水務署
WATER SUPPLIES DEPARTMENT

研新・延伸

SUSTAINNOVATE

FOR A SMART WATER FUTURE

成就智慧未來

目錄
Table of Contents

延伸、現新：成就智慧用水未來

水務署積極倡導和激發創新及協作式的解決方案，致力建設智慧用水未來。我們透過持續創新，力求將潛力化為優化水務設施管理和增強客戶體驗的新機遇；同時發展新技能組合和夥伴關係，為提高用水可持續性和應付氣候變化日趨加劇的影響的應變能力。

SUSTAINNOVATE FOR A SMART WATER FUTURE

At the Water Supplies Department, we initiate and inspire innovative and collaborative solutions for building a smart water future. Through sustaining innovations, we seek to transform the potential into new opportunities for optimised waterworks management and enhanced customer experience as well as to develop new skill sets and partnerships for advancing water sustainability and resilience against the intensifying impacts of climate change.

抱負
Vision

在滿足客戶對優質供水服務的需求，務求有卓越之表現。

To excel in satisfying customers' needs for the provision of quality water services.

使命
Mission

- 以最符合成本效益的方式為客戶提供可靠充足的優質食水及海水。
  To provide a reliable and adequate supply of wholesome potable water and sea water to our customers in the most cost-effective way.
- 提供以客戶為本的服務。
  To adopt a customer-oriented approach in our services.
- 維持及激勵一支能幹、高效率及完全投入的工作隊伍，以服務社群。
  To maintain and motivate an effective, efficient and committed workforce to serve the community.
- 時刻關注對保護環境方面須負的責任。
  To remain conscious of our responsibilities towards the environment.
- 善用資源和科技，力求不斷改善服務。
  To make the best use of resources and technology in our striving for continuous improvement in services.

信念
Values

以客為本 C ustomer satisfaction

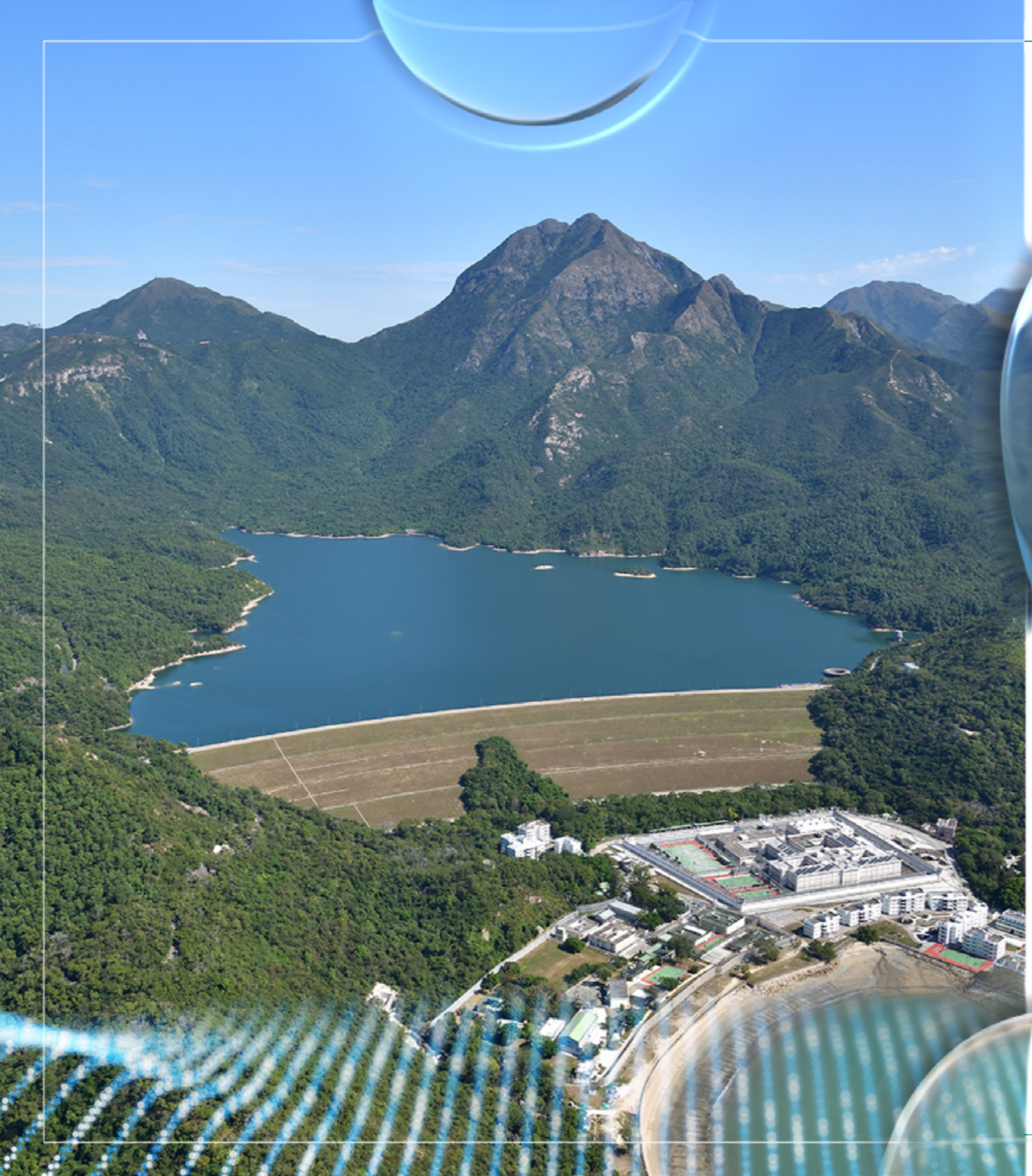
確保質量 R eliability

重視環保 E nvironmental awareness

竭盡所能 D edication

精益求精 I mprovement

同心協力 T eamwork



言策
INITIATE

高瞻遠矚 精心打造智慧用水城市
Building a Water-Wise City with Foresight and Dedication

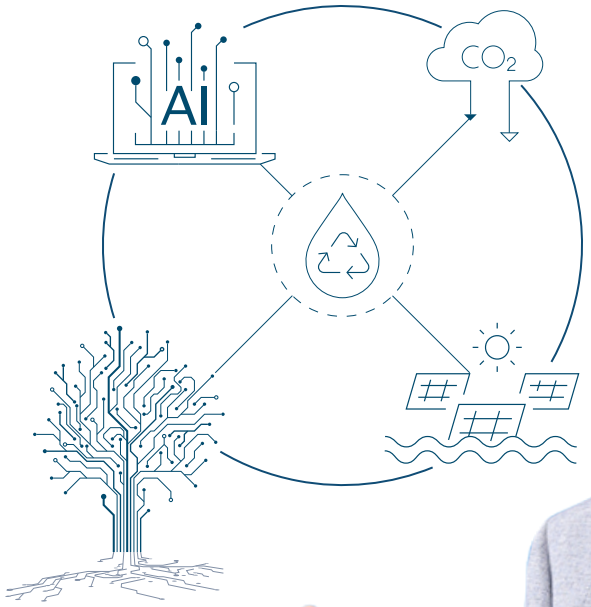
從過去開拓海水沖廁和在海中興建大型水塘，到現在利用先進的水處理技術實現水資源多元化、逐步發展智慧水務和在水塘安裝大型浮動太陽能發電場等，創新一直是我們工作的重心。

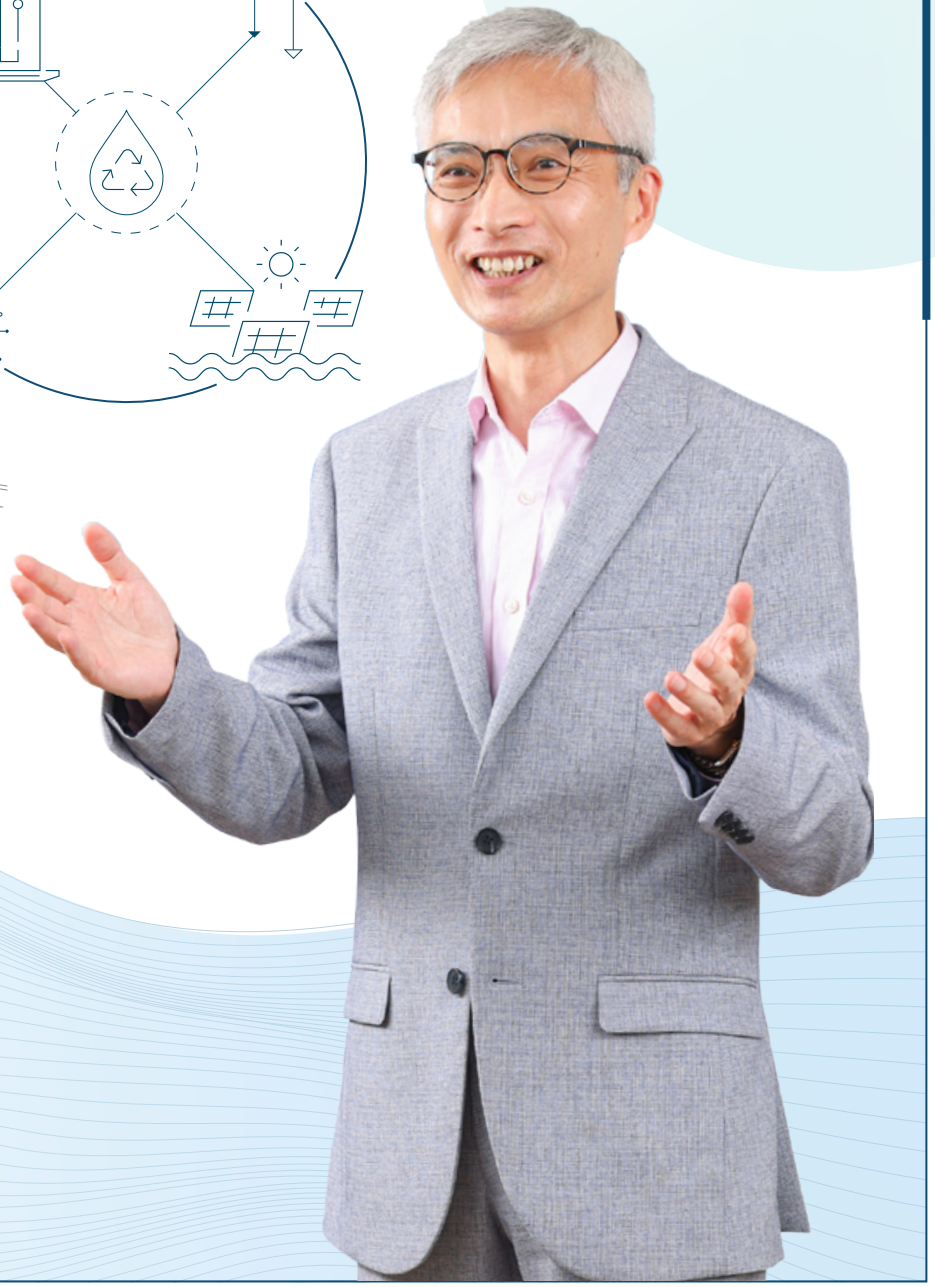
Innovation is always at the core of what we do, from pioneering the use of salt water for flushing and the construction of huge reservoirs in the sea in the past, to our current efforts in diversifying water resources using advanced water treatment technologies and progressively developing smart waterworks and mega-scale floating solar farms at impounding reservoirs.

署長的話
DIRECTOR'S STATEMENT

"在日益加劇的氣候風險、持續增長的用水需求和因時而變的用戶需求等挑戰下，我們將繼續秉承創新的精神，致力提升供水保障、實現更有效率及可持續的資產管理，以及進一步完善客戶體驗。

"Through sustaining our innovations, we strive to enhance water security, achieve more efficient and sustainable asset management, and further enhance customer experience amidst the challenges of increasing climate risks, growing water demands and evolving customer needs."





盧國華工程師太平紳士
水務署署長

Ir LO Kwok-wah, Kelvin,*JP*
Director of Water Supplies

從過去開拓海水沖廁和在海中興建大型水塘，到現在利用先進的水處理技術實現水資源多元化、逐步發展智慧水務和在水塘安裝大型浮動太陽能發電場等，創新一直是我們工作的重心。在日益加劇的氣候風險、持續增長的用水需求和因時而變的用戶需求等挑戰下，我們將繼續秉承創新的精神，致力提升供水保障、實現更有效率及可持續的資產管理，以及進一步完善客戶體驗。

提升供水保障

氣候變化持續對供水保障帶來威脅。二零二一年，東江流域遭遇60年來最嚴重旱情。同期，香港錄得自二零一一年以來最低的全年淨集水量，而全年食水用量則創下歷史新高，達10.55億立方米。為滿足上升的需求，東江水輸入量達8.11億立方米，已接近現行《東江供水協議》規定的年供水量上限8.2億立方米。儘管我們正竭力推行一系列需求管理措施，目標在二零四零年前將全年食水需求控制在10億立方米以內，我們必需利用多元化的水資源，包括淡化海水作飲用用途和循環再用水（即再造水、重用中水和回收雨水）作非飲用用途，提升供水的應變能力，以應對氣候變化預期所帶來的極端影響。

我們正興建將軍澳海水化淡廠第一階段，採用最新的逆滲透技術生產淡化海水——一種不受氣候變化影響的策略性水資源。該廠計劃於二零二三年投產，年產量可達5 000萬立方米，並已預留空間在未來倍增其產能。為求在整個項目生命週期減少碳足跡、提升工地安全及工作效率，該廠的設計、建造和保養融入了多項可持續發展設計和智慧工地措施。

使用循環再用水作非飲用用途不但可節省食水資源，亦可減少經處理的排放水被排放至受納水體，從而減低對環境的影響。為此，我們已展開基建工程，將石湖墟淨水設施處理後的排放水用作生產再造水，計劃由二零二四年起向新界東北地區每年供應達2 200萬立方米的再造水；以及在安達臣道石礦場用地發展項目中興建一套中央中水重用系統，二零二四年啓用後可每日供應達

Innovation is always at the core of what we do, from pioneering the use of salt water for flushing and the construction of huge reservoirs in the sea in the past, to our current efforts in diversifying water resources using advanced water treatment technologies and progressively developing smart waterworks and mega-scale floating solar farms at impounding reservoirs. Through sustaining our innovations, we strive to enhance water security, achieve more efficient and sustainable asset management, and further enhance customer experience amidst the challenges of increasing climate risks, growing water demands and evolving customer needs.

ENHANCING WATER SECURITY

Climate change continues to bring threats to water security. In 2021, the Dongjiang river basin experienced the worst drought in 60 years. In the same period, Hong Kong has recorded the lowest local annual net yield since 2011 while the annual fresh water consumption hit record high at 1 055 million m^3. To meet the increased demand, 811 million m^3 of Dongjiang water was imported, approaching the annual supply ceiling of 820 million m^3 as specified in the current Dongjiang Water Supply Agreement. While we are pressing ahead an array of demand management measures with an aim to contain the annual fresh water demand within 1 000 million m^3 by 2040, it is crucial to build resilience in our water supply with diversified water resources, including desalinated water for potable use and recycled water (viz reclaimed water, treated grey water and harvested rainwater) for non-potable uses, to cater for the anticipated extreme impacts of climate change.

Leveraging the latest reverse osmosis technology, we are building the first stage of the Tseung Kwan O Desalination Plant to produce desalinated seawater, a strategic water resource not susceptible to climate change impacts. Scheduled to be commissioned in 2023, the Desalination Plant will have an annual production capacity of 50 million cubic metres with the provision to double its capacity in the future. Numerous sustainable features as well as smart construction measures are integrated into the design, construction and maintenance of the plant for minimising carbon footprint and enhancing site safety and work efficiency throughout the whole project lifecycle.

Adopting recycled water for non-potable uses can not only preserve fresh water resources, but also reduce discharge of treated effluents into the receiving water, hence minimising impacts to the environment. We have embarked on the infrastructure works for further processing the treated sewage effluents from the Shek Wu Hui Effluent Polishing Plant to supply up to 22 million m^3/year of reclaimed water to the northeast New Territories from 2024 onwards. We are also constructing a centralised grey water recycling system

3 300 立方米的重用中水。該項目憑藉創意，以原地重用中水的方式節省了由遠處輸送沖廁水至該位處地勢較高的發展項目所需的耗電，獲頒二零二一年英國土木工程師學會 Chris Binnie 可持續水務管理大獎。我們計劃進一步擴大循環再用水的應用範圍至所有新發展區和合適的大規模重建區，以期提升海水和循環再用水的供應網絡覆蓋率，由目前佔香港總人口的 85% 至長遠目標 90%。

at the Anderson Road Quarry Site Development capable of supplying 3 300 m^3 of treated grey water daily to the Development by 2024. This grey water reuse project was awarded the Institution of Civil Engineers Award 2021 – Chris Binnie Award for Sustainable Water Management for its creativity in reusing treated grey water on-site to save the energy required for pumping flushing water from afar to the Development at high altitude. We plan to further extend the use of recycled water in all New Development Areas and suitable large scale redevelopment areas with a view to increasing the coverage of the salt water and recycled water supply networks from the current 85% of the total population to 90% in the long run.

實現更有效率和可持續的資產管理

藉著創意和科技發展，我們力求以更有效率和可持續的方式管理水務資產，並充分考慮公眾安全、社會需求和減碳目標。

為提升運作效率，我們正積極為濾水廠及供水管網建立「數碼分身」。「數碼分身」是真實系統的虛擬代表，能透過人工智能技術持續監測和分析運作數據，從而模擬和預測系統的運作，以協助我們發現潛在問題、優化系統運作、減少用水流失和耗能。作為水務設施運作自動化轉型的第一步，我們展開了先導計劃，試行在夜更遙距操作深井濾水廠。此外，我們正籌備於二零二五年成立先進的中央運作管理中心聯網，以加強實時遙距監測、協調和事故管理。

我們亦致力優化資產的運用，以市民的福祉為依歸。我們為 12 間主要濾水廠安裝現場氯氣生產設施，設施可按需要在現場生產氯氣作食水消毒之用。此安排可消除在運輸和貯存液體氯過程中洩漏氯氣的風險，亦可確保氯氣供應維持穩定。如此廣泛應用該技術於食水消毒為全球首例。因應社會對土地的需求，我們正籌劃將濾水廠和配水庫遷往岩洞，以騰出珍貴的土地資源作建屋和其他有利民生的用途。鑽石山配水庫遷往岩洞的建造工程將於二零二二年尾展開，而其他岩洞發展項目的可行性研究 / 勘查研究亦正進行中，涉及面積共約 30 公頃。

STRIVING FOR MORE EFFICIENT AND SUSTAINABLE ASSET MANAGEMENT

Pivoting innovation as well as technological advancement, we seek to manage our waterworks assets more efficiently and in a sustainable manner with due consideration to public safety, society 's needs and decarbonisation target.

We are actively developing digital twins of water treatment works and water supply networks to enhance our operation efficiency. Digital twin is a virtual representation of the real system which can simulate and predict the system operations through continuous monitoring and analysis of operational data with artificial intelligence. This will greatly facilitate us to anticipate potential problems, optimise system operations, reduce water losses and energy consumption. As our first step to transform the operation of waterworks installations towards automation, we have embarked on a trial project to enable remote operation on the night shift at the Sham Tseng Water Treatment Works (WTW). We are also planning the establishment of a cluster of advanced centralised operation management centres by 2025 to enhance real-time remote monitoring, coordination and incident management.

We also strive to optimise the utilisation of our assets for the benefits of the public. We are installing on-site chlorine generation facilities at 12 major WTWs to produce chlorine on demand for drinking water disinfection. This arrangement eliminates the risks of chlorine leakage during the transportation and storage of liquid chlorine, and ensures a reliable supply of chlorine gas. Such extensive application of the technology in drinking water disinfection is the first of its kind in the world. In response to the society's needs for land, we are making plans of relocating WTWs and service reservoirs to caverns to release precious land resources for housing and other beneficial uses. The construction works for the relocation of the Diamond Hill Service Reservoirs to cavern will commence by end 2022. The feasibility studies / investigation of other cavern development projects are underway which will involve areas totalling some 30 hectares.

發展可再生能源有助政府實現二零五零年碳中和的目標。我們把握面積達 24 平方公里的水塘塘面的機遇，積極發展大型浮動太陽能板發電系統，有效地收集太陽能。隨著位於石壁水塘、船灣淡水湖和大欖涌水塘的先導系統成功安裝後，我們正計劃在這三個水塘建造更大的浮動太陽能板發電場，預計每年合共可生產達 50 千兆瓦時的可再生能源。與此同時，我們亦正探討在船灣淡水湖興建大型浮動太陽能板發電場的可行性。我們計劃逐步提升可再生能源產能，目標是在二零三五年開始年產量達 160 千兆瓦時。宏觀來看，就算只能運用 10% 的塘面面積，我們已可以將年產量進一步提升至約 290 千兆瓦時，足以抵消二零二一至二二年度部門總耗電量的約 37%。

The development of renewable energy contributes towards the Government's target of achieving carbon neutrality by 2050. We grasp the opportunity brought by the 24 square kilometres of reservoir water surface to proactively develop mega-scale floating photovoltaic systems at impounding reservoirs for harnessing solar energy efficiently. With the successful pilots installed at the Shek Pik, Plover Cove and Tai Lam Chung reservoirs, we are planning larger floating solar farms at these three reservoirs to generate about 50 gigawatt-hours per year (GWh/year) of renewable energy in total. In parallel, we are also exploring the feasibility of a mega-scale floating solar farm at the Plover Cove Reservoir. Our plan is to increase progressively the renewable energy generation capacity up to about 160 GWh/year by 2035 onwards. From a macroscopic perspective, even if only 10% of the water surface area is leveraged, we can further increase the generation capacity up to about 290 GWh/year which can offset about 37% of the Department's total energy consumption in 2021/22.

大欖涌水塘的浮動太陽能板發電系統

Floating PV System at Tai Lam Chung Reservoir

自動讀錶系統流動應用程式

AMR Mobile App

完善客戶體驗

為不同客戶提供方便、靈活和高效的服務是我們推動創新的主要動力。我們利用創新科技完善多項服務，包括擴展電子平台處理公眾服務申請和業界的供水申請；將「暫停供水自動通知系統」的通知服務範圍由受影響大型屋苑的管理處延伸至相關用戶，以水務署流動應用程式通知受影響用戶緊急暫停食水供應；開發語音分析系統以提升客戶熱線服務；以及引入人工智能聊天機器人至水務署網頁。

為向公眾推廣用水效益和智慧生活，我們自二零一八年起於新建公營及私人發展項目中引入了有線自動讀錶系統。新發展項目的客戶能透過自動讀錶系統流動應用程序輕鬆地遙距監察用水量。為了擴展自動讀錶系統的應用至現有場所，我們於二零二二年初成功完成在大澳的試驗，共安裝了 500 個無線智能水錶，現正就現有建築物供應及安裝無線智能水錶進行可行性研究。

ENHANCING CUSTOMER EXPERIENCE

Providing convenient, flexible and efficient services to our diverse customers are our key motivation to drive innovation. We are advancing a number of service enhancements via emerging technologies. These include enhancing our electronic platform to facilitate the processing of services requests from the public as well as water supply applications from the trade; extending the coverage of the notification service of the Water Supply Suspension Notification System from the management offices of the affected large housing estates to individual consumers via WSD Mobile App in the event of emergency suspension of fresh water supply; developing speech analytic system for enhancing the services of our enquiry hotline; and introducing artificial intelligence chatbot to our website.

To promote water efficiency and smart living in the community, we have introduced wired Automatic Meter Reading (AMR) system in new public and private developments since 2018. Customers at these new developments can easily and remotely monitor their water consumption using the AMR mobile app. With a view to extending the use of AMR to existing premises, we have successfully completed the trial involving the installation of 500 wireless smart water meters at Tai O in early 2022. We are currently conducting feasibility studies on the supply and installation of wireless smart meters in existing buildings.

持續創新及凝聚力量

在努力推動水資源管理、資產管理和服務提升的同時，我們渴望與各界同心協力應對各項供水挑戰，共同開發創新的解決方案，將香港打造成智慧用水城市。

由員工自主研發的無人船系統在水塘自動監測水質、新建立的地下水管測漏中心「Q-Leak」成為業界及專上院校在水管測漏技術的教研合作平台，以至廣受幼稚園和小學師生歡迎的「惜水學堂」綜合教育計劃和工商界支持的「商約」惜水運動，這些富創意及影響力的項目獲得成功，實有賴各方的共同努力和貢獻，為智慧用水未來打下穩固的基礎。

疫情下，我們的運作、員工以及整個社會都經歷了最艱辛的考驗。我衷心感謝同事們緊守崗位，發揮專業精神，在疫情期間維持優質可靠的供水服務。我相信，只要我們持續創新和凝聚社會力量，我們定能克服未來的各種挑戰，並將其轉化為動力，共同構建香港成為智慧城市。

盧國華工程師*太平紳士*
水務署署長

SUSTAINING INNOVATIONS AND COLLABORATION

While we are striving to spur innovations in water resources management, asset management and service enhancement, we also aspire integrated collaboration by all parties to address water challenges and develop innovative solutions together for building Hong Kong into a water-wise city.

From the staff-initiated unmanned surface vessel system for automatic water quality monitoring in impounding reservoirs and the establishment of "Q-Leak, a new underground water mains leak detection training centre which is served as a teaching and research cooperation platform for the trade and post-secondary education institutions in the field of water mains leak detection, to the "Cherish Water Campus" Integration Education Programme which is well received by both kindergarten and primary students and teachers, and the Enterprises Cherish Water Campaign (ECH_2O) which garners the good support of the commercial and industrial sectors, we have achieved the success in these innovative and impactful projects by bringing the collaborative efforts and contributions from all parties, which have built a solid foundation for a smart water future.

The epidemic has put our operations, people and community to the most difficult test. I want to express my heartfelt gratitude to all our colleagues for their dedication and professionalism in delivering quality and reliable water supply services even during the epidemic. I trust that, as long as we sustain our innovations and collaboration with the community, we will overcome the challenges ahead and transform them into a driving force for building Hong Kong into a smart city.

Ir LO Kwok-wah, Kelvin, *JP*
Director of Water Supplies

部門總覽
Corporate Profile

穩定而優質的供水，對本港居民的生活不可或缺，同時亦是支持本港可持續發展的關鍵要素。香港特別行政區政府水務署的職責是維持供水可靠優質。

本港 17 個水塘集水區收集的本地雨水約佔香港總食水用量 20% 至 30%，餘下部分的原水由廣東省的東江輸入，兩者均經過嚴格處理及監測，確保食水水質符合香港食水標準。此外，自一九五零年代以來，我們充分利用香港近海的地理優勢，將海水用作沖廁用途。食水及海水由兩個完全獨立的供水系統供應，透過龐大的配水庫和水管網絡，配送至各家各戶及商用物業。

為確保香港供水穩健及具應變能力，我們繼續妥善管理水務資產以維持其健康狀況，以及透過海水化淡及循環再用水等技術開拓新水源，進一步提升香港的供水保障及應對氣候變化的能力。

作為香港最大的能源用戶之一，我們已實施相關措施，透過應用創新科技、開發可再生能源及提升能源效益，致力減少碳足跡。我們亦是香港特區政府首個獲得 ISO 50001:2011 能源管理系統認證的部門。

我們的抱負是滿足客戶對優質供水服務的需求。為此，我們的人員致力與持份者合作及提供以客為本的服務，確保客戶獲得最具效率及優質的服務。

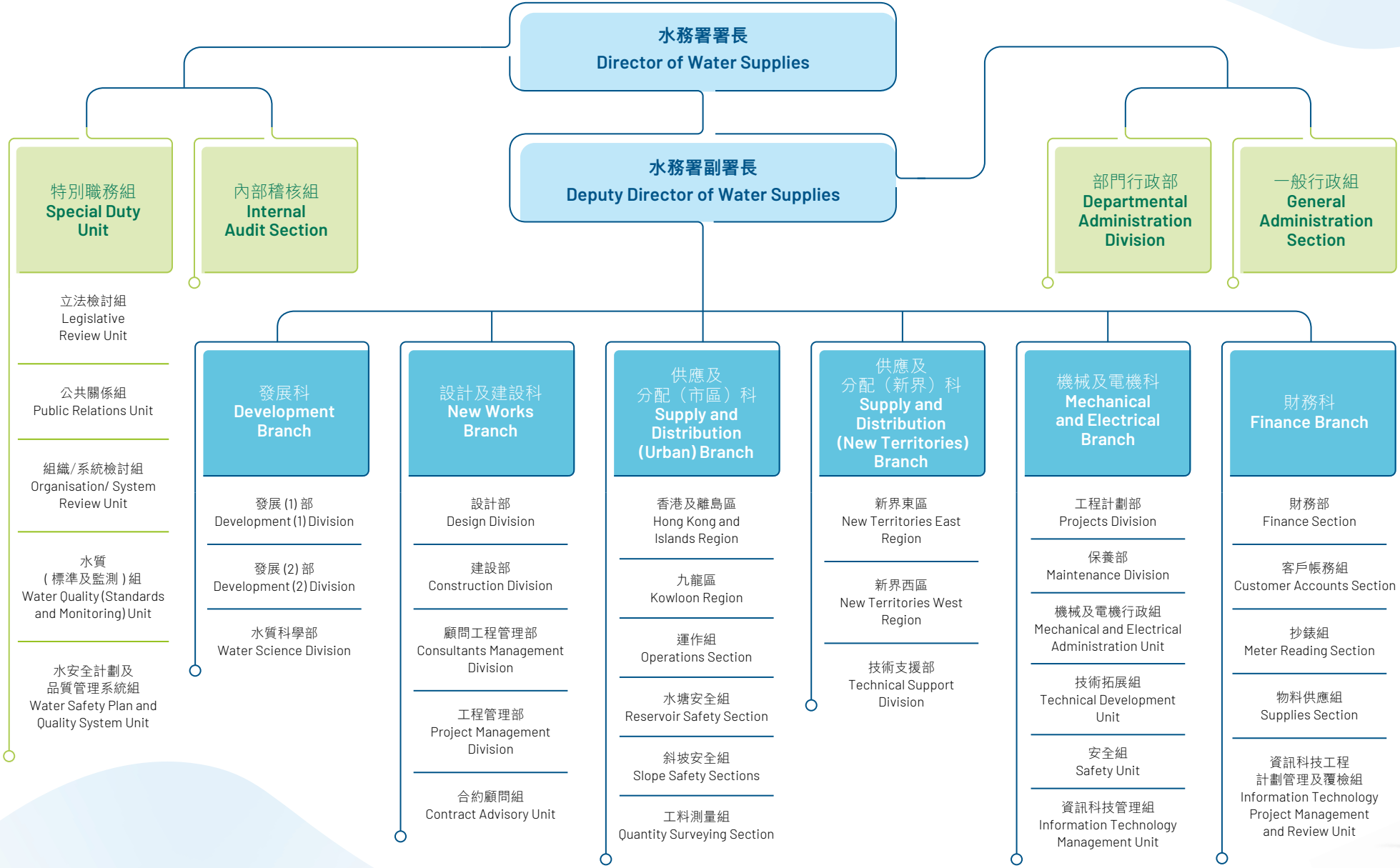
Reliable and quality water supplies are indispensable to the lives and livelihoods of the people in Hong Kong, and are critical for supporting the territory's sustainable development. The Water Supplies Department (WSD) of the Hong Kong SAR Government is charged with the responsibility of maintaining reliable and quality water supplies.

Approximately 20% to 30% of Hong Kong's fresh water supply comes from the local yield collected in catchment areas of the territory's 17 impounding reservoirs while the remaining raw water comes from Dongjiang in the Guangdong Province. Both the local yield and imported Dongjiang water are subject to stringent treatment and monitoring to ensure that the quality of treated water meets the Hong Kong Drinking Water Standards. Moreover, since the 1950s, we have taken full advantage of Hong Kong's geographic proximity to the ocean to adopt salt water for flushing purposes. Fresh water and salt water are supplied through two entirely separate supply systems. Our extensive array of service reservoirs and water mains provide these supplies for distribution to homes and commercial developments.

To ensure the sustainability and resilience of Hong Kong's water supplies, we continue to manage our asset to sustain their health and develop new sources of water including desalination and recycled water. These additional sources of water will give Hong Kong enhanced water security and the ability to adapt to climate change.

As one of the city's largest energy consumers, we have implemented measures to reduce our carbon footprint as much as possible by adopting innovation and technology, developing renewable energy and enhancing energy efficiency. We are the first Hong Kong SAR Government department to obtain the ISO 50001:2011 Energy Management System certification.

Our vision is to excel in meeting our customers' needs for quality water services. With this in mind, our committed workforce has collaborated with stakeholders and adopted a customer-oriented approach to ensure that our customers receive the most efficient and high-quality services.


水務署署長
Director of Water Supplies
水務署副署長
Deputy Director of Water Supplies
特別職務組
Special Duty Unit
內部稽核組
Internal Audit Section
部門行政部
Departmental Administration Division
一般行政組
General Administration Section
立法檢討組
Legislative Review Unit
公共關係組
Public Relations Unit
組織/系統檢討組
Organisation/ System Review Unit
水質（標準及監測）組
Water Quality (Standards and Monitoring) Unit
水安全計劃及品質管理系統組
Water Safety Plan and Quality System Unit
發展科
Development Branch
發展 (1) 部
Development (1) Division
發展 (2) 部
Development (2) Division
水質科學部
Water Science Division
設計及建設科
New Works Branch
設計部
Design Division
建設部
Construction Division
顧問工程管理部
Consultants Management Division
工程管理部
Project Management Division
合約顧問組
Contract Advisory Unit
供應及分配（市區）科
Supply and Distribution (Urban) Branch
香港及離島區
Hong Kong and Islands Region
九龍區
Kowloon Region
運作組
Operations Section
水塘安全組
Reservoir Safety Section
斜坡安全組
Slope Safety Sections
工料測量組
Quantity Surveying Section
供應及分配（新界）科
Supply and Distribution (New Territories) Branch
新界東區
New Territories East Region
新界西區
New Territories West Region
技術支援部
Technical Support Division
機械及電機科
Mechanical and Electrical Branch
工程計劃部
Projects Division
保養部
Maintenance Division
機械及電機行政組
Mechanical and Electrical Administration Unit
技術拓展組
Technical Development Unit
安全組
Safety Unit
資訊科技管理組
Information Technology Management Unit
財務科
Finance Branch
財務部
Finance Section
客戶帳務組
Customer Accounts Section
抄錶組
Meter Reading Section
物料供應組
Supplies Section
資訊科技工程計劃管理及覆檢組
Information Technology Project Management and Review Unit

即使面對瞬息萬變的需求和因氣候變化而加劇的影響，水務署多年來一直堅守使命，為香港提供優質的供水服務。從過去到現在，我們的管理層一直努力不懈，推陳出新，促進技術發展，提升水資源運用、設計和應用效益，致力將香港建設成為智慧水務城市。

Over the years, amidst the changing needs and accelerating impacts of climate change, the WSD has steadfastly upheld its mission to provide quality water supply services in Hong Kong. From the past to the present, our management has made unremittingly efforts in sustaining innovations and inspiring technological prowess for the enhancement of water usage, designs and applications in building Hong Kong into a water-smart city.

彭愛玲工程師
Ir PANG Oi-ling, Irene
助理署長 / 設計及建設
Assistant Director/New Works

曹炳豪工程師[1]
Ir CHO Ping Ho[1]
助理署長 / 機械及電機
Assistant Director / Mechanical & Electrical

林聖傑先生
Mr LAM Saint-kit, Byron
助理署長 / 特別職務
Assistant Director/Special Duty

馬漢榮工程師
Ir MA Hon-wing, Wilson
署理助理署長 / 發展
Acting AssistantDirector/ Development

盧國華工程師，太平紳士
Ir LO Kwok-wah, Kelvin, JP
水務署署長
Director of Water Supplies

周世威工程師，太平紳士
Ir CHAU Sai-wai, JP
水務署副署長
Deputy Director of Water Supplies

勞淑儀女士
Ms LO Shuk-yi
部門秘書
Departmental Secretary

黃俊光先生
Mr WONG Chun-kwong
助理署長 / 財務
Assistant Director/Finance

鍾永基工程師
Ir CHUNG Wing-kee, Philip
助理署長 / 市區
Assistant Director/Urban

尤孝賢工程師[2]
Ir YAU Hau Yin[2]
助理署長 / 新界
Assistant Director/ New Territories

[1]曹工程師自二零二一年十一月二十七日起出任助理署長/機械及電機。
[2]尤工程師自二零二二年三月三日起出任署理助理署長/新界。

[1]Ir CHO was appointed Assistant Director /Mechanical & Electrical on 27 November 2021.
[2]Ir YAU was appointed Acting Assistant Director/New Territories on 3 March 2022.

主要統計數字 Principal Statistics

（截至二零二二年三月三十一日）

(as of 31 March 2022)

17 個水塘
No. of Impounding Reservoirs

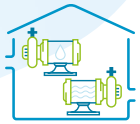
586 百萬立方米 million m^3
總容量
Total Storage Capacity

151 個食水抽水站（包括食水和原水抽水站及泵房）
No. of Fresh Water Pumping Stations (includes fresh & raw water pumping stations and pump houses)

32.5 百萬立方米 / 日 million m^3/day
總抽水量
Total Pumping Capacity

120 公里 km
引水道長度
Length of Catchwater

199 公里 km
輸水隧道長度
Length of Water Tunnel



7 個食水及海水抽水站
No. of Combined Fresh Water & Salt Water Pumping Stations

0.3 百萬立方米 / 日 million m^3/day
總抽水量
Total Pumping Capacity

179 個食水配水庫
No. of Fresh Water Service Reservoirs

4.4 百萬立方米 million m^3
總容量
Total Storage Capacity

20 個濾水廠
No. of Water Treatment Works

4.6 百萬立方米 / 日 million m^3/day
總濾水量
Total Water Treatment Capacity

35 個海水抽水站（包括泵房）
No. of Salt Water Pumping Stations (includes pump houses)

2.1 百萬立方米 / 日 million m^3/day
總抽水量
Total Pumping Capacity

6 709 公里 km
食水水管長度（直徑 20 毫米至 2 400 毫米）
Fresh Water Mains (20 mm to 2 400 mm diameter)

1 678 公里 km
海水水管長度（直徑 20 毫米至 1200 毫米）
Salt Water Mains (20 mm to 1200 mm diameter)

54 個海水配水庫
No. of Salt Water Service Reservoirs

0.3 百萬立方米 million m^3
總容量
Total Storage Capacity

主要工作表現指標
Key Performance Indicators

指標 Indicators	財政年度 Financial Year 2019/20	2020/21	2021/22
食水水質 100%符合香港食水標準* Fresh Water Quality 100% compliance with the Hong Kong Drinking Water Standards*	達到指標 Target achieved	達到指標 Target achieved	**達到指標 Target achieved**
海水水質 97%符合水務署所定的水質指標** Salt Water Quality 97% compliance with WSD Water Quality Objectives**	達到指標 Target achieved	達到指標 Target achieved	**達到指標 Target achieved**
食水供水水壓（15至30米）^ Fresh Water Supply Pressure (15 - 30 metres)^	100%	100%	**100%**
海水供水水壓（15米）^ Salt Water Supply Pressure (15 metres)^	100%	100%	**100%**
因預先計劃進行的工程而暫停供水的時間長度（98%於八小時內） Water Supply Suspension Duration for Planned Work (98% within 8 hours)	達到指標 Target achieved	達到指標 Target achieved	**達到指標 Target achieved**
準確水錶的比率98%的偏差程度不超過±3%*** Proportion of accurate water meters 98% with inaccuracy not exceeding ±3%***	98.2%	97.3%	**98.4%**

* 水務署自二零一七年九月起開始採用香港食水標準為指標，而在此之前，則一直採用世界衛生組織制訂的《飲用水水質準則》為指標。
The Hong Kong Drinking Water Standards have been adopted by the WSD in the target since September 2017. Before that, the World Health Organization's Guidelines for Drinking-water Quality were adopted in the target.

** 此指標於二零一九至二零年度經修訂為「海水水質— 97% 符合水務署所定的水質指標」，二零一八至一九年度則為「海水水質— 96% 符合水務署所定的水質指標」，而二零一七至一八年度所採用的指標為「海水水質（供水接駁位置）— 96% 符合水務署所定的水質指標」。
The target for 2019/20 has been revised as "Salt water quality - 97% compliance with WSD Water Quality Objectives". The target for 2018/19 was "Salt water quality - 96% compliance with WSD Water Quality Objectives". The target in 2017/18 was "Salt water quality (at connection points) - 96% compliance with WSD Water Quality Objectives".

*** 此指標將於二零二二至二三年度修訂為「準確水錶的比率— 98% 的偏差程度不超過 ±3%」，二零二一至二二年度則為「水錶的準確程度— 100% 的偏差程度不超過 ±3%」。
The target for 2022/23 is to be revised as "Proportion of accurate water meters-98% with inaccuracy not exceeding ±3%". The target for 2021/22 was "Accuracy of water meters-100% with inaccuracy not exceeding ±3%".

^ 配水系統內（不包括系統盡頭）最低的剩餘水壓。
Minimum residual pressure in the distribution systems except at their extremities.

現新
INNOVATE

將智慧解決方案全面融入我們的
策略規劃和資產管理
Integrating smart solutions holistically into our strategy planning and asset management

我們在服務的各方面都力求創新融合，
以加強水資源和水質管理、
提升資產管理的成效和促進可持續發展，
以及為客戶提供更貼心的增值服務。

We strive to be innovative in all facets of our services for enhanced water resources and water quality management, more efficient and sustainable asset management, and thoughtful and value-added customer services.

全面水資源管理
Total Water Management

水資源於本港的未來擔當著關鍵促成的角色，它不僅滋養生命萬物，更為家庭和社會經濟提供動力。然而，隨著人口增長、社會與經濟急速發展、氣候變化，管理和增加水資源和基礎設施的挑戰性亦與日俱增。為確保本港長遠享有穩健及具應變力的供水，水務署制定全面的水資源管理策略，務求以智慧和策略性的方式來管理我們的水資源。

Water plays a key enabling role in our city of the future. It powers homes, economies and nourishes all life. Yet with the growing population, rapid social and economic development and climate change, managing and expanding water sources and infrastructure have become increasingly challenging. To ensure sustainability and resilience of Hong Kong's water supplies in the long run, the WSD has formulated a holistic water management strategy for smart and strategic management of our water resources.

全面水資源管理策略

自二零零八年推行以來，「全面水資源管理策略」（「策略」）已成為促進香港民生和經濟發展的可持續用水藍圖。水務署與國際專家和顧問公司於二零一九年進行「策略」檢討，修訂後的「策略」（「策略 2019」）採用雙管齊下的方式，著重控制食水需求增長，以及利用多元化的水資源提升食水供應的應變能力，以應對氣候變化的極端影響。

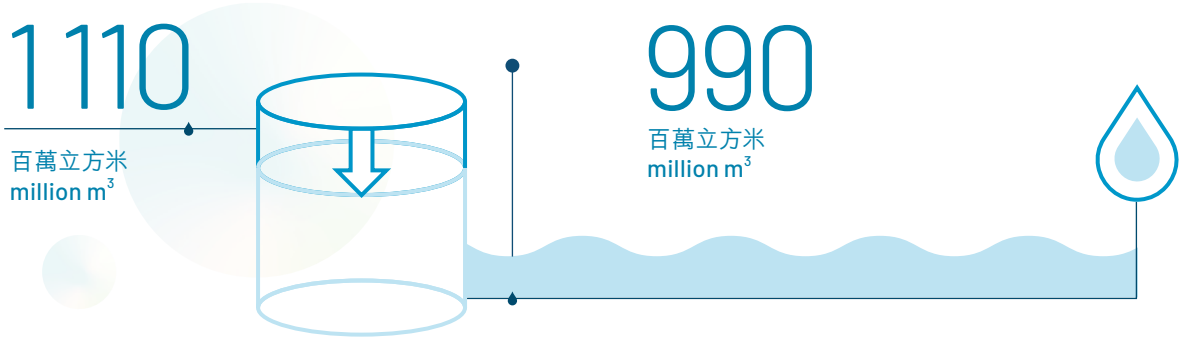
TOTAL WATER MANAGEMENT STRATEGY

Implemented since 2008, the Total Water Management Strategy has served as the road map for the sustainable use of water supporting the social and economic development in Hong Kong. Following the review of the Strategy in 2019 conducted with international experts and consultants, the WSD has updated it to adopt a two-pronged approach which focuses on containing water demands and building resilience in the fresh water supply with diversified water resources with a view to addressing the extreme effects of climate change.

「策略 2019」亦更新了至二零二四年用水需求和供應的推算方法及預測。根據政府統計處的預期人口增長情景，並考慮氣候變化導致每年雨量減少，在實施用水需求管理措施的前提下，每年食水需求量將減至 9.9 億立方米，目前的食水供應將能應付二零四零年的預測用水需求。

The 2019 Strategy Review also updated the forecast of water demand and supply methodologies and projections up to 2040. Under the expected population growth scenario provided by the Census and Statistics Department and taken into consideration the annual rainfall reduction due to climate change, the current fresh water supply arrangements will be able to meet the forecast demand up to 2040, provided that the demand management measures are implemented to reduce the annual fresh water demand to 990 million m^3.

至二零四零年之全年食水需求推算
Annual Fresh Water Demand Projection by 2040



持續監測和檢討

我們修訂「全面水資源管理策略」時，不僅以應變能力、經濟因素及可持續性等多項準則作為基礎來評估用水需求和供水管理方案，同時亦參考水務諮詢委員會和其他持份者的意見。為確保我們能夠應對比預期更嚴峻的情況，我們制定了一系列後備方案。其中包括興建更多海水化淡設施、擴大水塘容量和集水區、重啟已停用的濾水廠，以及增加東江水供應。若未來情況與目前的估算有偏差，我們可以按需要執行合適的後備方案。

Continuous Monitoring and Review

The Total Water Management Strategy was updated taking into account the evaluation of water demand and water supply management options based on the multiple criteria of resilience, economics and sustainability, as well as the views from the Advisory Committee on Water Supplies and other stakeholders. To ensure our ability to adapt to the worse-than-expected scenarios, a host of backup measures have been formulated. These include building up more desalination capacities, expanding our reservoir capacity and catchment, reactivating mothballed water treatment works and increasing Dongjiang water supply. If the future conditions deviate from our present projections, we can implement appropriate backup measures as necessary.

我們亦會定期檢討並修訂「策略 2019」，以適時應對用水需求變化、氣候變化對本地集水的影響，及各種水資源的成本效益、相關科技發展、可靠性及對環境的影響等。

We will conduct regular review of the "Strategy 2019" and update it as needed to make appropriate and timely responses to changes arising from water demand, the effect of climate change on the local yield, as well as the cost-effectiveness, technological development, reliability and environmental impact of various water resources.

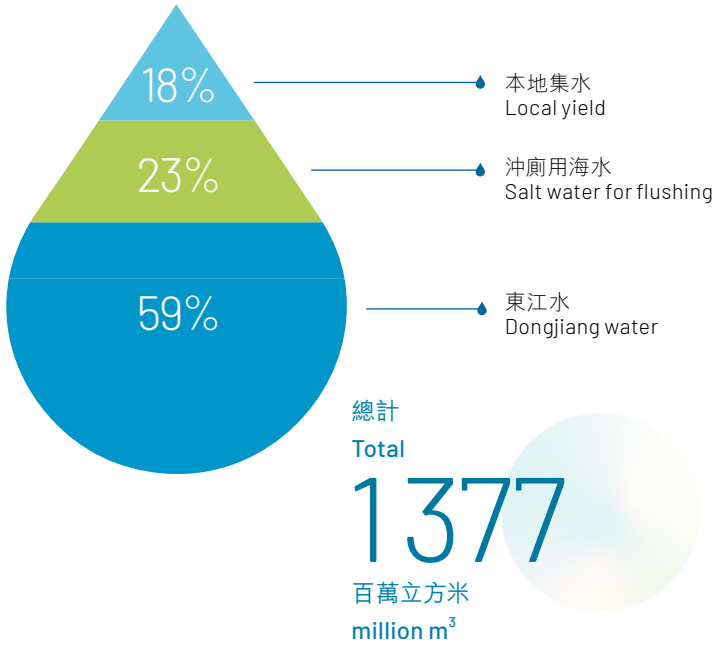
水資源

多年來，香港一直享有穩定的供水。香港水資源的三大來源為本地集水區的雨水、由廣東輸入的東江水及沖廁用海水。

WATER RESOURCES

Over the years, Hong Kong has enjoyed a reliable water supply. Hong Kong's water resources comprise three sources: Rainwater from local catchments, imported water from Dongjiang in the Guangdong Province, and salt water for toilet flushing.

二零二一年全港總用水量
Total Water Consumption of Hong Kong in 2021



二零二一年按用水類別劃分的食水用量
Annual Fresh Water Consumption by Sector 2021

用水類別 Sector	食水用量 Fresh Water Consumption 百萬立方米及佔總用量百分比 million m³ and percent of total
住宅用水 Domestic	623 (59.0%)
工業用水 Industrial	57 (5.4%)
服務業及商業用水 Service Trades	246 (23.3%)
政府用水 Government Establishments	47 (4.5%)
建築及船舶用水 Construction & Shipping	21 (2.0%)
臨時淡水沖廁 Flushing	61 (5.8%)
食水總用量 Total Fresh Water Consumption	1055 (100%)

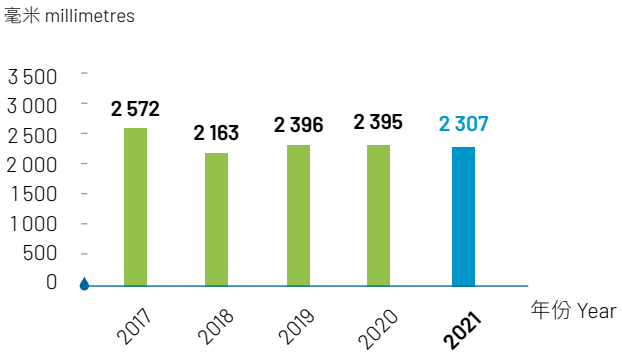
本地集水

儘管香港地勢起伏，但雨水收集和儲存系統完備且覆蓋廣泛。本地集水從集水區收集而來，大部分集水區均位於受嚴格規管保護，免受污染的郊野公園內。我們採用多重屏障的原則，在各集水區監控發展、定期巡查及監測水質的情況，以確保水質安全。在集水量方面，每年的本地集水量並不穩定，加上氣候變化的影響，我們預計未來本地集水量的變動將會更大。

Local Yield

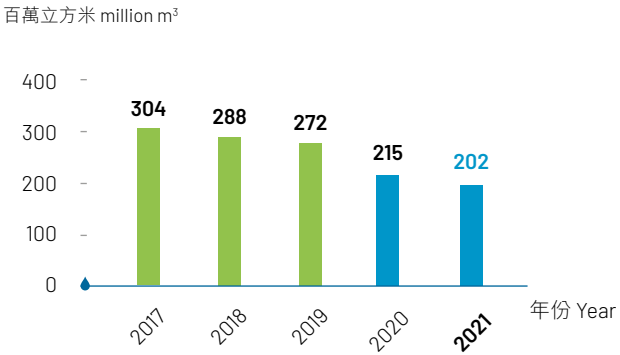
Despite the undulating terrain, Hong Kong has developed an extensive rainwater collection and storage system. The local yield is collected in catchment areas, most of which fall within country parks that are well regulated and protected from contamination. We adopt a multiple barrier approach to control development, regularly conduct inspections and monitor water quality in these areas to ensure water safety. In terms of quantity, the local yield is not stable every year, and can be subject to drastic fluctuations. Coupled with the effect of climate change, we foresee even greater fluctuations in the future.

二零一七年至二零二一年全年降雨量
Annual Rainfall 2017 – 2021



註：長期平均降雨量為 2 431 毫米
Note : Long-term mean rainfall is 2 431 mm

二零一七年至二零二一年全年淨集水量
Annual Net Yield 2017 – 2021



東江水

為填補香港本地集水量和用水需求的缺口，我們在粵港供水協議訂明的每年供水量上限，按需要以統包方式輸入東江水，確保香港供水穩定而靈活，滿足香港的實際需要。

為回應市民對東江供水按量收費的訴求，於二零二零年十二月簽訂的現行東江水協議已採用「統包扣減」收費方式，取代以往協議採用的「統包總額」方式計算，此新收費方式可至少維持至二零二九年。按二零二一年價格水平，估計在現行協議的機制下，這九年期間最高節省金額可達 3.24 億港元。

現行協議內的每年基本水價調整增幅為每年 1.33%，普遍地反映粵港兩地相關消費物價指數和人民幣兑港元匯率的變動。鑑於二零一九冠狀病毒病疫情對香港經濟環境帶來的挑戰，粵方同意將二零二一年的實際水價凍結在二零二零年水平（即 48.21 億港元），以紓緩香港的財政負擔。二零二一年，香港在東江水方面的支出為 48.21 億港元，而二零一九年和二零二零年的支出分別為 48.07 億港元和 48.21 億港元。

沖廁用海水

自一九五零年代，香港引入海水沖廁，至今仍是全球少數廣泛應用這種可持續資源沖廁的地方之一，在我們的水資源管理中發揮著舉足輕重的作用。目前，我們的海水供應網絡覆蓋全港約 85% 的人口，每年供應約 3.2 億立方米海水，節省了同等分量的食水，約佔香港總用水量的 23%。

使用海水沖廁有助節省珍貴淡水資源，加上供應海水的耗電量較供應食水的為低，因而可降低生產成本，亦能減少二氧化碳排放量。

Dongjiang Water

To fill the gap between Hong Kong's local yield and water demand, Dongjiang water is imported as needed with a package deal approach, up to the annual supply ceiling stipulated in the supply agreement between Guangdong and Hong Kong to ensure a stable but flexible supply for meeting the city's actual needs.

In response to the public request for payment based on the quantity of Dongjiang water supplied, the current agreement 2021-2023 was signed in December 2020 using a "package deal deductible sum" approach which will be maintained at least up to 2029 and replaces the previous "package deal lump sum" approach. Based on the 2021 price level, it is estimated that the mechanism of the current agreement will bring a maximum saving of HK$324 million under this nine-year period.

The annual ceiling water prices in the current agreement will be increased by 1.33% each year, which generally reflects the changes of the relevant consumer price indices of Guangdong and Hong Kong and the exchange rate between the Renminbi and the Hong Kong dollar. In view of the prevailing challenging economic environment arising from the COVID-19 epidemic, Guangdong authorities have agreed that the actual water price for 2021 was frozen at the 2020 level (i.e. HK$4,821 million) to ease the financial burden of Hong Kong. In 2021, Hong Kong's expenditure on Dongjiang water was HK$4,821 million, compared to HK$4,807 million and HK$4,821 million paid in 2019 and 2020 respectively.

Salt Water for Flushing

Since 1950s, salt water has been introduced in Hong Kong for toilet flushing. Hong Kong is one of the few places in the world extensively applying this sustainable resource which forms an important role in our water management. Currently, our salt water supply network covers about 85% of the Hong Kong population. Every year, about 320 million m^3 of seawater is supplied for flushing, conserving an equivalent amount of fresh water which is about 23% of the total water consumption in Hong Kong.

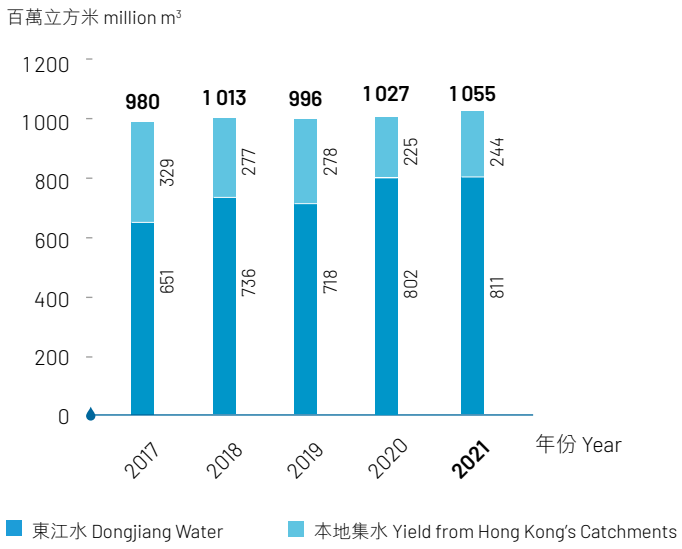
Using salt water for flushing not only conserves precious fresh water resources, but also reduces production costs and carbon dioxide emissions arising from lower electricity consumption for supplying salt water than fresh water.

點滴話你知
Did you know?

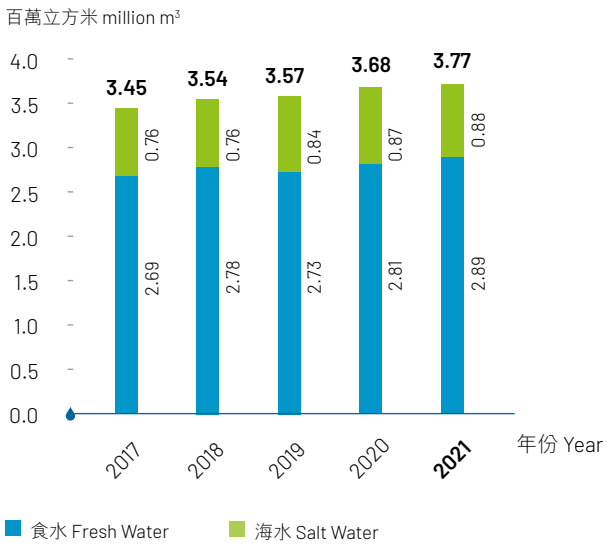
你需要做甚麼才能轉用海水沖廁
What you need to do for converting salt water for flushing

1. 查看水務監督發出有關轉用海水沖廁的通知
   Check the letter issued by the Water Authority about conversion to seawater for flushing
2. 聘請持牌水喉匠檢查內部沖廁系統，以確認系統是否準備就緒
   Employ licensed plumbers to inspect the inside service of flushing systems to confirm readiness
3. 如需改善供水系統，須向水務監督申請
   Apply to the Water Authority if modification works are required
4. 在持牌水喉匠檢查及改善系統後，便可申請接駁鹹水喉管
   Make application for connecting to seawater mains following the inspection and completion of modification works by licensed plumbers
5. 繳納水務監督規定的接駁費用
   Pay the pipe connection fee required by the Water Authority

二零一七年至二零二一年全年食水供應
Annual Quantity of Fresh Water Supply 2017 - 2021



二零一七年至二零二一年全年日均用量（食水及海水）
Total Average Daily Water Consumption (Fresh Water and Salt Water) 2017-2021



水資源未來的展望

氣候變化、人口和經濟持續增長令食水需求增加，以及大灣區內對水資源的需求殷切等，皆為我們帶來挑戰。為了讓香港就迎接這些挑戰做好準備，我們持續開發一些不受氣候變化影響的新水源，包括淡化海水和循環再用水（即再造水、重用中水及回收雨水）。

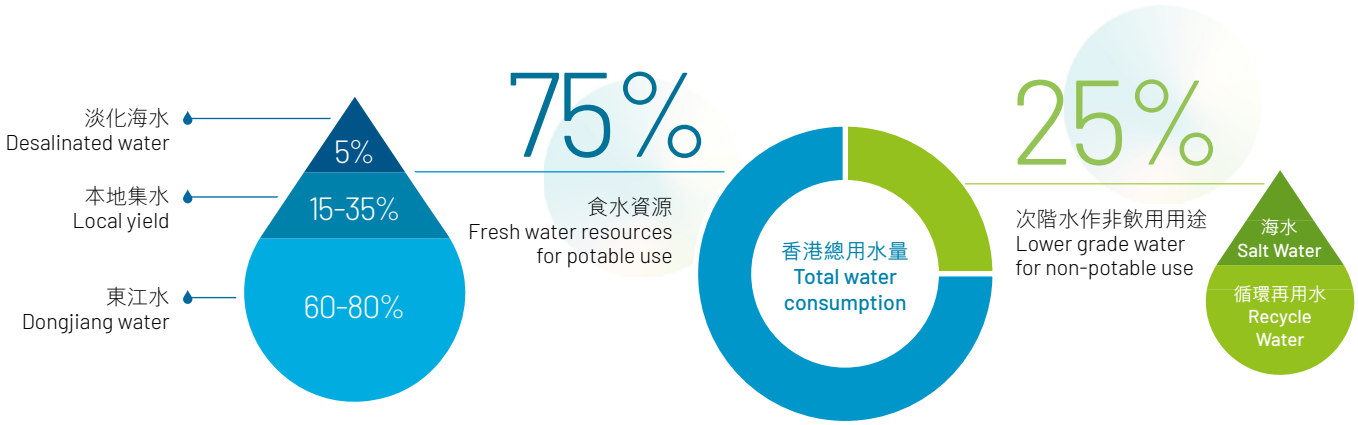
我們將繼續按照「策略 2019」的建議，採取雙管齊下方式，為未來建立多元化的水資源組合。食水資源將約佔香港總用水量 75%，而非飲用的次階水將佔其餘用水量 25%。

Outlook of Future Water Resources

To better prepare Hong Kong for the challenges of climate change, the increasing demand for fresh water due to its continuous population and economic growth, as well as the competition for water resources in the Greater Bay Area, we have been developing new water sources that are not susceptible to climate change, including desalinated water and recycled water (viz reclaimed water, treated grey water and harvested rainwater).

Following the recommended two-pronged approach under the Strategy 2019, we seek to build a diversified portfolio of water resources in future. Fresh water resources will account for about 75% of the total water consumption in Hong Kong while the lower grade water for non-potable uses will account for the remaining 25% consumption.

根據「策略 2019」預計的香港水資源組合
Estimated Composition of Hong Kong's Water Sources under Strategy 2019



控制食水需求增長

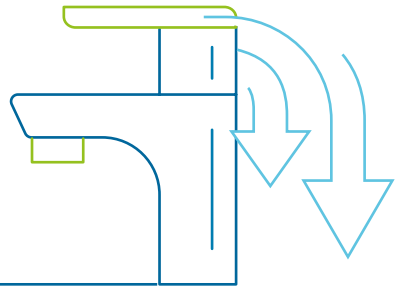
根據「策略 2019」，控制食水需求增長在水資源需求管理中是非常重要的一環。為配合本港的可持續發展，政府於二零一七年及二零一八年的《施政綱領》中承諾，最早於二零三零年達致人均食水用量減少 10% 的目標（以二零一六年為基準年）。

CONTAINING FRESH WATER DEMAND GROWTH

Following the Strategy Review in 2019, containing the growth of fresh water demand plays a pivotal role in water demand management. In line with the territory's sustainable development, the Government targets to reduce the average fresh water per capita consumption by 10% by 2030 at the earliest, using 2016 as the base year, as pledged in the Chief Executive's Policy Agenda in 2017 and 2018.

為了達致早於二零三零年人均食水用量減少 10% 的目標（以二零一六年為基準年），我們正推行三項主要用水需求管理措施，包括節約用水、管理政府和私人水管的用水流失，以及擴大使用海水和循環再用水等次階水作非飲用用途。

To reduce the per capita fresh water consumption by 10% by 2030 (using 2016 as base year), we are taking forward three major water demand management initiatives, namely water conservation, water loss management in both government and private water mains, and expanded use of lower grade water, including seawater and recycled water, for non-potable uses.



節約用水

推廣負責任和精明用水，有助保障長遠供水。其成功的關鍵在於業界和社會大眾的共同努力和貢獻。有見及此，我們與相關持份者緊密合作，推出多項用水效益措施、宣傳活動、學校教育計劃，以及用水效益最佳實務指引，致力推動文化和行為的改變，共同應對水資源的挑戰。

Water Conservation

Promoting responsible and smart use of water helps secure our water supply for the long term. The success of such lies in the collaborative efforts and contributions from both industries and the wider community. With this in mind, we are working closely with relevant stakeholders and have launched various water-efficiency measures, promotional campaigns, school education programmes, as well as best practice guidelines aiming to inspire cultural and behaviour changes to address our water challenges together.

透過水知園教育中心增強節約用水的意識

為提高公眾人士對節約用水的認識並促進有關行動，位於天水圍辦公大樓的水知園教育中心就全球水資源議題舉辦展覽。當中設有五十多個展品、互動遊戲和現場示範，開放予公眾免費入場參與。這些與水有關的教育資源，與學校課程和教育活動扣連，讓參觀人士可寓習於樂，在愉快的學習環境中增進有關水的知識，並激發他們身體力行，響應行動，共同應對水資源短缺問題。儘管受到二零一九冠狀病毒病疫情的影響，截至二零二二年三月，「水知園」已接待約 50 000 名訪客*。公眾可以預約參觀或在網上參加虛擬展覽，以獲取這些與水相關的教育資源。

* 鑑於二零一九冠狀病毒病疫情，水知園於二零二零年一月至二零二二年三月期間暫停開放約 320 天。

Raising Conservation Awareness through H_2OPE Centre

To promote community-wide awareness and action on water conservation, the H_2OPE Centre at our Tin Shui Wai Office Building holds exhibitions regarding worldwide issues on water resources, and features over 50 exhibits, interactive games and live demonstrations which are made available for free admission. These water education resources are linked to school curriculums and educational activities while providing visitors with an enjoyable learning environment for raising their water knowledge and inspiring concerted actions against water scarcity. As of March 2022, H_2OPE Centre has received about 50 000 visitors* despite the impact of COVID-19 epidemic. Members of the general public can book the visit or arrange a virtual tour for access to these water education resources.

* The H_2OPE Centre was temporarily closed for approximately 320 days during January 2020 to March 2022 due to COVID-19 epidemic.

水知園為公眾教育中心，旨在提高公眾對節約用水的認識。當中設有五十多個展品、互動遊戲和現場示範，供學校和公眾人士免費入場參與。

The H_2OPE Centre is a public education centre aimed at enhancing knowledge of water conservation. It features over 50 exhibits, interactive games and live demonstrations which are made available to schools and members of the general public for free admission.

專題展覽

水知園的教育內容包羅萬有，從水資源、食水水質、節約用水、循環再用水、水務工程、用水效益，以至可持續發展措施，均應有盡有。

為紀念大潭篤水塘落成百周年，水知園與香港大學房地產及建設系合作，於二零二一年九月舉辦專題展覽，重點介紹了水塘的建造歷史、水壩興建工程，以及相關的人物風貌，如原村民後代、漁民、工程師、工人及現居居民。

Themed Exhibition

The education contents of the H_2OPE Centre range from water resources, drinking water quality, water conservation and recycling, waterworks projects, water efficiency to sustainability initiatives.

Commemorating the centenary of the Tai Tam Tuk Reservoir, the H_2OPE Centre held a thematic exhibition about the Tai Tam Tuk Reservoir from September to December 2021 in collaboration with the Department of Real Estate and Construction of the University of Hong Kong. The exhibition focused on the development history of the Reservoir, dam construction and the people involved such as descendants of original villagers, fishermen, engineers, workers and current residents.

- *水知園的展品*
  Attractions@ H_2OPE Centre

在家庭、企業和學校推廣用水效益的實踐方法

用水效益標籤計劃

高用水效益的設備、裝置和器具，可增加節約用水的成效。二零零九年推出「自願參與用水效益標籤計劃」，現已擴展至六類型水喉裝置及用水器具，包括沐浴花灑、水龍頭、洗衣機、小便器用具、節流器和水廁，能幫助用戶作出明智的購買選擇。

此外，自二零一八年二月起規定新建樓宇、住宅處所的廚房，以及所有處所的浴室和洗手間的訂明水管工程，均必須使用在「用水效益標籤計劃」下登記及符合指定用水效益級別的產品。

為進一步提高用水效益，我們正準備修訂法例，規定在香港供應的指定類型產品，必須已在「用水效益標籤計劃」下登記，並貼上用水效益的標籤，方便消費者選擇具用水效益的產品。

Promoting Water Efficiency Practices for Homes, Businesses and Schools

Water Efficiency Labelling Scheme

Water efficient appliances, fixtures and devices are effective in strengthening conservation efforts. To help shrewd water users in making informed choices of purchase, the voluntary "Water Efficiency Labelling Scheme" (WELS) launched in 2009 has now been extended to six types of plumbing fixtures and water-consuming devices, which cover showers for bathing, water taps, washing machines, urinals equipment, flow controllers and water closets.

In addition, since February 2018, the mandatory use of WELS products of prescribed water efficiency grade has been in force for new buildings and prescribed plumbing works of existing buildings for kitchens of domestic premises, and bathrooms and toilets in all premises.

To further enhance water use efficiency, we are progressing with legislative amendments to require registration of products of the prescribed WELS types and affixation with WELS labels for supply in Hong Kong to facilitate consumers' selection of water efficient products.

「用水效益標籤計劃」說明六種類型的水喉裝置及用水器具的用水量和用水效益，幫助消費者作出明智的購買選擇。

The Water Efficiency Labelling Scheme shows the level of water consumption and water efficiency of the six types of plumbing fixtures and water-consuming devices helping consumers to make informed choices of purchase.

免費安裝節流器計劃

住宅用水量佔全港用水量超過一半，減少住宅用水便成為控制食水需求增長的長期措施之一。安裝節流器能有效減少水龍頭或沐浴花灑的用水量以及培養節約用水的習慣。自二零一四年起，我們便已為公共租住屋邨免費安裝節流器，藉此提升用水裝置的效益，並改變客戶的用水習慣。這個自願性計劃將於二零二三年完成。

我們於二零一九年把免費安裝節流器計劃擴展至私人屋苑和私立學校（包括幼稚園、小學及中學），並將其納入社區節約用水運動「齊來慳水十公升 2.0」，從而促進大眾參與，發揮更大的成效。有關詳情，請參閱「弦動」章節。

為了促進年輕一代節約用水，我們繼續為私立學校安排安裝節流器，但二零一九冠狀病毒病疫情限制了我們為公共和私人屋苑提供的安裝服務。然而，我們透過水務署網站向公眾提供免費節流器來自行安裝。

Free Installation of Flow Controllers Programme

One of the long-term measures to contain the growth of fresh water demand is reducing domestic consumption, which accounts for over half of the total water consumption in Hong Kong. The installation of flow controllers is an effective way to reduce water consumption from taps or showers and cultivate water conservation habits. Since 2014, we have offered free installation of flow controllers in public rental housing estates to increase efficiency of water devices and change usage habits. The programme is on voluntary basis and is scheduled to complete by 2023.

Leveraging the effectiveness of water conservation, the free installation scheme was extended in 2019 to private housing estates and private schools (including kindergartens, primary schools and secondary schools) to inspire their contributions as part of our community water conservation campaign titled "Let's Save 10L Water 2.0". See in the Inspire Section for more details.

While we continue to arrange installation of flow controllers in private schools to promote water conservation among the young generation, the COVID-19 epidemic has posed constraints on our installation services at public and private housing estates. Despite this challenge, we have enabled the public to apply for the flow controllers free of charge through the WSD website and perform self-installation.

182 000
個住戶來自
households in

164
個公共租住屋邨
public rental housing estates

5 100
個住戶來自私人屋苑
private estate households

672
間幼稚園
kindergartens

42
間私立小學
private primary schools

8
間私立中學
private secondary schools

截至 2022 年 3 月已安裝節流器
have installed flow controllers as at March 2022

用水效益最佳實務指引

為了提高各行各業的用水效益，我們制訂了用水效益最佳實務指引，以供業界參考國際最佳實踐經驗。我們正與酒店和餐飲業的協會合作，力求在營運的不同方面提升用水效益，包括設施保養、酒店服務、廚房和樓面運作、泳池和園景管理。

此外，我們鼓勵酒店業和餐飲業界從業員定期以「節水核對清單」展開用水評核，在核查器具的用水效益、業務運作常規和維修保養要求的同時，提高員工和客戶的節水知識，以期匯聚多方持份者的努力，使節約用水的成效更大。

Best Practice Industry Guidelines

To enhance water use efficiency across industries, we have developed a set of Best Practice Guidelines to the industry practitioners taking reference of the experiences of international best practices. We are collaborating with hotel and catering associations to promote water use efficiency in different aspects of their daily operations, including facilities maintenance, hospitality service, kitchen and dining area operations, swimming pools and landscape management.

In addition, we encourage the hotel and restaurant practitioners to conduct water audits regularly using the Water Efficiency Checklist to evaluate the water use performance of equipment and operational practices, identify maintenance requirements, as well as raise awareness and participation from their employees and customers on water conservation with a view to gathering greater contributions from various stakeholders.

推動精明的用水文化

我們相信，要展開大規模的節約用水工作，必須以針對性的方法與持份者緊密合作來向社區宣傳用水效益和精明用水生活，才能在控制食水需求增長方面，產生積極變化。有關水務署與業界和社區合作的詳情，請參閱「弦動」章節。

Promoting Water-Wise Culture

To advance water conservation efforts at scale, we believe a targeted approach in close collaboration with stakeholders to promote water efficiency and smart living in the community is the key to effect positive changes in containing the growth of fresh water demand. The details of the WSD's collaborative efforts with the industries and communities are covered in the Inspire Section.

管理用水流失

香港的山丘地形，加上對地下水管的各樣頻密干擾，導致水管滲漏的風險提高。為此，水務署實施一系列措施，管理逾8 300公里的水管，務求優化供水系統網絡的運作表現、減少水管爆裂和用水流失，同時協助客戶追蹤和管理其用水流失。

Water Loss Management

The hilly terrain as well as various disturbances to underground water mains in Hong Kong have caused higher risk of leakage from water mains. At the WSD, we implement a host of measures to manage our water mains of over 8 300km long and to optimise the operational performance of the water supply network, reduce pipe bursts and water loss while helping consumers track and manage their water loss.

「智管網」

在「智管網」計劃下，我們在全港食水分配管網內逐步設立約2 400 個監測區域，以監察用水流失的情況，其中部份監測區域亦用作水壓管理區域，配有減壓裝置，將水壓調節到合適水平，以減少滲漏引致的用水流失。截至二零二一年底，我們已設立約 1 550 個監測區域。每個監測區域均裝有監測設備和感應器，持續監測用水流失。

我們已建立「智能管網管理電腦系統」來協助收集各監測區域大量的管網數據，從中識別異常情況，從而決定最合適和最有效的管網管理措施。這些措施包括：

Water Intelligent Network

Under the project "Water Intelligent Network" (WIN), we have been progressively establishing about 2 400 District Metering Areas (DMAs) in our fresh water distribution network across the territory to monitor water loss. Some of these DMAs are also designated as Pressure Management Areas (PMAs) and equipped with pressure reduction devices that can modulate water pressure to a suitable level to reduce the quantity of water loss due to leakage. As at end 2021, we have set up about 1 550 DMAs. Monitoring and sensing equipment installed in each DMA allows continuous monitoring of water loss therein.

An "Water Intelligent Network Management System" has been established to assist in collecting vast amount of data from these DMAs, identifying anomalies for follow-up actions with the objective to determining the most suitable and effective network management measures. These measures include:

主動探測滲漏
Active Leakage Detection

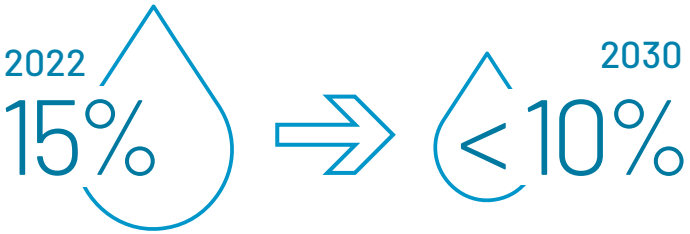
水壓管理
Pressure Management

快速維修滲漏水管
Speedy Repair of Water Main Leaks

更換及修復水管
Replacement and Rehabilitation of Water Mains

目標在二零三零年前，將政府水管的滲漏率從現時約 15% 降低至 10% 以下。

By 2030, we aim to reduce the leakage rate of public water mains from the current about 15% to below 10%.



管理私人水管滲漏

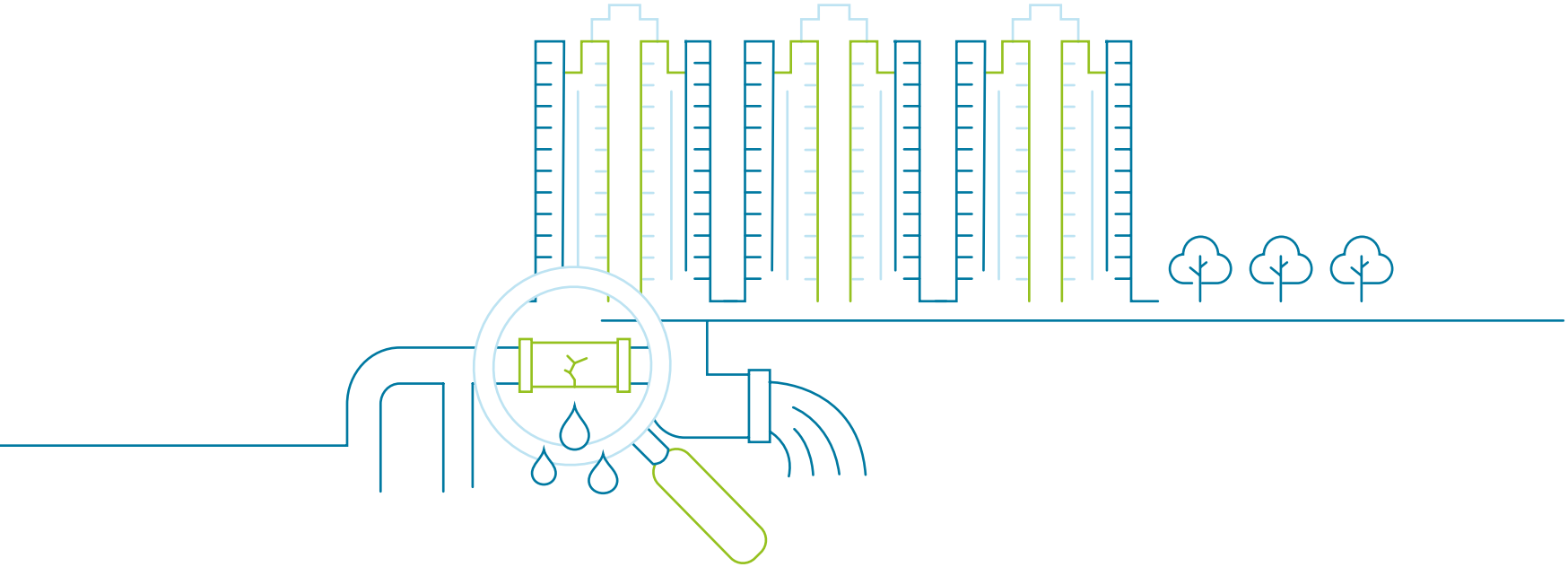
除了管理公共水管的用水流失外，我們亦採用一系列措施，例如為私人發展項目安裝總水錶，以監察私人水管用水流失的情況。我們亦透過編制合約條款及規格範本，以及提供測漏服務供應商參考名單，為業主、物業管理人和服務供應商提供建議和支援，以便他們安排測漏調查。

「智管網」的逐步推行亦讓我們能發現隱藏於私人水管的滲漏點。當「智管網」在某監測區域發現用水量異常，我們的團隊便會到場進行滲漏調查，包括目視和聽音檢查、滲漏噪聲相關測試和滲漏分段測試。若私人水管出現懷疑用水流失，我們會向相關業主和物業管理人提供建議和支援。

Managing leakage of private water mains

In addition to managing water loss from public mains, a series of measures, for example, installing master meters, have been put in place to monitor water loss at private developments. We also provide advice and support to property owners, management agents and service providers to facilitate leak investigations through publishing sample contract clauses and specifications, and providing a reference list of local leak detection service providers.

The progressive implementation of WIN also allows us to identify hidden leaks in private water mains. Once the intelligent network detects an unusual amount of water consumption in certain DMAs, our water loss management teams will assist in onsite visual and sounding inspections, leak noise correlation surveys and leak detection step tests. In case the water loss is suspected occurring in the private water mains, advice and support would be provided to the concerned property owners and management agents.



專題故事 FEATURE STORY

成立「Q-Leak」來提高香港測漏的卓越水平
Establishing Q-Leak to Elevate Hong Kong's Excellence in Leak Detection

隨著水資源變得緊得愈來愈珍貴，設計智慧解決方案來減少因滲漏而導致用水流失，以及提高滲漏檢測技術，是處理用水流失的關鍵。

多年來，水務署一直與多個行業和教育機構合作，制定滲漏檢測技術培訓和資格認證，推動持續專業發展，同時提高香港建築物的水管規劃和管理質素。

為配合「智管網」逐步擴展智能供水網絡，所建立的區域監測亦隨之增加。有鑑於此，一個全新的地下水管測漏培訓中心「Q-Leak」於二零二一年七月成立。Q-Leak 旨在進一步提升香港測漏技術和成效，同時為香港珍貴的水資源最佳實務和管理作出貢獻。

As water has increasingly become a strained resource, designing smart solutions to save water lost through leakage as well as capability building are key to tackling water loss.

Over the years, the WSD has been working with various industry and educational institutes in developing leak detection training and qualifications to enable continuing professional development while enhancing the quality of water mains planning and management in Hong Kong buildings.

In view of the extension of the smart water network which comprises more DMAs progressively established under the "Water Intelligent Network" initiative, a new underground water mains leak detection training centre, Q-Leak was newly established in July 2021. The Q-Leak aims to further elevate Hong Kong's leak detection technical excellence while contributing to the best practices and management of precious water resources of the territory.

「Q-Leak」於二零二一年七月成立，是首個用於判斷地下水管滲漏的培訓、研究和開發中心。

Established in July 2021, the Q-Leak is the first of its kind for training, research and development of diagnosing underground water main leakage.

位於青衣的 Q-Leak，是首個用於判斷地下水管滲漏的培訓、研究和開發中心，佔地 2 400 平方米，設施模擬香港複雜的供水管網及在不同情況下出現的地下水管滲漏，如不同的水管大小和物料，以及不同水流和壓力。Q-Leak 的設施讓水管測漏人員，在安全的環境下進行各種滲漏檢測技術的培訓和技能評估。

Situated at Tsing Yi, the Q-Leak is the first of its kind for training, research and development of diagnosing underground water main leakage. The Centre covers about 2 400 square metres with facilities simulating the complex water supply network of Hong Kong and its underground water main leakage under various conditions and scenarios, including different pipe sizes and materials, as well as different water flow and pressure. The Q-Leak provides a safe environment for leak detection practitioners to conduct training and skills assessments on various leak detection technologies.

設施模擬香港複雜的供水管網及在不同情況下出現的地下水管滲漏，讓水管測漏人員在安全的環境下進行各種滲漏檢測技術的培訓和技能評估。

The Centre covers facilities simulating the complex water supply network of Hong Kong and its underground water main leakage under various conditions and scenarios, providing a safe environment for leak detection practitioners to conduct training and skills assessments on various leak detection technologies.

水務署一直致力加強公共及私人內部喉管滲漏控制措施，以減少耗水。水務署期望「Q-Leak」能成為與專家、研究人員、業界及香港專上院校在水管測漏技術的教研合作平台，以加強測漏培訓工作和技術研究提供更佳設施。

The WSD has always been committed to stepping up measures to prevent water leakage from both public and private water mains in a bid to reduce water loss. The Q-Leak will serve as a teaching and research cooperation platform with specialists, researchers, industry practitioners as well as post-secondary education institutions in Hong Kong to provide better facilities and robust support for strengthening the industry with training and research capabilities on leak detection.

水務署署長 ***盧國華工程師太平紳士***
Ir LO Kwok-wah, Kelvin, JP *- Director of Water Supplies*

通過利用聲波和電磁訊號的先進無損檢測技術，Q-Leak 便可根據多個可重復和可改變的地下水管網絡的滲漏場況，從大型輸水管到幹管，以至鄉村的小型水管，解決了當前的培訓問題並加強檢漏培訓。中心更可透過提供不同級別的「盲測」，使學員能在現實世界中檢測「看不見的」網絡的滲漏位置，在提高智能水管理的學習經驗和專業技能方面取得了重大突破。

Leveraging a variety of re-usable and changeable leakage scenarios of buried water main networks ranging from large distribution and trunk mains to small village water pipes, the Q-Leak has addressed current teaching issues and enhanced leak detection training by using the advanced non-destructive testing (NDT) technology which rely on acoustic and electromagnetic signals. Through offering different levels of blind tests, the Centre enables learners to detect and locate leakage in the "invisible" network in the real world. This has marked a significant breakthrough in enhancing learning experience and professional skills in smart water management.

香港理工大學土地測量及地理資訊學系副教授 ***賴緯樂博士***
Ir Dr LAI W L, Wallace *- Associate Professor, Department of Land Surveying and Geo-informatics, The Hong Kong Polytechnic University*

智能水錶系統

作為推動香港成為智慧城市的一部分，我們從二零一八年起，於新建公營及私人發展項目引入智能水錶系統，以便進一步促用水效益和智能生活。除了改善讀錶的準確度和效率，我們期望客戶透過安裝相關的流動應用程式後能夠適時地獲得更多有關其用水量的資訊，從而培養長期節約用水的良好習慣。

至於現有樓宇的客戶，我們正研究採用各種無線技術的可行性。基於地理因素的考量，我們揀選大澳區作為首個測試無線智能水錶系統的試點。並在二零二一年，我們為 500 名大澳現有客戶更換其傳統機械水錶為無線智能水錶。整項工程已於二零二二年初完成，成果尚算滿意。根據是次經驗，我們正進一步研究為其他現有建築物安裝無線智能水錶的可行性和策略。

Advanced Metering Infrastructure

As part of advancing Hong Kong into a smart city, we have introduced Advanced Metering Infrastructure (AMI) since 2018 in new public and private developments to further promote water efficiency and smart living in the community. Besides improving accuracy and efficiency in water meter readings, we seek to raise customer awareness of water conservation and inspire their behaviour changes through the provision of water consumption information via mobile app.

With a view to extending the use of AMI to existing premises, we are assessing the feasibility of adopting wireless technology. Due to its remoteness from high-rise buildings and suitability for radio telecommunications, Tai O is selected as the first trial of our wireless AMI solution to improving efficiency and customer service. The trial was completed with satisfactory results in early 2022 and a total of 500 wireless smart water meters were installed in 2021. We are currently conducting feasibility studies on the supply and installation of wireless smart meters in existing buildings.

客戶可利用流動應用程式，輕鬆地遠程監測用水量。

Customers using mobile app can easily and remotely monitor water consumption.

智能水錶系統應用於新建和現有公營及私人發展項目，能進一步促進社區的用水效益和智能生活。

The implementation of AMI in new and existing public and private developments further promotes water efficiency and smart living in the community.

引進智能水錶系統的主要目標是提高客戶的用水意識並培養節水習慣。從郊區的漁村棚屋、村屋、公共屋邨及政府設施中吸取寶貴經驗後，我們將考慮在各類現有樓宇安裝無線智能水錶的可能性，繼續為提升效率及客戶服務而努力。

The introduction of AMI provides water meter readings to raise customer awareness of water conservation and inspire their behaviour changes. Following the satisfactory trials in fishermen's huts, village houses, public housing estates and government facilities, wireless smart water meters will be further implemented in existing buildings with a view to increasing efficiencies and enhancing customer services.

無線智能水錶於大澳的村屋（左）和公共屋邨安裝（右）。

Wireless smart water meters are installed at village houses (left), and public housing estate in Tai O (right).

次階水

我們利用創新技術，致力擴大使用次階水，包括海水及循環再用水（即再造水、重用中水及回收雨水），用於沖廁、園景灌溉和清潔街道等非飲用用途，務求節省食水資源。

長遠而言，我們的目標是擴展次階水用於沖廁和其他非飲用用途的供應網絡覆蓋範圍，由香港總人口的 85% 增加至 90%，並著重在新發展地區和現時使用淡水沖廁的地區推展。

海水供應網絡

為進一步降低食水用量，我們繼續擴大使用海水沖廁的範圍。我們現正為東涌新市鎮建造海水供應系統，以取代區內目前以淡水沖廁的安排。有關工程預計於二零二三年竣工，供應海水至東涌新市鎮及其擴展區。

在技術可行和具成本效益的情況下，我們將繼續尋求擴展海水供應網絡或利用新的水資源（例如循環再用水），務求減少使用淡水沖廁。

Lower Grade Water

Leveraging innovative technologies, we have been actively expanding the use of lower grade water, which includes salt water and recycled water (i.e. reclaimed water, treated grey water and harvested rainwater) for non-potable uses, for example, toilet flushing, landscape irrigation and street cleansing to help conserve fresh water resources.

We aim to expand the network coverage for supplying lower grade water from 85% to 90% of Hong Kong's total population for flushing and other non-potable uses in the long run with the focus on the new development areas and those areas currently being supplied with fresh water for flushing.

Salt Water Supply Network

To further reduce the fresh water consumption, we continue to expand the use of salt water for flushing. The Tung Chung New Town is currently being supplied with fresh water for flushing. We are building a replacement salt water supply system that will be completed in 2023 to supply salt water to the Tung Chung New Town and its extension for flushing.

With a view to reducing the use of fresh water for flushing, where technically feasible and cost-effective, we will continue to explore ways to expand our salt water supply network or leverage new water resources (e.g. recycled water).

供應再造水

石湖墟污水處理廠目前正進行工程，以升格為具備三級污水處理水平的淨水設施。工程除了可提升該廠處理來自上水、粉嶺及周邊發展區污水的能力外，經淨水設施處理的排放水為我們提供機會，生產再造水作沖廁及其他非飲用用途，從而節省珍貴的食水資源。這個再造水供應系統，每年可處理的總水量高達 2 200 萬立方米，覆蓋約 50 萬人口，因此每年可節省同等分量的食水供應。

自二零一七年起，上水及粉嶺基礎設施的建造工程，包括配水庫、敷設輸水幹管，以及在該區西南部的分配水管，已經分階段展開，以期為當區供應再造水。石湖墟再造水廠以及上水及粉嶺分配水管的餘下工程亦已於二零二一年七月如期動工，我們的目標是於二零二四年首季開始供應再造水，並於二零二六年第四季前分階段完成所有建造工程。

Supply of Reclaimed Water

The Shek Wu Hui Sewage Treatment Works is being upgraded to an Effluent Polishing Plant (EPP) with tertiary treatment process. This will increase its capacity for treating sewage from Sheung Shui, Fanling and adjacent development areas, and provide opportunities for us to produce reclaimed water by further processing the EPP's treated effluent so as to save our precious fresh water resources. The reclaimed water supply system is capable of processing a total volume of up to 22 million m^3 per year with a coverage of about 500 000 people, hence saving an equivalent amount of our fresh water supply each year.

Since 2017, the construction of infrastructure in Sheung Shui and Fanling, which includes a service reservoir, laying of trunk water mains, as well as local distribution mains in the south-west part of the areas, has been carried out in phases to facilitate reclaimed water supply to these areas. With the scheduled construction of the Shek Wu Hui Water Reclamation Plant and the remaining local distribution mains in Sheung Shui and Fanling in July 2021, we target to commence the supply of reclaimed water in the first quarter of 2024 and complete all construction works in stages by the fourth quarter of 2026.

石湖墟再造水廠每年最多可生產
The Shek Wu Hui Water Reclamation Plant will produce

約 about **22** 百萬立方米再造水 million m^3 of reclaimed water maximum each year

覆蓋約 covering the population of about

500 000 人口 people

中水重用及雨水回收

從住宅和工業收集的中水和回收的雨水，經處理後可重新用於非飲用用途，從而減少食水用量。我們於二零二零年九月開始，在安達臣道石礦場用地發展項目中，興建一套每日可處理最高達 3 300 立方米的中水重用系統。系統將由二零二四年開始分階段投入服務，以配合區內人口發展。

中央中水重用系統包括中水處理廠、抽水系統、貯存經處理中水的配水庫，及用於收集中水和向該發展區輸送經處理的中水作沖廁及其他非飲用用途的管道。

政府牽頭推動中水重用及雨水回收系統，更頒布內部指引，在新的政府工程項目採用這些循環再用水設施。在此倡議下，截至二零二二年三月，約有 125 個政府工程項目中的新建大樓已配備中水重用及/或雨水回收系統。水務署天水圍大樓是支持相關倡議的政府工程項目之一。

為推動私營企業採用中水重用和雨水回收，我們在香港綠色建築議會的綠建環評新建建築 2.0 版提出新規定，藉以鼓勵發展商在新發展項目中採用中水重用和雨水回收系統。截至二零二二年三月，約 190 個獲得綠建環評新建建築 1.2 或 2.0 版認證的項目已採用循環再用水設施。

Grey Water Recycling and Rainwater Harvesting

Grey water collected from households and industries as well as rainwater harvested can be treated and reused for non-potable uses thereby reducing fresh water consumption. From September 2020, we began the construction of a grey water recycling system with a maximum treatment capacity of 3 300 m^3 per day at the Anderson Road Quarry Site Development. The supply of grey water will commence in phases starting from 2024 to tie in with the population intake of the development.

The centralised grey water recycling system consists of a grey water treatment plant, a pumping system, a service reservoir for storing treated grey water, and water mains for grey water collection and distribution of the treated grey water within the development for flushing and other non-potable uses.

The Government is leading by example in adopting grey water recycling and rainwater harvesting systems with the promulgation of internal guidelines for installing these water recycling facilities in new government projects. Following this initiative, new buildings of approximately 125 government projects have been equipped with grey water recycling and/or rainwater harvesting systems as at March 2022. The WSD Tin Shui Wai Building is one of these government projects supporting the relevant initiative.

To advance adoption of grey water recycling and rainwater harvesting in the private sector, we have proposed new provisions in the Hong Kong Green Building Council's Building Environmental Assessment Method (BEAM) Plus New Buildings Assessment Tool Version 2.0 to incentivise project owners to adopt grey water recycling and rainwater harvesting systems in their new development projects. As at March 2022, about 190 certified projects under the BEAM Plus New Buildings Assessment Tool v1.2 and v2.0 have initiated efforts in adopting water recycling facilities.

我們於二零二零年九月開始，在安達臣道石礦場用地發展項目中，興建一套每日可處理最高達

From September 2020, we began the construction of a grey water recycling system with a maximum treatment capacity of

3 300

立方米的中水重用系統。

m^3 per day at the Anderson Road Quarry Site Development.

專題故事 FEATURE STORY

提升食水供應的應變力
Building Resilience in Fresh Water Supply

海水化淡

為應對氣候變化對本地集水帶來的極端影響，我們正發展海水化淡這種策略性的水資源，興建將軍澳海水化淡廠第一階段，以加強香港食水供應的應變能力。

將軍澳海水化淡廠第一階段採用先進的逆滲透技術，生產的食水符合香港食水標準。該廠計劃於二零二三年投產，年產量為5 000 萬立方米，未來更可擴展至每年 1 億立方米。

Seawater Desalination

To cope with the extreme impacts of climate change on the local yield, the WSD is developing a strategic fresh water resource — desalination and building the first stage of the Tseung Kwan O Desalination Plant to strengthen resilience for the fresh water supply in Hong Kong.

Using the latest reverse osmosis (RO) technology, the first stage of the Tseung Kwan O Desalination Plant will produce potable water in compliance with the "Hong Kong Drinking Water Standards". Scheduled to be commissioned in 2023, the Desalination Plant will have an annual production capacity of 50 million cubic metres with the provision to double its capacity to 100 million cubic metres per annum in the future.

交付逆滲透技術組件
Delivery of Reverse Osmosis Racks

1 *於上海製造和組裝*
Manufacture and Assembly in Shanghai

2 *運送組件*
Component delivery

3 *於香港的逆滲透淨化大樓現場安裝*
Onsite installation in the RO Building in Hong Kong

作為頂級的水務設施，可持續的環保特色已融入於化淡廠的設計、建造和保養工作中，包括採用可再生能源和低耗能工序、雨水回收作灌溉用途、智慧燈柱、屋頂和牆身的綠化，務求將碳足跡減至最低，並提升能源效益。根據香港綠色建築議會的暫定評估，將軍澳海水淡化廠的第一階段項目已獲得綠建環評（新建建築類別）的「暫定鉑金級」。

As a top-class waterworks infrastructure, sustainable and green features are integrated into the design, construction and maintenance of the plant. These include the adoption of renewable energies and low-energy consumption processes, rainwater harvesting for irrigation, smart street lighting poles, green roofs and walls to minimise carbon footprint while enhancing energy efficiency. Based on the Provisional Assessment by Hong Kong Green Building Council (HKGBC), the first stage of Tseung Kwan O Desalination Plant project has achieved the "Provisional Platinum" rating under the BEAM Plus (New Buildings Category).

我們亦計劃於新界東南堆填區建造大型太陽能發電場，為將軍澳海水化淡廠供應可再生能源。

該廠房不僅憑藉其氣候抵禦力高的基礎設施而獲得肯定，其智慧建造措施更在發展局推行的「建造業2.0」下促進創新、專業和年輕化而備受認可。這些措施包括建築信息模擬（BIM）、可供製造及裝配的設計（DfMA）、組裝合成建築法（MiC）、數碼工程監督系統（DWSS）和智慧安全裝置，以提高項目效率、團隊合作及地盤安全。這些智慧措施，使項目能在二零一九冠狀病毒病疫情的挑戰下，順利和及時實施工程管理和執行項目。例如，龐大的DfMA逆滲透技術組件[1]於上海廠房完成後，成功於香港的逆滲透淨化大樓現場安裝。有關水務署智能建築措施的詳情，請參閱「智慧建造」章節。

1. 每個逆滲透技術組件重量從20噸到80噸不等，尺寸可達8.3米（闊）x 9米（長）x 9.25米（高）。

We are also planning a large-scale solar farm at the South East New Territories Landfill for supplying renewable energy to the Tseung Kwan O Desalination Plant.

This plant was recognised not only for its climate-proof infrastructure, but also its smart construction measures to promote innovation, professionalism and revitalisation under the initiative of "Construction 2.0" as advocated by the Development Bureau. These include Building Information Modelling (BIM), Design for Manufacture and Assembly (DfMA), Modular Integrated Construction (MiC), Digital Works Supervision System (DWSS) and smart safety devices which are used for enhancing project efficiency and team collaboration, as well as improving site safety. These smart construction initiatives have enabled smooth and timely construction management and project delivery amidst the challenges brought by the COVID-19 epidemic. For example, the vast DfMA RO Racks[1] were successfully delivered from the fabrication yard in Shanghai then installed in the RO Building onsite in Hong Kong. More details of the WSD's smart construction initiatives are covered in the Smart Construction Section.

1. The weight of each RO rack ranges from 20 to 80 tonnes with the size up to 8.3 m(W) x 9m(L) x 9.25m(H).

展望二零二二年，其他機電及土木DfMA組件，包括二氧化碳儲存缸、熟石灰倉，以及混凝土外牆，將逐步運送至施工現場後安裝。

Looking ahead in 2022, other electrical, mechanical and civil DfMA components including carbon dioxide tanks, lime silo and external concrete wall panels will be progressively delivered to the construction site for subsequent installation.

將混凝土外牆安裝至成品抽水站

Installation of external concrete wall panels onto the Product Water Pumping Station

將熟石灰飽和器設置於後期處理大樓

Placing lime saturator in Post Treatment Building

將軍澳海水淡化廠第一階段能開拓可靠的食水水源，同時可將智慧建造、可持續和環保特色融入於廠房設計、建造和保養工作中。

The first stage of Tseung Kwan O Desalination Plant will produce a reliable source of potable water while integrating smart construction initiatives, sustainable and green features into the design, construction and maintenance of the plant.

食水安全及供水可靠性
Water Safety and Reliability

從恆常水質監測、全面的水安全計劃、法例規管，以至優質資產管理和策略性優化供水設施，我們均致力促進智慧用水管理和水務方面的科技創新、綜合和協作的解決方案，務求為香港提供安全和可靠的供水。

From routine water quality monitoring, comprehensive water safety plans and legislative regulation to quality asset management and strategic enhancements in water supply infrastructure, we foster technology innovation, integrated and collaborative solutions for smart water management and waterworks to provide Hong Kong with safe and reliable water supplies.

食水安全

香港是全球其中一個擁有最安全食水供應的城市。為了保障公眾健康，我們制定了一套綜合食水水質管理系統，管理從源頭到用戶水龍頭的水質，確保食水水質完全符合香港食水標準——一套參考由世界衞生組織（世衞）出版的《飲用水水質準則》及其他國際經驗而制定的標準。此外，我們亦訂立了食水感官準則，以確保香港食水的味道和氣味等感官質量。

WATER SAFETY

Hong Kong enjoys one of the safest water supplies in the world. We have developed an integrated Drinking Water Quality Management System to manage water quality from sources to consumers' taps and ensure that the quality fully complies with the Hong Kong Drinking Water Standards (HKDWS) for the protection of public health. The HKDWS is established with reference to the Guidelines for Drinking-water Quality published by the World Health Organization (WHO) and other international practices. In addition, Aesthetic Guidelines are also established to ensure the aesthetic quality of the drinking water in Hong Kong such as taste and odour.

水質監測

水質監測是確保水資源得以妥善保護和管理的基本工作。我們實施全面的水質監測計劃，對原水 * 和食水樣本進行一系列的物理、化學、細菌、生物和輻射檢測，以監測整個供水系統的水質。樣本收集範圍包括木湖抽水站的東江水接收點、集水區與相關設施、水塘、濾水廠、配水庫、食水缸、分配系統和用戶水龍頭。本年內共收集及檢測超過 17 萬個樣本。

* 原水包括東江水和本地集水區收集的雨水。

Water Quality Monitoring

Water quality monitoring is a fundamental tool to ensuring our freshwater resources are properly protected and managed. We undertake comprehensive programmes through a series of physical, chemical, bacteriological, biological and radiological examinations of our raw water* and drinking water samples to monitor water quality in the entire water supply system. These range from the reception point of Dongjiang water at the Muk Wu Raw Water Pumping Stations, catchment areas and related facilities, impounding reservoirs, water treatment works, service reservoirs, fresh water tanks, distribution systems and consumers' taps. During the year, more than 170 000 samples were collected and tested.

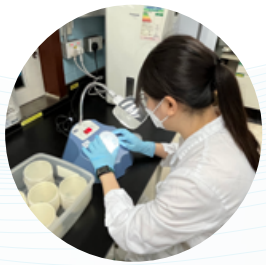
* Raw water includes Dongjiang water and rainwater collected from local water gathering grounds.

收集及檢測超過 17 萬個原水和食水樣本作全面測量，以確保優質食水

Over 170 000 raw and drinking water samples were collected and tested for comprehensive examinations to ensure quality drinking water

使用液 - 液萃取，提取水樣本中微量的有機化合物。

Extract trace organic compounds from water samples by using liquid-liquid extraction.



使用微生物菌落計數器檢查水樣本的細菌品質。

Examine the bacteriological quality of water samples through a microbial colony counter.

使用濁度計測量水樣本的混濁度。

Measure turbidity in water samples with a turbidimeter.

使用低本底阿爾法 - 貝他粒子計數系統監測水樣本的總 α 和總 β 的活度。

Monitor gross alpha and gross beta activity in water samples with a low level alpha-beta counting system.

使用電感耦合等離子體質譜儀檢測水樣本中的微量金屬。

Measure trace metal-contents in water samples using an inductively coupled plasma mass spectrometer.

測量食水樣本的餘氯含量。

Examine residual chlorine level in drinking water samples.

確保東江水水質

根據現行的《東江供水協議》，廣東省當局致力維持輸港東江水水質符合國家《地表水環境質量標準》（GB 3838-2002）第 II 類水的標準，此標準為適用作生活飲用水的地表水的最高國家標準。為防止輸港東江水受到污染，當局更採取了一系列措施和工程：

- 於深圳水庫設立生物硝化站；
- 興建東深專用輸水管道；
- 進行河流污水分流工程和污染防治；
- 設立東江流域水量水質監測和控制系統；以及
- 完成沙灣河水環境綜合整治工程。

我們在接收東江水的木湖抽水站設置在線水質監測系統，對東江水水質進行 24 小時監測。我們亦定期於木湖抽水站抽取樣本作詳細分析，確保供應香港的東江水符合 GB3838-2002 中的第 II 類水的國家標準。

Maintaining Dongjiang Water Quality

Under the current Dongjiang Water Supply Agreement, the Guangdong authorities ensure the quality of Dongjiang water delivered to Hong Kong meets the national standard for Type II water in the "Environmental Quality Standards for Surface Waters" (GB3838-2002), which is the highest national standard applicable to surface water abstracted for human consumption. A series of measures and projects have been adopted to prevent the contamination of Dongjiang water delivered to Hong Kong:

- provision of a bio-nitrification plant at the Shenzhen Reservoir;
- construction of dedicated aqueduct from Dongjiang to Shenzhen Reservoir;
- undertaking of river sewage diversion works and pollution prevention;
- implementation of the Dongjiang Basin Water Quantity and Quality Monitoring and Control System; and
- completion of the comprehensive remediation project for the water environment of the Sha Wan River Basin .

Through our online water quality monitoring system, we monitor the quality of Dongjiang water round the clock at the Muk Wu Raw Water Pumping Stations, where the Dongjiang water is received in Hong Kong and water samples are also collected regularly for detailed analysis to ensure that the Dongjiang water supplied to Hong Kong complies with the national standard for Type II water in the GB3838-2002.

食水樣本
Drinking Water Samples

財政年度 Financial Year	食水樣本總數 No. of Drinking Water Samples
2017/18	82 389
2018/19	82 717
2019/20	81 221
2020/21	74 411
2021/22	**76 499**

註：以上的食水樣本是從濾水廠、配水庫、食水缸、供水接駁點及公眾可達的用戶水龍頭抽取。
Note: The above drinking water samples were taken at water treatment works, service reservoirs, fresh water tanks, connection points and publicly accessible consumer taps.

東江水的平均氨氮及錳水平
Average Ammoniacal Nitrogen and Manganese Levels in Dongjiang Water

	單位 Unit	財政年度 Financial Year			GB3838-2002 第II類標準值 GB3838-2002 Type II Standard Value
		2019/20	2020/21	**2021/22**	
氨氮 Ammoniacal Nitrogen	毫克/公升 mg/L	0.03	0.03	**0.04**	≤0.5
錳 Manganese	毫克/公升 mg/L	0.03	0.02	**0.03**	≤0.1

優化食水水質監測

多年來，我們實施一套食水水質監測計劃，於濾水廠、配水庫、食水缸、供水接駁點和公眾可達的用戶水龍頭（例如商場、診所、社區設施、運動場、街市、政府辦事處及屋邨管理處等地方的水龍頭）抽取食水樣本，以監測食水水質，並建立全港食水水質數據庫以檢討香港食水標準。

自二零一七年，我們便推出「水質監測優化計劃」，藉此加強水質監測範圍至用戶水龍頭，透過在全港隨機抽出處所，並在其用戶水龍頭收集食水樣本，檢測可能在內部供水系統出現的六種金屬，即銻、鎘、鉻、銅、鉛和鎳。我們亦由二零二一年五月起，從上述的用戶水龍頭額外收集食水樣本化驗餘氯和埃希氏大腸桿菌。有關這六種金屬、餘氯和埃希氏大腸桿菌的水質統計數據， 每周於水務署網站上公布。

Enhancing Drinking Water Quality Monitoring

Over the years, we have implemented a drinking water quality monitoring programme to collect drinking water samples from water treatment works, service reservoirs, fresh water tanks, connection points and publicly accessible consumers' taps (such as those in shopping centres, clinics, community facilities, sports grounds, markets, government offices and estate management offices) to monitor the quality of drinking water and facilitate the creation of a territory-wide database for reviewing the HKDWS.

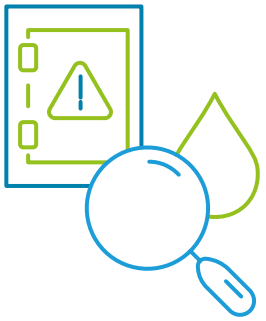
Since 2017, we have launched the "Enhanced Water Quality Monitoring Programme" (Enhanced Programme) to strengthen our water quality monitoring at consumers' taps in randomly selected premises in Hong Kong, and collect drinking water samples from these drinking taps for testing six metals, namely antimony, cadmium, chromium, copper, lead and nickel that could be present in internal plumbing systems. Starting from May 2021, we have collected additional drinking water samples from these drinking taps for testing residual chlorine and Escherichia coli (E.coli). The water quality statistics for the six metals, residual chlorine and E.coli will be published every week on the WSD website.

點滴話你知

Did you know?

政府不時檢討香港食水標準，以確保食水水質和安全。最新香港食水標準於二零二一年四月發布，包含了60 個水質參數。此外，政府亦制定了監察名單、觀察名單，以及感官準則，以全面監察香港的食水水質。

The HKDWS is reviewed from time to time by the Government to ensure the quality and safety of our drinking water. The latest HKDWS were released in April 2021 with 60 parameters. In addition, the Government estblished the Surveillance list, the Watch List, as well as the Aesthetic Guidelines for comprehensive monitoring of the drinking water quality in Hong Kong.



水塘的無人船系統

水塘的原水是香港的主要食水來源之一。水務署定期監測水塘的水質和抽取樣本，以便下游濾水廠更有效控制食水處理過程，確保食水安全。

為提升水塘水質監測，我們引入了嶄新的無人船系統，在船灣淡水湖進行自動監測水質和取樣，透過採用創新科技，提升緊急狀況應變能力和運作效率。採用多艘無人船進行水質監測，既可以增加監測的覆蓋範圍，亦可增加監測點數量。從而提升整個水塘表面水質的監測效率。

二零二一年八月，無人船系統的應用已擴展至萬宜水庫，進行自動水質監測。隨著實踐取得成功，無人船系統應用已於二零二二年九月進一步擴展至大欖涌水塘。我們計劃提升系統的智能，讓無人船系統能夠自動規劃航線和作出應變。透過提升系統的智能，當無人船系統上的實時感應器錄得異常讀數時，無人船系統能夠自動增加監測點以收集更多數據及進行額外取樣。

Unmanned Surface Vessels System at Impounding Reservoirs

Raw water in impounding reservoirs is one of the major drinking water sources in Hong Kong. We monitor water quality and collect water samples in impounding reservoirs on a regular basis which facilitate the effective control of water treatment process at downstream water treatment works to ensure the safety of drinking water supply.

To advance water quality monitoring, we have introduced a new unmanned surface vessel (USV) system to perform automatic water quality monitoring and sampling in the Plover Cove Reservoir, boosting emergency responsiveness and operational efficiency through the adoption of innovation and technology. The use of multiple USVs for water quality monitoring allows parallel operation to increase coverage and the number of monitoring points which enable the effective capture of the water quality of the whole reservoir surface.

In August 2021, the USV system was also deployed in the High Island Reservoir for automatic water quality monitoring. Following these successful trials, the application of the USV system was extended to the Tai Lam Chung Reservoir in September 2022. We plan to enhance the intelligence of the system with the introduction of automatic route planning and response. The enhanced system can automatically increase the number of monitoring points to collect more data; as well as additional water samples from the reservoir when abnormal water quality is detected by the real-time sensors of the USV.

利用無人船在船灣淡水湖進行水質監測

USV conducts water quality monitoring in the Plover Cove Reservoir

安裝在無人船底部的水質監測儀可以實時監測水質

Water quality monitoring unit is installed under the bottom of the USV for real-time monitoring of water quality

無人船系統由一個基站電腦和四艘電動無人船組成。每艘無人船均配置了水質監測裝置，用於監測溫度、導電率、混濁度、溶解氧、酸鹼值、葉綠素 -a 和藍綠藻；以及自動導航系統和避障系統，在運行時能繞過障礙物。

我們的人員可通過基站電腦遙距控制無人船，讓船隻沿預設路線自動導航、監測水質並在水塘的指定位置取樣。收集得到的水質數據將實時發送至基站電腦，迅速分析並製成水塘表面水質數據分布圖，顯示水質變化較大的區域，以便評估和採取適當的跟進行動。

The USV system consists of a base station computer and four electric USVs. Each USV is equipped with a water quality monitoring unit to monitor temperature, conductivity, turbidity, dissolved oxygen, pH, chlorophyll-a and blue green algae; as well as auto-navigation and obstacle avoidance systems for navigating around obstacles during operation.

By using the base station computer, our staff can remotely control the USVs to navigate automatically along a pre-set route, monitor water quality and conduct sampling at designated locations within the reservoir. The water quality data collected will be sent to the base station computer in real time for timely analysis and generation of a surface water quality profile indicating areas with significant variations in water quality to facilitate evaluation and appropriate follow-up.

無人船系統在「促進機械人科技應用」創新比賽中獲得優異獎
The USV system was recognised with the Merit Award in the "Leading Towards Robotics Technologies" Innovation Competition

智慧創新的無人船系統憑藉採用機械人科技來提升公共服務，在政府資訊科技總監辦公室「智慧政府創新實驗室」舉辦的「促進機械人科技應用」創新比賽中榮獲優異獎。無人船系統通過增加水質監測點密度和縮短數據收集時間，提升水質數據收集的效率。

The smart innovation of the USV system for adopting robotics technologies in enhancing public services was recognised with the Merit Award in the "Leading Towards Robotics Technologies" Innovation Competition organised by the "Smart Government Innovation Lab" of the Office of the Government Chief Information Office. The USV system has increased the efficiency of water quality data collection by increasing the number of water quality monitoring points and shortening the data collection time.

水安全計劃

我們採取風險為本和多重屏障的原則，確保食水安全。我們希望透過與各界別持份者通力合作，有效實施水安全計劃，確保從源頭至用戶水龍頭的食水水質，以保障公眾健康。

自二零零七年起，我們根據世衛的《飲用水水質準則》，制訂和實施水安全計劃。

Water Safety Plan

We have taken a risk-based and multiple barrier approach to ensuring the safety of our drinking water supply. Through the effective implementation of Water Safety Plan (WSP), in joint collaboration with various stakeholders, we hope to ensure drinking water quality from sources to consumers' taps for the protection of public health.

Since 2007, we have developed and implemented our WSP based on the Guidelines for Drinking-water Quality from the WHO.

食水水質管理系統

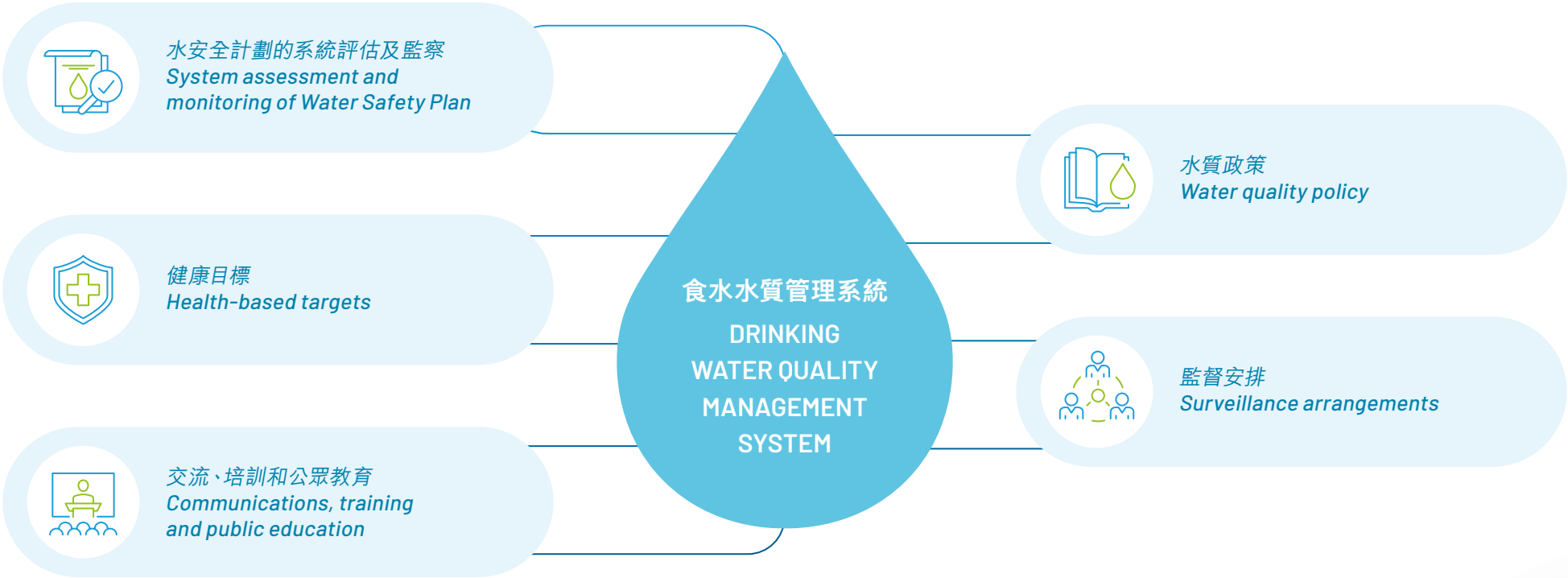
我們於二零一七年檢討了部門的水安全計劃，並參考國際專家的建議及西澳洲的實踐經驗，通過健康目標、水質政策、水安全計劃的系統評估和監察、監督安排、溝通、培訓和公眾教育等元素，制定了一套綜合的食水水質管理系統。

作為持續改進的一部分，我們參考內部和第三方審核的結果及建議、海外和本地水質管理的經驗，定期檢討工作流程和運作程序。為提高成效，我們於二零二一年十月更新了食水水質管理系統，其中包括加強緊急臨時供水的風險評估。

Drinking Water Quality Management System

In 2017, we reviewed and enhanced our (WSP by developing an integrated Drinking Water Quality Management System (DWQMS) via health-based targets, water quality policy, system assessment and monitoring of WSP, surveillance arrangements, communications, training and public education, in accordance with the recommendations of international experts as well as overseas practices in Western Australia.

As part of ongoing improvements, we conduct regular reviews of our practices and operational procedures taking reference from the findings and recommendations of internal and third-party audits as well as overseas and local experiences in water quality management. With a view to enhancing its effectiveness, we updated the DWQMS in October 2021 with, among others, enhancement in the risk assessment on emergency temporary drinking water supply.



建築物水安全計劃

建築物的食水水質可受其內部供水系統的多個因素影響，有機會導致微生物或化學污染。水務署致力推行建築物水安全計劃，以保障香港建築物的食水水質。

我們按照世衞的建議及水務諮詢委員會的意見，推出「大廈優質供水認可計劃－食水（管理系統）」。透過這項水質管理獎勵計劃，鼓勵業主和物業管理人在其處所實施建築物水安全計劃。

此外，我們亦根據風險管理的原則，制定了一套適用於一般建築物以及學校、安老院舍和醫院等特定建築物的指引和範本。

水務署的風險管理指引和範本，獲認可為最能夠促進建築物水安全計劃的實踐模式，並已上存至世衞和國際水協會共同管理的網站，供國際參考。

為促進計劃的推展，我們還在水務署網站上載《小型樓宇的食水安全小貼士》和《已接受有關建築物水安全計劃培訓的合資格人士名單》，供公眾查閱。

Water Safety Plan for Buildings

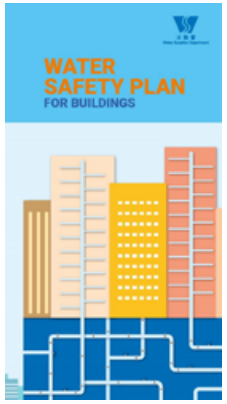
Numerous factors of a building's internal plumbing systems influence the quality of drinking water and may result in microbial or chemical contamination. The WSD is committed to promoting the implementation of Water Safety Plan for Buildings (WSPB) to safeguard drinking water quality in the buildings in Hong Kong.

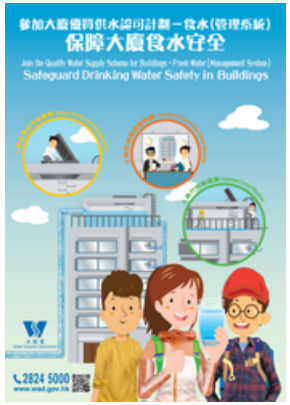
Following the recommendations of the WHO, in consultation with the Advisory Committee on Water Supplies, we have launched the "Quality Water Supply Scheme for Buildings – Fresh Water (Management System)", a fresh water quality management cum recognition scheme, to provide incentives for participation by property owners and management agents to implement the WSPB at their premises.

A set of risk management-based guidelines and templates have also been developed to cater for the application by general buildings, as well as specific buildings such as schools, residential care homes for the elderly and hospitals.

The WSD's risk management-based guidelines and templates are considered best practices in promoting the implementation of the WSPB, which are being archived in a website jointly managed by the WHO and the International Water Association for international reference.

To facilitate implementation, we have also published "Drinking Water Safety Tips for Small Buildings" and the "List of Qualified Persons Trained in WSPB" on the WSD's website for public access.



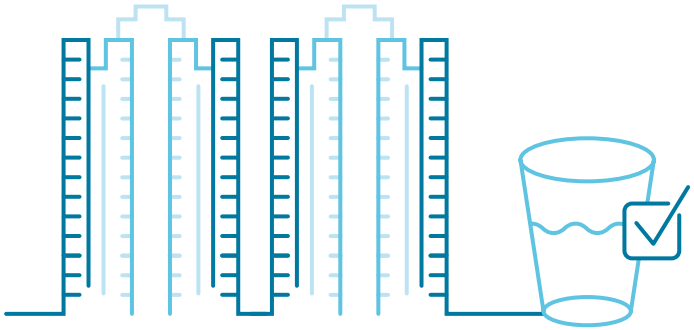


我們提供宣傳物品、實用指引和清單範本，以協助推行建築物水安全計劃。

To facilitate the implementation of the Water Safety Plan for Buildings, promotional materials, step by step guide and checklist materials are provided for use.

自推出以來，約有
Since its launch, about **3 400** 座建築物 buildings

已實施建築物水安全計劃並
加入相關的「大廈優質供水認可計劃－食水（管理系統）」，
have implemented the Water Safety Plan for Buildings and joined the associated Quality Water Supply Scheme for Buildings – Fresh Water (Management System),



惠及約
benefiting some **860 000** 戶家庭。households.

此外，政府已率先在轄下處所實施建築物水安全計劃，並計劃於二零二七年上半年前，在所有政府大樓全面推行。水務署正提供技術支援，協助相關決策局/ 部門在轄下建築物制定水安全計劃。

香港房屋委員會亦已承諾自二零一八年第四季度起，於四年內在轄下所有公共租住屋邨實施有關計劃。計劃將惠及全港約73 萬戶的公共租住房屋住戶（佔香港總住戶數目 28%）。

水安全計劃資助計劃

為鼓勵實施建築物水安全計劃，行政長官於二零一九年施政報告中宣布推出「水安全計劃資助計劃」，為合資格私人樓宇業主或物業管理人提供財政資助參與計劃。資助計劃獲撥款4 億 4 千萬港元，於五年內進行各項相關評估和實施管制措施。計劃自二零二零年七月起開始接受申請以來，收到的申請超過280 份。

為提供方便的一站式申請平台，水務署與市區重建局合作，將水安全計劃資助計劃納入在「樓宇復修綜合支援計劃」內。

In addition, the Government has taken the lead in implementing the WSPB on its premises. By the first half of 2027, the WSPB will be implemented in all government buildings. The WSD is providing technical assistance to the relevant bureaux/departments in the formulation of the WSPB for their buildings.

The Hong Kong Housing Authority has made commitment to implementing the WSPB in all of its public rental housing estates within four years since 2018. The plan will benefit about 730 000 households (28% of Hong Kong's total households) across all public rental housing estates.

Water Safety Plan Subsidy Scheme

To encourage the implementation of the Water Safety Plan for Buildings (WSPB) at premises, the Chief Executive announced the launch of the "Water Safety Plan Subsidy Scheme" (WSPSS) in the 2019 Policy Address providing eligible property owners or management agents of private buildings with financial assistance to adopt the WSPB. A funding of HK$440 million had been allocated for the subsidy scheme over five years to carry out various assessment and control measures. Since the launch of WSPSS application in July 2020, over 280 applications have been received.

To provide a convenient one-stop platform for application, the WSD has collaborated with the Urban Renewal Authority to include the WSPSS in its "Integrated Building Rehabilitation Assistance Scheme".

為加深公眾的了解和鼓勵申請，資助計劃特設專題網站，提供全面的資訊供公眾查閱，當中包括參加資格、申請方法、資助金額，以及常見問題和參考文件等。

To provide public understanding and encourage applications, a dedicated website giving comprehensive information ranging from eligibility criteria, application method, subsidy amount to frequently asked questions and reference materials is made available for public access.

了解更多
Read more

加強規管水喉物料及使用規定

為加強內部供水系統的食水安全，自二零一五年起，水務署為水喉物料及新供水系統的設計、建造和啟用制定了更為嚴格的管制措施和指引。水務署設有「一般認可」制度，預先批核符合《水務設施規例》所規定技術要求的水喉產品。

此外，水務署亦接納持有由獨立認可認證機構發出的「產品認證」證書的水喉產品。「產品認證」透過上游控制和持續監察工廠的生產過程，提升產業質量，從而確保產品品質穩定並符合認可標準。為鼓勵更多此類產品加入「一般認可」水喉產品的行列，水務署於二零一九年進一步推出計劃，豁免對持有「產品認證」證書的水喉產品在「一般認可」制度下的監察計劃要求。另外，水務署的物料測試所於二零二一年八月獲得由香港認可處（HKAS）管理的香港實驗所認可計劃（HOKLAS）發出認可資格。

Enhancing Plumbing Material Control and Commissioning Requirements

Since 2015, more stringent control measures and guidelines on plumbing materials, design, construction and commissioning of new plumbing systems have been enforced to strengthen drinking water safety in inside service. The WSD has a General Acceptance (GA) system in place to pre-approve plumbing products in compliance with the technical requirements set out in the Waterworks Regulations.

Plumbing products with product certificates from independent accredited certification bodies are also acceptable to the WSD. The benefits of product certification are to promote industrial quality through control at the upstream, continuous surveillance of production process in factory to ensure consistent production quality and compliance with the recognised standards. To promote inclusion of more of these products into the GA portfolio, the WSD has further introduced a scheme since 2019 to waive the surveillance requirements under the GA system for plumbing products which have joined the product certification scheme. Furthermore, the Material Testing Laboratory in WSD was accredited by Hong Kong Accreditation Service (HKAS) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) in August 2021.

專題故事 FEATURE STORY

自願性參與「《認可水喉產品》銷售商」計劃
Voluntary GA Product Shop Scheme

培養對「一般認可」認證水喉產品的認識

保障食水安全需要一套周全的計劃以及客戶和業界的共同努力。從全面的水質監察計劃和穩建的水安全計劃，到採取全面的水喉物料和產品規管措施，以及新安裝和作業的驗收規定，水務署從源頭至水龍頭的每一環，都致力確保食水安全。

為加強監察「一般認可」水喉產品，水務署於二零一七年設立有效的「一般認可」水喉產品監察計劃，以及於二零一八年設立物料測試所，亦於二零二零年推出自願性參與「《認可水喉產品》銷售商」計劃，讓市民了解和更廣泛地使用在零售市場的《認可水喉產品》。

Fostering Knowledge of General Acceptance Certified Plumbing Products

Safeguarding the safety of drinking water requires a holistic plan and joint efforts from both consumers and the industries. From comprehensive water quality monitoring programmes and robust water safety plans to the adoption of sound control of plumbing materials and products, as well as commissioning requirements for new installations and practices, the WSD takes every step to ensure drinking water safety from source to tap.

Aside from setting up the surveillance system for plumbing products with valid General Acceptance (GA) in 2017 and the Material Testing Laboratory in 2018 for enhancing the conformity of GA products, the WSD launched the Voluntary GA Product Shop Scheme in 2020 with a view to promoting public understanding and the wider use of GA plumbing products in the retail market.

獲得水務署「一般認可」資格的水喉產品可確保符合法定物料標準，能將相關的食水安全風險減至最低。水務署對有相當數量《一般認可》水喉產品在店內銷售的商店，發出「《認可水喉產品》銷售商」標籤，以供其貼在店內顯眼位置上，讓市民易於識別。

計劃涵蓋四類水喉產品，《認可水喉產品》銷售商必須出售最少一個類別的《一般認可》水喉產品，其中包括：

- 類別（A）- 閥門
- 類別（B）- 喉管及喉管配件
- 類別（C）- 水龍頭
- 類別（D）- 焊接物料

除了向水喉產品零售店宣傳這項計劃外，水務署亦製作短片於水務署網站和社交媒體發放，並出版宣傳刊物藉以提升顧客互動和公眾教育。

Plumbing products with GA approval by the WSD is a recognised product assurance that complies with the statutory material standards and minimises associated risk of water safety. Retail shops having a specified number of GA products on sale are provided with a GA Product Shop Label for affixing at a prominent location for easy identification by the public.

There are four categories of plumbing products covered by the Scheme. The GA Product Shops should sell GA products in at least one of the following categories in the shop:

- Category (A) - Valves,
- Category (B) - Pipes and Pipe Fittings,
- Category (C) - Taps and Mixers, and
- Category (D) - Soldering/Brazing Materials.

Besides promoting the Scheme to plumbing products retail shops, the WSD has produced a short video on the WSD website and social media channels, as well as publication materials for customer engagement and public education.

如何於《認可水喉產品》銷售商選購水喉產品
How to Choose Plumbing Products in GA Product Shop

1

在水務署網站查看《認可水喉產品》銷售商註冊名單。所有已註冊的銷售商，都必須在顯眼位置（如水喉產品銷售店的門口）貼上由水務署發出的「《認可水喉產品》銷售商」標籤，讓市民易於識別。

Check the list of registered GA Product Shops on the WSD website. All registered shops are required to have the GA Product Shop Label issued by the WSD affixed at a prominent location of the shop (e.g. at the entrance of the GA product shop) for convenient identification by the public.

了解更多
Read more

2

查看具備「一般認可」資格的水喉產品，並從店員獲取相關的產品資訊。公眾可透過張貼於《認可水喉產品》銷售商展示櫃台上的「產品標籤」，識別「一般認可」水喉產品。店內的職員亦應具備「一般認可」水喉產品的相關知識，並能夠向公眾解釋有關「一般認可」焊接物料的資訊。例如：（i）所有「一般認可」焊接物料均為無鉛焊接物料。（ii）使用無鉛焊接物料接駁食水內部供水系統內的銅喉是《水務設施規例》的規定，以及（iii）任何人使用含鉛焊接物料建造、安裝或更改食水內部供水系統，即觸犯了《水務設施條例》所訂的罪行。

Review GA product features and receive product information from shop staff. In the GA product shop, the public can identify GA plumbing products easily by the GA labels affixed on the display counter of GA products at the shop where the staff should possess knowledge of GA products and be able to explain to the public on the information about GA solders. For example, (i) all GA solders are lead-free solders, (ii) use of lead-free solders for the connections of copper pipes in fresh water inside service is a requirement of the Waterworks Regulations, and (iii) any person use leaded solders in the construction, installation or alteration of fresh water inside service commits an offence under the Waterworks Ordinance.

3

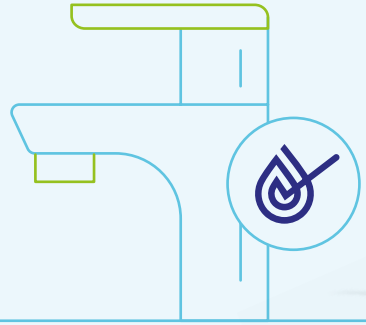
掃描標籤上的二維碼，查閱更多《一般認可》水喉產品資料，例如生產地及批核有效期等。

Scan the QR code on the GA label to retrieve useful information about the GA product, which includes its country of origin, expiry date, etc.

4

檢閱正式銷售收據上的《一般認可》水喉產品的《一般認可》參考編號。

Check the official sale receipt for the corresponding GA Reference Number of the GA product.



法例檢討

檢討法例以提升食水安全

我們已完成對《水務設施條例》（第 102 章）和《水務設施規例》（第 102A 章）的全面檢討，並已分析法例修訂建議的公眾諮詢結果。我們將會就修訂《水務設施條例》和《水務設施規例》的多個範疇展開法律草擬工作。其中包括水管工程的規管、水喉物料的管制、飲水罅及飲水機的管制、保障用戶水龍頭供應的食水安全、強制性「用水效益標籤計劃」，加強對內部供水系統滲漏的規管和供應循環再用水。

供水可靠性

資產管理

水務設施資產管理

為優化水務設施的表現，同時降低成本及減少故障風險，我們致力在水務設施的維修保養及管理上達致世界級水平。

我們分階段實施符合 ISO 55001 的資產管理系統來管理所有水務資產。此系統採用「生命周期」方式來籌劃、設計、興建、建造、運作、維修保養、更新以至棄置所有資產，讓我們作出適當的決策，以應對未來的挑戰，確保符合可持續發展，並提高運作可靠性和效率。此外，系統亦讓我們能夠管理故障風險，同時保持優質的服務水平，並根據風險分析調配資源和釐定行事的優次。

我們為水塘、濾水廠、抽水站、配水庫和斜坡等水務設施建立的資產管理系統，已獲得 ISO 55001 認證。我們計劃在未來將認證範圍擴展到其餘的水務資產。

Following the achievement of the ISO 55001 certification for our asset management system for impounding reservoirs, water treatment works, pumping stations, service reservoirs, slopes, etc., we aim to extend the certification scope to the remaining waterworks assets in future.

Legislative Review

Legislative Review for Enhancing Drinking Water Safety

We have completed the holistic review of the Waterworks Ordinance (Cap.102) and Waterworks Regulations (Cap.102A), as well as the analysis of the results of the public consultation on the proposed legislative amendments. We will proceed with the law drafting work for amending various aspects of the Waterworks Ordinance and Waterworks Regulations. These include the regulation of plumbing works, control of plumbing materials, control of drinking water dispensers and fountains, safeguarding drinking water safety at consumers' taps, mandatory water efficiency labelling scheme, enhancing regulatory control of inside service leakage and supply of recycled water.

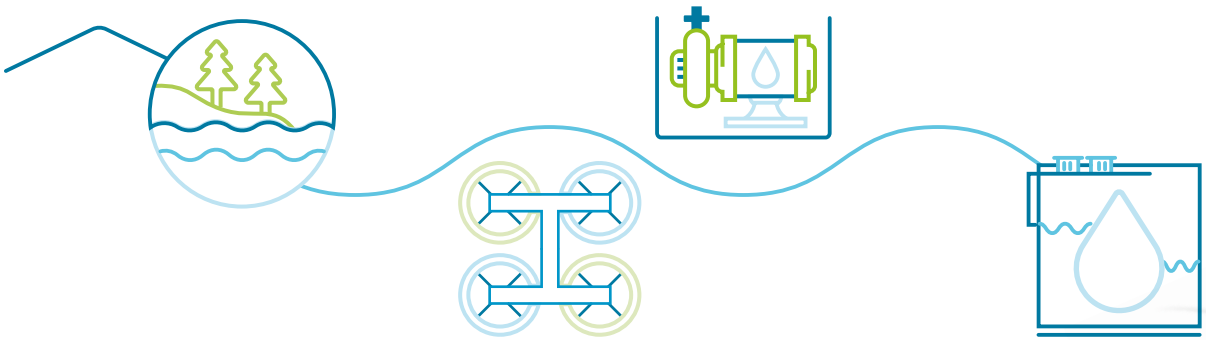
WATER RELIABILITY

Asset Management

Waterworks Asset Management

To optimise the performance of our waterworks while minimising costs and failure risks, we strive to attain the world-class quality for waterworks maintenance and management.

We have implemented the ISO 55001-compliant Asset Management System in stages to manage all of our waterworks assets. This system uses a "life-cycle" approach that encompasses planning, design, development, construction, operation, maintenance, renewal and disposal of all assets, allowing us to make appropriate decisions to meet future challenges, ensure sustainability and improve our operational reliability and efficiency. In addition, it allows us to manage risks of failure whilst maintaining a high level of service, and to allocate resources and priorities for the various kinds of work required according to risk analysis.



詳細及獨立的水塘視察

在二零二一年疫情持續的形勢下，我們外聘的海外專家顧問，繼續以遙距方式進行水塘視察。視乎二零二二年年中情況，我們會把握機會安排海外專家顧問來港，恢復實地視察水塘。

Detailed and independent reservoir inspections

Under the prevailing epidemic situation, we continued to conduct remote inspections of our reservoirs by external expert advisors throughout 2021. Where conditions permit, we would seize opportunity in allowing advisors to conduct physical inspections in some reservoirs in mid-2022.

在二零二一至二二年度，我們為水塘及配水庫進行了以下視察：
In 2021/22, we conducted the following inspections of our impounding and service reservoirs:

62 次由水務署人員進行的詳細視察
detailed inspections conducted by internal staff

47 次由外聘專家顧問進行的遙距獨立視察
remote independent inspections conducted by external expert advisors

斜坡維修及鞏固

我們定期為轄下斜坡進行維修及鞏固工程，包括打泥釘、加固斜坡表面、在斜坡底部建造矮牆以栽種植物、改善排水系統、栽種一般植被、提供安全通道走廊等，大幅降低發生山泥傾瀉的風險，以及減少對公眾、水務人員和設施所構成的威脅。

Slopes Maintenance and Upgrades

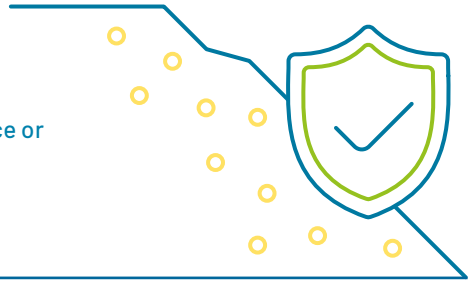
We regularly maintain and upgrade the slopes under our purview via soil-nailing, stabilisation of slope surface, construction of toe planter wall, improvement in drainage system, general planting, provision of safe access corridor and so forth. These efforts significantly decrease the risk of slope failure and the corresponding danger it can pose to the public, our staff and waterworks installations.

在二零二一至二二年度，我們負責保養約
In 2020/21, we oversee approximately

6 500 幅斜坡
slopes

並為其中 **74** 幅斜坡
Of these, slopes

進行了預防性維修或鞏固工程
received preventive maintenance or upgrades



水管資產管理

我們致力提升管理龐大水管資產的質素。水管爆裂的個案數字一直維持在低水平，在二零二一年亦只有約 30 宗。我們將繼續推行以風險為本的水管資產管理策略，以維持政府供水網絡的健康狀況，減低水管爆裂或滲漏的風險。

我們會根據水管爆裂或滲漏的後果、水管使用年期和物料、過往爆裂或滲漏記錄、周邊環境等各項因素，為高風險的水管優先進行改善工程，包括進行更換或修復水管，以減低水管爆裂或滲漏的風險。此外，我們亦會為位於「爆喉熱點」（即重複出現水管爆裂的段落）的水管進行改善工程。

Water Main Asset Management

We are committed to enhancing the management of our vast water main assets. Water main burst cases remain at a relatively low level. In 2021, about 30 main burst cases were recorded. We will continue to implement a risk-based water main asset management strategy to maintain the healthiness of the government water supply networks and to reduce the risk of water main bursts or leaks.

Taking into account various factors including the consequences of bursts or leaks, ages and materials of the water mains, past records of bursts or leaks, surrounding environment, etc., we accord priorities for improvement works to those water mains assessed with high risk, including replacement or rehabilitation to reduce the risk of water main bursts or leaks. In addition, we will carry out improvement works to water mains in "main burst hot spots" (i.e. sections with repeated water main bursts).

專題故事 FEATURE STORY

率先使用機械人技術檢查水管
Pioneering Use of Robotics Technology for Water Mains Inspection

數碼轉型是我們社會的未來。結合創新科技與智能解決方案，對確保水務資產的安全和有效運作至關重要。例如地下水管的結構複雜，維修人員一般難以進入檢查。此外，維修人員在管道內工作的安全與健康隱患，也對管道檢測構成了挑戰。

為提高供水系統的可靠性和安全性，水務署與香港理工大學合作研發使用機械人技術，檢測直徑 600 毫米金屬水管健康狀況的可行性，在無水的管道內，利用非破壞性水管檢查方法，檢測水管的餘壁厚度、表面有否裂紋，以及水管表面和內壁的情況。

Digital transformation is the future of our society. Integrating innovative technologies with smart solutions are critical to ensuring safe and efficient operation of waterworks assets. Underground water mains, for example, are generally difficult to be accessed by the maintenance personnel due to their complicated configurations. Furthermore, the safety and health hazards to the maintenance personnel working inside the pipes have posed challenges to the in-line inspection of water mains.

With a view to enhancing the reliability and safety of water supplies, in collaboration with the Hong Kong Polytechnic University, the WSD has conducted an investigation into the viability of using robotic technologies for assessing the health conditions of metallic water mains of 600 mm diameter, viz. residual wall thickness of pipes, presence of surface cracks and conditions of pipes and linings, by non-destructive testing methods in dry main condition.

利用新一代技術，我們能克服檢測地下水管的挑戰，使檢測工作能以更有效和安全的方式進行，提升準確率，並為全港不同物料和直徑的水管檢測工作做好準備。我們期望使用機械人技術和人工智能，進一步加強水務資產管理。長遠而言，透過採用科技為本的基礎設施和應用，「管道檢測機械人」項目所帶來的啟發和技術，讓我們能為智慧水務的未來做好準備。

Leveraging next generation technologies, we can overcome the challenges in conducting underground water mains inspection work which can be carried out in a more efficient and safer manner with higher accuracy rate. It has also paved the way for the territory-wide application for inspecting different materials and diameters of water mains. With the use of robotics and artificial intelligence we look forward to further enhancing our proactive approach to managing the waterworks assets. In the long run, through the adoption of technology-led infrastructure and applications, the "In-line Inspection Robot" project would equip us with insights and skills to better prepare for the smart water future.

水務署高級工程師 / 研究及發展 ***葉萬英先生***
Mr Stanley YIP *- Senior Engineer/Research & Development, WSD*

研發「管道檢測機械人」及相關的作業系統，採用了機械人設計、傳感器、掃描、影像和人工智能等一系列技術。管道檢測機械人在水管網絡中靈活移動，不僅能提供水管內壁表面的影像，更重要的是可提供優化非破壞性檢測方法的機會，從而在可行的情況下檢查水管的狀況及其結構的完整性，有助提高資產管理的營運效益和表現，以及工地安全。

A cluster of technologies including robotics design, sensors, scanning, imaging and artificial intelligence (AI) are adopted in developing the "In-line Inspection Robot" and relevant collaborative systems. The In-line Inspection Robot manoeuvring through the water mains network not only provides images on the internal surface of pipes, but more importantly offers the opportunity to optimise the use of non-destructive testing methods as far as practicable to inspect the conditions and assess the structural integrity of the pipes. This has enhanced operational efficiency and performance in asset management, as well as site safety.

管道檢測機械人的功能
Role of In-line Inspection Robot

導航
Navigation

機械人能夠在直徑 600 毫米的水管內部通過 T 型接頭和 90 度彎頭以及垂直管道單向行駛超過 150 米的距離。

The robot is capable of navigating along the interior of 600mm diameter water mains through T-joints and 90-degree bends, as well as vertical pipes in a single pass for over a distance of 150 metres.

影視覺檢測
Visual inspection

利用彩色燈光配以圖像處理演算法，檢查管道內壁的表面。

Visual inspection: Visual inspection of the internal pipe wall surface is carried out by using coloured lighting with different image processing algorithms.

超聲波檢測
Ultrasonic inspection

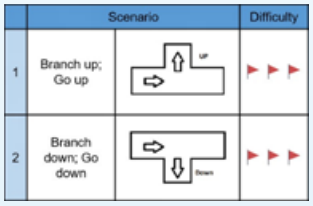
採用超聲波探頭量度管壁厚度。

Pipe wall thickness measurement is carried out by using ultrasonic probes.

超聲波波形訊號過濾器
Ultrasonic waveform filtering

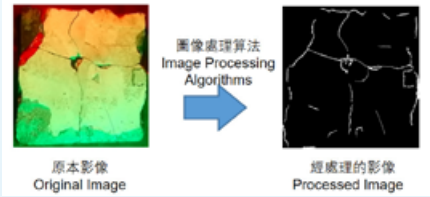
在數據處理軟件中增設人工智能過濾器，能自動剔除不適合使用的超聲波返回波。

An AI-filter has been added to the data processing software to automate the removal of ultrasonic returns that are not suitable for use.



T 型接頭的結構（側面圖）

T-joint configurations (Side view)



超聲波探頭

Ultrasonic probes

融合先進技術 開發管道機械人

在香港市區地下設施擠擁的情況下，管道檢測機械人能適應水管走線和直徑轉變等常見的特徵。使用管道檢測機械人，配以機械人設計、傳感器、掃描、影像和人工智能等一系列技術，能為我們未來的智慧水務管理提供先進的智能解決方案。

機械人設計：卷曲形的機械人能在水管網絡中靈活移動，並由已受訓的技術人員遙控操作，透過電纜向機械人傳輸數據和指令。

傳感器、掃描和影像：安裝在機械人上的超聲波，能向管道和內壁發出不同頻率的超聲波，並以反射和/或減弱的方法接收超聲波，以識別水管表面和內壁的缺陷和厚度。用先進的傳感器、掃描和影像技術來收集數據，有助我們了解水管的健康狀況。

人工智能：人工智能分析是利用演算法篩選由傳感器收集得來的訊號和圖像，並使用深度學習演算法以有系統的方式集中處理，使檢測結果更加準確，以了解和數碼化管道的狀況。這樣，我們便可在水管的健康狀況變得嚴重前，展開預防保養工作，以減少發生突發暫停供水的情況。

Integrating advanced technologies into in-line robot development

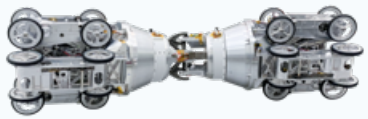
The In-line Inspection Robot can adapt to the sharp changes in pipe direction and diameter which are common features of water mains in the congested underground utilities in the urban areas of Hong Kong. The use of robotic in-line inspection supported by a cluster of technologies including robotics design, sensors, scanning, imaging and AI, is an advanced smart solution to our future smart water management.

Robotics design: The serpentine type robot manoeuvres through the water mains network and is operated remotely by a trained technician, while the data and commands are transmitted from the robot via a wire.

Sensors, scanning, and imaging: The ultrasonic waves mounted on the robot send out different frequency of ultrasonic waves into the inside surfaces of pipe and liners, and receive the ultrasound waveform by the methods of reflection and/or attenuation, to identify flaws and thickness of pipes and liners. The advancement of sensors, scanning and imaging for the acquisition of data would help visualise and understand the pipe problems.

Artificial intelligence: The AI-based analysis is used to apply algorithms to sift through the signals and images collected by the sensors and use deep learning algorithms to conduct a centralised processing with more accurate results in a systematic way to understand and digitise the in-situ conditions of pipes. It would help address the pipe problems before they become critical, and contribute to the predictive maintenance to reduce the unplanned shutdown of water supplies.

管道檢測機械人怎樣運作
How In-line Inspection Robot operates



- *管道檢測機械人能在多個地下環境下，以更短的處理時間，在水管內以不同角度單向高效地行駛超過 150 米。機械人最高的直線行駛速度為每秒 20 厘米。*

  Operating under various underground conditions, the In-line Inspection Robot can navigate efficiently along the interior of water mains in different angles in a single pass to reach over a distance of 150 meters with shorter processing time. The maximum linear driving speed of the robot is 20 cm/sec.

- *數據處理和控制中心收集、儲存、分析、匯報從視覺檢測相機和超聲波探頭收集所得的數據，並控制管道檢測機械人的動作。*

  The Data Processing and Control Unit collects, stores, processes, analyses, and reports the data obtained from the inspection cameras and the ultrasonic probes and controls movement of the in-line inspection robot.

- *數據處理軟件應用程式分析回流超聲波，以計算管壁的厚度，並分析所拍攝的影像來指出管道內壁或已出現的缺陷和裂縫。數據處理應用程式顯示結果後，能讓用戶審閱和篩選資訊來製作報告內容。*

  The data processing software application analyses the ultrasonic returns to calculate the pipe wall thickness and analyses the photographs taken to highlight possible flaws and cracks on the interior pipe surface. The data processing application then displays to the user results that are out of bounds for review and selection for inclusion in a generated report.

深井濾水廠晚間遙距運作監控改善工程

近年，全球水務業廣泛採用遙距控制和監測系統於水務處理裝置，尤其在疫情期間，世界多個水務機構面對用水需求急劇轉變，以及人力緊拙的問題。

為應對這些挑戰，並在不影響供水穩定的情況下優化對人力的需求，深井濾水廠展開夜更遙距運作監控試點項目，第一階段改善工程已於二零二二年展開，並將於二零二六年完成。我們將審慎檢視從第一階段收集得來的運作數據、趨勢和觀察結果，用於制定第二階段工程的策略改善計劃，使深井濾水廠邁向數碼化和自動化的運作模式。

提升供水可靠性

沙田濾水廠原地重置工程（南廠）

沙田濾水廠南廠和北廠分別於一九六四年和一九七三年分階段啟用，是香港最大的濾水廠，為九龍大部分地區、港島中西區和新界部分地區約 200 萬人口供應食水。項目旨在原地重置南廠，更換已使用約 50 年的老化濾水設施，同時提升濾水量，以確保有充足的優質食水供應，應付因逐步落成的新公營及私人房屋發展項目預期會增長的食水需求。

南廠原地重置工程，面對北廠仍在運作的挑戰，加上廠房周邊被密集而複雜的原水收集水管及食水供應網絡包圍，必須採用創新設計和先進濾水處理技術，如高速沉澱、深層濾池、紫外線和臭氧消毒，以優化土地的使用和廠房的運作。

Provision of M&E Equipment for Remote Operation of Sham Tseng Water Treatment Works for Night Time

In recent years, remote control and monitoring system of water treatment installations have been widely adopted in the global water industry, particularly under the epidemic situation where many water organisations in the world are confronted with the rapid change in water demands and tight manpower resources.

To address these challenges as well as optimise the manpower requirement without compromising a stable fresh water supply, a trial project to enable remote operation on the night shift at Sham Tseng Water Treatment Works (STsWTW) has commenced in 2022 for completion of the Stage 1 works in 2026. The operational data, trend and observations acquired in the Stage 1 will be critically examined for formulating the strategic improvement scope of the Stage 2 works with a view to transforming the operation mode of STsWTW towards digitalisation and automation in the long run.

Enhancing Water Supply Reliability

In-Situ Reprovisioning of Sha Tin Water Treatment Works (South Works)

Sha Tin Water Treatment Works comprise the South Works (as commissioned in 1964) and the North Works (as commissioned in stages from 1973). It is the largest water treatment works in Hong Kong, providing fresh water supply to a large part of Kowloon, the Central and Western Districts on the Hong Kong Island, and part of the New Territories for around two-million populations. The project aims to reprovision the South Works in-situ to replace the aged treatment facilities after its some 50 years of service and uprate the treatment capacity so as to ensure an adequate supply of quality potable water to meet the anticipated increase in fresh water demand due to the progressive implementation of new public and private housing developments.

Facing the challenges of rebuilding South Works at the original footprint with North Works operating and being surrounded by the extensive and comprehensively developed raw water collecting pipelines and fresh water outgoing supply network, innovative design and advanced water treatment technologies such as high rate sedimentation, deep bed filtration, ultraviolet light and ozone for water disinfection have been adopted to optimise land usage and plant operation.

此外，為了在施工階段提高生產力、促進地盤安全和增強環保表現，項目採用了創新的施工方法和技術，包括建築信息模擬、數碼工程監督系統和「組裝合成」建築法等。有關水務署智慧建造措施的更多詳情，請參閱「智慧建造」章節。

項目已採用可持續建築設計，冀以卓越建築表現，獲取「綠建環評」新建建築最高級別的鉑金評級。

採用可持續建築設計的沙田濾水廠原地重置工程（南廠）項目將增強供水可靠性。

Besides improving productivity, promoting site safety and enhancing environmental performance during construction stage, the project incorporates innovative construction methods and technologies, including Building Information Modelling (BIM), Digital Works Supervision System (DWSS) and Modular Integrated Construction (MiC). More details of the WSD's smart construction initiatives are covered in the Smart Construction Section.

Sustainable building design features have also been adopted throughout the project with a view to achieving the top BEAM Plus New Buildings Platinum accreditation for its outstanding building performance.

In-Situ Reprovisioning of Sha Tin Water Treatment Works (South Works), with sustainable building design features, will enhance water supply reliability.

主項工程動工
Main works commenced
於八月
in August
2020

預計於
Scheduled in
2026
第一季全面投入運作
first quarter full facility commissioning

小蠔灣濾水廠擴展工程

為滿足北大嶼山將來的發展需要，我們必須擴建小蠔灣濾水廠，將其濾水量倍增。工程已於二零二二年第一季度展開，並預計於二零二八年完成。此項目從設計階段已廣泛採用 BIM 技術。作為我們對可持續發展承諾的一部分，我們的目標是憑藉此項目的建築表現，獲取「綠建環評」新建建築最高級別的鉑金評級。

Siu Ho Wan Water Treatment Works Extension

To cope with North Lantau's future development, it is required to construct Siu Ho Wan Water Treatment Works extension to double its current water treatment capacity. Construction works commenced in the first quarter of 2022 and are scheduled for completion in 2028. Starting from the design stage, we have adopted the BIM extensively in this project. As part of our commitment to sustainable development, our goal is to achieve the top BEAM Plus New Buildings Platinum accreditation for its building performance for this project.

從 2028 年起，
每日濾水量將由
From 2028, the daily water treatment capacity will be doubled from
150 000 立方米 m^3
倍增至
to
300 000 立方米 m^3

配合新發展區的供水

為應付新界西北部發展計劃（包括元朗南、洪水橋/廈村、橫洲、丹桂村及朗邊）所帶來的用水需求增長，我們計劃擴建牛潭尾濾水廠，增加其每日濾水量至 44 萬立方米。我們已聘請顧問公司為擴建項目進行勘查研究工作，並考慮北部都會區的發展帶來新增的用水需求，以及新水務設施的要求等相關供水策略，以應對長遠的用水需求。

Facilitating Water Supply in New Development Areas

To meet the growth in water demand arising from the planned developments in the Northwest New Territories, including Yuen Long South, Hung Shui Kiu/Ha Tsuen, Wang Chau, Tan Kwai Tsuen and Long Bin, we will extend the Ngau Tam Mei Water Treatment Works to increase its daily water treatment capacity to 440 000 m^3. We have engaged consultants to carry out investigation works for the extension project taking into account the potential increase in water demand arising from the Northern Metropolis developments, as well as the relevant water supply strategy including the requirement of new waterworks, to meet the long-term water demand.

牛潭尾濾水廠的每日濾水量將由
The daily water treatment capacity of Ngau Tam Mei Water Treatment Works will extend from

230 000 立方米 m^3 增至 to **440 000** 立方米 m^3 以滿足與日俱增的食水需求。 to meet increasing fresh water demand.

東江水水管改善工程

為了持續地確保東江水供應的可靠性及靈活性，我們已於二零二零年九月展開工程，更換東江水 P4 水管已老化的玻璃纖維強化塑膠管部分，務求於二零二三年第一季完成工程。

在設計和建造階段，我們採用 BIM 技術，提高此工程的質素及效率。

Dongjiang Water Main Improvements

As part of our ongoing efforts to ensure a reliable and flexible supply of Dongjiang water, we commenced a project to replace the aged glass reinforced plastic section of the P4 Dongjiang water mains in September 2020 for completion in the first quarter of 2023.

Throughout the design and construction stage, we have adopted the BIM technology to enhance the quality and efficiency of this project.

透過無人機攝影測量法獲取的點雲記錄

Point cloud records taken by unmanned aerial vehicle photogrammetry

專題故事 FEATURE STORY

智慧建造
Smart Construction

永續智慧建造 成就卓越表現

隨著更多資訊和通訊科技整合至施工流程和模型，大型基礎設施項目可實行智慧工地，以建設更安全、高效和優質的水務設施資產。

為響應發展局推行的「建造業 2.0」，水務署已在重點基礎設施項目中採用多項尖端技術和智能設備，以建造未來創新的水務設施資產；並在職場安全、智慧建造管理、資訊整合、協同工作和地盤協調方面表現卓越。

Sustaining Smart Construction for Transformative Performance

With the emerging integration of information and communication technologies into construction processes and models, smart construction sites for mega infrastructure are made possible to deliver safe, efficient and high-quality waterworks assets.

Echoing the "Construction 2.0" initiatives advocated by the Development Bureau, the WSD has adopted various cutting-edge technologies and smart devices in key infrastructure projects to build innovative waterworks assets of the future and achieve transformative performance in workplace safety, intelligent construction management, information integration, collaborative work and site coordination.

將軍澳海水化淡廠 – 展現創新建造的典範

位於大廟灣旁的 8 公頃土地上的將軍澳海水化淡廠第一階段工程，旨在加強香港食水供應的應變力，是智慧建造的創新示範。海水淡化廠採用了多個智慧設備，例如建築信息模型（BIM）、數碼工程監督系統（DWSS）、組裝合成建築法（MiC）和製造及組裝設計（DfMA）等最新施工方法，以提升施工期間的生產力、職場安全、能力建構和團隊協作，同時能為整個項目周期提高質素、可持續性、時間和成本控制。

為成為現行和未來水務工程的模範，並促進知識共享和持續改進，經過全面的市場調查和可行性研究後，截至二零二一年十二 月，海水化淡廠採用了 50 多個智能解決方案。

Tseung Kwan O Desalination Plant –
An Exemplary Showcase of Innovative Construction

Located on an 8-hectare site adjacent to Joss House Bay to strengthen resilience for fresh water supply in Hong Kong, the first stage of Tseung Kwan O (TKO) Desalination Plant is an innovative showcase of smart construction. The Desalination Plant has adopted a diverse range of smart devices, as well as latest construction approaches such as Building Information Modelling (BIM), Digital Works Supervision System (DWSS), Modular Integrated Construction (MiC) and Design for Manufacture and Assembly (DfMA), to uplift productivity, workplace safety, capacity building and team collaboration during construction, while enhancing the quality, sustainability, time and cost control throughout the whole project life cycle.

With a view to establishing the Desalination Plant as a prototype for other ongoing and future waterworks projects and facilitating knowledge sharing for continuous improvement, as at December 2021, more than 50 smart solutions were adopted following comprehensive market researches and feasibility studies.

當中包括虛擬實境、擴增實境、人工智能、物聯網、綜合項目交付、機械人技術、BIM 及其他創新的建築設計方法。智慧水務管理的部分例子如下：
These range from virtual reality, augmented reality, artificial intelligence, Internet of Things, Integrated Project Delivery, robotics, BIM and other innovative construction design approaches. Examples of smart water management are highlighted as follows:

以水下無人拍攝機取代由潛水員來進行日常海上檢查的傳統方法，不但可消除安全隱患，同時在時間、準確率、可達性及數據處理方面，都能改善效率和工作流程。

Underwater inspection drone *is employed to replace the traditional approach of deploying divers for conducting daily marine inspection works to eliminate safety hazards while improving efficiency and workflow in terms of time, accuracy, accessibility and data handling.*

衛星導航系統由可再生能源供電，能在海洋挖掘的過程中提高監測側向支撐的精確度和效率。

Global Navigation Satellite System *supported by renewable energy enhances precision and efficiency for lateral support monitoring during marine excavation.*

數碼化工程監督系統的地盤安全巡查記錄功能，用於實地巡查安全和執行糾正措施，為需要即時糾正的地方提升效率，並為日後的工程分析需要完善的地方。

Site Safety Inspection Record feature of Digital Works Supervision System *is used to conduct site safety and assign corrective actions on the spot. This enhances efficiency in areas requiring timely rectification works and facilitates analysis for future improvement.*

中央處理平台能發布安全警報、警告訊號和即時訊息，有助促進迅速行動和數據分析，使安全措施得以持續改善。

Centralised Management Platform *issues safety alerts, warning signals and instant messages to facilitate prompt actions and data analysis for continuous safety improvement.*

人工智能攝錄機在施工現場檢測工人有否違反安全規定，以及進入斜波附近的危險區和其他限制區，有助促進地盤管理。

Artificial intelligence-powered cameras *conduct workplace monitoring for workers' safety breaches and their access to hazardous areas near slopes and other restricted areas to facilitate works site management.*

物聯網感應器持續監察石坡的移動情況、電箱開啟狀態（以確保供電穩定）和室內空氣質素。

Internet of Things sensors *are installed for continuous monitoring of rock slope movements, electrical box opening status (to ensure stable power supply) and indoor air quality.*

應用數碼化管理系統如流動應用程式和二維碼系統於管理起重機械和起重裝置。

Digital management system such as mobile applications and QR Code system *is applied to manage lifting appliances and lifting gears.*

虛擬實境安全培訓體驗中心為入職培訓配置針對施工現場的安全主題。

Virtual reality safety training experience centre *is furnished with site-specific safety topics for induction training.*

了解更多將軍澳海水淡化廠的智能安全技術
Learn more about smart safety in the TKO Desalination Plant

推動水務資產管理的先進技術向前邁進

Forging Ahead Advanced Technologies for Waterworks Asset Management

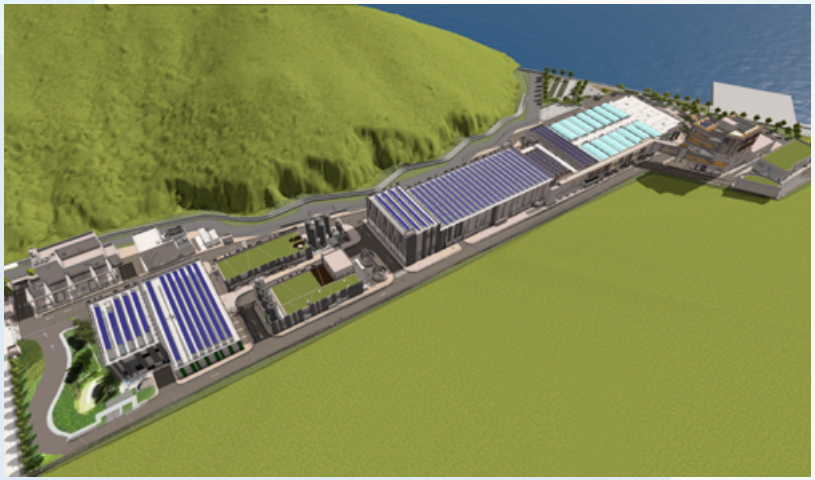
BIM

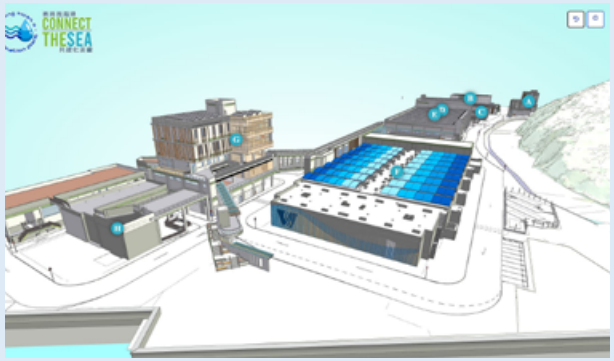
BIM 增強了項目的設計、施工和工程管理，並藉著提供立體模擬環境及可分享數據的高效數碼單一工作平台，令將興建的各部分呈現在持份者的眼前，讓他們識別到潛藏的設計不協調、施工或運作問題。竣工後，BIM 模型所包含的竣工資產資料，將用於設施管理（包括運作和安排維修保養），以優化成本及效率。

採用 BIM360 為共通數據環境，促進跨學科、跨地區的團隊協作，能在短至 18 個月內審批主要設計圖，當中包括尋求項目團隊以外的持份者意見，包括設計師、設計檢查員、以及分判商、分判顧問和供應商，務求以按時完成項目為共同目標。

BIM enhances the design, construction and project management, and enables all stakeholders to visualise what is to be built in a simulated 3D environment to identify any potential design clashes, construction or operational issues via an efficient digital working platform for relevant modelling works and data sharing. After completion, the asset information contained in the as-built BIM models would be used for facility management including operation and scheduling of future maintenance which optimise cost and efficiency.

The adoption of BIM360 as the Common Data Environment (CDE) has fostered cross-discipline, cross-region team collaboration to achieve approval of major design works within a swift period of 18 months, including the input sought from stakeholders outside the project team comprising designers, design checkers, as well as sub-contractors, sub-consultants and suppliers in order to meet the concerted goal of completing the project on time.





BIM 在水務資產管理中擔當著舉足輕重的角色，有助項目從一開始便可有更佳的設計選擇，並改善工作流程和項目效率。透過優化勞動力、物料和其他資源，將項目控制在預算之內。

BIM plays a vital role in waterworks asset management to enable better design choices, improve workflow and project efficiency from the start and keep projects under budget by optimising labour, materials, and other resources.

MiC

MiC 在廠房同時建造不同的預製組件，能大幅增強生產質素控制並提高施工生產力、安全和可持續性。海水淡化廠亦可透過採用 MiC，促進顧問和承辦商之間的團隊合作，一個月內便能生產和完成樓高兩層的綜合地盤辦公室。

MiC constructs different prefabricated modules in parallel in the factory which significantly enhances production quality control and improves construction productivity, safety and sustainability. The adoption of MiC in the Desalination Plant has also fostered team collaboration among consultants and contractors, making the production and delivery of the two-storey combined site office possible in one month's time.

MiC 以先在廠房組裝、後於現場裝嵌的方式，縮短樓高兩層綜合地盤辦公室的建造時間。該辦公室由 82 個模組單元組成，總建築面積為 2 400 平方米。

MiC using factory assembly followed by onsite installation shortens the construction time of the two-storey combined site office which comprises 82 modular units with a total floor area of 2 400 m^2.

DfMA

DfMA 有助加強品質控制、保護工人安全和加快完成項目，以及透過針對性的場外製造和組裝設計，將地盤的廢棄物減至最低。DfMA 利用綜合項目交付，來處理設施部分建築外牆和機電工程的場外施工，以促進廣大供應鏈的多方協作和融合。

DfMA offers benefits of better quality control, enhanced worker safety and speed of project delivery, and waste minimisation onsite via a purposeful design for manufacture and assembly offsite. Integrated Project Delivery is implemented for DfMA construction offsite for the external wall panels and electrical and mechanical works of some treatment buildings to foster multi-party collaboration and integration across the wider supply chain.

DfMA 施工管理能讓製造和組裝在場外進行，綜合交付逆滲透技術組件和二氧化碳組件等項目大型組件，並在現場安裝，務求將浪費減至最低。

DfMA construction management allows manufacture and assembly offsite, integrated project delivery of large-scale component delivery such as reverse osmosis racks and carbon dioxide racks as well as onsite installation to minimise waste.

「安全智慧工地」系統
Smart Site Safety System

改善職場環境 奉行安全第一

為將水務工程過程中的潛在風險減至最低，海水淡化廠項目在建造的階段參加了由發展局舉辦的「安全智慧工地」試點計劃，並推行使用多款「安全設計」裝置，提醒在施工和營運中的安全隱患。當中使用的智能設備種類繁多，從入職培訓到日常檢查，以至持續監控高風險活動，項目發展的各個方面都包括在內。

Safety First for Enhancing Workplace Environment

To minimise potential risks in the course of waterworks, the Desalination Plant project has participated in the pilot initiative of "Smart Site for Safety" organised by the Development Bureau during the construction stage, and implemented various "design for safety" devices to alert safety hazards during construction and operation. The variety of smart devices cover comprehensive aspects of project development ranging from induction training to daily inspection and continuous monitoring of high-risk activities.

我們利用創新的建造技術，為智慧水務未來致力培養創新文化，以及發展智能、安全和環保的水務建築物。為此，我們專注提升能力，促進採用創新科技，並向各行業和我們的國際網絡分享經驗和最佳實踐方案。

Leveraging innovative construction technologies, we seek to nurture an innovation culture and develop intelligent, safe and green waterworks buildings for our smart water future. To do this, we focus on building our capacity, promoting the adoption of innovation and technology and contributing our learning and best practices across industries and our international networks.

水務署總工程師 / 顧問工程管理 ***連登泰先生***
Mr LIN Tang-tai *- Chief Engineer/Consultants Management, WSD*

沙田濾水廠原地重置工程（南廠）

建築信息模擬和雲端共通數據環境平台，亦應用於沙田濾水廠（南廠）原地重置工程，讓參與重置南廠和行政大樓的不同專業的工程師及建築師能從設計、施工、移交、營運和保養階段的整個項目生命周期中，按照最新的設計，以有效和有效率的方式設計創作、協作、分析衝突和檢討。

In-Situ Reprovisioning of Sha Tin Water Treatment Works (South Works)

BIM and the cloud-based CDE platform are also applied to the In-Situ Reprovisioning of Sha Tin Water Treatment Works (South Works) project. This enables engineers of different disciplines and architects of the Reprovisioning of South Works and Administration Building to carry out design authoring, collaboration, clash analysis and review based on the most up-to-date design in an effective and efficient manner throughout the project life cycle from design, construction, handing over, operation and maintenance stages.

沙田濾水廠原地重置工程項目（南廠）的主要濾水設施，採用數碼化工地管理、建築信息模擬和可供製造和裝配的設計施工方法、智能安全設備和可再生能源發電等「建造 2.0」元素。

Construction 2.0 elements such as digitalisation of site management, BIM and DfMA construction approaches, smart safety devices and renewable energy generation are adopted in constructing major treatment facilities under the reprovisioning of Sha Tin Water Treatment Works (South Works) project.

新行政大樓約百分之 70% 的面積，將採用「組裝合成」建築法建造以縮短施工時間、改善工作環境和地盤安全。

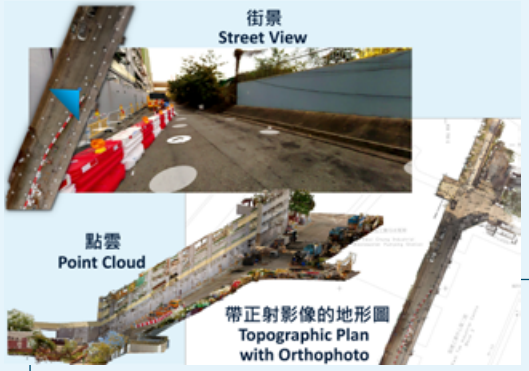
Approximately 70% of the new Administration Building is to be constructed by the MiC approach for shortening construction time as well as improving working environment and site safety.

試用穿戴技術 建設高效和優質地盤

為了呈現地盤的環境及提高收集地盤資料的效率，我們已在葵涌區的水管敷設工程中，試行使用穿戴式移動測繪系統。這種新穎的可穿戴實境測繪技術，透過精準的點雲數據和街景全景圖像，提供優質且詳細的工地複制圖，以及具有物件坐標和尺寸的可測量街景，適用於多種不同的建築文檔應用程序和工作流程。

Piloting Wearable Tech for Efficient and Quality Works Site Capture

To visualise construction site environment and enhance efficiency in collecting site information, we have piloted the use of wearable Mobile Mapping System for the mainlaying works in Kwai Chung areas. This novel wearable reality capturing technique provides high-quality mobile detailed works site replication with high accuracy point cloud data and street-view panoramic images, as well a measurable street view with coordinates and dimensions of an object which are applicable to a wide range of building documentation applications and workflows.



應用穿戴式移動測繪系統，透過收集優質的數據和優化工作流程記錄，令葵涌地區的水管敷設工程更便利。

Wearable Mobile Mapping System is applied to facilitate mainlaying works in Kwai Chung areas with high-quality data capture and enhanced documentation workflow.

可持續運作
Operational Sustainability

我們一直致力透過節約能源、發展可再生能源及減低環境影響等多項環保措施，在運作中實踐保護環境及減緩氣候變化的理念。

We are dedicated to protecting our environment as well as mitigating climate change in our operations through an array of green initiatives on energy conservation, renewable energy development and environmental mitigation.

節約能源與發展可再生能源

能源管理系統

我們致力在水務設施的管理和運作當中，實施一系列的節能措施，使水務設施的效能得以持續提升。

為展現我們實施有效能源管理的承擔，我們已完成提升我們的能源管理系統認證至 ISO 50001 的最新版本，覆蓋整個供水鏈，包括收集、貯存、輸送及原水處理、以及食水與海水的供應及分配。

ENERGY CONSERVATION AND RENEWABLE ENERGY DEVELOPMENT

Energy Management System

We strive for continuous improvement in our plant performance by implementing a series of energy conservation measures over a broad spectrum of water utility management and operations.

To demonstrate our commitment to effective energy management, we have completed the upgrade of our ISO 50001 certification to the latest version covering the entire water supply chain, from collection, storage, transfer and treatment of raw water to the supply and distribution of fresh water and salt water.

次氯酸鈉溶液投放系統

我們目前營運 22 個海傍海水抽水站，為香港近 85% 的人口每日平均供應 76 萬立方米的沖廁用海水。我們一般使用電解氯化設備將海水電解以製造次氯酸鈉溶液，為海水進行消毒。為了節省更多能源，我們計劃在海傍海水抽水站安裝更節能的次氯酸鈉溶液投放系統。

到目前為此，將軍澳海水抽水站和小西灣海水抽水站的次氯酸鈉溶液投放系統已投入使用。我們將於二零二二年中為九龍南二號海水抽水站和荃灣海水抽水站安裝次氯酸鈉溶液投放系統招標，而沙田海傍海水抽水站和西灣河海水抽水站的次氯酸鈉溶液投放系統的詳細設計工作正在進行中。以上四個工程項目預計將於二零二四年至二零二五年間分階段完成。

減少碳足跡

我們已經完成五座辦公室大樓的碳審計工作。隨著節能措施相繼實施，例如在部分辦公室大樓以更高能源效益的水冷式冷氣設備取代風冷式冷氣設備，減少整體溫室氣體排放量。

以下設施已完成碳審計工作：

- *長沙灣大樓*
- *九龍灣大樓*
- *北角大樓*
- *天水圍大樓*
- *龍翔道機電工場*

Sodium Hypochlorite Dosing Systems

Currently, we operate 22 seafront salt water pumping stations, which supply an average of 760 000 m^3 of salt water per day for toilet flushing to nearly 85% of Hong Kong's population. Electrochlorination plants have conventionally been used to produce sodium hypochlorite solution through the electrolysis of salt water to disinfect salt water. In order to achieve energy saving, we have planned to install more energy-efficient sodium hypochlorite dosing systems (SHDS) in the seafront salt water pumping stations.

So far, SHDS have been put into operation at Tseung Kwan O Salt Water Pumping Station (SWPS) and Siu Sai Wan SWPS. The tenders for the provision of SHDS at Kowloon South No.2 SWPS and Tsuen Wan SWPS will be invited in mid-2022 whilst the detailed design of SHDS at Sha Tin Seafront SWPS and Sai Wan Ho SWPS is underway. We target to complete the installations in stages from 2024 to 2025.

Carbon Footprint Reduction

We have completed carbon audits for five of our office buildings. With the implementation of energy-saving measures, such as the replacement of air-cooled chiller plant with higher energy-efficient water-cooled chiller plant in some of our office buildings, the overall greenhouse gas emission was reduced.

Carbon audits have been completed for:

- Cheung Sha Wan Building
- Kowloon Bay Building
- North Point Building
- Tin Shui Wai Building
- Lung Cheung Road Mechanical and Electrical Workshop

浮動太陽能板發電系統

長遠而言，我們計劃在香港水塘逐步發展大型浮動太陽能板發電場。水務署已於石壁水塘、船灣淡水湖和大欖涌水塘完成安裝各自一組 100 千瓦浮動太限能板發電系統，同時計劃於船灣淡水湖發展大型淨動太陽能板發電場。

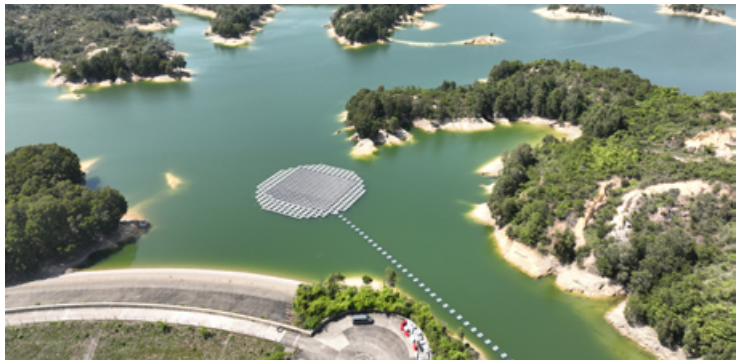
浮於水面上的浮動太陽能板發電系統可以自然冷卻太陽能電池板，以提高整體發電效能。每組 100 千瓦的浮動太陽能板發電系統能產生相當於 36 個普通家庭一年的耗電量，同時減少 84 噸二氧化碳排放。

了解更多浮動太陽能板發電系統
Learn more about floating solar power system

Floating Photovoltaic Systems

Our long-term plan is to progressively implement large-scale floating solar farms at reservoirs in Hong Kong. The WSD has completed the implementation of 100kW-capacity floating photovoltaic (FPV) systems at the Shek Pik, Plover Cove and Tai Lam Chung reservoirs while planning to implement a large-scale floating solar farm at the Plover Cove Reservoir.

The FPV systems on the water surface can naturally cool the solar panels to enhance the overall efficiency in electricity generation. The amount of electricity generated from each 100kW-capacity FPV system is equivalent to the annual electricity consumption of 36 average households with a reduction of 84 tonnes of carbon dioxide emission.



大欖涌水塘上的浮動太陽能板發電系統已經完成。

Floating photovoltaic system is completed at Tai Lam Chung Reservoir.

點滴話你知

Did you know?

除了從太陽能中採集可再生能源外，在水塘上安裝浮動太陽能板發電系統還有其他好處，包括減少水蒸發、抑制藻類生長、節省寶貴的土地資源，以及提高太陽能電池板的發電效能。每組浮動太陽能板發電系統，每年能產生約 12 萬千瓦時電力，為附近的抽水站或水塘的空氣壓縮機房供電。

Apart from harvesting renewable energy from the sun, there are additional benefits of installing floating photovoltaic systems (FPVs) over the reservoir surface, which include reducing water evaporation, suppressing algae growth, saving precious land resources and yielding a higher solar panel power generation efficiency. Each FPV system generates about 120 000kWh of electricity annually which will be used to power nearby pumping station or air compressor house of the reservoir.

水力發電廠

繼香港首個和第二個水力發電站分別於屯門濾水廠和沙田濾水廠落成後，位於馬鞍山濾水廠的水力發電站的設計工作亦已完成，預計於二零二六年投入運作。

了解更多水力發電站
Learn more about hydropower plant

Hydropower Generation Plants

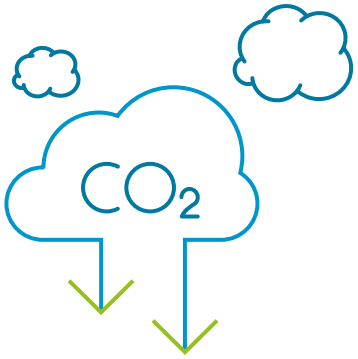
Following the establishment of Hong Kong's first and second hydropower plants at Tuen Mun Water Treatment Works and Sha Tin Water Treatment Works respectively, the design for another hydropower plant at Ma On Shan Water Treatment Works was completed which will be commissioned in 2026.

點滴話你知

Did you know?

設於沙田濾水廠和馬鞍山水濾水廠的水力發電站，分別能生產高達 24 萬和 56 萬千瓦時電力，相當於每年可分別減少排放約 170 噸及 390 噸二氧化碳。

The hydropower plants at Sha Tin Water Treatment Works and Ma On Shan Water Treatment Works can generate up to about 240 000 kWh and 560 000 kWh of electricity annually which is equivalent to the potential reduction of about 170 and 390 tonnes of carbon dioxide emission each year respectively.



內聯閉式水力發電裝置

在線監測儀器和無線數據傳輸器是管理現代供水網絡的重要工具。我們正著手於在「智管網」的部分監測區域安裝內聯閉式水力發電裝置，為感應及監測設備和數據傳輸裝置提供電力。在創新及科技局的科技統籌（整體撥款）計劃資助下，我們已從香港理工大學採購了 20 套內聯閉式水力發電裝置，其中四套已於「智管網」的站點試行，表現令人滿意。我們正尋求合適的「智管網」站點，務求在內聯閉式水力發電裝置的運行範圍符合食水分配網絡的運行條件時，並安裝更多已採購的內聯閉式水力發電裝置。

In-line Hydropower Harnessing Devices

Online monitoring instruments and wireless data transmitters are important tools for the management of a modern water supply network. We are installing in-line hydropower harnessing devices (IHHD) in some of the District Metering Areas (DMAs) that we are establishing under the Water Intelligent Network (WIN) to power sensing and monitoring equipment and data transmission devices. We have procured 20 sets of IHHD from the Hong Kong Polytechnic University, funded by the Innovation and Technology Bureau's TechConnect Block Vote, and have deployed four IHHD sets to the WIN sites as a trial with promising performance. Suitable WIN sites are being explored for installing more procured IHHDs when the operating range of the IHHDs ties in with the operating conditions of the fresh water distribution network.

內聯閉式水力發電裝置，為監測和數據傳輸裝置「智管網」的感應及監測設備和數據傳輸裝置提供電力，以達至實現遙距監測的目標。

In-line hydropower harnessing devices provide electric power supply to the sensing and monitoring equipment and data transmission devices of the Water Intelligent Network for real-time remote monitoring purposes.

減低環境影響

現場生產氯氣

我們繼續為十間主要濾水廠升級消毒設施，並預計於二零二二年五月起陸續完成調試工作。二零二三年初完工後，現場氯氣生產設施將會全面投入運作。這樣便無需要運輸和貯存進口液態氯，因而可消除與液態氯的運輸和貯存相關的氯氣洩漏風險，提升食水消毒作業的安全。

ENVIRONMENTAL MITIGATION

Onsite Chlorine Generation

We continue to upgrade the disinfection facilities of our 10 major Water Treatment Works, which will be commissioned progressively from May 2022. Upon completion in early 2023, the on-site chlorine generation facilities will be put into operation in full swing. In so doing, we can do away with transportation and storage arising from importation of liquid chlorine, and thus eliminating the risk of chlorine gas leakage associated with the transportation and storage of liquid chlorine, resulting in enhancement of the safety of the disinfection operation.

減低建造工程的影響

我們的設計及建設科竭力於水務工程中的規劃、設計及建造等各個環節，盡量降低工程對環境造成的影響。每年，我們均會參照《ISO14001:2015 環境管理體系》認證訂立新方向和目標，不斷提升我們在環境管理體系及環保方面的表現。

提高生物多樣性

根據環境及生態局（時為環境局）制定的《生物多樣性策略及行動計劃 2016021》，水務署繼續在漁農自然護理署的支持下，致力加強天然溪澗和引水導的保育工作，以改善和盡量減少維修工程對生態造成的影響。此外，我們將繼續尋找機會，貢獻政府的生物多樣性保育工作，以及中國國家《生物多樣性策略及行動計劃》，同時提高公眾意識和社區參與度。

為確保城市的可持續發展，社會各界需同心協力保護生物多樣性。除了在灌溉水塘建設人工生態棲息地等多項生物多樣性試點項目外，我們一直與環保團體合作，向公眾宣傳集水區的水資源和生態保護。

我們與綠色力量和香港賽馬會慈善信託基金合作，開展賽馬會集水成自然教育計劃。我們透過網絡研討會來支持交流會議。該會議將於二零二二年六月舉行，以討論和探索集水區棲息地、生態系統與人類利益之間的相互關係。

為了宣傳「水與生態」關係的重要性，我們亦給予中學教師支持，於二零二一年和二零二二年出版由綠色力量出版教師用書。

Minimising Construction Impacts

Our New Works Branch strives to minimise the environmental impacts arising from our waterworks construction throughout the planning, design and construction processes. Each year, we establish new objectives and targets under the ISO 14001:2015 Environmental Management System (EMS) to continually improve our EMS and environmental performance.

Enhancing Biodiversity

Under the "Biodiversity Strategy and Action Plan 2016-2021" (BSAP) formulated by the then Environment Bureau (now the Environment and Ecology Bureau), the WSD continues to contribute efforts in enhancing conservation of natural streams and catchwaters by improving practices in and minimising ecological impacts from our maintenance works, with the support of the Agriculture, Fisheries and Conservation Department. In addition, we will continue seeking opportunities to contribute to the Government's efforts on biodiversity conservation and to China's national BSAP while promoting public awareness and community involvement.

Concerted efforts across the society to conserving biodiversity is essential to ensuring the city's sustainable development. Apart from various pilot biodiversity enhancements including artificial ecological habitats in irrigation reservoirs, we have been collaborating with green groups to promote water and ecology conservation in water gathering grounds to members of the public.

In collaboration with Green Power and the Hong Kong Jockey Club Charities Trust in its JC Flow Programme (Jockey Club – Fluvial Liveliness of Water Gathering Grounds), we would provide support to an interflow session via webinar which will be held in June 2022 to discuss and explore the interrelationship between the habitats in Water Gathering Grounds, ecosystems and the benefits to people.

To promote the importance of the interrelationship between Water and Ecology, we have also provided support to the development of reference books for secondary school teachers, which were published by Green Power in 2021 and 2022.

有見公眾對垂釣的興趣日益增加，為提高他們對保護水資源和周邊自然景觀重要性的認識和理解，水務署於二零二一年四月推出先導計劃，放寬水塘的釣魚期，讓持有有效釣魚牌照人士，於二零二一年全年在船灣淡水湖及大潭水塘群垂釣。水務署委任專家顧問在先導計劃期間，評估放寬釣魚期對水塘環境和水質的影響，以及水塘內魚類的種類和數量。評估結果顯示，放寬釣魚期限制對水塘環境、水質、魚類種類和數量沒有構成明顯影響。 水務署檢視專家顧問的意見後，在不影響供水可靠性及安全的前提下，自二零二二年四月起放寬釣魚期，讓持有有效釣魚牌照人士可在全港所有水塘享受釣魚樂（即 17 個水塘和 9 個灌溉水塘）。水務署會繼續密切監測水塘的水質，定期抽取水樣本進行化驗，以確保水塘的水質優良。

To raise public awareness and appreciation of the importance of protecting water resources and the surrounding natural sceneries amidst increasing public interest in fishing activities, the WSD launched a pilot scheme in April 2021 to relax the fishing period in reservoirs, allowing anglers holding valid fishing licences to fish in the Plover Cove Reservoir and the Tai Tam Group of Reservoirs throughout 2021. The WSD commissioned an expert consultant to assess the impact of relaxing the fishing period on the reservoir environment and water quality, as well as the species and quantities of fish inside the reservoirs during the period of the pilot scheme. The assessment indicated that relaxing the restriction on the fishing period showed no appreciable impact on the reservoir environment and water quality, as well as the species and quantities of fish inside the reservoirs. After reviewing the expert consultant's advice, the WSD has relaxed the fishing period since April 2022, given that the reliability and safety of the water supply should not be affected, to allow anglers holding valid fishing licences to enjoy the fun of fishing in all Hong Kong reservoirs (i.e. 17 reservoirs and nine irrigation reservoirs) throughout the year. The WSD will continue to closely monitor the water quality by conducting regular examinations of water samples taken at reservoirs to ensure good water quality.

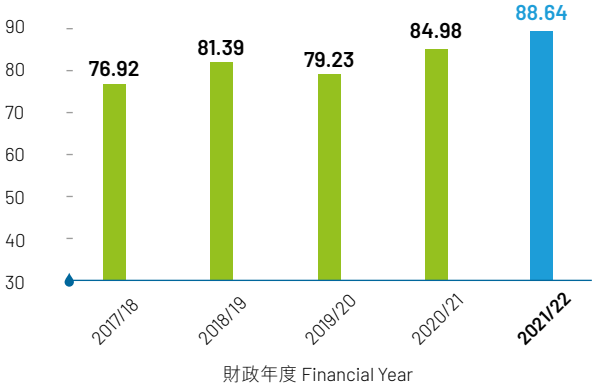
放寬水塘釣魚期先導計劃於二零二一年推出，讓市民享受釣魚樂。

A pilot scheme was launched in 2021 to relax fishing period in reservoirs for public enjoyment.

可持續發展數據
FIGURES UNDER SUSTAINABILITY

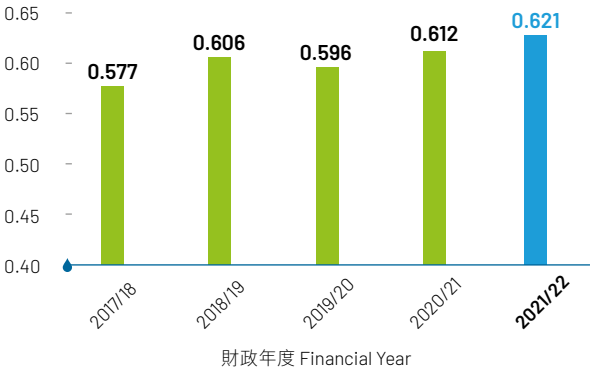
人均耗電量（食水及原水）
Per Capita Electricity Consumption (Fresh Water and Raw Water)

千瓦時/每人/每年 kWh/head/year



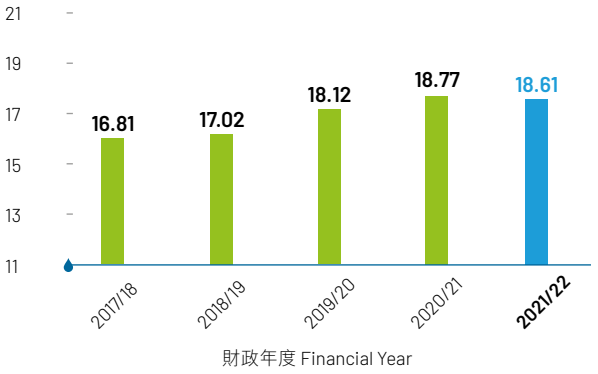
每單位耗電量（食水及原水）
Unit Electricity Consumption (Fresh Water and Raw Water)

千瓦時/立方米 kWh/m³



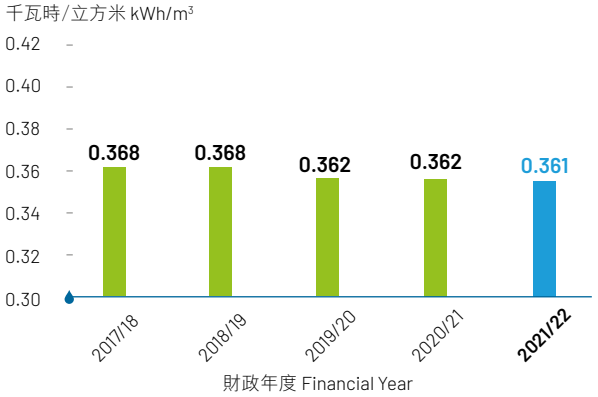
人均耗電量（海水）
Per Capita Electricity Consumption (Salt Water)

千瓦時/每人/每年 kWh/head/year



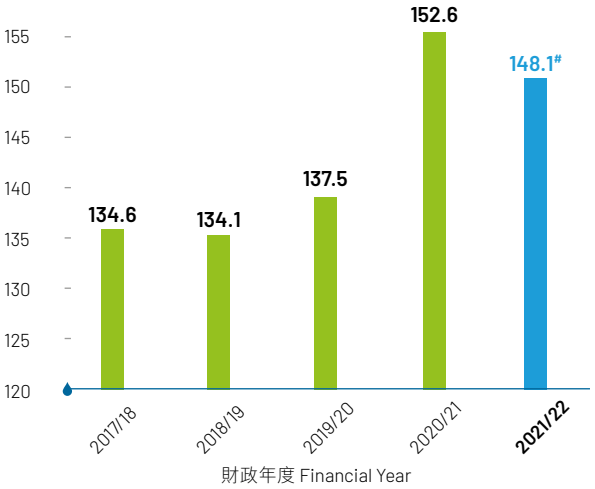
每單位耗電量（海水）
Unit Electricity Consumption (Salt Water)

千瓦時/立方米 kWh/m³



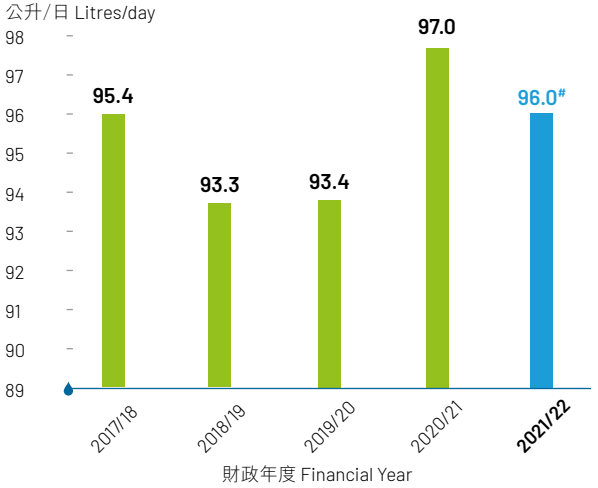
人均住宅食水用量
Per Capita Domestic Fresh Water Consumption

公升/日 Litres/day



人均沖廁水用量（食水及海水）
Per Capita Flushing Water Consumption (Fresh Water and Salt Water)

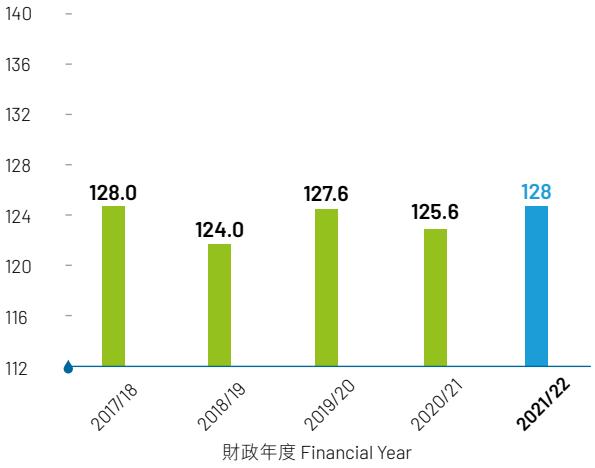
公升/日 Litres/day



註：人均沖廁水用量（食水及海水）是根據本港的沖廁水總用量計算而得。
Note: Per Capita Flushing Water Consumption (Fresh Water and Salt Water) is based on Hong Kong's total flushing water consumption.

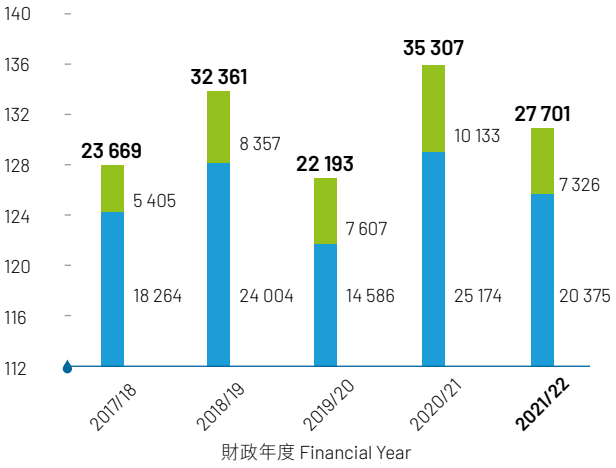
辦公室每單位樓面面積的耗電量
Office Electricity Consumption Per Unit Floor Space

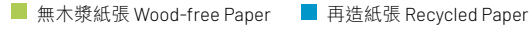
千瓦時/平方米 kWh/m²



耗紙量
Paper Consumption

令 Reams



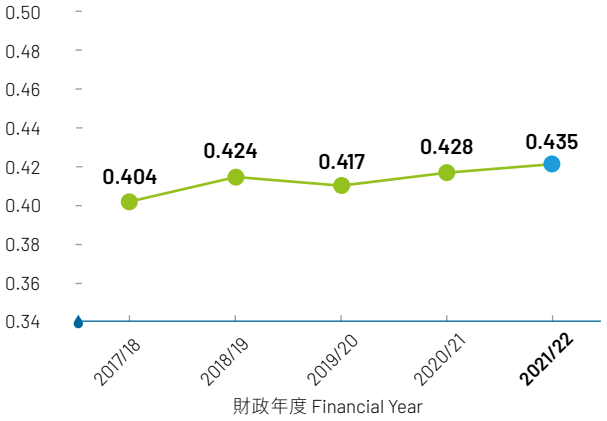


註：由於在二零二零年第一季實施的特別上班安排，原定預計於二零一九至二零年度訂購的 1 752 令無木漿紙張和 5 442 令再造紙張延遲至二零二零至二一年度。

Note: 1 752 reams of wood-free paper and 5 442 reams of recycled paper originally planned to be ordered in 2019/20 was deferred to 2020/21 due to the special work arrangements implemented in the first quarter of 2020.

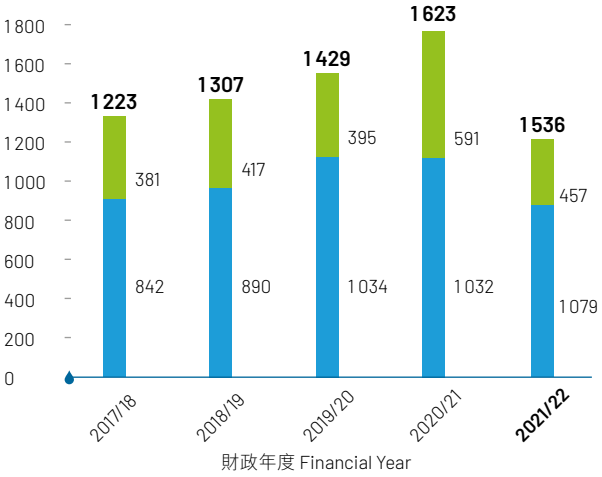
水務署因使用電力處理食水而產生的溫室氣體排放
Greenhouse Gas Emissions Due to Electricity Used for Fresh Water Processing by the WSD

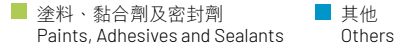
千克二氧化碳/立方米 kg CO_2/m^3



內部工作所需揮發性有機化合物耗用量
VOC Consumption for In-house Work

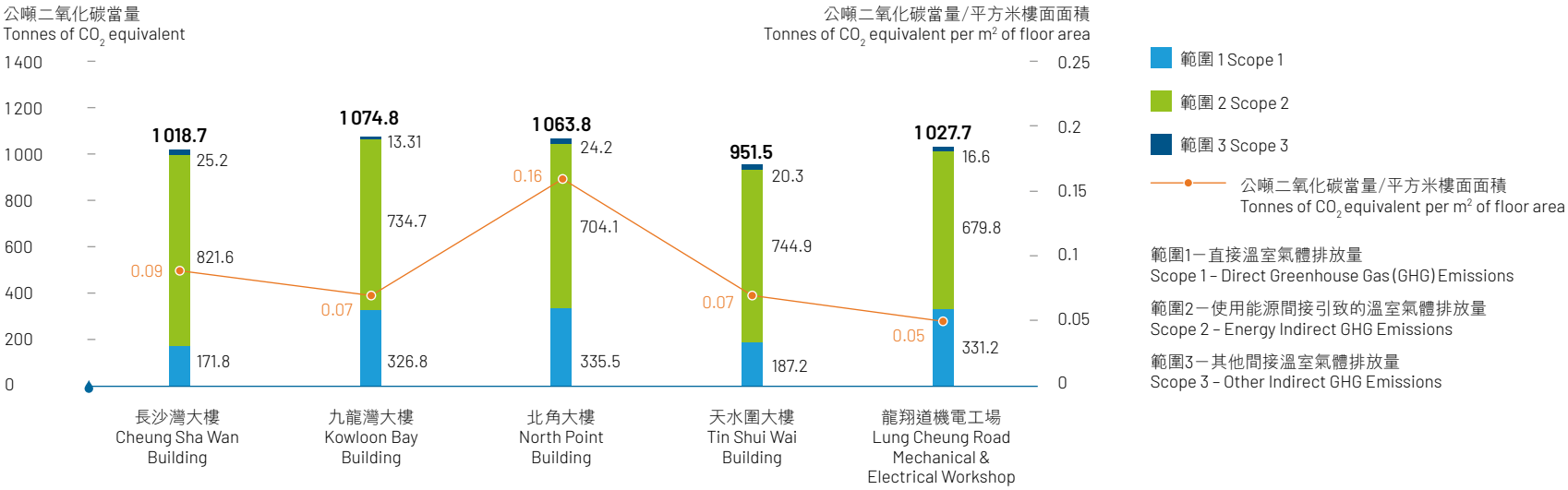
公斤 kg





VOC：揮發性有機化合物
Volatile organic compound

碳審計報告
Carbon Audit Report



範圍1－直接溫室氣體排放量
Scope 1 – Direct Greenhouse Gas (GHG) Emissions

範圍2－使用能源間接引致的溫室氣體排放量
Scope 2 – Energy Indirect GHG Emissions

範圍3－其他間接溫室氣體排放量
Scope 3 – Other Indirect GHG Emissions

可再生能源產量
Renewable Energy Generated

財政年度 Financial Year	17/18	18/19	19/20	20/21	21/22
水務設施中的太陽能板發電系統的發電量（千瓦時）（見下面的註釋） Renewable Energy (RE) Generated by Land-based Photovoltaic (PV) Panels in Waterworks Installations (kWh) (see Note below)	33 397	29 437	28 940	230 257	**267 438**
水塘浮動太陽能板發電系統的發電量（千瓦時） RE Generated by Floating PV Systems in Impounding Reservoirs (kWh)	134 857	131 328	200 428	209 007	**211 811**
濾水廠中的水力發電系統的發電量（千瓦時） RE Generated by Hydropower Plant at Water Treatment Works (kWh)	133 078	311 587	1 491 819	1 478 767	**1 510 453**
總量（千瓦時）Total (kWh)	301 332	472 352	1 721 187	1 918 031	**1 989 702**
減少二氧化碳排放當量（公斤）【全港性的溫室氣體排放系數預設值為0.7公斤/千瓦時】 Equivalent Reduction in CO_2 Emission (kg) [The territory-wide default value of the emission factor is 0.7 kg/kWh]	210 932	330 646	1 204 831	1 342 622	**1 392 791**

註：欣澳海水抽水站的可再生能源發電系統的發電量，為 12 千瓦太陽能板發電系統和 2.5 千瓦風力發電系統的總和。
Note: The RE generated from Sunny Bay Salt Water Pumping Station is the summation of both 12kW PV system and 2.5kW wind turbine system.

公用集調車輛資料
Information on Vehicle Pool Transport

財政年度 Financial Year	投入運作的政府車輛 No. of Government Vehicles in Operation			總燃料耗用量（公升） Total Fuel Consumption (Litres)			總車程（公里） Total Mileage (km)		
	19/20	20/21	21/22	19/20	20/21	21/22	19/20	20/21	21/22
柴油 Diesel	86	90	**112**	199 676	220 661	**273 899**	1 062 437	1 112 553	**1 343 851**
汽油 Petroleum	116	112	**104**	313 666	285 478	**264 289**	1 599 969	1 513 801	**1 491 913**
混合（汽油/電力） Hybrid (Petrol/Electric)	1	1	**1**	298	671	**620**	6 439	13 903	**13 590**
液化石油氣 LPG	11	11	**11**	49 097	47 122	**47 599**	135 514	126 774	**129 778**
電力 Electricity	13	13	**13**	–	–	**–**	81 510	65 975	**65 972**

廢氣排放
Emissions

以公噸計 Figures in Tonnes	二氧化碳 CO_2			二氧化硫 SO_2			氮氧化物 NO_x			可吸入懸浮粒子 RSP		
財政年度 Financial Year	19/20	20/21	21/22	19/20	20/21	21/22	19/20	20/21	21/22	19/20	20/21	21/22
直接廢氣排放 Direct emissions												
車輛（柴油）Vehicle fleet (diesel)	522	536	**730**	–	–	**–**	1	1	**2**	–	–	**–**
車輛（汽油）Vehicle fleet (petrol)	741	565	**561**	–	–	**–**	1	1	**1**	–	–	**–**
車輛（液化石油氣）Vehicle fleet (LPG)	82	77	**84**	–	–	**–**	–	–	**–**	–	–	**–**
間接廢氣排放 Indirect emissions												
耗用電（九龍及新界） Electricity consumed (Kowloon and New Territories)	322 807	255 372	**278 889**	65	30	**38**	297	170	**189**	8	6	**6**
耗用電（港島） Electricity consumed (Hong Kong Island)	53 632	50 053	**50 107**	12	8	**6**	48	38	**36**	1	1	**1**
總量 Total	377 784	306 603	**330 371**	77	38	**44**	347	210	**228**	9	7	**7**

客戶服務
Customer Services

提升服務質素 應付客戶增長

我們一直秉承以客為本的核心理念，竭誠提供適時、高效及以客為本的服務。我們不斷探索嶄新和有效措施，滿足增長中的客戶的各種需求，同時促進經濟繁榮。

隨著資訊和通訊科技的迅速發展，我們完善了多項服務，務求提供方便、靈活和高效的服務。

ENHANCING SERVICES TO MEET CUSTOMER GROWTH

As part of our core values, we strive to enhance customer satisfaction in delivering responsive, efficient and customer-oriented services. We are constantly exploring new and effective ways to meet diverse needs of our increasing customers while underpinning a thriving economy.

With the advanced development in information and communication technology, we have implemented a number of service enhancements to provide convenience, flexibility and efficiency.

財政年度 Financial Year	17/18	18/19	19/20	20/21	21/22
客戶數目 Number of Customer Accounts	2 988 700	3 042 700	3 077 800	3 115 900	**3 159 000**

多元化的付款方法

為進一步方便客戶，我們提供更多元化的繳費方式，當中包括自動轉賬、自動櫃員機、繳費靈、轉數快、支票、電話理財和網上繳費。我們將繼續了解客戶需求，適時調整安排。

電子賬單服務

為了向客戶提供更方便和環保的賬單管理服務，我們推出了電子賬單服務，提供多項增值服務，例如即時以電郵接收最新賬單、可獲延長繳費限期一個月（水費結算期為一個月的高用水量用戶除外）、接收繳費提示電郵，以及查閱過去兩年的用水和付款記錄。截至二零二二年三月三十一日，超過 161 000 名客戶已選用電子賬單。

水務署流動應用程式

「水務署流動應用程式」為用戶提供實用功能，可用於查閱賬單摘要、催繳通知，以及有關水務署的計劃和服務的最新資訊。此外，用戶也可以利用應用程式：

- 以二維碼於便利店繳付帳單，無須出示實體水費單。
- 接收來自 452 個區議會劃分選區的暫停供水通告。
- 獲取水務署「一般認可」水管及配件的產品資料。

我們期望透過展示用水量的即時摘要，提高客戶精明用水的意識，從而推動行為改變，實現節約資源和成本。

免費下載「水務署流動應用程式」
Download the WSD Mobile App for free

Android 版本
Android version

iOS 版本
iOS version

Diversified Payment Options

To bring greater convenience to customers, we provide diversified payment options for water bills. These include autopay, ATM, PPS, FPS (Faster Payment System), cheque, phone and internet banking. We will continue to gauge the emerging needs of our customers for appropriate and timely arrangement.

E-Bill Service

To offer customers a more convenient and environmentally friendly billing management service, we have launched e-bill service with value-added benefits, such as instantly receiving new bills by email, enjoying one-month extension of payment due date (except for high water consumption consumers who are billed at monthly intervals), getting email payment reminders, and viewing water consumption records and payment history for the last two years. As at 31 March 2022, over 161 000 customers have switched to electronic billing.

WSD Mobile App

Our mobile application "WSD Mobile App" provides a useful tool for users to view bill summary, reminders as well as the latest news about the WSD's initiatives and services. In addition, users can make use of the app to conduct the following:

- Make payments at convenience stores or through FPS by using the QR code provided without the need to present paper water bills.
- Receive water suspension notices from among 452 sub-districts according to the District Council Election Constituencies.
- Obtain product information of water supply pipes and fittings with general acceptance of the WSD.

Through presenting an instant overview of water consumption, we hope to raise customer awareness of using our water wisely and inspire their behaviour changes to achieve resource and cost saving.

提升供水申請服務

為方便水喉業界和市民大眾，水務署正計劃透過一套新的供水申請管理系統來提升服務。新系統將於數碼平台運作，用於接收和處理供水申請。該系統的可行性研究將於二零二三年展開，目標於二零二五年開始分階段實施。

繼二零一九年和二零二零年提供電子遞交申請服務予村屋和簡單的水管工程後（當中包括特定行業如飲食業、理髮店、美容店和洗衣店，以及申請分拆水錶），我們已於二零二一年十二月起將此服務擴展至採用建築信息模擬設計的供水申請項目。

此外，為方便水喉業界查閱有關水管工程及提交申請的最新指示和指引，我們於二零一八年起推出了《樓宇水管工程技術要求》和《申請供水指引》，並每年檢視和更新該兩份刊物。於年度更新期間，所有新政策和指引都將透過通函發布。除此之外，每季度舉行的會議亦成為我們與業界溝通的平台。

暫停供水自動通告系統

為加強與客戶溝通，我們正逐步設立一套以地理訊息系統為本的「暫停供水自動通知系統」，主動通知因緊急暫停食水供應而受影響的客戶。在水管發生緊急故障時，該系統能協助我們識別因緊急維修而需要關閉的閥門和暫停使用的水管，從而確認供水受影響的建築物並通知有關方面。

第一階段「暫停供水自動通知系統」已於二零二零年十二年推出。當大型屋苑（即不少於 1 000 個住宅單位的屋苑）受緊急暫停食水供應所影響，「暫停供水自動通知系統」將通知受影響的大型屋苑管理處。該服務將由二零二二年四月開始，透過水務署流動應用程式擴展至大型屋苑的相關用戶。我們亦計劃將該服務擴展至受緊急暫停沖廁水影響的大型屋苑。

Service Enhancement for Applications for Water Supply

With a view to providing convenience to the plumbing trade and members of the general public, the WSD is planning a service enhancement through a new water supply application management system. The new system will run on a digital platform for receiving and processing applications for water supply. The feasibility study of the system will commence in 2023 with the target implementation in phases starting in 2025.

Further to our provision of the electronic submission channels implemented in 2019 and 2020 for the applications for water supply catered for village-type houses and simple plumbing cases, including selected business trade such as food business, barber & beauty shops and laundries, and separate meters, we have extended this service to the application for water supply for projects adopting Building Information Modelling since December 2021.

In addition, in order to facilitate easy reference for the plumbing trade to identify the latest instructions and guidelines on the requirements on plumbing works and submissions, we have promulgated "Technical Requirements for Plumbing Works in Buildings" and "Guide to Application for Water Supply" since 2018, and both publications will be reviewed and updated annually. In between the two updates, any new policies and guidelines will be promulgated by means of Circular Letters. Moreover, we have established a communication platform with the trade through quarterly meetings.

Water Suspension Notification System

To enhance customer communications, we are progressively developing a geographic information system (GIS)-based Water Suspension Notification System ("WATSUN") to proactively notify affected customers of emergency suspension of water supply. At times of emergency failure in water mains, the WATSUN could assist to identify the valves to be closed and the sections of water mains to be isolated for emergency repair works, thereby identifying the buildings to be affected and notifying the concerned parties.

The Phase 1 development of WATSUN was rolled out in December 2020. When there is emergency fresh water supply suspension affecting Large Housing Estates (LHEs), i.e. estates with not less than 1 000 housing units, WATSUN will notify the management offices of the affected LHEs. In April 2022, the notification service will be extended to individual consumers in LHEs through the WSD Mobile App. We are also planning to extend the notification service to cover emergency flushing water supply suspension affecting LHEs.

為合資格水喉匠提供電子牌照

隨著「智方便」流動應用程式推出後，自二零二二年三月起，我們開始提供電子牌照選項，透過網上方式向合資格水喉匠發出數碼格式的牌照。電子牌照具有防偽特色，透過掃瞄電子牌照上的二維碼，可以連結到水務署的持牌水喉匠名冊，輕鬆驗證牌照及相關資料如牌照的有效期等。

提供電子牌照讓申請者可以全天候辦理網上牌照申請服務，亦無須親身前往發牌辦事處領取傳統紙本水喉匠牌照。

聊天機器人和語音分析

語音生物識別和分析技術近年發展迅速。該等技術提供有效的工具，在自動化、速度、準確性和方便的領域上，提升客戶服務的質素。

利用含有人工智能的聊天機器人技術，我們正在開發自助聊天機器人系統，從而提升客戶服務。該系統能迅速向客戶提供資訊和支援，例如處理來自公眾的簡單查詢，和提供住宅用水賬戶相關的資訊。

為了改善客戶電話諮詢中心的服務，我們亦正在開發語音分析系統，把電話諮詢中心的電話語音記錄轉換為文字記錄。這方面能為未來的服務提升及客戶互動，預先提供了大數據，為部門作好準備。

Provision of Electronic Licence for Eligible Plumbers

With the launch of iAM Smart mobile application (iAM Smart), we have started providing an electronic licence (e-licence) option for eligible plumbers by issuing licence in digital format through online means since March 2022. The e-licence contains security features for demonstrating its authenticity. With the QR code contained in the e-licence, relevant licence information such as the validity period can be verified with ease through an established link to the WSD's Licensed Plumber Directory.

The provision of e-licence allows applicants to obtain online licensing application services round the clock without the need to visit the licensing offices in person to get their plumber's licences in conventional paper format.

Chatbot and Speech Analytics

Increasingly, rapid development of voice biometrics and speech analytics technologies provides an effective tool to enhance customer service in terms of automation, speed, accuracy and availability.

Leveraging the artificial intelligence (AI) chatbot technology, we are developing a self-service chatbot system to enhance customer service by providing fast access to information and support, for example to handle simple enquires from the public and provide information on domestic account related matters.

With a view to improving the service of the Customer Telephone Enquiry Centre (CTEC), we are also developing a Speech Analytic System to convert the audio records of the CTEC calls to textual records, in order to provide actionable insights and big data for future service enhancement and customer engagement.

弦動
INSPIRE

成就員工、機構和廣大社區，
激發及延續用水創新

Empowering employees, institutions and
the wider community to inspire and
sustain water innovations

我們相信，促進水務管理、能力提升、新思分享和
社區參與，定能與社區攜手應對水資源所帶來的挑戰，
為可持續發展產生積極和深遠的影響。

Through fostering water governance, capacity building,
insights sharing and community engagement,
we believe in the potential to address water challenges
and make a positive and greater impact to
water sustainability together.

我們的員工
Our People

賦予能力 服務更佳

水務署相信提升員工的知識、技能、安全 和健康水平，是提供卓越服務的開端。現今世界中，氣候變化、科技發展或客戶期望均瞬息萬變。我們透過傳承知識、鼓勵協作和推動學習文化來迎接及適應轉變，從而不斷提升服務質素，並讓員工發揮潛能，成就更多。

EMPOWERING OUR PEOPLE TO SERVE BETTER

At the WSD, we believe the provision of outstanding service starts with empowering our staff with enhanced knowledge, skills, safety and wellness. Today, major changes in climate, technology or customer expectations can literally occur in the space of just a few hours. Through fostering knowledge, collaboration and learning culture, we are embracing and adapting to changes to continuously enhance our services, as well as enable our staff to flourish and achieve greater success.

人員編制 Staff Establishment

財政年度 Financial Year	17/18	18/19	19/20	20/21	21/22
初級人員 Junior Staff	411	411	416	418	**412**
一般及共通職系人員 General & Common Grades Staff	1 634	1 649	1 673	1 688	**1 679**
督察及技術人員 Inspectorate & Technical Staff	2 048	2 074	2 127	2 163	**2 221**
專業人員 Professional Staff	374	379	387	398	**397**
總數Total	4 467	4 513	4 603	4 667	**4 709**

知識管理

創新科技和知識管理是穩建政策、流程、服務，以及造就人才培育規劃的關鍵。

從單純應用價廉感應器和實時監察智能供水網絡，到應用人工智能和預測各種未知情況，以至潛在極端狀況的風險管理，創新的知識管理不但可改變水資源管理，使流程和服務質素發揮最大的效益，同時亦能提升員工的專業水平，以及促進員工和社會的參與。

以多元的知識管理計劃激發創新

水務署於二零二一年九月推出「水務專業學院」，旨在以系統化方式培養職場的學習文化，並滿足員工不同的學習需求。除了系統化課程，學院亦以面授和網上模式舉辦各種活動來推廣知識管理。我們的員工能透過學習、經驗和工程案例分享，擴闊對水務和衞生不同領域的知識和視野。

二零二一年，接近 2 000 人次參加了 30 項知識管理活動，包括「知識管理茶座」、分享會和 K-POP。新計劃 K-POP 旨在提供網上平台，讓我們的專業團隊能跨領域、職級和地域地分享重點項目的經驗。

我們的工程師透過「K-POP」網上分享平台，與水務署社群的多個團隊分享最新項目進展和經驗。

Our engineer shared the latest project progress as well as learning through the online sharing platform "K-POP" to the wider teams of the WSD community.

Knowledge Management

Technology, innovation and knowledge management are key to inform sound policies, processes and services, as well as contribute to supporting capacity building initiatives.

From the simple utilisation of low-cost sensors and real-time monitoring of smart water networks, to the application of artificial intelligence and prediction for a range of future scenarios and potential extreme events for crisis management, innovative knowledge management can transform water resources governance to achieve the best possible optimisation of processes and services, enhance competencies, as well as increase staff and community engagement.

Inspiring Innovation with Diversified Knowledge Management Programmes

Launched in September 2021, the WSD AQUA-DEMY aims to foster learning culture in the workplace and address different learning needs of our staff through a systematic approach. In addition to the structured curriculum, the Academy promotes knowledge management with a diverse range of initiatives via in-person and online modes. Through sharing learning, experiences and project cases, our staff can acquire knowledge and broaden their vision in different fields of the water and sanitation sector.

In 2021, nearly 2 000 man-time participated in 30 Knowledge Management (KM) activities including KM Cafes, Sharing Sessions and K-POPs. The K-POP is a new initiative offering an online platform for our professionals to share key projects among teams across disciplines, grades and geographies.

加強知識轉移和職業規劃的知識管理平台

為促進知識共享，我們的一站式知識管理平台「點聚」，整合了與水務相關資訊和即將舉行培訓活動和課程，讓員工能規劃自己的專業發展，提高培訓效率和整體的工作能力。

年內，為保持知識共享及適時回顧有關工作的知識，我們於「點聚」增加了可觀看影片的容量，讓員工能更新、分享和觀看更多有關培訓和經驗分享的短片。

除了網上報名的培訓課程外，「點聚」新推出的培訓活動管理系統，亦可讓員工檢索個人培訓記錄，並提供證書到期和更新提示。這些新功能不僅讓員工有效地規劃自己的學習旅程，同時亦促進水務署對「水務專業學院」的管理。

Enhance KM Portal for Knowledge Transfer and Career Planning

As the focal point of waterworks-related materials and upcoming training events and courses, our one-stop KM Portal facilitates knowledge sharing and enables staff to plan for their professional development, thereby enhancing training efficiency and overall work capability.

During the year, to sustain knowledge sharing and facilitate timely review of work knowledge, we have increased the video viewing capacity in the KM Portal to feature more training and experience-sharing videos for easy updates, sharing and access.

In addition to the online enrollment of training courses, the new training activity management system in the KM Portal enables the retrieval of personal training records and provides staff with reminders on certificate expiry and renewal. These new enhancements enable our staff to effectively plan for their learning journeys and facilitates the administration of the WSD AQUA-DEMY.

- *助理署長 / 發展馬漢榮先生代表水務署領取二零二一年香港最具創新力知識型機構大獎。*

  Mr MA Hon-wing, Wilson, Assistant Director/Development, received the Hong Kong MIKE Award 2021 on behalf of the WSD.

創新知識管理備受國際認可
International Recognition for Innovative Knowledge Management

水務署榮幸躋身享負盛名的二零二一年「全球最具創新力知識型機構大獎」和二零二一年「香港最具創新力知識型機構大獎」得獎機構，表揚我們在知識管理實施和創新方面的表現和貢獻。

這些獎項，表揚企業持續實踐知識培養，並將知識轉化為卓越產品、服務和解決方案。當中包括變革型領導、賦予知識型員工創新、實踐知識來達致知識創新，及以實施創新理念來為持份者創造價值。

In recognition of our contribution and performance in knowledge management implementation and innovation, the WSD was honoured as one of the winners at the prestigious Global Most Innovative Knowledge Enterprise (MIKE) Award 2021 and Hong Kong MIKE Award 2021.

These awards commend enterprises' sustainable practices in cultivating and converting their knowledge into superior products, services and solutions through transformative leadership, empowerment of knowledge workers for innovation, enforcement of knowledge practices for knowledge creation, as well as implementation of creative concepts for stakeholder value creation.

員工培訓

二零二一至二二年度，我們提供了 9 977 個員工培訓工日。

培訓工日 Training Man-days

財政年度 Financial Year	19/20	20/21	21/22
培訓工日 Training Man-days	8 666	*5 532	**9 977**

Staff Training

In 2021/22, we provided 9 977 man-days of training.

* 在二零一九冠狀病毒病疫情下，面授培訓課程的人數受限或需要長時間暫停。

*In-person training courses were highly restricted or suspended for a prolonged period during the COVID-19 epidemic.

職業健康及安全

我們致力保障員工和工人在職場的健康和安全，並按需要採取措施提高安全標準。

我們定期舉行會議，討論與職業健康及安全相關的議題，並舉辦宣傳活動，推廣健康和愉快的工作環境。例如，我們簽署了《好心情 @ 健康工作間約章》，向員工宣傳「健康飲食」、「體能活動」和「心理健康」等健康資訊。

我們的水務工程合約意外率一直遠低於政府就工務工程合約規定的上限，對此我們感到十分自豪。展望將來，我們將致力進一步降低意外率。

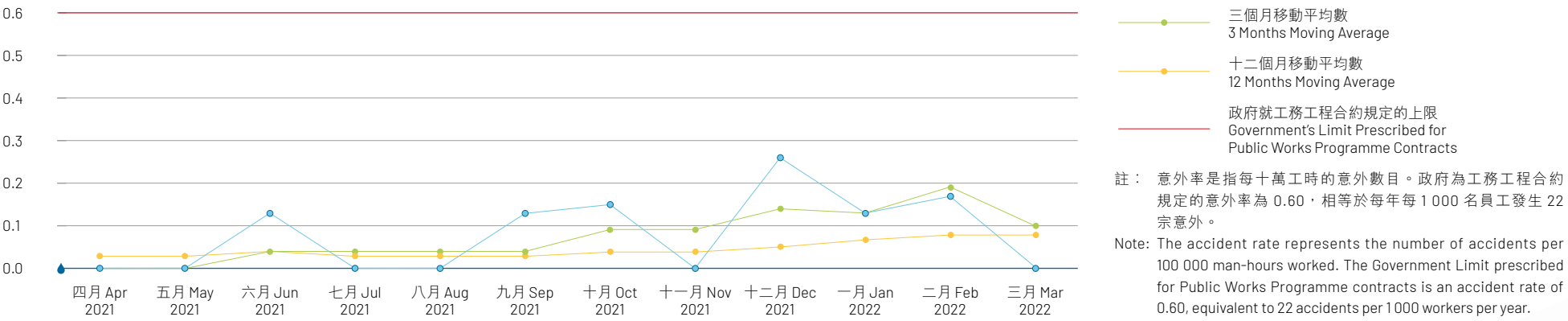
Occupational Health and Safety

We are committed to protecting the health and safety of our staff and workers in the workplace and introducing measures to enhance the safety standards where needed.

We hold meetings on a regular basis to discuss matters of concern relating to occupational health and safety, and organise awareness campaigns to promote a healthy and joyful workplace. For example, we have signed the Charter of Joyful@Healthy Workplace and developed communications to promote "Healthy Eating", "Physical Activity" as well as "Mental Well-being" health messages to our staff.

We take pride in our consistently low accident rate in our waterworks projects compared to the Government Limit prescribed for Public Works Programme contracts. We are dedicated to lowering the accident rate even further in future.

二零二一至二二年度水務工程合約意外率 Accident Rate in Waterworks Contracts 2021/2022



註： 意外率是指每十萬工時的意外數目。政府為工務工程合約規定的意外率為 0.60，相等於每年每 1 000 名員工發生 22 宗意外。

Note: The accident rate represents the number of accidents per 100 000 man-hours worked. The Government Limit prescribed for Public Works Programme contracts is an accident rate of 0.60, equivalent to 22 accidents per 1 000 workers per year.

服務社區

積極保持工作與生活平衡，是水務署文化的核心。我們鼓勵和支持員工參與體育活動，以及社區和慈善項目。

水務署義工隊於二零零二年成立，旨在鼓勵員工積極參與各項社區和慈善活動，包括探訪和服務弱勢社群、清潔海灘、電話輔導和外展服務支援、籌款等。

儘管二零一九冠狀病毒病疫情帶來挑戰，我們的義工隊對社區的承諾和關懷毫不間斷，包括透過探訪長者和殘疾人士、以互聯網和電話提供服務與支援，以及協助籌集善款。我們本年共貢獻了 1 208 小時的義工服務。

Serving the Community

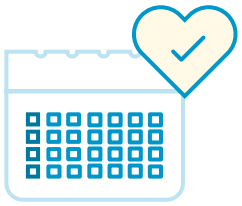
At the WSD, maintaining a positive work-life balance is central to our culture. We encourage and support staff participation in sports activities as well as community and charitable causes.

Established in 2002, the WSD Volunteer Team aims to encourage staff to make active contributions to various community and charitable causes, ranging from visits and services to vulnerable groups, beach cleaning to lifeline and outreach services support, fundraising and so forth.

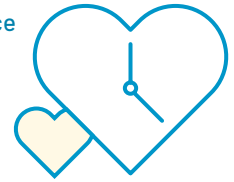
Despite the challenges posed by the COVID-19 epidemic, our Volunteer Team continued our commitment and care for our community by conducting visits to the elderly and disabled, providing services and support through the internet or telephone, as well as helping with fundraising. During the year, a total of 1 208 man-hours of volunteer work were contributed.

二零二一至二二年度員工義工服務 Staff Volunteer Service in 2021/22

28 個慈善活動 charity events



貢獻了 Contributed 1208 義工服務時數 volunteer service man-hours



員工義工服務（工時） Staff Volunteer Service (Man-hours)

財政年度 Financial Year	17/18	18/19	19/20	20/21	21/22
工時 Man-hours	4 902	5 217	3 153*	1 000*	**1 208***

註： 鑑於二零一九冠狀病毒病疫情，二零二零年年初起有多項活動被取消。
Note: A lot of activities were cancelled since early 2020 due to the COVID-19 epidemic.

員工嘉許認可和活動

員工嘉許認可和獎項

獎項和嘉許印證我們的出色表現，鼓舞團隊再接再厲，再下一城。今年，我們的員工和工程項目繼往開來，員工出眾的表現和水務署對行業的專業貢獻再次受到嘉許，得獎如下：

- 申訴專員公署頒發之 2021 年**申訴專員嘉許獎（公營機構獎）**及 2 位同事榮獲**申訴專員嘉許獎（公職人員獎）**

- 11 名人員榮獲**行政長官公共服務獎狀**
- 2 名人員獲頒 **2021 年公務員事務局局長嘉許狀**

Staff Recognition and Activities

Staff Recognition and Awards

Award and appreciation are a testament to our outstanding performance boosting our motivation and inspiring team for further success. This year, our staff and projects were once again commended for their outstanding performance and professional contributions to the industry. These include the following:

- Grand Award of **Ombudsman's Awards 2021 for Public Organisations** and two of our officers were given Individual Awards

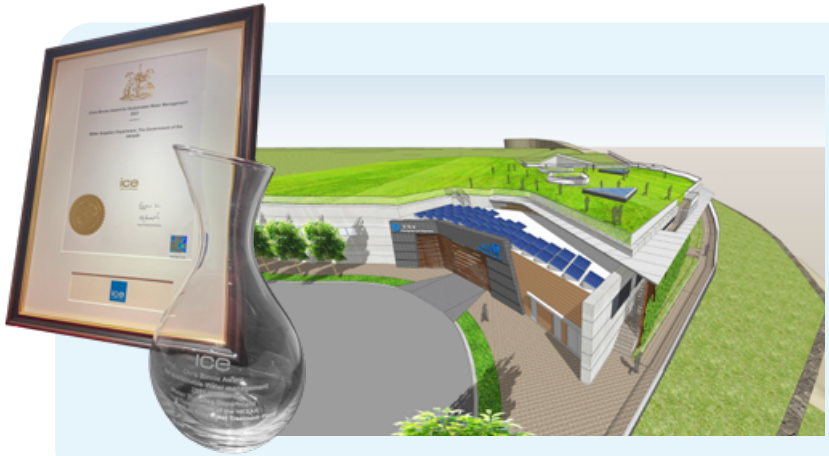
- 11 officers received **Chief Executive's Commendation for Government/Public Service**
- 2 officers received **The Secretary for the Civil Service's Commendation Award 2021**

項目 *安達臣道石礦場用地發展 — 中水處理廠建造工程*

獎項 *英國土木工程師學會 — 2021 年 Chris Binnie 持續水務管理大獎*

Project *Development of Anderson Road Quarry Site – Construction of Grey Water Treatment Plant*

Award *Institution of Civil Engineers (ICE) – 2021 Chris Binnie Award for Sustainable Water Management*



安達臣道中水處理廠項目憑藉為香港帶來裨益、項目成本益效、可持續性，以及切合於香港高密度高樓大樓的新發展區，榮獲 Chris Binnie 持續水務管理大獎。

獎項旨在表揚世界各地在土木工程和可持續水資源管理方面的傑出成就。項目位於前安達臣道石礦場，為 30 000 人口提供實地處理的中水來作沖廁用途，解決高地勢及遠離海邊而導致無法使用海水沖廁的問題。

The Anderson Road Grey Water Treatment Plant project was awarded the Chris Binnie Award for Sustainable Water Management for its benefits, value of money, sustainability and versatile application to new dense high-rise developments in Hong Kong.

The Award aims to recognise outstanding achievements in civil engineering and sustainable water management around the world. The project supplies onsite treated grey water for toilet flushing for the population of 30 000 at the former Anderson Road Quarry site and solved the problem - caused by its high altitude and distance from the seashore - of using seawater for toilet flushing.

體育比賽

水務署體育隊聯同發展局不同部門的同事，參加建造業議會籃球聯賽 2021，並勇奪亞軍。

Sports Competitions

The WSD team joined with colleagues of other departments from the Development Bureau to compete in the Construction Industry Council Basketball Tournament 2021 and won the first runner-up title.

我們的社區
Our Community

推廣智慧用水文化

為保持市民惜水的習慣，及在控制食水需求增長方面帶來積極的影響，我們透過公眾教育活動，以目標為本的方針來與社區密切合作，務求推動公眾支持，提高活動的成效。

PROMOTING WATER-WISE CULTURE

To sustain water-cherishing behaviour and effect positive changes in containing the growth of fresh water demand, we leverage both public education campaigns as well as a targeted approach in close collaboration with the local communities to mobilise support and enhance effectiveness.

「齊來慳水十公升 2.0」活動
"Let's Save 10L Water 2.0" Campaign

為鼓勵市民積極節約用水，我們舉辦了「齊來慳水十公升 2.0」社區節約用水活動。當中包括「創新節水花灑頭設計比賽」、「挑戰沖涼 4 分鐘」及「為私人屋苑及私立學校免費安裝節流器」等一系列活動。

To encourage the public in making active contributions in cherishing water, we organised the community water conservation campaign namely "Let's Save 10L Water 2.0". This campaign comprises a series of activities including the "Innovative Water Efficient Showerhead Design Competition", the "4-minute Shower Challenge" and "Free Installation of Flow Controllers at private housing estates and private schools" etc.

「惜水大使計劃 2021-22」KOL 計劃
"Cherish Water Ambassador Scheme 2021-22" KOL Scheme

「惜水大使計劃」始於二零一八年十月，透過一系列教育和培訓活動，培養保護水資源的學生大使，推廣節約用水的良好習慣。超過 200 名來自中學和大專院校的學生曾獲委任為「惜水大使」。

由於計劃反應熱烈，我們便於二零二一/二二學年再接再厲，與一眾「KOL」（網絡紅人）緊密合作，繼續推行「惜水大使」計劃。我們邀請人氣 KOL 擔任計劃導師，舉辦網上工作坊，培訓學生大使成為推廣惜水文化 KOL，透過發佈社交媒體宣傳和製作短片，向其家人和朋友宣傳節約用水。

Established in October 2018, the "Cherish Water Ambassador" Scheme was launched to develop student ambassadors to protect precious water resources and promote good habits of water conservation through a series of educational and training activities. More than 200 students from secondary schools and tertiary institutions were recruited as "Cherish Water Ambassadors".

With encouraging feedback, we continued the "Cherish Water Ambassador" scheme in the 2021/22 academic year in close collaboration with "KOLs" (Key Opinion Leaders). Popular KOLs were invited as scheme instructors to hold online workshops and groom student ambassadors as KOLs for promoting water conservation to family and friends by means of effective social media promotion proposals and video production.

抽水俠 Ben Sir 醒你慳水小貼士
Water Saving tips from Word Jacker (Ben Sir)

為使節約用水的訊息更具吸引力，提高市民的慳水意識，名人歐陽偉豪博士（Ben Sir）寓教於樂，設計一系列可應用於日常生活的節水小貼士，並透過社交媒體、網站、出版物和戶外場地等不同媒界廣泛傳揚這些節約用水小貼士。

To enhance the appeal of the water-saving messages and raise public awareness of water conservation, a suite of water-saving tips for different daily life applications using edutainment approach are designed and promoted by the popular celebrity Au Yeung Wai Hoo (Ben Sir). These water-saving tips are widely disseminated through different media covering social media, website, publications and outdoor spots.

「滴滴遊蹤深導行」參觀活動
"Excursion with Water Save Dave" Visiting Programme

自二零一九年開始舉辦「滴滴遊蹤深導行」參觀活動，活動致力讓公眾透過導賞團的形式到訪水務署水塘和濾水廠等不同水務設施，加深公眾對水資源的認識，鼓勵大家響應共同保障後代獲得水資源的機會。

導賞團共設三個主題、共七個參觀點，藉此讓參加者以互動方式了解水務署的日常運作、供水基礎設施錯綜複雜的動態，以及個人和集體需節約用水的原因。儘管二零一九受冠狀病毒疫情的限制和挑戰的情況下，我們仍然盡力於二零二一至二二年度舉辦了數個導賞團。

導賞主題：
Guided tour themes:

- 我們的水資源
  Our Water Resources and Nature
- 水務文物徑
  Waterworks Heritage Trails
- 食水處理與質量控制
  Fresh Water Treatment and Quality Control

Established since 2019, the "Excursion with Water Save Dave" Visiting Programme aims to raise public knowledge about water resources and encourage their collective efforts in protecting our water resources for future generations via a guided tour of the WSD's various waterworks facilities including reservoirs and water treatment works.

Under the Programme which comprises three thematic topics with a total of seven visiting locations, participants could learn more through an interactive mode about the daily operations of the WSD, the complex dynamics of our water supply infrastructure, as well as the reason for conserving water both at individual and collective levels. Despite the restrictions and challenging environment due to the COVID-19 epidemic, we managed to organise some of the guided tours in 2021/22.

參觀地點：
Visiting locations:

- 船灣淡水湖 Plover Cove Reservoir
- 萬宜水庫 High Island Reservoir
- 大潭水務文物徑 Tai Tam Waterworks Heritage Trail
- 九龍水務文物徑 Kowloon Waterworks Heritage Trail
- 牛潭尾濾水廠 Ngau Tam Mei Water Treatment Works
- 馬鞍山濾水廠 Ma On Shan Water Treatment Works
- 大埔濾水廠 Tai Po Water Treatment Works

惜水運動

除了提高市民的節約意識和推動智慧用水的生活外，我們亦與學校和企業等目標群組合作，提高節約用水的成效。

Cherish Water Programme and Campaigns

Apart from promoting conservation awareness and water-wise living among members of the public, we have also collaborated with targeted groups such as schools and enterprises to enhance effectiveness in conserving water.

「惜水校園」綜合教育計劃
"Cherish Water Campus" Integrated Education Programme

為培養年青一代良好的節約用水習慣，我們推出專門為幼稚園和小學而設的「惜水校園」綜合教育計劃，旨在透過多元化的教材，結合理論與實踐，拓寬學生對水資源的認識，並提高他們對節約用水和可持續發展的意識。

我們於二零二一年六月舉辦「**節約用水週**」，透過一系列的比賽和活動，鼓勵學生學習和理解珍惜用水的重要性。當中包括專為小學生而設的「挑戰沖涼 4 分鐘」及「水資源知識網上問答比賽」，以及專為小學生和幼稚園學生而設的「節約用水 4 格漫畫創作比賽」。年內，我們共收到超過 35 000 份參賽作品，以下為各項比賽的得獎作品：

To nurture good water-saving habits amongst the younger generation, we have launched a dedicated "Cherish Water Campus" Integrated Education Programme (IEP) for kindergartens and primary schools. The Programme aims to broaden students' knowledge about water resources and raise their awareness about water conservation and sustainability by integrating theory with practice with the aid of diversified teaching materials.

In June 2021, the **"Cherish Water Campus" Water Saving Week** was held to encourage students to learn and understand the importance of cherishing water via a series of competitions and activities. The "4-minute Shower Challenge" and "Water Resources Online Quiz Competition" were designed for primary students while the "Water Saving 4-Panel Comic Drawing Competition" was organised for both primary and kindergarten students. During the year, over 35 000 entries were received and below are winning entries of respective competitions:

幼稚園 - 新界區冠軍
Champion of Kindergarten (New Territories District)

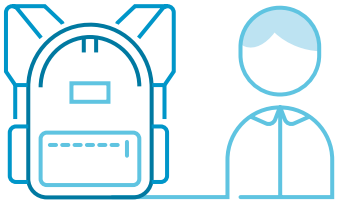
高小組冠軍
Champion of Primary School (Senior Level)

為了在個別學習計劃下推動家庭和學校節約用水，我們亦建議舉辦「校園用水考察」、「家庭用水考察」及主題比賽等多項活動，讓學生和老師享受積極參與的樂趣。

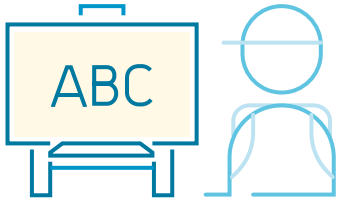
To promote application of water conservation at home and in schools under the IEP, we also suggested various activities such as School Water Audit, Home Water Audit as well as thematic competitions which enjoyed active participation from both students and teachers.

參與「惜水校園」綜合教育計劃的學校數目：
Number of schools participated in the "Cherish Water Campus" Integrated Education Programme:

377
間小學
primary schools



390
間幼稚園
kindergartens



教學資源豐富的電子學習平台
E-learning Platform with Enhanced Teaching Resources

為了讓學生加深對水資源及水資源保護的認識，我們亦於二零一一年出版的通識科教材中更新了《知水 • 惜水》的內容，並將其轉化為適用於電子學習平台的教材。這些內容，涵蓋與水有關的科目、討論主題、STEAM 活動、圖像說明和照片，務求平衡不同範疇的知識來促進學生對水資源保護、社會發展和水資源可持續發展重要性的關注。

除了學校，我們亦鼓勵全民參與來管理和減少用水與用水流失，並且身體力行，教育年輕一代及其家人（包括外籍家庭傭工）節約用水，帶領智慧用水的生活方式。

To equip students with a better understanding of water resources and conservation, we have also revamped the contents of the teaching kit of Liberal Studies "Water: Learn & Conserve" published in 2011 and transformed them into an e-learning platform. These cover water-related subjects, discussion topics, STEAM activities, illustrative diagrammes and photographs, aiming to foster a balanced consideration of water conservation, social development and the importance of water resource sustainability.

Apart from schools, we encourage every citizen to manage and reduce water use and loss, and join our cause in educating the younger generation and their families (including foreign domestic helpers) in conserving water and leading a water-wise lifestyle.

建立企業承諾協作平台
Building Collaboration Platform for Enterprise Commitment

為提升非住宅用戶的用水效益，水務署聯同環保促進會合辦 **ECH$_2$O -「商約」惜水運動**，藉以尋求跨界別對節約用水的支持和承諾。工商業等非住宅用水量約佔香港總用水量的 45%。此運動為工商機構提供協作平台，當中涵蓋不同類型活動，包括簽署惜水承諾、委任「惜水經理」、宣傳教育（例如攤位、網絡研討會、工作坊和展覽）、改善設備，以及嘉許計劃，務求促進非住宅減少用水量。自活動開展以來，獲得商會和不同行業協會的積極參與。年內超過 600 個處所簽署惜水約章。

為了協助機構制訂合適的用水效益指標，水務署為四類主要處所，包括商場、工商業樓宇、酒店和餐廳，編制了營運活動數據和相關用水量，以制定績效基準和規劃提升表現的措施。

In order to enhance water efficiency in the non-domestic sector, in collaboration with the Green Council, the WSD has launched the **ECH$_2$O - Enterprises Cherish Water Campaign** to seek multi-sectoral support and commitment in water conservation. The Campaign serves as a collaboration platform for commercial and industrial organisations to reduce non-domestic water use which accounts for approximately 45% of the total water consumption in Hong Kong. It covers different components which include the signing of charter, appointment of "Water Conservation Manager", education and promotion activities (e.g. booths, webinars, workshops and exhibitions), equipment improvement; as well as an award recognition programmes. Since its launch, the Campaign has received positive response from commerce chambers and industry associations. During the year, over 600 premises have pledged to commit to cherishing water.

To help organisations develop appropriate water efficiency indicators, business activity data and associated water consumption across four major industries: shopping malls, industrial and commercial buildings, hotels and restaurants are compiled to facilitate performance benchmarking and action planning.

我們舉辦了兩次培訓工作坊，以提醒缺水的風險和介紹最新的節水知識和技術。節流器亦分發給參與機構安裝使用。

Two training workshops were conducted to alert water risks and introduce the latest water conservation knowledge and technologies. Water flow controllers were also distributed for installation at participating organisations.

同心協心 推動行動

要推動精明運用水資源，以及應對與日俱增之水資源風險，同心協力是當中的重要關鍵。在這一年裡，我們與不同團體建立合作關係，支持各大社區活動，使節約和安全用水的訊息能深入社會的每個角落。

Fostering Synergies to Inspire Action

Concerted efforts and collaboration are critical drivers to inspiring wise use of our water resources and addressing the growing water risks. During the year, we built partnerships and provided support in various community activities to widen our reach to all walks of life and amplify our messages on water conservation and safety.

活水健步行 2021
Walk for Living Water 2021

我們今年與愛德基金會 (香港) 攜手合作的第十一屆「活水健步行」，經已圓滿結束。來自香港、加拿大、西班牙和英國的 300 多名參加者，可自己選擇適合的時間和地點，邁步健行。活動籌集逾 28 萬港元善款，用於為尼泊爾、緬甸和斯里蘭卡農村的乾旱地區，建設安全食水和衞生設施。

Co-organised with the Amity Foundation, the 11th "Walk for Living Water" was successfully held. Participants could freely conduct their own walks at time and location of their choice. Over 300 participants from Hong Kong, Canada, Spain and the United Kingdom took part in the event, and a funding of more than HK$ 280 000 was raised to construct water and sanitation systems for the rural water-deprived regions in Nepal, Myanmar and Sri Lanka.

2021 年國際環保博覽
Eco Expo Asia 2021

由香港貿易發展局主辦的公眾論壇，主題為「推動綠色復蘇，邁向碳中和」，我們藉以推廣「齊來慳水十公升 2.0」活動。此外，我們在上水及粉嶺再造水供應項目及安達臣道石礦場發展計劃的中央中水重用系統項目中，分別引進再造水及中水重用的最新發展和技術，以宣揚循環再用水的好處。

Organised by the Hong Kong Trade Development Council under the theme “Promoting Green Recovery for Carbon Neutrality”, we joined the public forum to promote the ‘Let's Save 10L Water 2.0’ Campaign. In addition, we advocated the benefits of recycled water through the introduction of the latest developments and technologies of reclaimed water and grey water recycling respectively in the projects of “Reclaimed Water Supply to Sheung Shui and Fanling” and the Centralised Grey Water Recycling System at Anderson Road Quarry Development.

創新科技嘉年華 2021
InnoCarnival 2021

我們參與由創新科技署舉辦的 「創新科技嘉年華 2021」，以加深公眾對水務署積極採用創新科技及提升服務的認識。活動期間，我們向公眾介紹水務署如何於日常工作中應用創新科技。其中包括使用無人船系統監測水塘的水質，以及運用機械人技術進行水管的檢查和維修工作。

With a view to increasing public knowledge of WSD’s proactive adoption and service enhancements in innovation and technologies, we participated in the InnoCarnival 2021 organised by the Innovation and Technology Commission. During the event, we introduced application of innocation technologies in our daily operations. These include the smart use of Unmanned Surface Vessel (USV) System for water quality monitoring in impounding reservoirs, as well as the robotic technology for in-line inspection and repair of water mains.

香港水足印定向 2021
Hong Kong Water Race 2021

由和富社會企業主辦的「香港水足印 2021」為公眾提供機會，透過野外定向運動加深對水資源的認識。參加者可掃描設置在城門水塘不同檢查站的二維碼，回答有關水資源的問題。作為活動的協辦機構，我們負責就香港的水資源問題和危機演講，目的是鼓勵大眾在日常生活中奉行節約用水的習慣。

Organised by the Wofoo Social Enterprises, the "Hong Kong Water Race 2021" provided an opportunity to enhance public understanding about water resources through nature orienteering. Participants could scan the QR code to answer the questions related to water resources at different checkpoints of the Shing Mun Reservoir. As a co-organiser of the event, we offered a talk on the issues concerning Hong Kong's water resources and the emerging water crisis with the objective to inspire the adoption of water conservation practices in daily life.

第十八屆環保嘉年華 2021
The 18th Green Carnival 2021

受二零一九冠狀病毒病疫情的影響，環保促進會將第十八屆「綠色嘉年華」移師至網上舉行，以鼓勵公眾參與。作為支持機構，我們舉辦了多項活動，包括在綠色嘉年華的官方網站設置虛擬攤位，以短片宣傳節約用水；在網上舉辦升級再造工作坊，教導市民製作環保口罩架和廚餘酵素；設計問答遊戲，以有獎形式激發公眾學習環保知識的興趣。

In light of the COVID-19 epidemic, the Green Council held the 18th Green Carnival online for public participation. As a supporting organisation, we conducted various initiatives, which include setting up a virtual booth in the dedicated Green Carnival Website to promote water conservation through videos; organising online upcycling workshops to teach members of the public in making eco face mask holder and food waste enzyme; and developing a quiz game to stimulate public interest in learning about environmental protection with prizes.

香港綠色日 2021
Hong Kong Green Day 2021

作為環保促進會的支持機構，我們積極在社交媒體平台和網站宣揚環保生活訊息來宣傳其舉辦的「香港綠色日」。約有 150 間機構以「綠色商店」和「綠色食肆」的身份參與其中，以及在辦公室和店鋪長期實施綠色措施，並向客戶和合作夥伴傳播綠色生活訊息。

此外，我們亦以支持機構的身份參與由環保促進會舉辦的「著綠狂奔 2021」，鼓勵市民減少碳排放。

Participating as a supporting organisation, we contributed in promoting green living messages through our social media platform and website to promote the "Hong Kong Green Day" organised by the Green Council. Approximately 150 organisations participated as "Green Shops" and "Green Restaurants" to implement long-term green measures at offices and stores, as well as spreading green living messages to their clients and partners.

We also joined the Green Run 2021 organised by the Green Council as a supporting organisation to encourage the public to reduce carbon emissions.

加強與區議會交流

時任九龍城區議會主席蕭亮聲先生應水務署邀請，率領當區區議員於二零二一年六月到訪位於天水圍的「水知園」教育中心。水務署署長及職員與代表團就有關九龍城區供水服務事宜展開討論。是次參觀活動讓九龍城區議員對本港水資源的相關事宜，以及社會各界多元化的節約用水工作有更進一步的了解。

水務署署長於二零二一年五月及二零二一年十一月分別到訪荃灣區議會及觀塘區議會，就香港水資源的概況作介紹，並就兩區的供水服務事宜展開討論。

Enhancing Exchange with District Councils

Upon our invitation, the Kowloon City District Council (KCDC) members led by the then Chairman Mr SIU Leong-sing visited the H_2OPE Centre at Tin Shui Wai in June 2021. The Director of Water Supplies and WSD staff held discussion with the delegation about the water supply services in Kowloon City District. Through the visit, the KCDC members gained a better understanding of the issues related to water resources in Hong Kong as well as diverse water conservation efforts in the community.

In May and November 2021, the Director of Water Supplies visited Tsuen Wan District Council and Kwun Tong District Council respectively to provide an overview of Hong Kong's water resources and hold discussion about the water supply services in the districts.

同心抗疫服務社區
Joining Anti-Epidemic Work to Serve the Community

二零一九冠狀病毒病疫情為香港帶來了前所未有的挑戰。為回應市民和社會的需要，政府力求推出多輪積極措施，協助受影響民眾抗疫。

水務署聯同其他政府部門調動人手及資源，務求盡快推行並完成多項抗疫行動，確保對受影響居民的滋擾減至最低，並以盡早發現確診者為目標，實行及早隔離和及早治療的安排。

- 在二零二一年三月至二零二一年五月期間，超過50名水務署職員聯同醫院管理局的同事，營運社區疫苗接種中心，為市民安排接種疫苗。
- 二零二二年三月的第五波疫情嚴重。有見及此，水務署派出100多名人員參與六次「受限區域強制檢測」行動（帶領其中五次行動）。

The COVID-19 epidemic has brought exceptional challenges to Hong Kong. The Government strives to respond to the needs of the public and society and has launched many rounds of measures to assist the affected population in fighting the virus.

In joint collaboration with other Government departments, the WSD has mobilised available manpower and resources for a number of anti-epidemic operations with a view to completing the operations as soon as possible, minimising the disturbance on the affected residents and achieving the objective of early identification, early isolation and early treatment.

- From March to May 2021, more than 50 WSD staff, jointly with colleagues from the Hospital Authority, operated community vaccination centres and arranged vaccinations for the public.
- In the face of the fifth wave of severe epidemics in March 2022, more than 100 WSD staff were deployed to participate in six "Restriction-testing Declaration" operations (taking charge in five of those operations).

專題故事 FEATURE STORY

前深水埗配水庫
Ex-Sham Shui Po Service Reservoir

活化主教山歷史悠久的前深水埗配水庫

前深水埗配水庫於一九零四年落成，及後於一九七零年停用，是當時九龍重力自流供水計劃的一部分。配水庫採用經典的設計和建築結構，如花崗岩支柱、紅磚拱券、和混凝土拱形天花，吸引市民對文物價值的關注。

前深水埗配水庫於二零二一年六月獲評定為一級歷史建築。因應公眾關注，水務署的不同團隊展開多項文物保育及提升服務措施。其中包括穩定結構的加固工程、編制教材以提高公眾的理解，以及改善設施以供公眾到訪和參觀。

Revitalising the Historic Ex-Sham Shui Po Service Reservoir at Mission Hill

Built in 1904 and later decommissioned in 1970, the ex-Sham Shui Po Service Reservoir was established as part of the then Kowloon Waterworks Gravitation Scheme. Its iconic design and architectural structure, such as granite block piers, red brick arches and concrete cove ceiling, have attracted public's attention over heritage conservation.

In view of public interest and following the assessment of the Ex-Sham Shui Po Service Reservoir as a Grade 1 historic structure in June 2021, different teams at the WSD have commenced various initiatives for heritage conservation and service enhancement. These include reinforcement works to stabilise the structure; development of educational materials to enhance public understanding and enhancement of facilities for public access and visit.

公眾欣賞教育之旅

百年古蹟為公眾教育提供良好平台，藉以了解香港水源、水務設施設計、食水供應系統的歷史發展，以及欣賞歷史建築的美學設計和內部結構。配水庫的虛擬導覽和導賞團已分別於二零二一年三月和十二月開始舉行，供公眾了解和參與。每日共設三場約90分鐘的導賞團，每團名額為12人。市民可透過網上系統預約。截至二零二二年三月，導賞團共吸引逾630人次入場，反應熱烈。

Education Tours for Public Appreciation

The century-old monument provides a good education platform to understand water resources, waterworks design, historical development of the fresh water supply system in Hong Kong, as well as to appreciate the aesthetic design and internal structures of the historic building. The WSD has arranged both virtual and guided tours for public knowledge and participation in March and December 2021 respectively. With three guided tours daily, each tour lasts about 90 minutes that accommodates up to 12 visitors. Members of the public can make an appointment through the online book system. As at March 2022, the guided tour attracted over 630 visitors with an overwhelming response.

確保結構完整的修復工程

我們參考了古物古蹟辦事處的意見和技術建議，並進行多項臨時加固及保護工程，得以令這座古蹟適合開放給市民參觀。這些改善工程，包括安裝架高地台通道、內部照明、通風設施、消防裝置和臨時排水設施。另外亦裝設玻璃天窗，以免配水庫受風化侵蝕的影響，並在天窗底下安裝樓梯為遊客提供便捷的通道。

Restoration Works to Ensure Structural Integrity

To enable the public to enjoy the place, various temporary strengthening and protection works were conducted following the views and technical advice from the Antiquities and Monument Office. These improvement works include the installation of a raised floor pathway, internal lighting, ventilation facilities, fire service installations and temporary drainage facilities. A skylight was also installed to protect the service reservoir from the weathering effects, and staircases were provided under the skylight as an easy access to the visitors.

為未來的保護工作徵求意見

Seeking Views on Future Conservation Efforts

我們盡力復修前深水埗配水庫的結構，並提供設施以配合公眾欣賞這座歷史建築。我們正收集參與導賞團人士的意見，協助制訂配水庫的長遠保育和活化方案。

We seek to contribute the best possible efforts to restore structures and provide facilities for public appreciation of the historic Ex-Sham Shui Po Service Reservoir. We are collecting views upon participation in the guided tours, to assist in evaluating options of conserving and revitalising the service reservoir in the long run.

水務署高級工程師/水塘安全 ***黃曦諾先生***
Mr WONG Hei-nok *- Senior Engineer/Reservoir Safety, WSD*

為配水庫的混凝土天花、拱券和其他結構裝設臨時支架，以確保配水庫有良好的結構承托。

Temporary support for the local concrete roof slabs, brick arches and other structures was erected to ensure structural integrity of the service reservoir.

為免內部結構受風化影響，在配水庫頂部洞口裝設玻璃天窗。

To protect the internal structures from weathering effects, a temporary skylight on the opening of the roof slab was installed.

為配合導賞團活動，水務署安裝內部照明、通風設施、消防裝置、架高地台通道、通道設施和地面綠化工程。

To facilitate guided tours, the WSD has made provision of internal lighting, ventilation facilities, fire service installations, raised floor pathway, access facilities and ground level greening works.

放眼世界
Our Global Network

合作推進水務管理

為香港提供優質且可持續的供水服務是我們一直秉承的抱負。為此，我們投入參與國際性水務專業團體，並與海內外國際同業緊密合作，以探索與水務管理相關的創新科技和最佳實務方案、提升實力，以及分享我們的見解及解決方案，與其他智慧用水的城市優勢互補。

水務署投入參與以下世界頂尖的水務公用事業網絡和知識平台，以汲取可持續和智慧水務管理的實踐和創新資訊，並連繫水務行業具影響力的領導者：

PARTNERING FOR ADVANCING WATER MANAGEMENT

As part of our vision to excel in providing quality and sustainable water supply in Hong Kong, we join the global knowledge hubs for water professionals and work in close collaboration with our regional and international counterparts. We seek to explore the latest innovations, technologies and best practices of water management; build capacity; as well as contribute insights and solutions adding value to the work of many other water-wise cities.

The WSD joins the following international leading water utility networks and knowledge hubs to access sustainable and smart water practices and innovations, and collaborate with thought leaders of the water sector:

- 國際水協會
  International Water Association (IWA)
- 國際海水化淡協會 *
  International Desalination Association
- 國際公用事業專業網絡 *
  Leading Utilities of the World
- 國際水利與環境工程學會
  International Association for Hydro-Environment Engineering and Research
- 美國水務協會 *
  American Water Works Association
- 智能供水網絡論壇 *
  Smart Water Networks Forum

* 註：中文譯名

疫情下，我們參加了多個地區性及國際性的線上會議，學習和分享水務管理的見解、最佳實務方案和未來趨勢。當中包括：

第三屆粵港澳大灣區水務論壇

這一年一度的論壇，對象為大灣區水務行業的領袖和從業者，於二零二一年十二月十五日至十六日以線上會議方式舉行，內容涵蓋水務行業多個熱門話題，包括數碼化轉型和減碳。我們藉此機會與大灣區的同業交流創新構思和最佳實務方案，包括應用機械人技術於水質監測、建立「Q-Leak」提升滲漏檢測能力，以及發展內聯閉式水力發電裝置使營運更具可持續性。

2021 年國際水協會數字世界水大會

本屆大會於二零二一年五月二十四日至六月四日以線上會議方式舉行，是為整個水循環各層面的全球水務專業人士而設的大型線上會議。在會上，我們分享了水務署在實施「全面水資源管理策略」、提升公眾對香港食水安全的信心、制訂香港食水標準和策略性使用海水沖廁的經驗。

2021 年線上新加坡國際水資源週

這個全球性的線上活動於二零二一年六月二十一日至七月二日舉行。當中包括接近 100 個主題演講、主題網絡研討會，以及有關城市水循環最佳實務和解決方案的工作坊。我們獲邀介紹將軍澳海水化淡廠第一階段的採購策略，以及大埔濾水廠擴建工程採用的可持續發展創新方案。

Despite the epidemic, we virtually participated in various regional and international conferences for learning as well as sharing water management insights, best practices and future trends. These include:

3rd Guangdong-Hong Kong-Macao Greater Bay Area Water Forum

Targeted at the leaders and practitioners of the water utilities in the Greater Bay Area, this annual forum was held virtually on 15 and 16 December 2021 covering a wide spectrum of trending topics in the water sector which include digital transformation and decarbonisation. Our team took the opportunity to exchange innovative ideas and best practices with our counterparts in the Greater Bay Area, including the application of robotic technologies for water quality monitoring, establishment of the Q-leak for elevating leak detection capability and development of in-line hydropower harnessing devices for more sustainable operations.

IWA Digital World Water Congress 2021

Held virtually from 24 May to 4 June 2021, this Congress is a major conference for water professionals globally across the entire water cycle. At the Congress, we shared our experiences in implementing the Total Water Management Strategy, enhancing public confidence in drinking water safety in Hong Kong, developing the Hong Kong Drinking Water Standards and strategic use of salt water for toilet flushing.

Singapore International Water Week 2021 Online

This virtual global event was held from 21 June to 2 July 2021. It featured close to 100 keynotes, thematic webinars and workshops on best practices and solutions spanning the urban water cycle. Our staff were invited to present on the procurement strategy of the first stage of the Tseung Kwan O Desalination Plant, as well as the sustainability innovations adopted in the expansion of the Tai Po Water Treatment Works.

財務及水費
Finance and Water Charges

水費

與世界其他主要城市相比，香港客戶為優質食水所繳付的費用相對低廉。除了一九九六年七月修訂的非本地船隻用水收費外，水費自一九九五年二月至今一直維持不變。

WATER CHARGES

Customers in Hong Kong pay less for high-quality fresh water than their counterparts in most major cities around the world. Water charges have not been revised since February 1995 (other than the charge for non-local vessels, which was last revised in July 1996).

收費幅度

住宅用戶的食水水費（沖廁用水除外）按以下四級制，以四個月為期計算：

SCALE OF CHARGES

Fresh water for domestic use (other than flushing) is charged by four-month periods, with rates set out in a four-tier system as follows:

	每單位 (1立方米) 收費 Charging rate per unit of one cubic metre
第一級 — 首12個單位 Tier 1 for the first 12 units	免費 Free
第二級 — 繼後的31個單位 Tier 2 for the next 31 units	$4.16 (註一 Note 1)
第三級 — 再繼後的19個單位 Tier 3 for the next 19 units	$6.45 (註二 Note 2)
第四級 — 餘下單位 Tier 4 for the remainder	$9.05 (註三 Note 3)

作其他用途的食水，會根據其用途按下表所列收費：

Fresh water for other uses is charged at different rates as follows, based on the purpose of consumption.

用途 Purpose	每單位（1立方米）收費 Charging rate per unit of one cubic metre
商業 Trade	$4.58 (註四 Note 4)
建築 Construction	$7.11 (註五 Note 5)
航運（非本地船隻）Shipping (Non-local Vessels)	$10.93 (註六 Note 6)
航運（本地船隻）Shipping (Local Vessels)	$4.58 (註七 Note 7)
航運以外的任何用途（非本地船隻），並以預先繳費票繳交水費 Any purpose other than Shipping (Non-local Vessels) where payment is made against a prepaid ticket	$4.58 (註七 Note 7)
沖廁水每四個月的收費率 Flushing per four-month period — 首30個單位 for the first 30 units — 餘下單位 for the remainder	免費 Free $4.58 (註七 Note 7)

海水沖廁費用全免。

Sea water for flushing is supplied free of charge.

註一：一九七九年推出水費分級制度時，第二級收費的目標是大致收回每單位的淨生產成本，即按照水錶記錄的耗水量計算每單位的總生產成本（包括固定資產平均淨值的目標回報率）減去每單位的差餉補貼。於二零二一至二二年度，每單位的淨生產成本為 12.7 元，遠超 4.16 元的收費水平，主要因為水費自一九九五年起並無任何變動。

註二：一九七九年推出水費分級制度時，第三級收費的目標是大致收回每單位的總生產成本，即按照水錶記錄的耗水量計算每單位的平均生產成本（包括固定資產平均淨值的目標回報率）。於二零二一至二二年度，每單位的總生產成本為 17.7 元，遠超 6.45 元的收費水平，主要因為水費自一九九五年起並無任何變動。

註三：第四級收費定價比第三級收費高出約 40%，以阻止過量及浪費用水。

註四：一九九二年前，商業用途的收費與住宅用戶第二級收費相同。自一九九二年起，商業用途的收費修訂至高於住宅用戶第二級收費水平，旨在減少對非住宅用戶的補貼。

註五：一九九二年前，建築用途的收費與住宅用戶第三級收費相同。自一九九二年起，建築用途的收費修訂至高於住宅用戶第三級收費水平，旨在減少對非住宅用戶的補貼。

註六：航運（非本地船隻）收費於一九九六年作出修訂，當時收費水平訂為高於每單位總生產成本的 40%，目的是阻止非本地船隻在香港取水。

註七：此等收費與商業用途收費相同。

Note 1. When the tariff structure was introduced in 1979, the charge for the second tier was to recover approximately the net unit production cost, which meant the full unit production cost (including a target rate of return on average net fixed assets (ANFA)) less the average contribution from rates per unit, calculated based on the quantity of the metered consumption. In 2021-22, the net unit production cost is $12.7, which is materially higher than the charging rate of $4.16, mainly because water tariffs have not been changed since 1995.

Note 2. When the tariff structure was introduced in 1979, the charge for the third tier was to recover approximately the full unit production cost, which meant the average production cost per unit (including a target rate of return on ANFA), calculated based on the quantity of the metered consumption. In 2021-22, the full unit production cost is $17.7, which is materially higher than the charging rate of $6.45, mainly because water tariffs have not been changed since 1995.

Note 3. The fourth tier is set about 40% higher than the third tier to discourage extravagant and wasteful use of water.

Note 4. Prior to 1992, the charging rate for trade purposes was equal to the second-tier rate for domestic purposes. Commencing from 1992, the charging rate for trade purposes was set higher than the second-tier rate for domestic purposes mainly to reduce the subsidy to non-domestic consumers.

Note 5. Prior to 1992, the charging rate for construction purposes was equal to the third-tier rate for domestic purposes. Commencing from 1992, the charging rate for construction purposes was set higher than the third-tier rate for domestic purposes mainly to reduce the subsidy to non-domestic consumers.

Note 6. The charging rate for shipping (non-local vessels) was last revised in 1996. At that time, it was set at 40% above the full unit production cost to discourage the taking of water in Hong Kong.

Note 7. These charging rates were set at the rate equal to the charging rate for trade purposes.

自一九九八至九九年度起，水務經營帳目包括各項補貼收入後仍錄得虧損，需依靠政府一般收入補助。二零二一至二二年度錄得虧損20.6億元，成本回收率為81.9%。政府會繼續定期檢討水費，審慎考慮各項因素，包括承擔能力、水務設施的財政表現、當時的經濟形勢，以及立法會議員的意見。

除水費外，《水務設施規例》（第102A章）亦列明25項法定收費項目。我們一直遵照政府的「用者自付」原則檢討這些收費項目，旨在悉數收回提供服務的成本。於二零一八至一九年度，25項法定收費項目已作調整，修訂自二零一九年三月二十九日起生效。

水費收入總覽

於二零二一至二二年度，約14%住宅用戶毋須支付任何水費；39%達到第二級水費，需繳付每單位4.16元水費；20%需繳付第三級水費，即每單位6.45元；餘下27%需繳付第四級水費，即每單位9.05元的水費。於二零二一至二二年度，280萬住宅用戶（包括無須繳付水費之用戶）的每月平均水費為52元。根據政府統計處的住戶開支統計調查，水費及排污費開支約相等於住戶每月平均開支的0.3%。

水費收入（按用戶類別劃分）

過去五年按用戶類別劃分的水費收入分析如下：

Waterworks operations, after including revenue from various contributons, have seen deficits since 1998-99, and thus are subsidised by the Government's General Revenue. In 2021-22, the deficit was $2,060.0M and the cost recovery rate was 81.9%. The Government continues to review the water tariff periodically, taking into consideration a number of factors, including affordability, financial performance of waterworks operations, the prevailing economic situation, and the views of Legislative Council members.

Other than water charges, there are 25 statutory fee items stipulated in the Waterworks Regulations (Cap. 102A). The WSD periodically review these fee items in accordance with the Government-wide "user pays" principle, which aims to recover the full cost of providing services. During the year 2018-19, 25 statutory fee items have been revised effective from 29 March 2019.

PROFILES OF THE REVENUE FROM WATER CHARGES

During this financial year, about 14% of domestic customers were not required to pay water charges, 39% paid up to the tier 2 rate of $4.16 per unit, 20% paid up to the tier 3 rate of $6.45 per unit, and 27% paid up to the tier 4 rate of $9.05 per unit. For the WSD's 2.8 million domestic customers, the average water charge in 2021-22, including those not required to pay any charge, was $52 per month. According to the Census & Statistics Department household expenditure survey, the water and sewage charges amount to about 0.3% of the average monthly household expenditure.

WATER CHARGES (BY SECTOR)

An analysis of the water charges by sector over the past five years is outlined as follows:

用戶類別 Sector	財政年度（百萬元） Financial Year ($million)					
	17/18	18/19	19/20	20/21	21/22	% (21/22)
商業 Trade	970	974	727(905)	277(828)	**298(890)**	**12.7(29.7)**
住宅 Domestic	1,552	1,556	1,643(1,643)	1,867(1,867)	**1,768(1,768)**	**75.0(58.9)**
政府 Government	156	164	172(172)	148(148)	**162(162)**	**6.9(5.4)**
其他# Others#	195	187	165(182)	125(177)	**128(180)**	**5.4(6.0)**
總收入 Total	2,873	2,881	2,707(2,902)	2,417(3,020)	**2,356(3,000)**	**100.0(100.0)**

包括沖廁用淡水
Includes fresh water for flushing

括號內數字為實際水費收入加上水費寬減額。
Figures in brackets are actual water charges received plus concession.

收入及開支分析

水費收入包括一般水費、各項收費、牌費，以及可收回支出的工程費用。在編製水務賬目時，會以應計賬目基準呈列財務表現及狀況，其中包括各項非現金收入項目，主要為差餉補貼、免費用水補貼及政府用水。總運作成本主要包括員工開支、購買東江水的成本、折舊、運作及行政開支。過去五年的收入及開支分析如下：

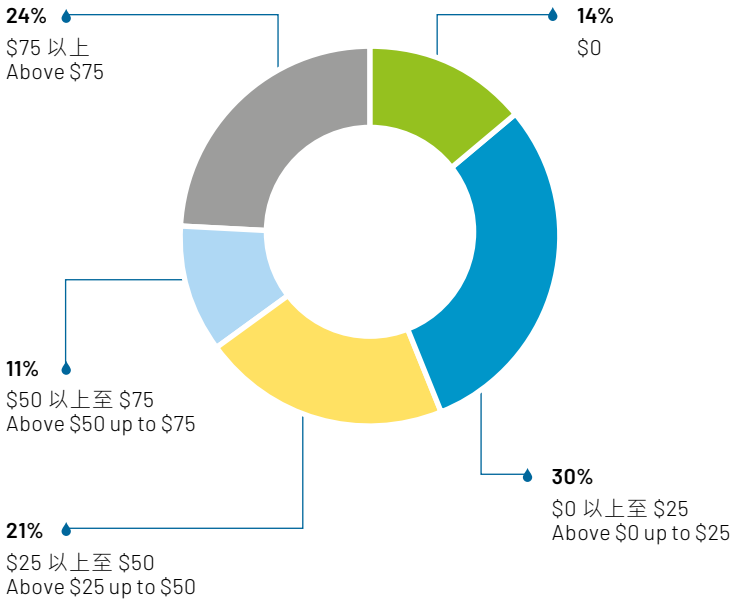
ANALYSIS OF REVENUE AND EXPENDITURE

Revenue collections include chargeable water supplies, fees, licences, and reimbursable works. In preparing the Waterworks Operating Accounts which present the WSD's financial results and positions on an accrual accounting basis, the revenues include non-cash items, mainly contributions from rates, contributions on free allowance, and water supplies to Government establishments. The total operating costs include mainly staff costs, Dongjiang water purchase costs, depreciation, operating and administration expenses. An analysis of the revenue and expenditure over the past five years is as follows:

收入（百萬元）
Revenue ($million)

財政年度 Financial Year	17/18	18/19	19/20	20/21	21/22
一般水費 Chargeable Supplies	2,716.9	2,717.2	2,534.8	2,268.5	**2,193.6**
差餉補貼 Contribution from Rates	3,330.1	2,574.8	3,146.7	2,856.4	**2,888.1**
差餉寬減補貼 Contribution on Concession of Rates	1,611.9	2,665.0	2,340.3	2,622.2	**2,252.6**
水費寬減補貼 Contribution on Concession of Water Charges	-	-	195.2	603.3	**644.5**
免費用水補貼 Contribution on Free Allowance	1,048.6	1,055.0	1,083.3	1,129.8	**1,171.5**
政府用水 Supplies to Government Establishments	156.0	163.8	172.0	148.3	**162.1**
各項收費、存款利息及其他 Fees, charges, interest from deposits and others	42.6	60.3	72.6	35.4	**28.5**
總額 Total	8,906.1	9,236.1	9,544.9	9,663.9	**9,340.9**

二零二一/二二年度住宅用戶每月水費分佈圖
Distribution of Household Average Monthly Bills 2021/22



開支（百萬元）
Expenditures ($million)

財政年度 Financial Year	17/18	18/19	19/20	20/21	21/22
員工開支 Staff costs	1,917.1	2,077.9	2,195.0	2,042.7	**1,973.0**
運作及行政開支 Operating and administration expenses	2,024.1	2,023.6	2,094.1	2,453.7	**2,389.8**
購買東江水的成本 Purchase cost of Dongjiang water	4,782.2	4,796.5	4,810.9	4,821.4	**4,856.6**
折舊 Depreciation	1,917.1	2,013.6	2,120.5	2,171.2	**2,181.5**
總額 Total	10,640.5	10,911.6	11,220.5	11,489.0	**11,400.9**

本署致力以符合成本效益的方式提供服務，並在固定資產、設備、資訊科技及人力資源方面投入大量資源，藉此提高運作效益及員工生產力，務求滿足市民對更優質服務的需求。社會大眾以及我們的用戶可以放心，我們會實行嚴謹的財務紀律，在提供優質服務滿足用戶需要之餘，不忘提升成本效益。這是我們實現抱負和使命的基本法則。

The WSD is committed to providing services as cost effectively as possible, and has made substantial investments in fixed assets, equipment, information technology and human resources to improve operational efficiency and staff productivity to meet the public's demand for a higher quality of services. Our customers and the public at large can rest assured that the WSD will exercise strict financial discipline and be very cost conscientious in delivering quality services to meet customer demands. This is the WSD's underlying approach to achieve its vision and missions.

水務 - 經營帳目

二零二一/二零二二年度回顧

截至二零二二年三月三十一日止的財政年度

工作方面 Activities
按照水錶記錄的淡水耗水量上升0.1%至6.77億立方米 Metered fresh water consumption increased by 0.1% to 677 million cubic metres

WATERWORKS – OPERATING ACCOUNTS

REVIEW OF THE YEAR 2021-22

For the year ended 31 March 2022

財務表現 Financial Performance
收入下降3.3% Revenue decreased by 3.3%
開支下降0.8% Expenditure decreased by 0.8%
税後虧損由二零二零/二一年度的18.251億元升至二零二一/二二年度的20.6億元 Deficit after taxation increased from $1,825.1 million in 2020-21 to $2,060.0 million in 2021-22
按固定資產平均淨值計算的回報率由二零二零/二一年度的-2.7%降至二零二一/二二年度的-2.9% Return on Average Net Fixed Assets decreased from -2.7% in 2020-21 to -2.9% in 2021-22

經營帳目

截至二零二二年三月三十一日止的財政年度

OPERATING ACCOUNTS

For the year ended 31 March 2022

		註 Note	2022(百萬元)$M	2021(百萬元)$M
收入	Revenue	2	**9,340.9**	9,663.9
開支	Expenditure	3	**11,400.9**	11,489.0
税前虧損	**Deficit before taxation**		**(2,060.0)**	(1,825.1)
税項	Taxation	1(e), 1(f), 4	**-**	-
税後虧損	**Deficit after taxation**	1(j)	**(2,060.0)**	(1,825.1)

附註為這帳目的一部分。 The annexed notes form part of these accounts.

衡量財務表現的指標

截至二零二二年三月三十一日止的財政年度

FINANCIAL PERFORMANCE MEASURES

For the year ended 31 March 2022

		註 Note	2022 (百萬元) $M	2021 (百萬元) $M
固定資產平均淨值	Average net fixed assets (ANFA)	1(i), 5	**70,301.0**	67,001.5
實際回報額	Actual return		**(2,060.0)**	(1,825.1)
目標回報額	Target return		**1,827.8**	1,742.0
按固定資產平均淨值計算的實際回報率	Actual return as % of ANFA	1(h)	**(2.9%)**	(2.7%)
按固定資產平均淨值計算的目標回報率	Target return as % of ANFA		**2.6%**	2.6%

附註為這帳目的一部分。 The annexed notes form part of these accounts.

財務狀況表

截至二零二二年三月三十一日止的財政年度

STATEMENT OF FINANCIAL POSITION

For the year ended 31 March 2022

		註 Note	2022 (百萬元) $M	2021 (百萬元) $M
可動用淨資產	**Net assets employed**			
固定資產	**Fixed assets**	1(b),1(c), 5	**72,235.8**	68,366.2
流動資產	Current assets	1(d), 6	**2,894.1**	2,915.4
流動負債	Current liabilities	7	**(2,838.5)**	(2,819.3)
流動資產淨值	**Net current assets**		**55.6**	96.1
			72,291.4	68,462.3
財政來源	**Financed by**			
公共資本帳目	**Public capital account**	1(j), 8	**72,291.4**	68,462.3

附註為這帳目的一部分。 The annexed notes form part of these accounts.

帳目附註

1. 會計政策

(a) 會計基礎

此帳目是根據歷史成本基礎來制定，並略加修訂以包括名義的收支。

(b) 固定資產

(i) 除政府收回的土地外，固定資產不包括水務設施和集水區位處的土地。至於政府收回的土地，其收回成本已包括在有關的工程成本內。

(ii) 至於工程項目，成本包括實際直接開支，和施工期間有關設計、規劃和監督等的員工開支。

(iii) 所有其他固定資產，除了建造中的資產以成本值計算外，均以其成本值減去累積折舊列出。

(c) 折舊

(i) 折舊是根據固定資產成本值減去使用期末的剩餘值，採用直線攤銷法按其預計使用年期分期攤銷。每年折舊率為：

隧道、堤壩、收回土地及造林等	1%
土木工程	2%
喉管 — 淡水	2%
— 海水	5%
機電工程、機器及設備	4%-20%
水錶	8.33%
電腦硬件、軟件及系統	10%-33.33%
車輛	10%-20%

(ii) 建造中的資產並沒有折舊撥備。

Notes to the Accounts

1. Accounting Policies

(a) Basis of Accounting

The accounts have been prepared on the historical cost basis of accounting, modified to include notional receipts and payments.

(b) Fixed Assets

(i) No cost is included for land which is occupied by installations or sterilised by catchment areas except that, where it has been resumed, the cost of resumption has been included in the capital cost of the project concerned.

(ii) For capital projects, the costs include the actual direct expenditure and staff costs for design, planning and supervision during the construction period.

(iii) All other fixed assets are stated at cost less accumulated depreciation except assets under construction which are stated at cost.

(c) Depreciation

(i) Depreciation is provided on a straight-line basis to amortise the cost of fixed assets less residual value over their estimated useful lives. The annual rates of depreciation used are:

Tunnels, dams, resumption and afforestation, etc.	1%
Civil engineering works	2%
Water mains – fresh	2%
– salt	5%
Mechanical/electrical works, plant and machinery	4%-20%
Meters	8.33%
Computer hardware, software and system	10%-33.33%
Motor vehicles	10%-20%

(ii) No depreciation is provided on assets under construction.

(d) 現有存貨

重要的現有存貨以加權平均法，按成本值計值。

(e) 稅項

名義利得稅乃按年度預期的應課溢利，以報告期末日期的現行稅率，及過往年度的應付稅項調整而作出所需要的撥備。由於這項公用事業於本年度沒有應課稅溢利，因此無需在帳目上作出名義利得稅的撥備。

(f) 遞延稅項

遞延稅項指就資產及負債帳面值與計算應課稅溢利所用相應稅基間之所有重大暫時差額而作出的適當確認。遞延稅項資產則於應課稅溢利有可能抵銷可扣稅暫時差額時予以確認。由於這項公用事業沒有應課稅溢利可用作抵銷可扣稅暫時差額，因此無需在帳目上就所有重大暫時差額作出遞延稅項撥備。

(g) 僱員福利

僱員福利（包括薪金、酬金、退休金、房屋津貼和年假）會被確認為對僱員當年度所提供之相關服務而列作應計開支。

(h) 按固定資產平均淨值計算的實際回報率

按稅後溢利或虧損與固定資產平均淨值的比率計算。

(i) 固定資產平均淨值

固定資產平均淨值是指總固定資產值減去累積折舊在期初及期末兩項數值的簡單平均數。

(j) 虧損

由於水務監督沒有獨立的法定身份，其財政資源均視為政府一般收入的一部分，而有關虧損亦會於這項公用事業的公共資本帳目中調節。

(d) Stocks in Hand

Stocks in Hand are valued at cost using the weighted average cost method to the extent that they are material.

(e) Taxation

Notional profits tax is provided, where necessary, based on the expected taxable surplus for the year, using the tax rates prevailing at the reporting period end date, and any adjustment to tax payable in respect of previous years. No provision for notional profits tax has been made in the accounts, as the utility has no taxable surplus for the year.

(f) Deferred Tax

Deferred tax is recognised, where appropriate, for all material temporary differences between the tax bases of assets and liabilities and their carrying amounts in the accounts. Deferred tax assets are recognised to the extent that it is probable that taxable surplus will be available against which the temporary differences can be utilised. No provision for deferred tax in respect of all material temporary differences has been made in the accounts, as the utility has no taxable surplus against which the temporary differences can be utilised.

(g) Employee Benefits

Employee benefits, including salaries, gratuities, pensions, housing benefits and annual leave, are accrued and recognised as an expense in the year in which the associated services are rendered by employees.

(h) Actual Return on ANFA

This is calculated as a percentage of surplus/deficit after taxation to average net fixed assets (ANFA).

(i) Average Net Fixed Assets

The average net fixed assets (ANFA) represents the simple average of the opening and closing value of total fixed assets less accumulated depreciation.

(j) Deficit

Since the Water Authority does not have a separate legal identity, its financial resources form part of the General Revenue. All deficits are deemed to be financed by the General Revenue and adjusted to the Public Capital Account of the utility.

2. 收入

2. Revenue

		2022(百萬元)$M	2021(百萬元)$M
收費供水	Chargeable supplies	**2,193.6**	2,268.5
差餉補貼	Contribution from rates	**2,888.1**	2,856.4
政府對寬減計劃的補貼	Contribution from Government on concessions	**2,897.1**	3,225.5
政府為用戶提供免費用水的補貼	Contribution from Government on free allowance to consumers	**1,171.5**	1,129.8
政府樓宇用水	Supplies to Government establishments	**162.1**	148.3
收費、牌照及可收回支出的工程	Fees, licences and reimbursable works	**25.7**	25.3
存款利息	Interest from deposits	**2.8**	10.1
		9,340.9	9,663.9

政府對寬減計劃的補貼包括差餉及水費兩部分：

(i) 政府對二零二零/二一年度及二零二一/二二年度的差餉寬減計劃的補貼分別為26.222億元及22.526億元，以彌補於該年度因實行差餉寬減措施而造成的差額；及

(ii) 政府對二零二零/二一年度及二零二一/二二年度的水費寬減計劃的補貼分別為6.033億元及6.445億元，以彌補於二零二零年四月一日至二零二二年三月三十一日因實行非住宅用戶的淡水收費寬減措施而造成的差額。

政府為用戶提供免費用水補貼的計算方法，是把二零二零/二一年度及二零二一/二二年度分別為12.2元和12.7元的淡水每單位淨生產成本（已包括按固定資產平均淨值計算的目標回報額，在相關年度分別為每單位2.6元和2.8元），乘以按照水錶記錄淡水耗用量內的免費用水補貼用量。

The Government contribution on concessions comprises two parts:

(i) contribution from Government on concession of rates of $2,622.2M in 2020-21 and $2,252.6M in 2021-22 to cover the shortfall in contribution from rates resulting from the concession of rates granted during the years; and

(ii) contribution from Government on concession of water charges of $603.3M in 2020-21 and $644.5M in 2021-22 to cover the shortfall in chargeable supplies resulting from concession of water charges for fresh water consumption for non-domestic purposes from 1 April 2020 to 31 March 2022.

The calculation of Government contribution on free allowance to consumers is based on the fresh water net unit production cost of $12.2 and $12.7 for the years 2020-21 and 2021-22 respectively, which has included a target return on ANFA of $2.6 and $2.8 per unit for the respective years, multiplied by the quantity of metered fresh water consumption within the free allowance quantity.

3. 開支

3. Expenditure

		2022 (百萬元) $M	2021 (百萬元) $M
員工開支	Staff costs*	**1,973.0**	2,042.7
運作及行政開支	Operating and administration expenses*	**2,389.8**	2,453.7
購買東江水的成本	Dongjiang water purchase cost	**4,856.6**	4,821.4
折舊	Depreciation	**2,181.5**	2,171.2
		11,400.9	11,489.0

* 帳目不包括「防疫抗疫基金」撥款推行的創造職位計劃所涉及的開支。
* The expenditure relating to Job Creation Scheme funded under the Anti-epidemic Fund have been excluded.

4. 稅項

4. Taxation

		2022 (百萬元) $M	2021 (百萬元) $M
名義利得稅	Notional profits tax charge for the year	**0.0**	0.0
以下項目的遞延稅項資產/（負債）未被確認： 未使用的稅項虧損	Deferred tax assets/(liabilities) not recognized in respect of: Unused tax loss	**49,920.4**	46,432.0
由折舊免稅額所產生的重大暫時差異	Material temporary difference arising from depreciation allowances	**(29,025.8)**	(27,579.9)

5. 固定資產

5. Fixed Assets

		樓宇、過濾器、喉管等 Buildings, Filters, Mains, etc. (百萬元)$M	機器及設備 Plant and Machinery (百萬元)$M	電腦硬件、軟件及系統 Computer Hardware, Software & System (百萬元)$M	海水沖廁設施 Salt Water Flushing (百萬元)$M	船灣淡水湖 Plover Cove (百萬元)$M	萬宜水庫 High Island (百萬元)$M	水錶 Meters (百萬元)$M	車輛 Motor Vehicles (百萬元)$M	建造中的資產 Assets Under Construction (百萬元)$M	總額 Total (百萬元)$M
成本	**Cost**										
二零二一年四月一日	At 1 April 2021	71,968.3	298.3	463.2	15,033.4	702.0	1,661.2	474.2	106.2	8,965.4	99,672.2
添置	Additions	-	5.2	11.6	-	-	-	-	3.1	6,052.1	6,072.0
轉撥	Transfers	1,193.2	-	18.2	178.8	-	-	-	2.8	(1,393.0)	-
處置/ 註銷	Disposals/ Write off	(1.4)	(69.3)	(1.8)	(0.5)	-	-	(12.9)	(6.0)	(19.2)	(111.1)
二零二二年三月三十一日	**At 31 March 2022**	**73,160.1**	**234.2**	**491.2**	**15,211.7**	**702.0**	**1,661.2**	**461.3**	**106.1**	**13,605.3**	**105,633.1**
累積折舊	**Accumulated Depreciation**										
二零二一年四月一日	At 1 April 2021	21,644.3	222.6	377.3	6,912.6	485.8	1,274.0	332.2	57.2	-	31,306.0
該年折舊	Charge for the year	1,523.2	11.4	17.4	549.9	9.3	28.6	31.1	10.6	-	2,181.5
處置/註銷後轉回	Written back on Disposals/Write off	(1.1)	(69.1)	(0.9)	(0.5)	-	-	(12.9)	(5.7)	-	(90.2)
二零二二年三月三十一日	**At 31 March 2022**	**23,166.4**	**164.9**	**393.8**	**7,462.0**	**495.1**	**1,302.6**	**350.4**	**62.1**	**-**	**33,397.3**
帳面淨值	**Net Book Value**										
二零二二年三月三十一日	**At 31 March 2022**	**49,993.7**	**69.3**	**97.4**	**7,749.7**	**206.9**	**358.6**	**110.9**	**44.0**	**13,605.3**	**72,235.8**
二零二一年三月三十一日	At 31 March 2021	50,324.0	75.7	85.9	8,120.8	216.2	387.2	142.0	49.0	8,965.4	68,366.2

帳目不包括搬遷食水及海水配水庫和濾水廠往岩洞工程項目的資本開支。
The capital expenditure relating to the relocation of fresh water and salt water service reservoirs and water treatment works into caverns have been excluded.

6. 流動資產

6. Current Assets

		2022 (百萬元) $M	2021 (百萬元) $M
現有存貨	Stocks in Hand	**157.5**	158.3
應收帳項	Debtors	**398.9**	424.0
與庫務署的往來帳	Current Account with Treasury	**2,337.7**	2,333.1
		2,894.1	2,915.4

7. 流動負債

7. Current Liabilities

		2022 (百萬元) $M	2021 (百萬元) $M
用戶和承建商的按金	Consumers' and contractors' deposits	**2,327.7**	2,323.1
應付帳項	Creditors	**510.8**	496.2
		2,838.5	2,819.3

8. 公共資本帳目

公共資本帳目指政府在這項公用事業的投資。

8. Public Capital Account

The Public Capital Account represents the Government's investment in this utility.

		2022 (百萬元) $M	2021 (百萬元) $M
四月一日結餘	Balance as of 1 April	**68,462.3**	65,864.0
本年度的虧損	Deficit for the year	**(2,060.0)**	(1,825.1)
政府的額外現金投資	Additional cash investment by the Government	**5,889.1**	4,423.4
三月三十一日結餘	**Balance as at 31 March**	**72,291.4**	**68,462.3**

9. 承擔

於二零二二年三月三十一日及二零二一年三月三十一日，未於經營帳目作出撥備的未償還承擔如下：

9. Commitments

Outstanding commitments as at 31 March 2022 and 31 March 2021 not provided for in the operating accounts were as follows:

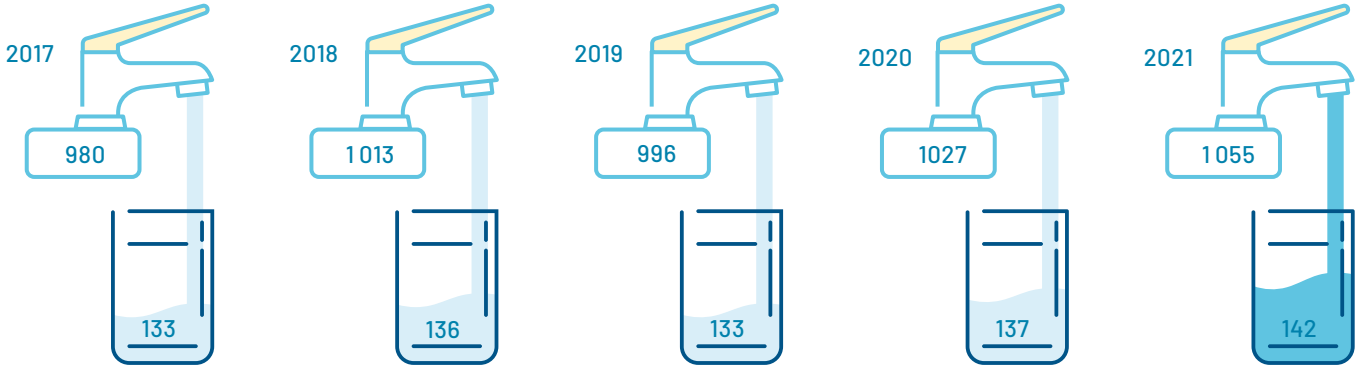
		2022 (百萬元) $M	2021 (百萬元) $M
(i) 基本工程項目、物業、機器及設備以及非經常資助金	(i) Capital works projects, property, plant and equipment and capital subvention	**29,391.8**	26,619.7
(ii) 非經常性開支	(ii) Non-recurrent expenditure	**-**	-
(iii) 投資	(iii) Investments	**-**	-
(iv) 貸款及非經常性撥款補助金	(iv) Loans and non-recurrent grants	**-**	-
三月三十一日結餘	**Balance as at 31 March**	**29,391.8**	**26,619.7**

數據一覽

二零一七至二一年全年食水用量及人均用水量

全年食水用量
Annual Fresh Water Consumption
（百萬立方米 million m^3）

人均用水量 *
Per Capita Consumption*
（立方米/每年 m^3 per year）



DATA SUMMARY

Annual Fresh Water Consumption and Per Capita Consumption 2017 – 2021

二零一七至二一年全港人口及獲食水供應人口

Population in Hong Kong and Population Served with Fresh Water 2017 - 2021

年份 Year	2017	2018	2019	2020	2021
全港人口*（百萬） **Population in Hong Kong*** (million)	7.39	7.45	7.51	7.48	**7.41**
獲食水供應人口（百萬） **Population served with fresh water** (million)	7.39#	7.45#	7.51#	7.48#	**7.41#**

* 根據政府統計處公佈的年中人口數字。
* Based on the mid-year population figures released by the Census and Statistics Department.

全港超過 99.9% 人口獲食水供應。
Over 99.9% of the population in Hong Kong is served with fresh water.

二零一七至二一年全年海水用量及獲海水供應人口

Annual Salt Water Consumption and Population Served with Salt Water 2017 – 2021

年份 Year	2017	2018	2019	2020	2021
全年海水用量（百萬立方米） **Annual Salt Water Consumption** (million m^3)	278	279	307	318	**321**
獲海水供應人口（百萬） **Population Served with Salt Water** (million)	6.22	6.27	6.33	6.31*	**6.27***

* 在二零二一年，儘管沖廁用海水供應網絡的覆蓋率輕微上升，但由於全港人口下跌，獲海水供應人口相比二零二零年亦因而有所減少。

* In 2021, notwithstanding the slight increase in the network coverage of salt water supply for flushing, the population served with salt water is less than that in 2020 due to the decline in Hong Kong's population.

二零二一年四月至二零二二年三月的食水水質

香港特別行政區政府於二零二一年四月二十二日公布了最新的香港食水標準，當中包括 60 項水質參數。市民可參閱水務署網頁了解香港食水標準。

政府亦訂立了食水感官準則，以確保食水的外觀、味道和氣味等感官質量。

所有食水樣本是從濾水廠、配水庫、食水缸、供水接駁點及用戶水龍頭抽取。

這時段內供應至客戶的香港食水水質達標率躋身世界發達國家及城市前列，食水水質優良。

Drinking Water Quality for the Period of April 2021 - March 2022

The Government of the Hong Kong Special Administrative Region promulgated on 22 April 2021 the latest Hong Kong Drinking Water Standards ("HKDWS") which includes 60 water quality parameters. The public may visit the WSD website for information on HKDWS.

The Government has also established the Aesthetic Guidelines ("AG") in ensuring the aesthetic quality, such as the taste and odour, of the drinking water in Hong Kong.

Drinking water samples were taken at water treatment works, service reservoirs, fresh water tanks, connection points and consumers' taps.

The compliance rate of the quality of drinking water supplied to customers in Hong Kong during this period is high amongst developed countries and cities and the drinking water is of excellent quality.

甲、香港食水標準
Part A. Hong Kong Drinking Water Standards

參數	Parameter	單位 Unit	監測結果 Monitoring Data (04/2021 - 03/2022) 最低值 Minimum	最高值 Maximum	平均值 Average	香港 食水標準 HKDWS	達標(註釋 1) Compliance(Note 1)
艾氏劑和狄氏劑	Aldrin & dieldrin	微克/公升 µg/L	< 0.008	< 0.008	< 0.008	≤ 0.03	✓
銻	Antimony	毫克/公升 mg/L	< 0.001	< 0.001	< 0.001	≤ 0.02	✓
砷	Arsenic	毫克/公升 mg/L	< 0.001	0.003	< 0.001	≤ 0.01	✓
鋇	Barium	毫克/公升 mg/L	0.003	0.037	0.017	≤ 1.3	✓
苯	Benzene	微克/公升 µg/L	< 2.5	< 2.5	< 2.5	≤ 10	✓
苯并[a]芘	Benzo[a]pyrene	微克/公升 µg/L	< 0.002	< 0.002	< 0.002	≤ 0.7	✓
硼	Boron	毫克/公升 mg/L	< 0.02	0.09	0.04	≤ 2.4	✓
溴酸鹽	Bromate	微克/公升 µg/L	< 1	2.1	< 1	≤ 10	✓
一溴二氯甲烷	Bromodichloromethane	微克/公升 µg/L	< 15	21	< 15	≤ 60	✓

參數	Parameter	單位 Unit	監測結果 Monitoring Data (04/2021 - 03/2022) 最低值 Minimum	最高值 Maximum	平均值 Average	香港 食水標準 HKDWS	達標(註釋 1) Compliance(Note 1)
溴仿	Bromoform	微克/公升 μg/L	< 25	< 25	< 25	≤ 100	✓
鎘	Cadmium	毫克/公升 mg/L	< 0.001	0.001	< 0.001	≤ 0.003	✓
四氯化碳	Carbon tetrachloride	微克/公升 μg/L	< 0.5	< 0.5	< 0.5	≤ 4	✓
氯酸鹽	Chlorate	微克/公升 μg/L	< 10	150	35	≤ 300	✓
氯丹	Chlordane	微克/公升 μg/L	< 0.05	< 0.05	< 0.05	≤ 0.2	✓
氯	Chlorine	毫克/公升 mg/L	< 0.1	1.5	0.7	≤ 5	✓
亞氯酸鹽	Chlorite	微克/公升 μg/L	< 10	< 10	< 10	≤ 700	✓
氯仿	Chloroform	微克/公升 μg/L	< 50	< 50	< 50	≤ 300	✓
鉻	Chromium	毫克/公升 mg/L	< 0.001	0.015	< 0.001	≤ 0.05	✓
銅	Copper	毫克/公升 mg/L	< 0.003	0.62	0.024	≤ 2	✓
二(2-乙基己基)鄰苯二甲酸鹽	Di(2-ethylhexyl)phthalate	微克/公升 μg/L	< 2	< 2	< 2	≤ 8	✓
二溴乙腈	Dibromoacetonitrile	微克/公升 μg/L	< 0.5	1.1	< 0.5	≤ 70	✓
二溴一氯甲烷	Dibromochloromethane	微克/公升 μg/L	< 25	< 25	< 25	≤ 100	✓
1,2-二溴-3-氯丙烷	1,2-Dibromo-3-chloropropane	微克/公升 μg/L	< 0.25	< 0.25	< 0.25	≤ 1	✓
1,2-二溴乙烷	1,2-Dibromoethane	微克/公升 μg/L	< 0.1	< 0.1	< 0.1	≤ 0.4	✓
二氯乙酸鹽	Dichloroacetate	微克/公升 μg/L	< 2	17	5.5	≤ 40	✓
二氯乙腈	Dichloroacetonitrile	微克/公升 μg/L	< 2.5	3.3	< 2.5	≤ 20	✓
1,4-二氯苯	1,4-Dichlorobenzene	微克/公升 μg/L	< 75	< 75	< 75	≤ 300	✓
1,2-二氯乙烷	1,2-Dichloroethane	微克/公升 μg/L	< 7.5	< 7.5	< 7.5	≤ 30	✓
二氯甲烷	Dichloromethane	微克/公升 μg/L	< 5	< 5	< 5	≤ 20	✓

參數	Parameter	單位 Unit	監測結果 Monitoring Data (04/2021 - 03/2022) 最低值 Minimum	最高值 Maximum	平均值 Average	香港 食水標準 HKDWS	達標(註釋 1) Compliance(Note 1)
1,4-二噁烷	1,4-Dioxane	微克/公升 μg/L	< 1.5	2.5	< 1.5	≤ 50	✓
異狄氏劑	Endrin	微克/公升 μg/L	< 0.15	< 0.15	< 0.15	≤ 0.6	✓
乙苯	Ethylbenzene	微克/公升 μg/L	< 75	< 75	< 75	≤ 300	✓
氟化物	Fluoride	毫克/公升 mg/L	< 0.1	0.60	0.49	≤ 1.5	✓
六氯丁二烯	Hexachlorobutadiene	微克/公升 μg/L	< 0.15	< 0.15	< 0.15	≤ 0.6	✓
鉛	Lead	毫克/公升 mg/L	< 0.001	0.009	< 0.001	≤ 0.01	✓
林丹	Lindane	微克/公升 μg/L	< 0.5	< 0.5	< 0.5	≤ 2	✓
汞	Mercury	毫克/公升 mg/L	< 0.00005	< 0.00005	< 0.00005	≤ 0.006	✓
甲氧毒草安	Metolachlor	微克/公升 μg/L	< 2.5	< 2.5	< 2.5	≤ 10	✓
微囊藻毒素-LR	Microcystin-LR	微克/公升 μg/L	< 0.5	< 0.5	< 0.5	≤ 1	✓
禾草特	Molinate	微克/公升 μg/L	< 1.5	< 1.5	< 1.5	≤ 6	✓
一氯乙酸鹽	Monochloroacetate	微克/公升 μg/L	< 2	< 2	< 2	≤ 20	✓
鎳	Nickel	毫克/公升 mg/L	< 0.001	0.044	0.003	≤ 0.07	✓
硝酸鹽 (以 NO_3- 計)	Nitrate (as NO_3-)	毫克/公升 mg/L	< 2.5	17	5.2	≤ 50	✓
亞硝酸鹽 (以 NO_2- 計)	Nitrite (as NO_2-)	毫克/公升 mg/L	< 0.004	0.015	< 0.004	≤ 3	✓
N-亞硝基二甲胺	N-Nitrosodimethylamine	微克/公升 μg/L	< 0.025	< 0.025	< 0.025	≤ 0.1	✓
高氯酸鹽	Perchlorate	微克/公升 μg/L	< 1	11	1.2	≤ 70	✓
硒	Selenium	毫克/公升 mg/L	< 0.003	< 0.003	< 0.003	≤ 0.04	✓
西瑪三嗪	Simazine	微克/公升 μg/L	< 0.5	< 0.5	< 0.5	≤ 2	✓
苯乙烯	Styrene	微克/公升 μg/L	< 5	< 5	< 5	≤ 20	✓

參數	Parameter	單位 Unit	監測結果 Monitoring Data (04/2021 - 03/2022) 最低值 Minimum	最高值 Maximum	平均值 Average	香港 食水標準 HKDWS	達標(註釋 1) Compliance(Note 1)
特丁津	Terbuthylazine	微克/公升 μg/L	< 1.8	< 1.8	< 1.8	≤ 7	✓
四氯乙烯	Tetrachloroethene	微克/公升 μg/L	< 10	< 10	< 10	≤ 40	✓
甲苯	Toluene	微克/公升 μg/L	< 175	< 175	< 175	≤ 700	✓
總三鹵甲烷	Total trihalomethanes	比率總和(註釋2) sum ratio(Note 2)	0	0.56	0.23	比率總和 ≤ 1 sum ratio ≤ 1	✓
三氯乙酸鹽	Trichloroacetate	微克/公升 μg/L	< 2	15	4.2	≤ 200	✓
氟樂靈	Trifluralin	微克/公升 μg/L	< 5	< 5	< 5	≤ 20	✓
鈾	Uranium	毫克/公升 mg/L	< 0.0002	0.0005	< 0.0002	≤ 0.03	✓
二甲苯	Xylenes	微克/公升 μg/L	< 125	< 125	< 125	≤ 500	✓
總 α 活度	Gross alpha (α) activity	貝可/公升 Bq/L	< 0.1	0.1	< 0.1	≤ 0.5	✓
總 β 活度	Gross beta (β) activity	貝可/公升 Bq/L	< 0.2	0.2	< 0.2	≤ 1.0	✓
埃希氏大腸桿菌	Escherichia coli	菌落數/100毫升 cfu/100mL	0	1	0	0	註釋 3 Note 3

註釋

1. "✓" 表示這時段內抽取的食水樣本的食水水質均完全符合香港食水標準。
2. 總三鹵甲烷的比率總和不得超出 1，其計算方式如下：

$$\frac{\text{溴仿含量}}{\text{其香港食水標準值}} + \frac{\text{一溴二氯甲烷含量}}{\text{其香港食水標準值}} + \frac{\text{二溴一氯甲烷含量}}{\text{其香港食水標準值}} + \frac{\text{氯仿含量}}{\text{其香港食水標準值}}$$

3. 於 2021 年 9 月底在恆常水質監測期間中發現一個不達標的樣本。水務署已即時採取了適當的跟進行動並提供臨時食水。於 10 月 6 日完成清洗供水系統並從該系統的水樣本確認不含埃希氏大腸桿菌，水質符合香港食水標準，適合飲用。本報告涵蓋期內，埃希氏大腸桿菌的達標率為 99.996%。

Notes

1. "✓" indicates full compliance of drinking water quality with the HKDWS in all water samples taken during this period.
2. Sum ratio of total trihalomethanes should not exceed 1, as calculated by:

$$\frac{\text{Bromoform}}{\text{its HKDWS}} + \frac{\text{Bromodichloromethane}}{\text{its HKDWS}} + \frac{\text{Dibromochloromethane}}{\text{its HKDWS}} + \frac{\text{chloroform}}{\text{its HKDWS}}$$

3. One non-compliant sample was found in late September 2021 during the routine monitoring of drinking water quality. Appropriate follow-up actions were taken immediately and temporary water supply was provided. On 6 October 2021 cleaning work of the supply system was completed and test results of water samples collected from the system confirmed no presence of Escherichia coli. The water quality is in compliance with the HKDWS and fit for consumption. The compliance rate of Escherichia coli during the reporting period is 99.996%.

乙、感官準則
Part B. Aesthetic Guidelines

參數	Parameter	單位 Unit	監測結果(註釋1) Monitoring Data(Note 1) (04/2021 - 03/2022) 最低值 Minimum	最高值 Maximum	平均值 Average	準則值 Guideline Value	達標(註釋 2) Compliance(Note 2)
鋁	Aluminium	毫克/公升 mg/L	< 0.01	0.20	0.03	≤ 0.2	✓
色度	Colour	Hazen	< 5	< 5	< 5	≤ 15	✓
鐵	Iron	毫克/公升 mg/L	< 0.01	0.18	< 0.01	≤ 0.3	✓
錳	Manganese	毫克/公升 mg/L	< 0.01	0.03	< 0.01	≤ 0.08 註釋3 Note 3	✓
2-甲基異莰醇	2-Methyl-isoborneol (MIB)	納克/公升 ng/L	< 5	38	8.2	≤ 50	✓
氣味	Odour	–	無異味 Unobjectionable			無異味 Unobjectionable	✓
酸鹼值(水溫25℃時)	pH at 25 ℃	–	6.6	9.1	8.3	6.5 - 9.5	✓
味道	Taste	–	無異味 Unobjectionable			無異味 Unobjectionable	✓
混濁度	Turbidity	NTU	< 0.1	6.8	0.2	≤ 3	✓
鋅	Zinc	毫克/公升 mg/L	< 0.01	0.15	< 0.01	≤ 1.5	✓

註釋

1. 以上參數是有關香港食水的感官質量。水質超過感官準則值一般不會導致健康問題，但可能會導致較差的感官質量。
2. "✓" 表示這時段內抽取的食水樣本的食水水質均完全符合感官準則。
3. 錳的準則值於 2022 年 3 月 10 日起由 <0.1 毫克/公升更新為 <0.08 毫克/公升。
4. 於 2021 年 5 月 4 日、5 月 11 日和 10 月 25 日，在恆常水質監測期間的三個食水樣本錄得混濁度分別為 6.8 NTU、3.5 NTU 及 3.3 NTU。水務署已即時採取了適當的跟進行動。分別在 2021 年 5 月 5 日、5 月 12 日和 10 月 25 日所抽取的食水樣本確認相關供水系統的混濁度已恢復正常並符合感官準則。本報告涵蓋期內，混濁度的達標率為 99.991%。

Notes

1. The above parameters relate to the aesthetic quality of drinking water in Hong Kong. The exceedance of which could cause objectionable aesthetic effects but will not cause health concerns in general.
2. "✓" indicates full compliance of drinking water quality with the AG in all water samples taken during this period.
3. The guideline value of manganese was updated from <0.1 mg/L to <0.08 mg/L on 10 March 2022.
4. Turbidities of 6.8 NTU, 3.5 NTU and 3.3 NTU were found in three drinking water samples collected on 4 May, 11 May and 25 October 2021 respectively, during the routine monitoring of the drinking water quality. Appropriate follow-up actions were taken immediately. Water samples collected on 5 May, 12 May and 25 October 2021 respectively, confirmed that turbidity levels of the relevant water supply systems resumed normal and were in compliance with the AG. The compliance rate of turbidity during this reporting period is 99.991%.

丙、香港食水的一般特性
Part C. General Properties of the Drinking Water in Hong Kong

參數	Parameter	單位 Unit	監測結果(註釋1) Monitoring Data(Note 1) (04/2021 - 03/2022) 最低值 Minimum	最高值 Maximum	平均值 Average
導電率（水溫25℃時）	Conductivity at 25 ℃	μS/cm	64	335	201
溫度	Temperature	℃	10.8	33.5	25.0
總鹼度（以 $CaCO_3$ 計）	Total alkalinity (as $CaCO_3$)	毫克/公升 mg/L	8	75	32
總硬度（以 $CaCO_3$ 計）	Total hardness (as $CaCO_3$)	毫克/公升 mg/L	< 5	93	48
鈣	Calcium	毫克/公升 mg/L	0.8	35	16
鎂	Magnesium	毫克/公升 mg/L	0.3	2.8	1.8
氯化物	Chloride	毫克/公升 mg/L	6	27	15
硫酸鹽	Sulphate	毫克/公升 mg/L	4	40	20
正磷酸鹽（以 PO_4 計）	Ortho-phosphates (as PO_4)	毫克/公升 mg/L	< 0.01	0.03	< 0.01
二氧化硅（以 SiO_2 計）	Silica (as SiO_2)	毫克/公升 mg/L	0.2	18	8.4

註釋

1. 以上項目是有關香港食水的一般物理和化學特性。香港食水標準及感官準則並不包括這些項目，因此沒有以上項目的標準值或準則值。

Notes

1. The above parameters relate to the general physical and chemical properties of the drinking water in Hong Kong. The HKDWS and AG do not include these parameters and hence there are no standard values or guideline values for them.

附錄一

客戶諮詢中心

香港區

灣仔客戶諮詢中心
灣仔告士打道 7 號入境事務大樓 1 樓

九龍區

大角咀客戶諮詢中心
大角咀鐵樹街 41 號地下

新界區

大埔客戶諮詢中心
大埔汀角路 1 號大埔政府合署 4 樓

沙田客戶諮詢中心
沙田上禾輋路 1 號沙田政府合署 3 樓

屯門客戶諮詢中心
屯門屯喜路 1 號屯門政府合署 7 樓

APPENDIX I

Customer Enquiry Centres

Hong Kong

Wan Chai Customer Enquiry Centre
1/F, Immigration Tower, 7 Gloucester Road, Wan Chai

Kowloon

Tai Kok Tsui Customer Enquiry Centre
G/F, 41 Tit Shu Street, Tai Kok Tsui

New Territories

Tai Po Customer Enquiry Centre
4/F, Tai Po Government Offices, 1 Ting Kok Road, Tai Po

Sha Tin Customer Enquiry Centre
3/F, Sha Tin Government Offices, 1 Sheung Wo Che Road, Sha Tin

Tuen Mun Customer Enquiry Centre
7/F, Tuen Mun Government Offices, 1 Tuen Hi Road, Tuen Mun

附錄二

客戶查詢及申請服務的統計數字

APPENDIX II

Statistics on Customer Enquiries and Requests for Service

	年份 Year				
個案數目 Number of Enquiries and Requests	2017	2018	2019	2020	2021
書面、傳真、電郵 Letter, Fax and Email	247 665	259 039	266 624	290 771	**316 721**
電話 Telephone	847 330	860 650	836 767	859 836	**846 353**
親身 Counter	335 271	329 551	317 921	232 078	**315 435**
總數 Total	1 430 266	1 449 240	1 421 312	1 382 685	**1 478 509**

附錄三

客戶投訴的統計數字

APPENDIX III

Statistics on Customer Complaints

投訴數目 Number of Complaints	年份 Year 2017	2018	2019	2020	2021
與帳戶有關的投訴# Account-Related#	145	138	94	679	**544**
與帳戶無關的投訴 Non-Account-Related	7 498	6 454	5 828	6 519	**7 174**
總數 Total	7 643	6 592	5 922	7 198	**7 718**

由區議會、立法會及申訴專員轉介與帳戶有關的投訴。
Account-related complaints from District Councils, Legislative Council and The Ombudsman.

附錄四

二零二一至二二年度繳費方式的統計數字

APPENDIX IV

Statistics on Mode of Payment 2021/22

繳費方式 Mode of Payment	交易數目 No. of Cases	百分比 Percentage (%)
親身繳費 In person	3 227 000	40.5
郵寄 By post	52 000	0.7
自動轉帳 Autopay	864 000	10.8
繳費靈 Payment by Phone Service (PPS)	558 000	7.0
自動櫃員機 ATM	235 000	2.9
網上繳費 Internet	3 037 000	38.1
總數 Total	**7 973 000**	**100.0**

財政年度：由每年四月一日起至翌年三月三十一日止
年份：由每年一月一日起至十二月三十一日止

Financial Year: 1 April to 31 March
Year (Calendar Year): 1 January to 31 December

匯率
除另有說明外，本年報所用「元」均指港元。自一九八三年十月十七日起，政府透過一項有關發行紙幣的措施，將港元與美元聯繫，以 7.8 港元兑 1 美元為固定匯率。

Exchange Rates
When dollars are quoted in this report, they are, unless otherwise stated, Hong Kong dollars. Since 17 October 1983, the Hong Kong dollar has been linked to the US dollar, through an arrangement in the note-issue mechanism, at a fixed rate of HK$7.80 = US$1.

水務署
WATER SUPPLIES DEPARTMENT

香港灣仔告士打道七號入境事務大樓四十八樓
電話：(852) 2824 5000
傳真：(852) 2824 0578
電子郵件：wsdinfo@wsd.gov.hk
互聯網地址：http://www.wsd.gov.hk

48/F Immigration Tower, 7 Gloucester Road, Wan Chai, Hong Kong.
Telephone：(852) 2824 5000
Facsimile：(852) 2824 0578
E-mail：wsdinfo@wsd.gov.hk
Website address：http://www.wsd.gov.hk