100%的機電署員工接受工作表現評估及培訓需要評估。 * 100% of the EMSD's employees received performance review as well as evaluation on training needs during the reporting period.	-	✓
<b>多元化與平等機會 Diversity and Equal Opportunity</b>				
<b>GRI 3: 重要議題 2021 GRI 3: Material Topics 2021</b>	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	社會成效 Social Performance	P. 193	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 405: 多元化與平等機會 2016 GRI 405: Diversity and Equal Opportunity 2016</b>	<b>405-1</b> 管治機構及員工多樣性 Diversity of governance bodies and employees	社會成效 Social Performance  統計資料摘要 Summary of Statistics  * 機電署沒有員工多樣性相關資料提供。 * The EMSD does not hold any information on diversity of employees.	P. 192-193  P. 221	✓
	<b>405-2</b> 女性對男性基本薪資加薪酬的比率 Ratio of basic salary and remuneration of women to men	* 釐定公務員薪酬的政策和安排並不涉及任何性別因素的考慮，並且完全遵守《性別歧視條例》現有框架下對同值同酬的要求。女性對男性基本薪資加薪酬的比率為1:1。 * The policy and practice for the determination of civil service pay is gender neutral by design and is in full compliance with the requirements for equal pay for work of equal value under the existing framework as provided for under the Sex Discrimination Ordinance. Ratio of basic salary and remuneration of women to men is 1:1.	-	✓



# 全球報告倡議組織內容索引

## GRI Content Index

可持續發展報告標準 GRI Standards	特定議題標準 Topic-specific Standards	參照 / * 直接解釋 Reference / * Direct Answer	頁數 Page No.	外部認證 External Assurance
<b>反歧視 (非重要議題)</b> <b>Non-discrimination (Not material topic)</b>				
<b>GRI 3: 重要議題 2021</b> <b>GRI 3: Material Topics 2021</b>	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	社會成效 Social Performance	P. 193	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 406: 反歧視 2016</b> <b>GRI 406: Non-discrimination 2016</b>	<b>406-1</b> 歧視事件及採取的糾正行動 Incidents of discrimination and corrective actions taken	社會成效 Social Performance	P. 193	✓
	<b>防止強迫或強制勞動</b> <b>Prevent Forced or Compulsory Labour</b>			
<b>GRI 3: 重要議題 2021</b> <b>GRI 3: Material Topics 2021</b>	<b>3-1</b> 重要議題決定的流程 Process to determine material topics	關於本報告 About this Report	P. 164-165	✓
	<b>3-2</b> 重要議題清單 List of material topics	社會成效 Social Performance	P. 193	
	<b>3-3</b> 重要議題的管理 Management of material topics			
<b>GRI 409: 強迫或強制勞動 2016</b> <b>GRI 409: Forced or Compulsory Labour 2016</b>	<b>409-1</b> 具有強迫或強制勞動事件重大風險的機構和供應商 Operations and suppliers at significant risk for incidents of forced or compulsory labour	社會成效 Social Performance	P. 193	✓

# 統計資料摘要

## Summary of Statistics

### 環境

### Environment

	單位 Unit	2019/20	2020/21	2021/22	
<b>能源 Energy</b>					
柴油 Diesel	千兆焦耳 <sup>8</sup> (GJ) <sup>8</sup> (升 L)	4 044 (112 336)	3 917 (108 802)	4 909 (136 360)	
汽油 Gasoline	千兆焦耳 <sup>8</sup> (GJ) <sup>8</sup> (升 L)	10 848 (328 741)	9 094 (275 564)	8 540 (258 801)	
太陽能發電系統所生產的可再生電力 <sup>9</sup> Renewable electricity generated from solar photovoltaic system <sup>9</sup>	千兆焦耳 <sup>8</sup> (GJ) <sup>8</sup> (千瓦小時 kWh)	699 (194 121)	902 (250 684)	630 (174 933)	
購買電力使用總量 Total purchased electricity consumption	千兆焦耳 <sup>8</sup> (GJ) <sup>8</sup> (‘000 千瓦小時 ‘000 kWh)	120 321 (33 423)	129 049 (35 847)	141 947 (39 430)	
購買電力使用強度 Purchased electricity consumption intensity	千瓦小時 / 員工 kWh/employee	5 837	5 937	6 656	
<b>水 Water</b>					
水 Water	立方米 m <sup>3</sup>	14 809	16 177 <sup>10</sup>	14 703	
<b>溫室氣體排放<sup>11</sup> GHG Emissions<sup>11</sup></b>					
直接排放 (範圍一) Direct emissions (Scope 1)	燃油 Fuel	公噸二氧化碳當量 tCO <sub>2</sub> e	1 199	1 046	1 062
	製冷劑 Refrigerant	公噸二氧化碳當量 tCO <sub>2</sub> e	-	1 298 <sup>12</sup>	593
	乙炔 <sup>13</sup> Acetylene <sup>13</sup>	公噸二氧化碳當量 tCO <sub>2</sub> e	-	0.07	0
能源間接排放 (範圍二) Energy indirect emissions (Scope 2)	公噸二氧化碳當量 tCO <sub>2</sub> e	16 877	13 434	15 518	
其他間接排放 (範圍三) Other indirect emissions (Scope 3)	公噸二氧化碳當量 tCO <sub>2</sub> e	75 <sup>14</sup>	18 <sup>15</sup>	29 <sup>16</sup>	
總排放量 Total emissions	公噸二氧化碳當量 tCO <sub>2</sub> e	18 151	15 796	17 202	

<sup>8</sup> 系數的單位統一換算成千兆焦耳：柴油 (0.036 千兆焦耳/升)、汽油 (0.033 千兆焦耳/升)、電力 (0.0036 千兆焦耳/千瓦小時)。  
Conversion factors used to standardise the units to gigajoules (GJ): diesel (0.036GJ/L), gasoline (0.033GJ/L), electricity (0.0036GJ/kWh).

<sup>9</sup> 產生的可再生電力，只供內部使用。  
The generated renewable electricity is for internal use only.

<sup>10</sup> 2020/21 年度用水量因應水錶評估審核後從 16 743 立方米更正為 16 177 立方米。  
Water consumption data in 2020/21 was revised from 16 743 m<sup>3</sup> to 16 177 m<sup>3</sup> after water meter evaluation.

<sup>11</sup> 參考《香港建築物 (商業、住宅或公共用途) 的溫室氣體排放及減除的審計和報告指引》(由環境保護署及機電工程署發布)，溫室氣體包括二氧化碳、甲烷、氧化亞氮及氫氟碳化物。  
Made reference to the Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings of Commercial, Residential or Institutional Purposes in Hong Kong (by Environmental Protection Department and the EMSD), GHG types include CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and HFCs.

<sup>12</sup> 2020/21 年度製冷劑數據經審核後新增其溫室氣體排放。  
In 2020/21, refrigerant consumption was available after data review, its associated GHG emission was newly included.

<sup>13</sup> 參考《香港中小企業碳審計工具箱》(由香港大學及香港城市大學發布)。  
Made reference to the Carbon Audit Toolkit for Small and Medium Enterprises in Hong Kong (by The University of Hong Kong and City University of Hong Kong).

<sup>14</sup> 2019/20 年度的範圍三排放數據僅包括公務旅行。  
It includes business travelling only in 2019/20.

<sup>15</sup> 棄置到堆填區的廢紙和公務旅行已納入 2020/21 年度的範圍三排放數據計算中，然而由於 2019 冠狀病毒病的情況下，2020/21 年度沒有公務旅行的排放數據記錄。  
It includes paper waste disposal and business travelling in 2020/21. There was no overseas business travelling recorded in 2020/21, due to the Coronavirus Disease 2019 epidemic.

<sup>16</sup> 數據包括 2021/22 年度處置廢紙、公務旅行、處理食水和污水時耗用的電力。  
The figure includes waste paper disposal, business travelling, electricity used for fresh water and sewage processing.

## 統計資料摘要 Summary of Statistics

	單位 Unit	2019/20	2020/21	2021/22
<b>物料 Material</b>				
<i>不可再生材料 Non-renewable materials</i>				
油漆及溶劑 Paint & solvent	升 L	132	18	30
潤滑油 Lubrication oil	升 L	3 565	1 992	2 546
油脂 Grease	公斤 kg	264	32	22
工業用氣體 Industrial gas	立方米 m <sup>3</sup>	0	61	0
蓄電池電解液 Battery electrolyte	升 L	0	0	0
原子車胎 Tubeless tyre	條 No.	217	197	232
外車胎 Outer cover tyre	條 No.	0	0	0
車胎內膽 Inner tube	條 No.	0	0	0
<i>可再生材料 Renewable materials</i>				
紙張 <sup>17</sup> Paper <sup>17</sup>	令 ream	28 023	28 224	28 826

<sup>17</sup> 機電署購買和使用再造紙張。  
At the EMSD, we purchase and consume paper with recycled content.

	單位 Unit	2019/20		2020/21		2021/22	
		妥善棄置 Properly Disposed	由承辦商處理 Handled by Contractors	妥善棄置 Properly Disposed	由承辦商處理 Handled by Contractors	妥善棄置 Properly Disposed	由承辦商處理 Handled by Contractors
<b>污水及廢物 Effluents and Waste</b>							
<i>無害廢物<sup>18</sup> Non-hazardous waste<sup>18</sup></i>							
廢紙 Waste paper	公斤 kg	6 281	23 685	3 670	34 117	3 178	36 039
鋁罐及金屬罐 Aluminium and metal cans	個 No.	0	17 375	0	10 563	0	10 625
膠樽 Plastic bottles	個 No.	0	6 438	0	5 219	0	5 313
即棄電池 Disposable batteries	公斤 kg	290	131	38	138	59	94
金屬廢料 Metal scraps	公斤 kg	9 996	3 785	6 780	250	21 340	1 550
<i>有害廢物<sup>19</sup> Hazardous waste<sup>19</sup></i>							
可充電電池 Rechargeable batteries	公斤 kg	-	1 669	-	282	-	447
廢油(潤滑油) Waste oil (lubrication oil)	升 L	-	6 931	-	2 844	-	2 391
舊車胎 Used vehicle tyres	條 No.	-	40	-	197	-	232
舊光管/含水銀照明燈 Spent fluorescent/ mercury lamps	盞 No.	-	8 123	-	5 279	-	1 847

	單位 Unit	2019/20	2020/21	2021/22
<b>車輛的排放<sup>20</sup> Emissions from vehicles<sup>20</sup></b>				
氮氧化物 Nitrogen Oxides (NOx)	克 g	- <sup>21</sup>	- <sup>21</sup>	2 897 743
硫氧化物 Sulfur Oxides (SOx)	克 g	- <sup>21</sup>	- <sup>21</sup>	4 523
顆粒物 Particulate Matter (PM)	克 g	- <sup>21</sup>	- <sup>21</sup>	214 162

<sup>18</sup> 廢物處置方法根據本地政府要求處理。產生的無害廢物由合資格承辦商收集以作回收或妥善棄置。  
Disposal method determined based on compliance with local government requirements. Non-hazardous waste is collected through licensed contractors for recycling or disposal to the landfills.

<sup>19</sup> 廢物處置方法根據本地政府要求處理。產生的有害廢物由合資格承辦商收集以作回收或妥善棄置。可充電電池、廢油(潤滑油)、舊車胎及舊光管/含水銀照明燈沒有棄置量數據記錄。  
Disposal method determined based on compliance with local government requirements. Hazardous waste is collected by licensed contractors for recycling or disposal to the landfills. There were no data record keeping for disposal of rechargeable batteries, waste oil (lubrication oil), used vehicle tyres and spent fluorescent/mercury lamps.

<sup>20</sup> 參考《如何編備環境、社會及管治報告—附錄二：環境關鍵績效指標匯報指引》(由香港交易所發布)的計算方法。  
Made reference to the calculation method in the How to prepare an ESG Report – Appendix 2: Reporting Guidance on Environmental KPIs (by Hong Kong Exchanges and Clearing Limited).

<sup>21</sup> 2019/20 和 2020/21 數據沒有記錄。  
No data record keeping in 2019/20 and 2020/21.

## 統計資料摘要 Summary of Statistics

### 社會 Social

#### 僱員人數<sup>22</sup> Employees Statistics<sup>22</sup>

	截至 2021 年 3 月 31 日 (百分比) As of 31 March 2021 (Percentage)	截至 2022 年 3 月 31 日 (百分比) As of 31 March 2022 (Percentage)
<b>總人數 Total number</b>	6 038	5 924
<b>男女分佈 By gender</b>		
男性 Male	5 339 (88.4%)	5 210 (87.9%)
女性 Female	699 (11.6%)	714 (12.1%)
<b>合約類型分佈 By employment type</b>		
<b>常任制 Permanent</b>		
男性 Male	3 463 (86.5%)	3 540 (86.3%)
女性 Female	541 (13.5%)	560 (13.7%)
<b>合約制 Contract</b>		
男性 Male	1 876 (92.2%)	1 670 (91.6%)
女性 Female	158 (7.8%)	154 (8.4%)
<b>年齡分佈 By age group</b>		
50 歲或以上 Aged 50 or above	1 776 (29.4%)	1 724 (29.1%)
30-49 歲 Aged 30-49	2 717 (45.0%)	2 774 (46.8%)
29 歲或以下 Aged 29 or under	1 545 (25.6%)	1 426 (24.1%)

#### 2021/22 新入職員工 2021/22 New Hires

	截至 2021 年 3 月 31 日 (百分比) As of 31 March 2021 (Percentage)	截至 2022 年 3 月 31 日 (百分比) As of 31 March 2022 (Percentage)
<b>總人數 Total number</b>	745 (佔總員工 12.3%) (12.3% of total employee)	552 (佔總員工 9.3%) (9.3% of total employee)
<b>年齡分佈 By age group</b>		
50 歲或以上 Aged 50 or above	100 (13.4%)	80 (14.5%)
30-49 歲 Aged 30-49	134 (18.0%)	151 (27.4%)
29 歲或以下 Aged 29 or under	511 (68.6%)	321 (58.2%)
<b>男女分佈 By gender</b>		
男性 Male	676 (90.7%)	486 (88.0%)
女性 Female	69 (9.3%)	66 (12.0%)

<sup>22</sup> 機電署並無聘用任何非僱員的工人，所有員工均在香港執勤。  
The EMSD does not employ workers who are not employees. All staff are based in Hong Kong.

#### 2021/22 離職員工 2021/22 Turnover

	截至 2021 年 3 月 31 日 (百分比) As of 31 March 2021 (Percentage)	截至 2022 年 3 月 31 日 (百分比) As of 31 March 2022 (Percentage)
<b>總人數 Total number</b>	302 (佔總員工 5.0%) (5.0% of total employee)	527 (佔總員工 8.9%) (8.9% of total employee)
<b>年齡分佈 By age group</b>		
50 歲或以上 Aged 50 or above	168 (55.6%)	244 (46.3%)
30-49 歲 Aged 30-49	37 (12.3%)	93 (17.6%)
29 歲或以下 Aged 29 or under	97 (32.1%)	190 (36.1%)
<b>男女分佈 By gender</b>		
男性 Male	271 (89.7%)	481 (91.3%)
女性 Female	31 (10.3%)	46 (8.7%)

#### 管理層的結構 Composition of Senior Management

	截至 2021 年 3 月 31 日 (百分比) As of 31 March 2021 (Percentage)	截至 2022 年 3 月 31 日 (百分比) As of 31 March 2022 (Percentage)
<b>總管理層人數 Total number of senior management staff</b>	198 (佔總員工 3.3%) (3.3% of total employee)	186 (佔總員工 3.1%) (3.1% of total employee)
<b>年齡分佈 By age group</b>		
50 歲或以上 Aged 50 or above	114 (57.6%)	115 (61.8%)
30-49 歲 Aged 30-49	84 (42.4%)	71 (38.2%)
29 歲或以下 Aged 29 or under	0 (0%)	0 (0%)
<b>男女分佈 By gender</b>		
男性 Male	173 (87.4%)	162 (87.1%)
女性 Female	25 (12.6%)	24 (12.9%)



## 統計資料摘要 Summary of Statistics

### 職業健康及安全指標 Occupational Health and Safety Indicators

機電署員工 For EMSD employees		2020/21	2021/22
死亡 Fatalities	數字 Number 比率 Rate	0 0	0 0
嚴重工傷 <sup>23</sup> High-consequence work-related injuries <sup>23</sup>	數字 Number 比率 Rate (按每 200 000 工時計算) (number per 200 000 man-hours)	0 0	2 0.03
工傷 <sup>24</sup> Recordable work-related injuries <sup>24</sup>	數字 Number 比率 Rate (按每 200 000 工時計算) (number per 200 000 man-hours)	27 0.39	22 0.37
工作小時 Number of hours worked	小時 Hour	13 878 852	11 978 096
職業病所造成的死亡數量 Number of fatalities as a result of work-related ill health	數字 Number	0	0
可記錄之職業病的案件數量 Number of cases of recordable work-related ill health	數字 Number	0	0
機電署承辦商 For EMSD contractors		2020/21	2021/22
死亡 Fatalities	數字 Number 比率 Rate	0 0	0 0
嚴重工傷 <sup>23</sup> High-consequence work-related injuries <sup>23</sup>	數字 Number 比率 Rate (按每 200 000 工時計算) (number per 200 000 man-hours)	3 0.07	0 0
工傷 <sup>25</sup> Recordable work-related injuries <sup>25</sup>	數字 Number 比率 Rate (按每 200 000 工時計算) (number per 200 000 man-hours)	11 0.27	13 0.26
工作小時 Number of hours worked	小時 Hour	8 184 268	9 979 456
職業病所造成的死亡數量 Number of fatalities as a result of work-related ill health	數字 Number	0	0
可記錄之職業病的案件數量 Number of cases of recordable work-related ill health	數字 Number	0	0

<sup>23</sup> 嚴重工傷(不包括死亡)指因工作而導致的損傷,從而使員工不能/不可/預計未能於六個月內回復傷前的健康狀態。  
High-consequence work-related injuries (excluding fatalities) refer to work-related injury that results in an injury from which the worker cannot, does not, or is not expected to recover fully to pre-injury health status within six months.

<sup>24</sup> 報告涉及機電署人員工作時的任何意外,包括未導致給予受傷人員病假的意外。2021/22 年度機電署員工工傷主要類型是提舉或搬運物件時受傷、滑倒、絆倒或在同一高度跌倒,或撞到固定或靜止物體。  
Any accident involving the EMSD personnel on duty reported, including those accidents which have not resulted in the granting of any sick leave to the injured person. Main types of work-related injury reported in 2021/22 for the EMSD employees were injured whilst lifting or carrying object, slip, trip or fall on the same level, or striking against fixed or stationary object.

<sup>25</sup> 2021/22 年度機電署承辦商工傷主要類型是高處墮下、滑倒、絆倒或在同一高度跌倒,及受困於物件內或物件之間。  
Main types of work-related injury reported in 2021/22 for the EMSD contractors were fall of person from height, slip, trip or fall on the same level, or trapped in or between objects.

### 培訓與教育 Training and Education

	單位 Unit	2020/21	2021/22
<b>平均受訓時數 Average training hours</b>			
<b>男女分佈 By gender</b>			
男性 Male	小時 Hour	22.7	23.6
女性 Female	小時 Hour	25.5	32.7
<b>職系分佈 By grade</b>			
高級管理層 <sup>26</sup> Senior management <sup>26</sup>	小時 Hour	21.1	25.2
一般員工 <sup>27</sup> General staff <sup>27</sup>	小時 Hour	23.0	23.8

<sup>26</sup> 高級管理層指首長職系員工。  
Senior management refers to directorate grade staff.

<sup>27</sup> 一般員工指技術職系、專業職系和行政及輔助職系員工。  
General staff refers to technical, professional, administrative and support staff.

## 統計資料摘要

### Summary of Statistics

#### 育嬰假 Parental Leave

	2020/21	2021/22
<b>享有育嬰假的員工總數 Total number of employees that were entitled to parental leave</b>		
<b>男女分佈 By gender</b>		
男性 Male	_28	4 845
女性 Female	_28	660
<b>實際使用育嬰假的員工總數 Total number of employees that took parental leave</b>		
<b>男女分佈 By gender</b>		
男性 Male	_28	103
女性 Female	_28	23
<b>休完育嬰假後，在報導期間復職的員工總數 Total number of employees that returned to work in the reporting period after parental leave ended</b>		
<b>男女分佈 By gender</b>		
男性 Male	_28	98
女性 Female	_28	15
<b>休完育嬰假且復職後十二個月仍在職的員工總數 Total number of employees that returned to work after parental leave ended that were still employed 12 months after their return to work</b>		
<b>男女分佈 By gender</b>		
男性 Male	_28	92
女性 Female	_28	15
<b>復職率<sup>29</sup> Return to work rates<sup>29</sup></b>		
<b>男女分佈 By gender</b>		
男性 Male	_28	95.1%
女性 Female	_28	65.2%
<b>留任率<sup>30</sup> Retention rates<sup>30</sup></b>		
<b>男女分佈 By gender</b>		
男性 Male	_28	93.9%
女性 Female	_28	100%

<sup>28</sup> 2020/21 年度的數據沒有記錄。

No data record keeping in 2020/21.

<sup>29</sup> 復職率是以育嬰假後實際復職的員工總數除以育嬰假後應該復職的員工總數再乘 100% 計算。

Return to work rate is calculated as the total number of employees who did return to work after parental leave divided by total number of employees due to return to work after taking parental leave, and then multiplied by 100%.

<sup>30</sup> 留任率是以育嬰假結束後且復職後十二個月仍在職的員工總數除以上個報告期內育嬰假結束後復職的員工總數再乘 100% 計算。

Retention rate is calculated as the total number of employees retained 12 months after returning to work following a period of parental leave divided by total number of employees returning from parental leave in the prior reporting period(s), and then multiplied by 100%.

## 獨立保證意見聲明書

### Independent Assurance Opinion Statement



#### 核實聲明

##### 範圍及目的

香港品質保證局已對機電工程署(以下簡稱「機電署」)的社會及環保報告 2021/22(以下簡稱「報告」)的內容進行獨立驗證。該報告涵蓋機電署在 2021 年 4 月 1 日至 2022 年 3 月 31 日期間於可持續發展表現的數據和資料。

此核實聲明的目的是對報告所記載之內容提供合理保證。報告是根據全球報告倡議組織(GRI)標準 2021 的要求編製。

##### 保證程度和核實方法

香港品質保證局的核實程序是參照國際審計與核證準則委員會(International Auditing and Assurance Standards Board)發布的《國際核證聘用準則 3000(修訂版)·歷史財務資料審計或審閱以外的核證聘用》(International Standard on Assurance Engagements 3000 (Revised), Assurance Engagements Other Than Audits or Reviews of Historical Financial Information)執行。核實過程是基於風險考慮和為獲取恰當的合理保證意見和結論而制訂。核實的範圍是按照 GRI 標準 2021 而定。

我們的驗證重點包括數據管理機制、編製報告過程和檢閱有關數據和資料樣本的原始數據和支持證據。並與負責處理資料和編製報告的代表進行面談。

##### 獨立性

我們的驗證工作是絕對獨立和公正。核實過程嚴格遵守香港品質保證局有關誠信、公正和保密的紀律守則。

##### 結論

基於是次的驗證結果，香港品質保證局對報告作出合理保證並總結：

- 報告是按照 GRI 標準 2021 編製；
- 報告平衡、具比較性、清晰、一致和適時地將重要的可持續發展表現範疇和議題作出闡述；及
- 報告內的數據和資料準確、可靠和完整。

總括而言，報告清楚地表達機電署在可持續發展方面的承諾、管理和表現。

##### 香港品質保證局代表簽署

蔣齊仲  
創新業務高級總經理  
2022 年 11 月

# 獨立保證意見聲明書

## Independent Assurance Opinion Statement



### VERIFICATION STATEMENT

#### Scope and Objective

Hong Kong Quality Assurance Agency ("HKQAA") has conducted an independent verification for the Social and Environmental Report 2021/22 (hereafter referred to as "the Report") of the Electrical and Mechanical Services Department (hereafter referred to as "EMSD"). The Report covers the sustainability performance data and information of the EMSD from the period of 1 April 2021 to 31 March 2022.

The aim of this verification is to provide reasonable assurance on the reliability of the Report. The Report has been prepared in accordance with the Global Reporting Initiative (GRI) Standards 2021.

#### Level of Assurance and Methodology

HKQAA's verification procedure has been conducted with reference to the International Standard on Assurance Engagements 3000 (Revised), Assurance Engagements Other Than Audits or Reviews of Historical Financial Information issued by the International Auditing and Assurance Standards Board. Our evidence gathering process is risk-based driven and has been designed to obtain a reasonable level of assurance as set out in the standard for the purpose of devising the verification conclusion. The extent of this verification process covers the criteria set in the GRI Standards 2021.

The focus areas of our verification are the data management mechanisms, report compilation processes and reviewing relevant raw data and supporting information of the selected samples. Also, representatives with accountability for handling the information and preparing the Report were interviewed.

#### Independence

Our verification activities are independent and impartial. HKQAA's Code of Conduct with regard to integrity, impartiality and confidentiality has been strictly followed.

#### Conclusion

Based on the verification results and in accordance with the verification procedures undertaken, HKQAA has obtained reasonable assurance and is in the opinion that:

- The Report has been prepared in accordance with the GRI Standards 2021;
- The Report illustrates the sustainability performance of the material aspects and topics in a balanced, comparable, clear, consistent and timely manner; and
- The data and information disclosed in the Report are accurate, reliable and complete.

In conclusion, the sustainability commitments, stewardship and performance of the EMSD are expressed legibly in the Report.

#### Signed on behalf of Hong Kong Quality Assurance Agency

Meico Cheong  
Senior General Manager, Innovation Business  
November 2022

# 鳴謝

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在年報製作過程中，承蒙下列部門及機構提供協助，機電工程署特此鳴謝。

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民眾安全服務隊	Civil Aid Service
香港海關	Customs and Excise Department
衛生署	Department of Health
渠務署	Drainage Services Department
教育局	Education Bureau
食物環境衛生署	Food and Environmental Hygiene Department
政府飛行服務隊	Government Flying Service
政府產業署	Government Property Agency
路政署	Highways Department
香港消防處	Hong Kong Fire Services Department
香港警務處	Hong Kong Police Force
醫院管理局	Hospital Authority
康樂及文化事務署	Leisure and Cultural Services Department
社會福利署	Social Welfare Department
運輸署	Transport Department
將軍澳醫院	Tseung Kwan O Hospital

