新思睿智

Strategy Wise

由水資源及水質管理、水務基礎設施策劃及建造，以至水務資產管理和運作，我們致力採用更具智慧及策略性的方式，並利用嶄新科技及凝聚廣大持份者的支持，以不斷提升本港供水的可持續性、可靠性和應變能力。

From water resources and water quality management, waterworks infrastructure planning and construction, to waterworks asset management and operations, we strive to adopt a smarter and more strategic approach, and leverage the latest technologies and robust stakeholder support for continuous improvement in the sustainability, reliability and resilience of Hong Kong's water supplies.

邁向可持續且具應變力的未來

Striding towards a sustainable and resilient future

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，隨著人口及經濟增長、氣候變化的影響，以及生活和工作模式的轉變，供水保障及應變力變得更為重要。為此，水務署制定全面的水資源管理策略，以確保本港長遠享有穩健及具應變力的供水。

Water plays a key enabling role in our city of the future. It powers homes, economies and nourishes all life. Yet with growing population and economy, climate change impacts and changing life and work styles, water security and resilience have never been more important. To this end, the WSD has formulated a holistic water management strategy to ensure the security and resilience of Hong Kong's water supplies in the long run.

全面水資源管理策略

水務署於2008年推行「全面水資源管理策略」（「策略」），為促進香港民生和經濟發展勾劃出可持續用水的藍圖。面對與日俱增的需求和氣候變化帶來的挑戰，我們聘請了國際專家和顧問公司檢討「策略」，使水資源管理得以更精明及具策略性，確保香港的供水穩定可靠和提升其應變力。「策略」檢討肯定了用水需求和供應管理方面的主要措施已達到預期的成果。

TOTAL WATER MANAGEMENT STRATEGY

Promulgated by the WSD and implemented since 2008, the Total Water Management Strategy has outlined the road map for the sustainable use of water for the social and economic development in Hong Kong. To ensure sustainability of Hong Kong's water supplies and strengthen its resilience against surging demand and challenges brought about by climate change, we have engaged international experts and consultants to conduct the Strategy review for smarter and strategic management of our water resources. The Review confirmed that the major initiatives in both water demand and supply management have achieved their respective milestones.

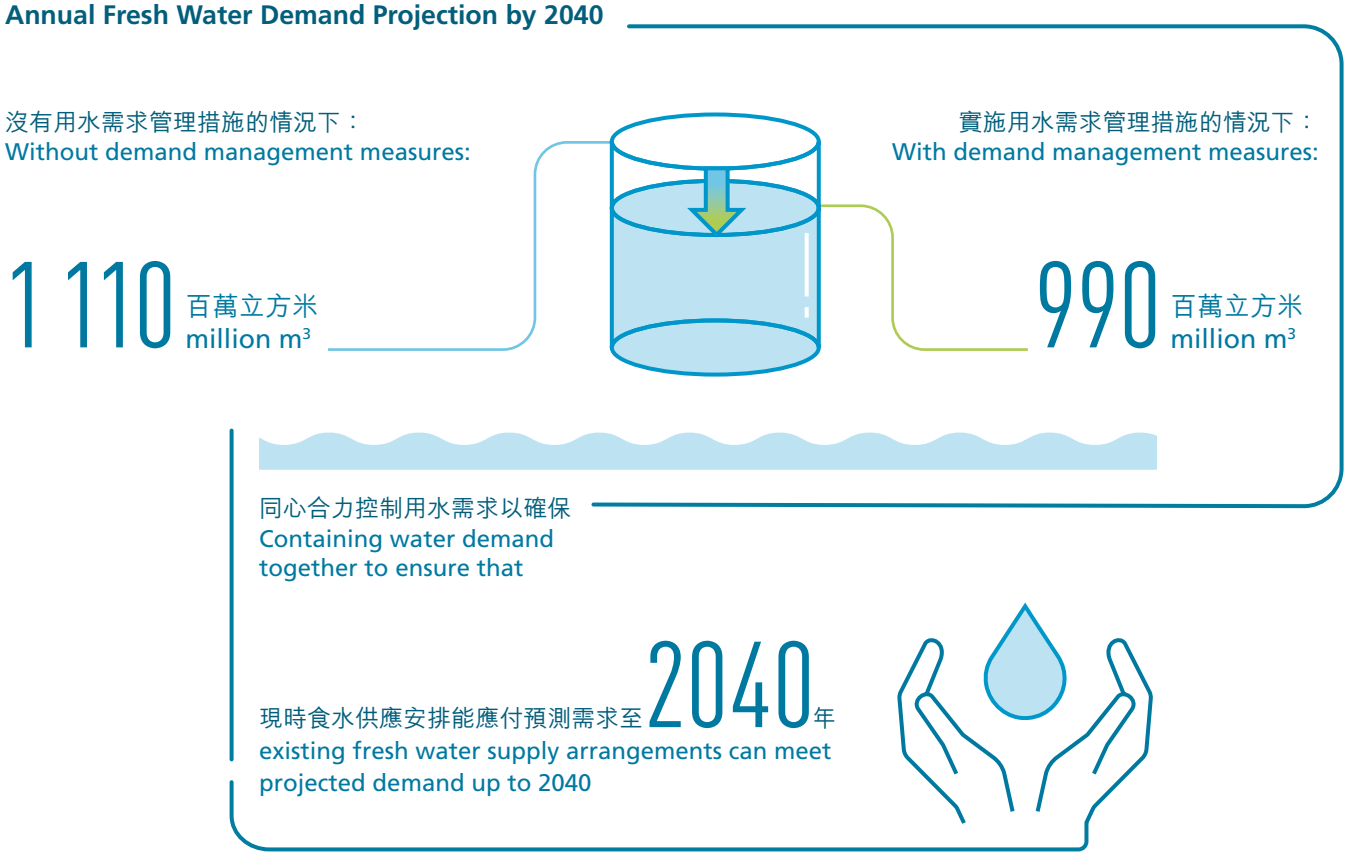
氣候變化和水資源預測推算

是次檢討，將氣候變化的極端影響納入考量，並更新了至二零四零年用水需求和供應的預測方法及推算。用水需求推算是以政府統計處的基線人口作為估算基礎，按預期的人口增長推算，在不採取任何用水需求管理措施的情況下，香港於二零四零年的每年食水需求估計將增至11.1億立方米。

Climate Change and Water Forecast Projections

Taking into account the extreme impacts of climate change, the Review updated the forecast of water demand and supply methodologies and projections up to 2040. The water demand projection was estimated based on the baseline population projection provided by the Census and Statistics Department. Under the expected population growth scenario, the annual fresh water demand is projected to increase to 1 110 million m^3 in 2040, in the absence of water demand management measures.

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



參與檢討「策略」的國際專家評估了目前的供水安排，並考量氣候變化導致每年降雨量減少的情況，認為在實施用水需求管理措施以減低需求至9.9億立方米的情況下，現時食水供應的安排足以應付至二零四零年的預測需求。

Having assessed the current arrangements taken into consideration the annual rainfall reductions due to climate change, the international experts confirmed that with the implementation of water demand management measures to reduce the demand to 990 million m^3, the current fresh water supply arrangements will be able to meet the forecast demand up to 2040.

雙管齊下

於是次檢討中，我們針對應變能力、經濟因素及可持續性三項準則評估各項水資源管理方案，並同時徵詢了水務諮詢委員會和其他持份者的意見，以修訂「全面水資源管理策略2019」(「策略2019」)。修訂後之「策略2019」採取雙管齊下的方式，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。控制食水需求的主要措施包括加強節約用水宣傳、管理用水流失和擴大使用次階水作非飲用用途。有關詳情，請參閱「控制食水需求增長」。

除了管理食水需求外，我們亦透過利用新的水資源——淡化海水，在提升供水應變能力方面取得重大進展。淡化海水是一種不受氣候變化影響的策略性水資源。將軍澳海水化淡廠第一階段工程已展開，該廠採用最新的逆滲透技術生產食水。設施落成後，預計能應付香港約5%的食水需求。相關詳情請參閱「海水化淡」章節。

持續監測和檢討

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。

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。

A Two-Pronged Approach

In the Review, we have also evaluated water management options using multiple criteria of resilience, economics and sustainability and updated the Total Water Management Strategy (Strategy 2019) to adopt a two-pronged approach which has taken account of the views from the Advisory Committee on Water Supplies and other stakeholders. The updated approach places emphasis on containing fresh water demand growth and building resilience in the fresh water supply with diversified water resources. The key initiatives of containing fresh water demand include strengthening promotion of water conservation, managing water loss and expanding the use of lower grade water for non-potable purposes. See Containing Fresh Water Demand Growth for more details.

Aside from managing fresh water demands, we are making great strides in building resilience in water supply by utilising new water resources – desalinated water, which is a strategic water resource not susceptible to the effects of climate change. We have commenced the construction of the first stage of "Tseung Kwan O Desalination Plant" which uses the latest reverse osmosis technology to produce fresh water. Upon completion, it is estimated to meet around five per cent of Hong Kong's total fresh water consumption. See Seawater Desalination for more details.

Continuous Monitoring and Review

To ensure our ability to adapt to 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.

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.

現有水資源

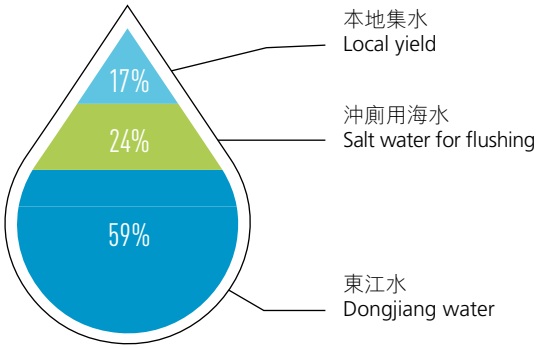
多年來，香港一直享有穩定的供水。香港水資源的三大來源為本地集水區的雨水、由廣東輸入的東江水及沖廁用海水。

EXISTING 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.

二零二零年全港總用水量
Total Water Consumption of Hong Kong in 2020

總計 Total **1 345** 百萬立方米 million m³



二零二零年按用水類別劃分的食水用量
Annual Fresh Water Consumption by Sector 2020

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	**626 (61.0%)**
工業用水 Industrial	**53 (5.2%)**
服務業及商業用水 Service Trades	**222 (21.6%)**
政府用水 Government Establishments	**44 (4.3%)**
建築及船舶用水 Construction & Shipping	**19 (1.8%)**
臨時淡水沖廁 Flushing	**63 (6.1%)**
食水總用量 Total Fresh Water Consumption	**1 027 (100%)**

氣候變化、人口和經濟持續增長令食水需求增加，以及珠江三角洲地區對水資源的競逐等，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）。

To better prepare Hong Kong for the challenges of climate change, the increasing demand for fresh water due to continuous population and economic growth, as well as the competition for water resources in the Pearl River Delta region, 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).

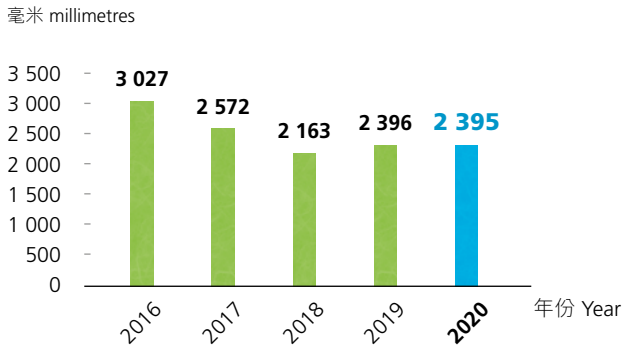
本地集水

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。

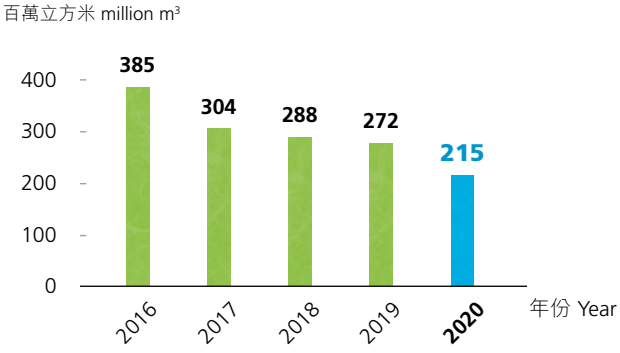
Local Yield

The 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.

二零一六年至二零二零年全年降雨量
Annual Rainfall 2016 – 2020



二零一六年至二零二零年全年淨集水量
Annual Net Yield 2016 – 2020



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

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範圍，按需要輸入東江水。在本地集水量較多的年份，我們會減少輸入東江水。這靈活彈性的供水安排既可避免浪費水資源，又可節省輸水成本。

Dongjiang Water

To fill the gap between Hong Kong's local yield and water demand, Dongjiang water is imported as needed, up to the annual supply ceiling stipulated in the supply agreement between Guangdong and Hong Kong. If more local yield is available in a particular year, less Dongjiang water will be imported. This flexible arrangement avoids wasting water resources and saves pumping costs.

東江水水管
Dongjiang water mains

新一份東江水供水協議已於二零二零年十二月簽訂，由二零二一年至二零二三年為期三年。新協議把以往採用的「統包總額」方式優化為「統包扣減」，按實際東江水取水量而扣減水價，並沿用統包方式，訂明每年供水量上限，確保香港擁有穩定而靈活的東江水供應，滿足香港的實際需要。

A new agreement on the supply of Dongjiang water to Hong Kong for a three-year period from 2021 to 2023 was signed in December 2020. The previously adopted "package deal lump sum" approach is enhanced to a "package deal deductible sum" approach in which the water price will be deducted according to the actual amount of Dongjiang water supplied. The continual adoption of a package deal approach to stipulate an annual supply ceiling can guarantee Hong Kong a stable yet flexible supply of Dongjiang water to meet the city's actual needs.

新協議已加入扣減水價的機制，每年按供水量上限扣除一筆款項(透過單位價格乘以供水量上限與實際供水量的差額)得出該年的實際水價。「統包扣減」方式回應了市民就東江水供水按量收費的訴求，並至少可應用至二零二九年。按二零二一年價格計算，在新協議的機制下，估計在這九年期內最高節省金額可達3.24億港元。

The new agreement has introduced a water price deduction mechanism under which the annual ceiling water price will be subject to the deduction of a sum (by multiplying a unit rate to the difference between the annual supply ceiling and the actual amount of water supplied) to arrive at the annual actual water price. This "package deal deductible sum" approach has addressed the requests by the public for payment based on the quantity of Dongjiang water supplied and will be maintained at least up to 2029. It is estimated that under the mechanism in the new agreement, based on the 2021 price level, the maximum saving within this nine-year period will be HK$324 million.

新協議內的每年基本水價調整增幅為每年1.33%，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)，而非48.86億港元，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預計為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。

The annual ceiling water prices in the new 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 instead of HK$4,886 million, the actual water price for 2021 is to be 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 will be HK$4,821 million, compared to HK$4,807 million and HK$4,821 million paid in 2019 and 2020 respectively.

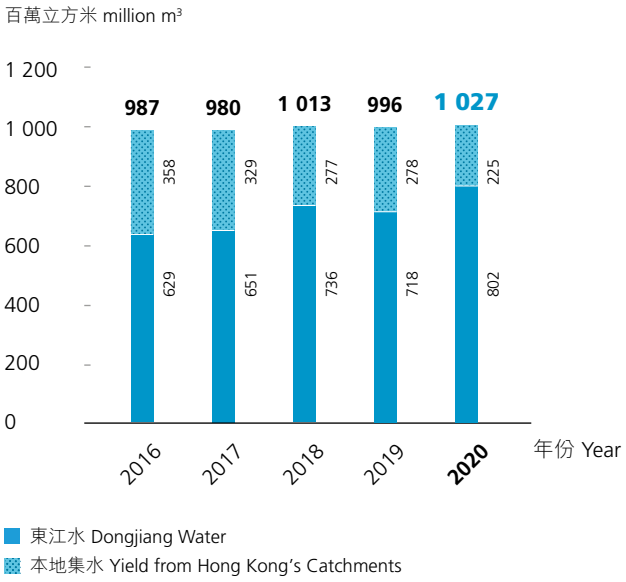
沖廁用海水

一九五零年代末，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3億立方米海水，節省了同等分量的食水，約佔總供水量的24%。

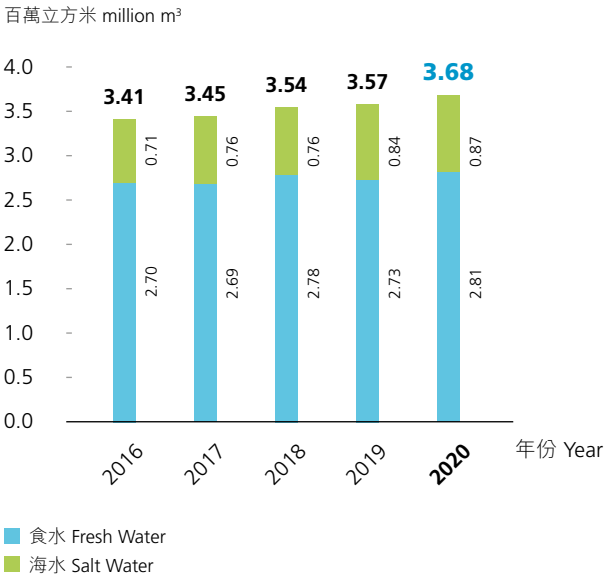
Salt Water for Flushing

In the late 1950s, salt water was 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 of our water management. Currently, our salt water supply network covers about 85% of the Hong Kong population. About 300 million m^3 of seawater is supplied per annum, conserving an equivalent amount of fresh water which is about 24% of the total water supply.

二零一六年至二零二零年全年食水供應量
Annual Quantity of Fresh Water Supply 2016 – 2020



二零一六年至二零二零年日均用量(食水及海水)
Total Average Daily Water Consumption (Fresh Water and Salt Water) 2016 – 2020



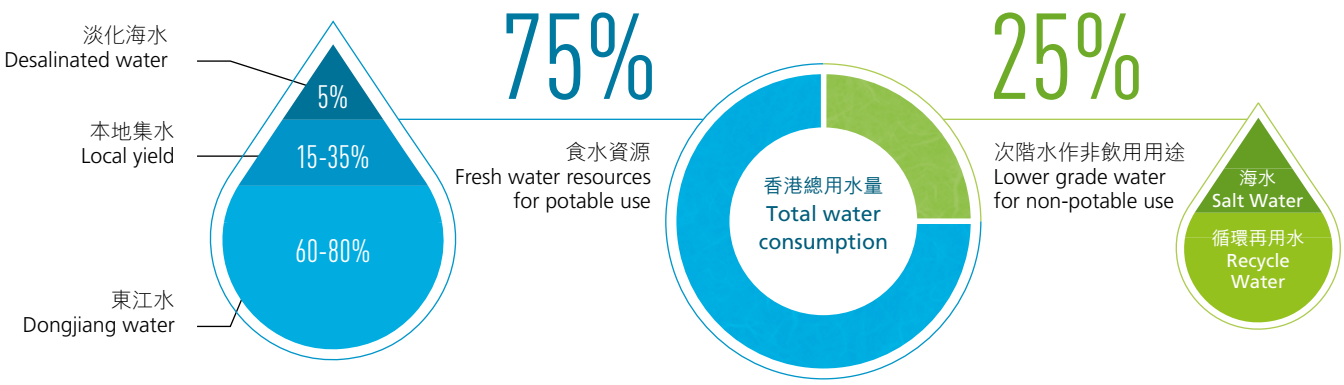
水資源未來的展望

我們將繼續按照「策略2019」的建議，採取雙管齊下方式，為求在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

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，政府將根據二零一七年及二零一八年的《施政綱領》中的承諾，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)。為達成這個目標，我們正推行三項主要用水需求管理措施，包括節約用水、管理用水流失，以及擴大使用次階水作非飲用用途。

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. To achieve this goal, we are taking forward three major water demand management initiatives, namely water conservation, water loss management, and expansion of use of lower-grade water for non-potable uses.

節約用水

節約和精明用水，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

Conserving water and using water wisely help 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.

水知園教育中心

為接觸更多公眾人士，提高他們對水資源的認識和節約用水的重要性，我們於二零一九年十二月於天水圍辦公大樓開設全新的水資源教育中心－「水知園」。二零二零年十月至二零二一年四月期間，我們與長春社文化古蹟資源中心合辦名為「水展」的專題展覽，藉此喚起參觀者對一九六零年代水資源匱乏的艱難歲月，從中了解有關未來水資源的挑戰，及採取即時行動以應對水資源短缺的迫切性。儘管受到二零一九冠狀病毒病疫情的影響，截至二零二一年三月，「水知園」已接待約13 000名訪客*。

* 鑑於二零一九冠狀病毒病疫情，水知園由二零一九年十二月開幕至二零二一年三月期間暫停開放約220天。

H_2OPE Centre

To reach out to the wider community and enhance their knowledge of water resources and the importance of water conservation, we opened the "H_2OPE Centre", the new Water Resources Education Centre at our Tin Shui Wai Office Building in December 2019. During the year, we collaborated with the Conservancy Association Centre for Heritage to hold a themed exhibition titled "Water Exhibition" from October 2020 to April 2021. Through the exhibition, visitors could evoke the old and difficult days of water scarcity which occurred in the 1960s for a better understanding about the future water challenges and urgency for today's actions against water scarcity. As of March 2021, H_2OPE Centre has received about 13 000 visitors* despite the impact of COVID-19 epidemic.

* The H_2OPE Centre was temporarily closed for approximately 220 days from its opening in December 2019 to March 2021 due to COVID-19 epidemic.

水知園設有十二個展區，五十多個互動展品和遊戲，提供各種與水有關的資訊，從水資源、食水水質、節約用水和循環再用水、水務工程、用水效益，以至可持續發展措施，內容包羅萬有。

The H_2OPE Centre has 12 exhibition zones with over 50 interactive exhibits and games to provide various water-related information. These range from water resources, drinking water quality, water conservation and recycling, waterworks projects, water efficiency to sustainability initiatives.

我們與長春社文化古蹟資源中心合作舉辦「水展」，讓公眾了解未來水資源的挑戰，以及採取即時行動以應對水資源短缺的迫切性。

Collaborated with the Conservancy Association Centre for Heritage, we held the "Water Exhibition" to educate the public about the future water challenges and urgency for today's actions against water scarcity.

用水效益標籤計劃

為鼓勵客戶選用節水產品，我們於二零零九年推出「自願參與用水效益標籤計劃」。用水效益標籤說明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。計劃分階段推行，現已擴展至六種類型的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。

強制性「用水效益標籤計劃」亦分階段實施。自二零一八年二月一日起，所有住宅處所的廚房，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。為進一步提升用水效益，我們正準備修訂法例，規定在零售店出售的規定類型產品，必須已在「用水效益標籤計劃」下登記，並貼上用水效益標籤，方便消費者選擇具用水效益的產品。

Water Efficiency Labelling Scheme

Launched in 2009, our voluntary "Water Efficiency Labelling Scheme" (WELS) encourages customers to use water-saving products. The WELS label shows the level of water consumption and water efficiency of the plumbing fixtures and water-consuming devices helping consumers to make informed choices of purchase. Implemented in phases, the Scheme 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.

The mandatory WELS is also implemented in stages. Since 1 February 2018, the use of WELS products of prescribed water efficiency has been required in kitchens (domestic premises), bathrooms and toilets (all premises) for prescribed plumbing works. 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 sale in retail outlets 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.

用水效益最佳實務指引

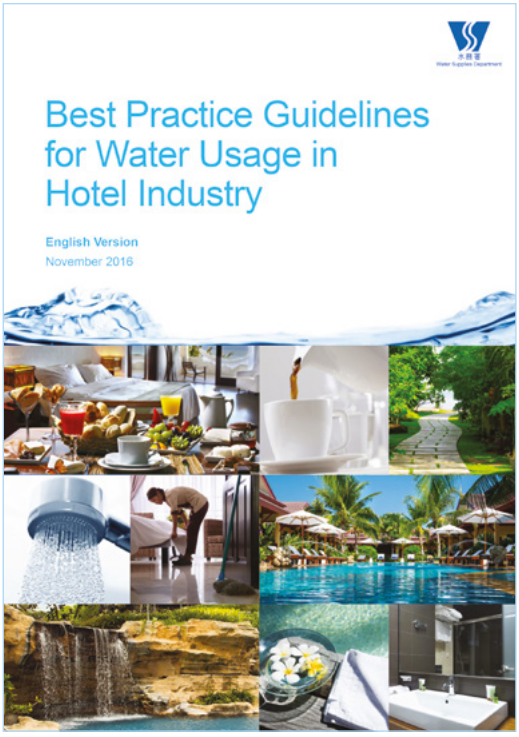
為了提高各行各業的用水效益，減少非住宅用戶用水量，我們制訂了用水效益最佳實務指引，以供業界參考國際最佳實踐經驗。我們正與酒店和餐飲業的協會合作，力求在營運的不同方面提升用水效益，包括設施保養、酒店服務、廚房和樓面運作、泳池和園景管理。

我們亦鼓勵機構提高員工和客戶對節約用水的認識和參與，凝聚各界持份者作出更大的貢獻。

Best Practice Guidelines

To enhance water use efficiency across industries thereby reducing non-domestic water consumption, 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 operations, including facilities maintenance, hospitality service, kitchen and dining area operations, swimming pools and landscape management.

We also encourage organisations to raise awareness and participation from their employees and customers on water conservation with a view to gathering greater contributions from various stakeholders.



用水效益最佳實務指引
Best Practice Guidelines

飲食業節約用水貼紙
Stickers on "WATER SAVING TIPS FOR CATERING INDUSTRY"

安裝節流器

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二零二二年完成。

我們於二零一九年把免費安裝節流器計劃擴展至所有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」，從而發揮更大的成效。有關詳情，請參閱「共融啟智」章節的「推廣智慧用水的文化」。

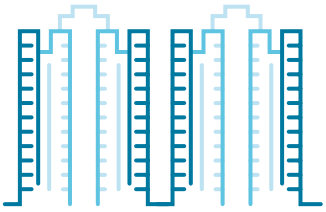
Installation of Flow Controllers

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 reducing water consumption from taps or showers and cultivating 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 2022.

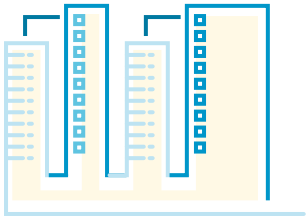
Leveraging the effectiveness of water conservation, the free installation scheme was extended in 2019 to all private housing estates and private schools (including kindergartens, primary schools and secondary schools) as part of our community water conservation campaign titled "Let's Save 10L Water 2.0". See Promoting Water-Wise Culture in the Community Wise section for more details.

171 000
個住戶來自
households in

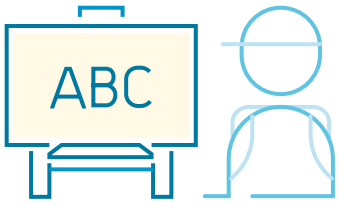
148
個公共租住屋邨
public rental housing estates



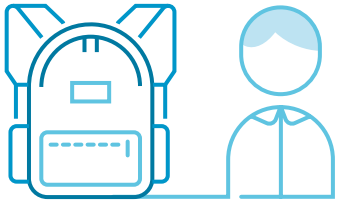
912
個住戶來自私人屋苑
private estate households



642
間幼稚園
kindergartens



32
間私立小學
private primary schools



截至2021年3月已安裝節流器。
have installed flow controllers as at March 2021.

推動精明的用水文化

我們相信，以針對性方法與持份者緊密合作來宣揚精明用水生活和貫徹惜水的行為，才能在控制食水需求增長方面，產生積極的變化。「共融啟智」章節載有水務署與社區合作推廣節約用水和精明用水文化的詳情。

Promoting Water-Wise Culture

We believe a targeted approach in close collaboration with stakeholders in promoting water-wise living and sustaining water-cherishing behavior 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 community to promote water conservation and water-wise culture are covered in the Community Wise Section.

管理用水流失

香港的山丘地形，加上頻密的道路工程、繁忙的交通，以及擠迫的地下公用設施，對地下水管造成各種干擾，導致水管滲漏的風險提高。為此，我們以全面的方式管理逾8 300公里的水管，並實施了一系列措施以減少用水流失。

Water Loss Management

The hilly terrain as well as various disturbances to underground water mains in Hong Kong due to frequent roadworks, busy traffic and congested underground utilities have caused higher risk of leakage from water mains. To this end, we adopt a holistic approach in managing over 8 300km of our water mains, and have implemented a host of measures to cut down water loss.

「智管網」

在「智管網」計劃下，我們將於二零二四年前，在全港食水分配管網逐步設立監測區域，以監察用水流失的情況。「智管網」將香港的食水分配管網分為約2 400個監測區域，其中部份監測區域並將用作水壓管理區域，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。截至二零二零年底，我們已設立約1 440個監測區域。每個監測區域均裝有監測設備和感應器，以監測區域內用水流失的情況。

Water Intelligent Network

Under the project "Water Intelligent Network" (WIN), we have been progressively establishing District Metering Areas (DMAs) in our fresh water distribution network across the territory by 2024 to monitor water loss. The WIN divides Hong Kong's fresh water distribution networks into about 2 400 DMAs. 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 2020, we have set up about 1 440 DMAs. Monitoring and sensing equipment will be installed in each DMA to monitor water loss therein.

全新推出的「智能管網管理電腦系統」會協助收集各監測區域大量的管網數據，識別異常情況，並對需要跟進的監測區域進行排序，從而決定最合適和最有效的管網管理措施。這些措施包括：

- 主動探測滲漏；
- 水壓管理；
- 快速維修滲漏水管；及
- 更換及修復水管。

The newly introduced "Water Intelligent Network Management System" assists in collecting vast amount of data from these DMAs, identifying anomalies and prioritising areas for follow-up actions with the objective to determining the most suitable and effective network management measures. These measures include:

- active leakage detection;
- pressure management;
- quality and speedy repair of water main leaks; and
- replacement and rehabilitation of water mains.

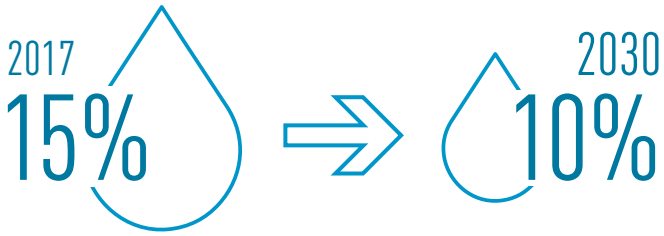
於二零二零至二一年度，隨著「智管網」逐步實施，
In 2020/21, with the progressive implementation of the Water Intelligent Network,

「智管網」
Water Intelligent Network

580 個滲漏點被發現並修復
leaks were identified and repaired

= 14 200 立方米 m^3
的食水
of fresh water

目標在二零三零年前，將政府水管的滲漏率從二零一七年的15%降低至10%以下。
By 2030, we aim to reduce leakage rate of government mains from 15% in 2017 to below 10%.



管理私人水管滲漏

除了管理政府水管的用水流失外，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，使他們能更方便安排測漏調查。

「智管網」的逐步推行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，我們的負責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

Apart from managing water loss from government mains, a series of measures, for example, installing master meters at private developments, have been put in place to monitor water loss. 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 on-site 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

提高滲漏探測的專業技能
RAISING PROFESSIONAL SKILLS IN LEAK DETECTION

加強相關從業員的知識和能力是處理用水流失的關鍵。為提升從業員的監測滲漏質素和專業技能，水務署一直與多個業界和教育機構合作，發展培訓和認可資歷，並與業界分享實踐經驗。

其中一個例子是我們與香港建造學院合作，推出地下水管測漏證書課程，用以提升從業人員的技術能力。該課程於二零一九年推出，內容包括理論、實習、撰寫檢查報告和考試，是促進持續專業發展的重要平台，同時提高香港建築物的水管規劃和管理質素。

Enhancing knowledge and capability of practitioners is the key to tackling water loss. To raise the quality of monitoring water leakage and professional skills of the practitioners, the WSD has been working with various industry and educational institutes in developing training and qualifications as well as sharing practical experiences to the industry.

One example of enhancing capability of practitioners is our collaboration with the Hong Kong Institute of Construction in developing a certificate course in leak detection on water mains. Launched in 2019 and comprising components of theory, practical training, inspection report writing and examination, the course provides a key platform for enabling continuing professional development while enhancing quality of water mains planning and management in Hong Kong buildings.

本證書課程為從事水務和樓宇管理的工作人員而設，教導地下水管測漏的理論知識及提供實習訓練，填補現時業界缺乏的基礎知識培訓，提升從業員在規劃和管理滲漏維修工程方面的知識。

This Certificate course offers both theoretical knowledge and practical training on leak detection of underground water mains, which is the most common difficulty faced by practitioners and those in the water and building management industries. The course not only helps practitioners build a solid foundation on the subject, but also enriches their knowledge on planning and managing leakage repair works.

*香港建造學院建造專業進修院校校長(署任)**趙家信先生***

Mr CHIU Ka-shun, Daniel - *Principal (Acting), School of Professional Development in Construction of Hong Kong Institute of Construction*

課程旨在提高從業員在測漏工作方面的技能和質素。從業員和有關業界能透過參加本課程接受實習訓練，學習使用各種最新的測漏儀器，及多種地下水管測漏和滲漏點定位的方法。我們相信透過參加此課程，從業員能提供既有效又高效率的測漏工作，將有助及時定位和修復滲漏喉管，減少政府供水管網和私人處所的地下水管的用水流失。

Practitioners and relevant sectors will receive practical training in the use of various and latest leak detection equipment and methods to detect and locate water leaks at underground water mains through participating in this course. The course aims at enhancing their skill and quality of leak detection work. Through this course, we believe that practitioners can become more effective and efficient in leak detection, facilitating timely locating and repairing the leak points. This will help reduce water loss in underground water mains within both government networks and private premises.

*水務署發展(一)部水管測漏組總水務督察**李達斌先生***

Mr LI Tat-pun - *Chief Waterworks Inspector of Leak Detection Unit, Development (1) Division, WSD*

自動讀錶系統

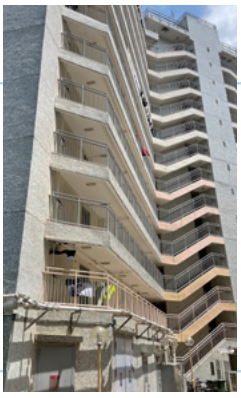
作為推動香港成為智慧城市的一部分，我們從二零一八年起，於新建公營及私人發展項目引入智能水錶系統——自動讀錶系統，以進一步促進社區的用水效益和智能生活。除了改善讀錶的準確度和效率，我們期望透過自動讀錶系統的流動應用程式，提供客戶用水量的資訊，從而提高客戶節約用水的意識並鼓勵他們作出行為上的轉變。此外，當水管滲漏或滴漏的水龍頭導致異常的用水量時，系統會適時發出警報，使客戶能作出滲漏檢測和水管維修。

為擴展自動讀錶系統的應用至現有處所，我們正研究採用無線技術的可行性。由於大澳不僅遠離高層建築物，而且適合無線電網關通訊，我們選擇了它為首個無線自動讀錶系統的試點，以提升用水效益和客戶服務。試驗已於年內初步完成，結果令人滿意。我們於二零二一年安裝了共500個智能水錶。我們將進一步研究無線技術的可行性。

Automatic Meter Reading System

As part of advancing Hong Kong into a smart city, we have introduced a smart water meter system — Automatic Meter Reading (AMR) 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 inspiring their behaviour changes through the provision of water consumption information via the AMR mobile app. The AMR system also helps in enabling leakage detection and repair of water mains through timely alerts on unusual consumption due to water seepage or dripping taps.

With a view to extending the use of AMR to existing premises, we are assessing the feasibility of adopting wireless technology. Due to its remoteness from high-rise buildings and suitability for radio gateway telecommunications, Tai O is selected as the first trial of our wireless AMR solution to improving efficiency and customer service. During the year, the trial was initially completed with satisfactory results and a total of 500 smart water meters were installed in 2021. We will further investigate the viability of the wireless technology.



為改善讀錶的效率和準確度，我們目前正於漁村棚屋、村屋、公共屋邨和政府設施測試無線自動讀錶系統。

Wireless AMR system is currently being tested in fishermen's huts, village houses, public housing estates and government facilities with a view to improving efficiency and accuracy in water meter readings.

次階水

我們利用先進技術，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。

Lower Grade Water

Leveraging advanced technologies, we have been actively expanding the use of lower grade water, which includes salt water and recycled water (i.e. reclaimed water and 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.

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%，並著重新發展地區和現時使用淡水沖廁的地區。

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.

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，以替換區內目前使用的淡水沖廁系統。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。

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.

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更可用作生產再造水作沖廁及其他非飲用用途。此舉不但可節省珍貴的食水資源，還能減少經處理的排放水被排放至受納水體。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。

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 allow us to produce reclaimed water by further processing the EPP's treated effluent. Using reclaimed water for flushing and other non-potable purposes not only saves our precious fresh water resources, but also reduces the amount of treated effluent discharge to the receiving water bodies. 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.

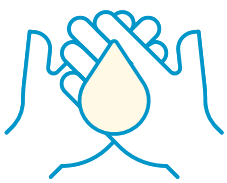
我們已於二零一七年四月開始興建配水庫及敷設輸水幹管，為上水及粉嶺等新界東北部供應再造水做好準備。再造水生產設施、抽水系統及分配水管等餘下工程的設計已大致完成，並計劃於二零二一年五月向立法會財務委員會申請撥款。建造工程計劃於二零二一年第三季度動工，並於二零二四年在上水和粉嶺率先供應再造水，隨後陸續供應新界東北的新發展區。

In April 2017, we began to construct a service reservoir and lay trunk water mains to pave the way for the supply of reclaimed water to the northeast New Territories, including Sheung Shui and Fanling. The design of the remaining works, including water reclamation facilities, a pumping system and local distribution mains, has been substantially completed and we aimed to seek the funding approval from the Legislative Council Finance Committee in May 2021. The construction works are scheduled to commence in the third quarter of 2021 and the supply of reclaimed water will be first commissioned in Sheung Shui and Fanling in 2024 to be followed by new development areas in the North-east New Territories progressively.

供應再造水後，
The supply of reclaimed water will

每年可節省食水
save fresh water each year

約 about **22** 百萬立方米 million m^3



覆蓋約
covering 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。系統將於二零二三年投入服務，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，截至二零二一年三月，約有115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。

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 2023 to tie in with the population intake of the development.

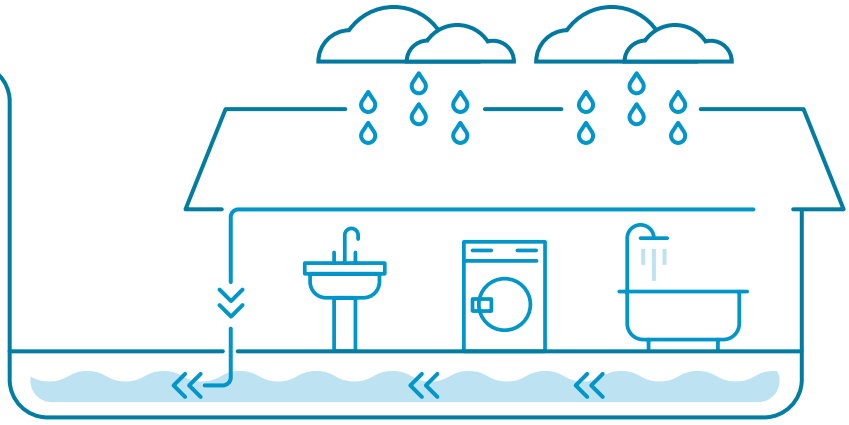
The centralised grey water recycling system consists of a grey water treatment plant, a pumping system, a service reservoir for storing treated grey water, and water mains for grey water collection and distribution of the treated grey water within the development for flushing and other non-potable uses.

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 115 government projects have been equipped with grey water recycling and/or rainwater harvesting systems as at March 2021. The WSD Tin Shui Wai Building is one of these government projects supporting the relevant initiative.

截至二零二一年三月，約
As at March 2021, about

115 個政府工程項目
government projects'

的新建大樓已配備中水重用及/或雨水回收系統。
new buildings have been equipped with grey water recycling and/or rainwater harvesting systems.



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。截至二零二一年三月，約60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。

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 2021, about 60 certified projects under BEAM Plus New Buildings Assessment Tool v1.2 and v2.0 have initiated efforts in adopting water recycling facilities.

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力。

香港作為沿海城市，海水供應充足，為發展海水化淡工程提供了有利的條件。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。該廠的年產量為5 000萬立方米，未來更可擴展至每年1億立方米。

佔地8公頃的海水化淡廠毗鄰大廟灣，計劃於二零二三年啟用。我們致力將可持續的環保特色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。我們力求打造頂級的環保基礎設施，使化淡廠的卓越建築表現獲得「綠建環評」新建建築鉑金級認證。

在興建過程中，我們響應發展局推行的「建造業2.0」，引入多項促進創新、專業化和年輕化的措施。例如，我們使用建築信息模擬(BIM)技術、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，以提高項目效率及地盤安全。

Seawater Desalination

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

As a coastal city, Hong Kong enjoys an abundant supply of seawater providing a favourable condition for supplying desalinated water. Using the latest reverse osmosis technology, the first stage of the Tseung Kwan O Desalination Plant will produce potable water in compliance with the "Hong Kong Drinking Water Standards" (HKDWS). It 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.

Located on an 8-hectare site which is adjacent to Joss House Bay (also known as Tai Mui Wan), the desalination plant is scheduled to be commissioned in 2023. We strive to integrate sustainable green features 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. We seek to build a top-class green infrastructure and achieve the top BEAM Plus New Buildings Platinum accreditation for its outstanding building performance.

In the course of construction, we have incorporated a number of measures to promote innovation, professionalism and revitalisation under the initiative of "Construction 2.0" as advocated by the Development Bureau. For example, we have used Building Information Modelling (BIM), Design for Manufacture and Assembly (DfMA), Modular Integrated Construction (MiC), Digital Works Supervision System (DWSS) and smart safety devices for enhancing project efficiency as well as improving site safety.

憑藉將軍澳海水化淡廠第一階段的創新設計、配以高效的BIM技術應用，以及氣候抵禦力高的基礎設施，項目於二零二零年榮獲多個重要的行業獎項，包括：

- 2020香港建築信息模擬學會大獎銀獎
- 在建造業議會舉辦的2020建築信息模擬成就嘉許禮上榮獲「2020建築信息模擬項目」

In 2020, the First Stage of Tseung Kwan O Desalination Plant was recognised with important industry awards on its innovative design, efficient BIM collaboration, and climate-proof infrastructure. These include:

- Silver Award at the Hong Kong Institute of Building Information Modelling (HKIBIM) Awards 2020
- "BIM Projects 2020" in the Celebration of BIM Achievement 2020 organised by Construction Industry Council

將軍澳海水化淡廠第一階段不僅能開拓生產可靠的食水資源，同時將可持續的環保特色融入化淡廠的設計、建造和保養工作中。

The First Stage of Tseung Kwan O Desalination Plant produces a reliable source of potable water while integrating sustainable 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

水務署致力透過持續水質監測、全面的水安全計劃、法例規管、優質資產管理和策略性優化供水設施，為香港提供安全和可靠的供水。

At the WSD, we strive to provide Hong Kong with safe and reliable water supplies through routine water quality monitoring, comprehensive water safety plans, legislative regulation, quality asset management and strategic enhancements in water supply infrastructure.

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。為保障公眾健康，我們制定了一套綜合食水水質管理系統，監測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。

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 monitor 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 was established with reference to the Guidelines for Drinking-water Quality published by the World Health Organization (WHO) and other international practices.

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。我們開展全面的計劃，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

* 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

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

相關設施、水塘、濾水廠、配水庫、分配系統和用戶水龍頭。本年內共收集及檢測超過16萬個樣本。

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, distribution systems and consumers' taps. During the year, more than 160 000 samples were collected and tested.

食水樣本
Drinking Water Samples

財政年度 Financial Year	食水樣本總數 No. of Drinking Water Samples
2016/17	84 089
2017/18	82 389
2018/19	82 717
2019/20	81 221
2020/21	**74 411**

註： 以上的食水樣本是從濾水廠、配水庫、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, connection points and publicly accessible consumer taps.

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。

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.

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東江水樣本作詳細分析，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。

Via 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. Dongjiang water samples are also collected regularly at the Muk Wu Raw Water Pumping Stations for conducting 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.

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
		2018/19	2019/20	2020/21	
氨氮 Ammoniacal Nitrogen	毫克/公升 mg/L	0.04	0.03	0.03	≤0.5
錳 Manganese	毫克/公升 mg/L	0.03	0.03	0.02	≤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、供水接駁點和公眾可達用戶水龍頭(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。

我們於二零一七年十二月推出「水質監測優化計劃」，藉此加強水質監測範圍至用戶水龍頭，透過隨機抽取處所用戶水龍頭的食水樣本，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。

Enhancing Drinking Water Quality Monitoring

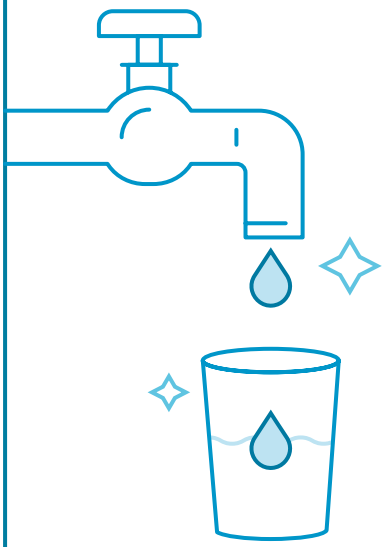
Over the years, we have implemented a drinking water quality monitoring programme to collect drinking water samples from water treatment works, service reservoirs, connection points and publicly accessible consumers' taps (such as those in shopping centres, clinics, community facilities, sports grounds, 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.

In December 2017, we 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.

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。將於二零二一年四月發布的最新香港食水標準，包含了60個水質參數。政府亦參考了世界衞生組織的指引，在最新的香港食水標準中，採用了對氯酸鹽和二氯乙酸鹽更嚴格的標準。

The Hong Kong Drinking Water Standards (HKDWS) is reviewed from time to time by the Government to ensure our drinking water quality and safety. In the latest HKDWS to be released in April 2021, 60 parameters are included. With reference to the WHO's Guidelines, the Government has adopted more stringent standards for chlorate and dichloroacetate in the latest HKDWS.



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專題故事
Feature Story

擁抱創新，提升水質監測表現
EMBRACING INNOVATION FOR RAISING WATER QUALITY MONITORING PERFORMANCE

以無人船系統監測水質和取樣

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，以便有效控制下游濾水廠的食水處理過程，確保食水安全。

為提升水塘水質監測，水務署近年引入了嶄新的無人船系統，在水塘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。

Unmanned surface vessel system deployed in water quality monitoring and sampling

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

To advance water quality monitoring, the WSD has introduced a new unmanned surface vessel (USV) system in recent years to perform automatic water quality monitoring and sampling in impounding reservoirs, boosting emergency responsiveness and operational efficiency through the adoption of innovation and technology.

為提升效率和緊急狀況應變能力，無人船船隊在船灣淡水湖執行自動水質監測和取樣。

The USV fleet performs automatic water quality monitoring and sampling at the Plover Cove Reservoir enhancing efficiency and emergency response.

無人船收集溫度、導電率、混濁度、溶解氧、酸鹼值、葉綠素-a、藍綠藻等數據，並發送至基站電腦進行實時分析。

The USV system collects and sends data of temperature, conductivity, turbidity, dissolved oxygen, pH, chlorophyll-a and blue green algae to the base station computer for real-time analysis.

無人船系統由可再生能源驅動，可連續運作約3至4小時，航程為11至14公里。

Powered by renewable energy, the USVs can continuously operate for about three to four hours for a distance of 11km to 14km.

提高應變能力

目前，香港有17個水塘儲存原水。水塘水質有時會受到自然環境或突發事件影響，例如天氣變化可能導致藻類過度生長，令水質改變。水務署引入無人船「船隊」，主要在全港面積最大的水塘——船灣淡水湖進行水質監測，以掌握水質情況，並於緊急情況下採取適當的行動。

Enhancing emergency responsiveness

Currently, there are 17 impounding reservoirs for raw water storage in Hong Kong. The water quality of impounding reservoirs may be sometimes affected by the natural environmental conditions or unexpected incidents. For instance, a change of weather may lead to excessive growth of algae thereby causing an impact on water quality. The USV "fleet" introduced by the WSD mainly conducts water quality monitoring at the Plover Cove Reservoir, Hong Kong's impounding reservoir with the largest surface area, to keep track of water quality and initiate appropriate action in case of emergency.

配備監測和自動導航系統

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。每艘無人船上的取水裝置都連接船底的水管，直接將水抽進樣本箱內。

無人船還配備了自動導航系統和避障系統，在運行時能繞過障礙物。水務署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。

Equipped with monitoring and auto-navigation systems

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. The water sampling unit on each vessel is connected to a pipe underneath, pumping water into the water sampling tank directly.

The USVs are also equipped with auto-navigation system and obstacle avoidance system for navigating around obstacles during operation. By using the base station computer, the WSD 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.

擴展到其他地點和應用

Scaling up to other locations and applications

經過船灣淡水湖的成功實踐後，我們計劃將無人船船隊分階段推展至其他水塘，以提升水質監測的成效。

水務署團隊將繼續嘗試提升系統對實時水質數據的應對能力。例如，當記錄到較高的葉綠素讀數時，無人船能自動增加監測點的密度，以收集更多數據和樣本，供實驗室詳細分析藻類的數量和品種。

Leveraging the successful implementation at the Plover Cove Reservoir, we plan to roll out the USV fleet in phases at other impounding reservoirs for enhancing performance of water quality monitoring.

The WSD team will continue to make attempts at upgrading the system response capability to real-time water quality data. For example, when a higher chlorophyll reading is recorded, the USVs will automatically respond by increasing the number of monitoring points for more data and sample collection to facilitate detailed analysis on the quantity and species of algae in the laboratory.

*水務署水務化驗師**鄧浩維先生***
Mr TANG Ho-wai, *Waterworks Chemist, WSD*

無人船系統的優點

與使用傳統載人船隻監測水質比較，新引進的無人船系統具有以下優點：

- ***更容易調配人手：***無人船可由已受訓的技術人員操作，而傳統船隻則需由持牌船員駕駛。
- ***可於淺水運作：***無人船船身較小，能行駛到水塘較狹窄或淺水的區域，擴大監測範圍。
- ***製作圖像報告：***無人船系統可參照水塘地形製作水質圖像報告，令工作人員更容易判斷水質數據的分布和趨勢。
- ***應變行動：***無人船系統易於調動和運輸，遇上緊急水質狀況時，如有需要，可以調配到不同水塘工作。
- ***太陽能供電：***無人船由可再生能源供電。水務署已在無人船的儲存室外，安裝太陽能板發電系統，產生電能供給無人船使用。

Benefits of the USV system

Compared with water quality monitoring by the traditional manned vessels, the newly introduced USV system has the following advantages:

- ***Ease of deployment:*** The USVs can be operated by a trained technician, whereas traditional vessels have to be operated by a licensed vessel operator.
- ***Shallow water applications:*** The USVs can travel to relatively narrow or shallow areas in impounding reservoirs due to smaller in size and therefore potential to broaden the areas of monitoring.
- ***Graphic report generation:*** The USV system can generate water quality graphical reports with reference to the map of the impounding reservoirs. This makes it easier for the staff to diagnose the distribution and trends of water quality data.
- ***Emergency operation:*** With ease of deployment and transportation, the USV system can be deployed at various impounding reservoirs in the event of water quality emergencies if necessary.
- ***Solar-powered:*** The USVs are powered by renewable energy. The WSD has installed a solar panel system outside the USV storage house for generating electricity to the USVs.

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，從源頭至用戶水龍頭確保食水水質，以保障公眾健康。

自二零零七年起，我們根據世衛在二零零四年推出的《飲用水水質準則》，制訂和實施水安全計劃。

食水水質管理系統

我們於二零一七年檢討了水安全計劃，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測、監督、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，加上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，我們於二零二零年六月更新了食水水質管理系統，其中包括加強配水庫翻新工程的風險評估。

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，有機會受到微生物或化學污染。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。

我們按照世衛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。

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 source to consumers' taps for the protection of public health.

Since 2007, we have developed and implemented our WSP based on the 2004 Guidelines for Drinking-water Quality from the WHO.

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 June 2020 with, among others, enhancement in the risk assessment on renovation works of service reservoirs.

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 of drinking water. 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.

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。

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.

水務署的風險管理指引和範本，獲認可為其中一項最能夠促進建築物水安全計劃的實踐模式，並已上存至世衛和國際水協會共同管理的網站，供國際參考。

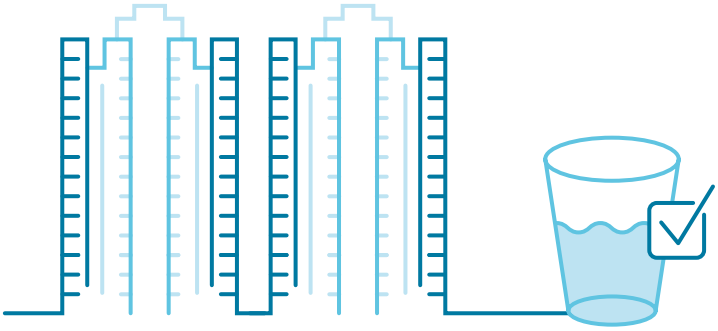
The WSD's risk management-based guidelines and templates are considered among the best practices in promoting the implementation of the WSPB, which are being archived in a website jointly managed by the WHO and the International Water Association for international reference.

為促進計劃的推展，我們還在網站上載《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。

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 website for public access.

自推出以來，約有 **2 000** 座建築物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)」，

Since its launch, about **2 000** buildings have implemented the Water Safety Plan for Buildings and joined the associated Quality Water Supply Scheme for Buildings – Fresh Water (Management System),

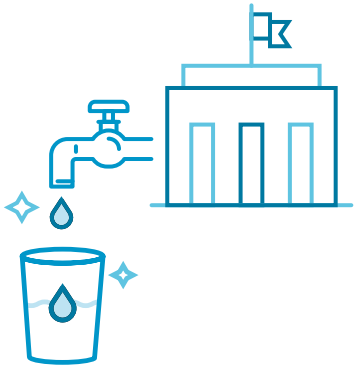


惠及約 **660 000** 戶家庭。

benefiting some **660 000** 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。而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%）。

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



於二零二七年上半年前，所有政府大樓中將實施建築物水安全計劃。

By the **first half of 2027**, the WSPB will be implemented in all government buildings.

專題故事
Feature Story

攜手向前邁步，確保建築物水安全
ENABLING JOINT EFFORTS FOR WATER SAFETY IN BUILDINGS

要全面實施建築物水安全計劃，有賴業主和物業管理人的齊心協力、財政資源配合、對建築物內部供水系統的認識，以及向公眾教育和宣傳。

為鼓勵採用建築物水安全計劃，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」，為合資格的私人樓宇業主或物業管理人，提供財政資助以實施建築物水安全計劃，進一步保障食水安全。

計劃獲撥款4億4千萬港元，於五年內資助合資格業主或物業管理人進行各項相關評估和實施控制措施，包括為樓宇內部供水系統進行水安全風險評估，以及根據水安全風險評估的建議進行維修工程以控制水安全風險。計劃自二零二零年七月起開始接受申請。

為提高公眾對計劃的了解及鼓勵申請，我們舉辦了一系列的公眾講座和宣傳活動，以推廣建築物水安全計劃的優點和講解「水安全計劃資助計劃」的申請程序。

政府將以身作則在所有政府大樓實施建築物水安全計劃。水務署會為該計劃提供技術支援，協助相關決策局/部門在轄下建築物制定水安全計劃。

The implementation of Water Safety Plan for Buildings (WSPB) requires long-term coordinated efforts of property owners and management agents, financial resources, technical knowledge of the building's internal plumbing system, as well as public education and promotion.

To encourage the adoption of the WSPB in buildings, 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 initiate the implementation of the WSPB at their premises with a view to further safeguarding the safety of drinking water.

A funding HK$440 million has been allocated over five years to subsidise eligible property owners or management agents to carry out various assessment and control measures. These include water safety risk assessment on the internal plumbing system of the building for formulating the WSPB and rectification works for controlling the risk(s) as recommended in the water safety risk assessment. From July 2020, the Scheme began accepting applications.

To facilitate public understanding and encourage applications, we have organised a series of public talks and promotional campaigns to promote the benefits of the WSPB and the application procedures of the WSPSS.

To lead by example, there is a new policy for all Government buildings to implement the WSPB. The WSD is responsible to provide technical assistance to the relevant bureaux/departments in the formulation of the WSPB for their buildings.

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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，更為嚴格的水喉物料、設計、建造和新啟用供水系統的管制措施和指引已經執行。

水務署設有「一般認可」系統，預先批核符合《水務設施規例》規定技術要求的水喉產品。為加強監察「一般認可」的產品，水務署於二零一七年設立監察系統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，讓市民識別在零售市場可購買的「一般認可」產品。這些產品的銷售商，必須為所有「一般認可」產品，貼上由水務署簽發的標籤，讓顧客可掃描標籤上的二維碼，查閱有關「一般認可」產品的有用資訊，包括原產地、質量保證資料、有效期等。為保障顧客，所有「一般認可」產品的銷售商，發出的正式銷售收據上均印有「一般認可」產品的參考編號。已註冊成為「一般認可」銷售商的商店名單，已上載於水務署網站。此外，所有已註冊的銷售商，都必須在當眼位置貼上「《認可水喉產品》銷售商」標籤，讓市民易於識別。

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生產過程，促使產業質量的提升，從而確保產品品質穩定並符合認可標準。水務署於二零一九年推出計劃，免除對持有「產品認證」証書的水喉產品的監察要求，以鼓勵更多此類產品加入「一般認可」產品的行列。

法例檢討

檢討水務法例提升食水安全

我們繼續全面檢討《水務設施條例》(第102章)和《水務設施規例》(第102A章)，並於二零二零年十一月就有關法例修訂建議，展開為期90天的公眾諮詢。其中包括水管工程規管、水喉物料管制、飲水噴及飲水機管制、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」，以及加強對內部水喉滲漏的規管。

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. Apart from setting up the surveillance system in 2017 and the Material Testing Laboratory in 2018 for enhancing the conformity of GA products, the WSD launched a Voluntary GA Product Shop Scheme in 2020 to promote accessibility of GA products for the public in the retail market. In a GA Product Shop, all GA products are affixed with labels issued by the WSD. By scanning the QR code on the label, customers can retrieve useful information about the GA product including its country of origin, quality assurance status, expiry date, etc. To provide better customer protection, all official sale receipts issued by the GA Product Shops for GA products are also imprinted with corresponding GA Reference Numbers. The list of registered GA Product Shops can be found in the WSD's website. Besides, all registered shops are required to have GA Product Shop Labels affixed at prominent locations for convenient identification of the public.

Plumbing products with product certificates of independent accredited certification body 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. In 2019, the WSD introduced a scheme to waive surveillance requirements for product certification scheme plumbing products so as to promote inclusion of more of these products into the GA portfolio.

Legislative Review

Legislative Review for Enhancing Drinking Water Safety

We continued our holistic review of the Waterworks Ordinance (Cap.102) and Waterworks Regulations (Cap.102A) and launched a 90-day public consultation in November 2020 on the proposed legislative amendments. 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, and enhancing regulatory control of inside service leakage.

我們於二零二零年十二月舉辦了兩次網上公眾諮詢會，約150人參加。我們現正檢視公眾諮詢所收集的意見，並適時展開相應的法案草擬工作。

In December 2020, we held two online public forums participated by about 150 persons. We are currently reviewing the views collected from the public consultation and will proceed with the corresponding law drafting work as appropriate.

供水可靠性

WATER RELIABILITY

資產管理

Asset Management

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。

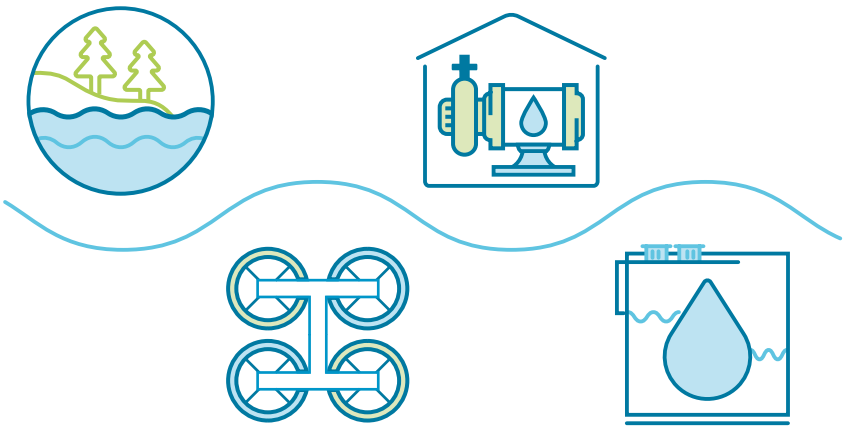
Waterworks Asset Management

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.

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，已於二零二零年底獲得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. in end 2020, we aim to extend the certification scope to the remaining waterworks assets in future.



詳細及獨立的水塘視察

鑑於二零一九冠狀病毒病疫情，我們外聘的海外專家顧問未能到訪香港作實地視察。在繼續由內部人員進行視察和風險評估的同時，我們致力在技術上尋求有效和可行的安排，使外聘專家顧問的獨立視察得以在疫情期間進行。年內，我們安排身在海外的專家顧問以遙距方式進行了17次水塘視察。我們將在可行的情況下恢復海外專家顧問來港作實地視察的安排。

Detailed and independent reservoir inspections

Due to the COVID-19 epidemic, our external expert advisors from overseas could not visit Hong Kong to conduct onsite inspections. While the in-house inspections and risk assessment continue to operate, we sought to explore effective and technically practicable arrangements to resume independent inspections by them under epidemic condition. During the year, we made arrangements to enable our advisors to conduct at their home countries 17 remote inspections of our reservoirs. Where conditions permit, we would seize opportunity in allowing advisors to inspect in a usual manner.

在二零二零至二一年度，我們為水塘及配水庫進行了以下視察：
In 2020/21, we conducted the following inspections of our impounding and service reservoirs:

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

17 次由外聘專家顧問進行的遙距獨立視察
17 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.

在二零二零至二一年度，我們負責保養約
In 2020/21, we oversee approximately

6 500 幅斜坡
6 500 slopes

並為其中 **47** 幅斜坡
Of these, **47** slopes

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

提升水管資產管理

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，在二零二零年亦只有約40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。

Enhancing Water Main Asset Management

We are committed to enhancing the management of our huge water main assets. Water main burst cases remain at a relatively low level. In 2020, about 40 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).

提升供水可靠性

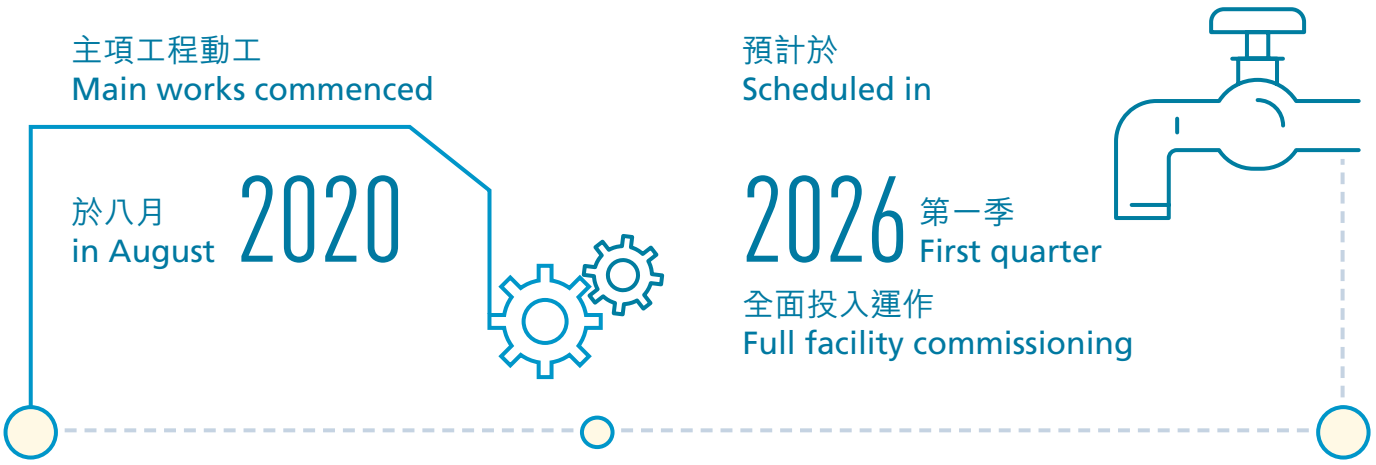
沙田濾水廠原地重置工程(南廠)

此項目旨在確保提供足夠的優質食水予由將相繼落成的公私營住宅發展所帶來的額外食水需求。

Enhancing Water Supply Reliability

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

The project aims 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.



為提高生產力、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，當中包括BIM、DWSS和MiC等。特別一提，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參與者的眼前，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。

To improve productivity, promote site safety and enhance environmental performance, the project incorporates innovative construction methods and technology, including BIM, DWSS and MiC. In particular, BIM enhances the design, construction and project management, and enables all parties 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 single 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.

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。

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

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。

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

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。工程預計於二零二二年第一季度展開，並於二零二八年完成。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 are anticipated to commence in the first quarter of 2022 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(包括元朗南、洪水橋/厦村、橫洲、丹桂村及朗邊)發展計劃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。我們已聘請顧問為擴建項目進行勘查研究工作。

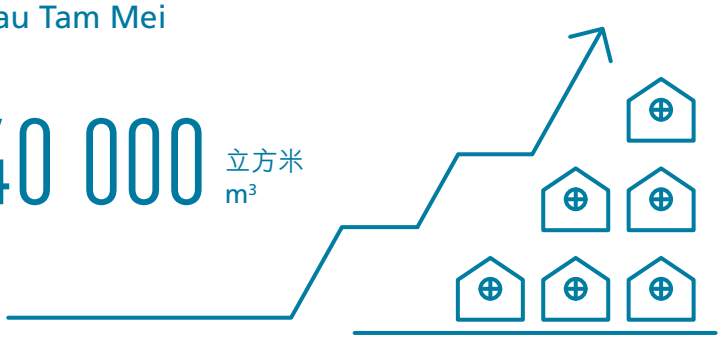
Facilitating Water Supply in New Development Areas

To meet the growth in water demand arising from the planned developments in the Northwest New Territories, including Yuen Long South, the 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.

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。

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.

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.

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

ENERGY CONSERVATION AND RENEWABLE ENERGY DEVELOPMENT

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，我們已於二零二零年十月，成功提升我們的能源管理系統認證至ISO 50001的最新版本。該認證覆蓋整個供水鏈，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 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 successfully upgraded our ISO 50001 certification to the latest version in October 2020. This certification covers 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.

次氯酸鈉液體投放系統

目前，我們營運22個海傍海水抽水站，為香港近85%的人口平均每日供應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液體投放系統。

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 saving in energy, we have planned to install more energy-efficient sodium hypochlorite dosing systems (SHDS) in the seafront salt water pumping stations.

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液體投放系統已投入使用。我們正計劃在九龍南二號海水抽水站、荃灣海水抽水站、屯門海水抽水站、沙田海濱海水抽水站和沙田海濱二號海水抽水站安裝次氯酸鈉液體投放系統，目標於二零二三年底到二零二四年中分階段完成。

So far, SHDS have been put into operation at Tseung Kwan O Salt Water Pumping Station (SWPS) and Siu Sai Wan SWPS. At present, we are planning for the provision of SHDS at Kowloon South No.2 SWPS, Tsuen Wan SWPS, Tuen Mun SWPS, Sha Tin Seafront SWPS and Sha Tin Seafront No.2 SWPS. We target to complete the installation in stages from late 2023 to mid-2024.

全面使用次氯酸鈉液體投放系統後，
Upon the full replacement of sodium hypochorite solution dosing systems,

預計每年節省的能源：
Estimated energy saved per year:

7 千兆瓦時 GWh

及每年電費
& Electricity cost per year

~$7 百萬元 million

相當於
equivalent to

每年減少二氧化碳排放：
Annual carbon dioxide emissions reduction:

CO_2

4 000 噸 tonnes

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*

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

隨著於石壁水塘和船灣淡水湖的先導項目取得成功後，我們目前正在大欖涌水塘安裝一組100千瓦的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。我們亦正研究轄下各項設施使用可再生能源的可行性。

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。

Floating Photovoltaic Systems

Following the success of our pilot projects at the Shek Pik and Plover Cove reservoirs, we are currently implementing a 100kW-capacity floating photovoltaic (FPV) system at the Tai Lam Chung Reservoir. Our long-term plan is to progressively implement large-scale FPV farms on reservoirs in Hong Kong. We are also exploring the application of renewable energy in various facilities.

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.

船灣淡水湖的浮動太陽能板發電系統
Floating PV System at Plover Cove Reservoir

了解更多
Read more

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

繼香港首個水力發電站在屯門濾水廠落成後，位於沙田濾水廠的第二個水力發電站亦已竣工，並於二零二零年第三季開始投入使用。而位於馬鞍山濾水廠的水力發電站的設計工作亦已完成，預計於二零二四年投入運作。

Hydropower Generation Plants

Following the establishment of Hong Kong's first hydropower plant at Tuen Mun Water Treatment Works, we completed the construction of a second hydropower plant at Sha Tin Water Treatment Works, and its operations began in the third quarter of 2020. The design for the hydropower plant at Ma On Shan Water Treatment Works was completed which will be commissioned in 2024.

沙田濾水廠的水力發電站
Hydropower Plant at Sha Tin Water Treatment Works

了解更多
Read more

點滴話你知
Did You Know?

屯門水力發電廠不單是香港獨有的創舉，更是全球首個在濾水廠興建的500千瓦水力發電設施。系統每年發電約3千兆瓦時，相當於每年可減少約2 000 噸二氧化碳排放。

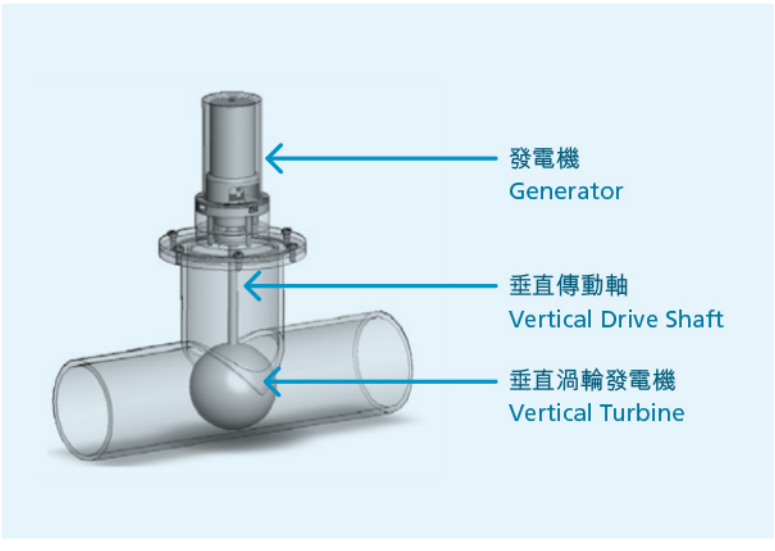
First of its kind in Hong Kong, the hydropower plant at Tuen Mun is a pioneer in the world to construct 500kW hydropower facilities at a water treatment works. The hydropower system can generate up to about 3 GWh of electricity annually (equivalent to the potential reduction of about 2 000 tonnes of carbon dioxide emissions each year).

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。

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.



內聯閉式水力發電裝置，為「智管網」的監測和數據傳輸設備提供電力，以達至實現遙距監測的目標。

In-line hydropower harnessing devices provide power supply to the monitoring and data transmission equipment 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，並預計於二零二一年底起陸續完成。完成後，現場氯氣生產設施將投入使用，因而避免運輸及儲存液態氯氣過程中洩漏氯氣的風險。

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

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。水務署響應參與由環境局制定的香港首份城市級《生物多樣性策略及行動計劃2016-2021》，與其他政府部門攜手合作，力求透過改良維修工作的流程及減少相關工作對生態環境的影響，優化天然溪澗和引水道的保育。

ENVIRONMENTAL MITIGATION

On-site Chlorine Generation

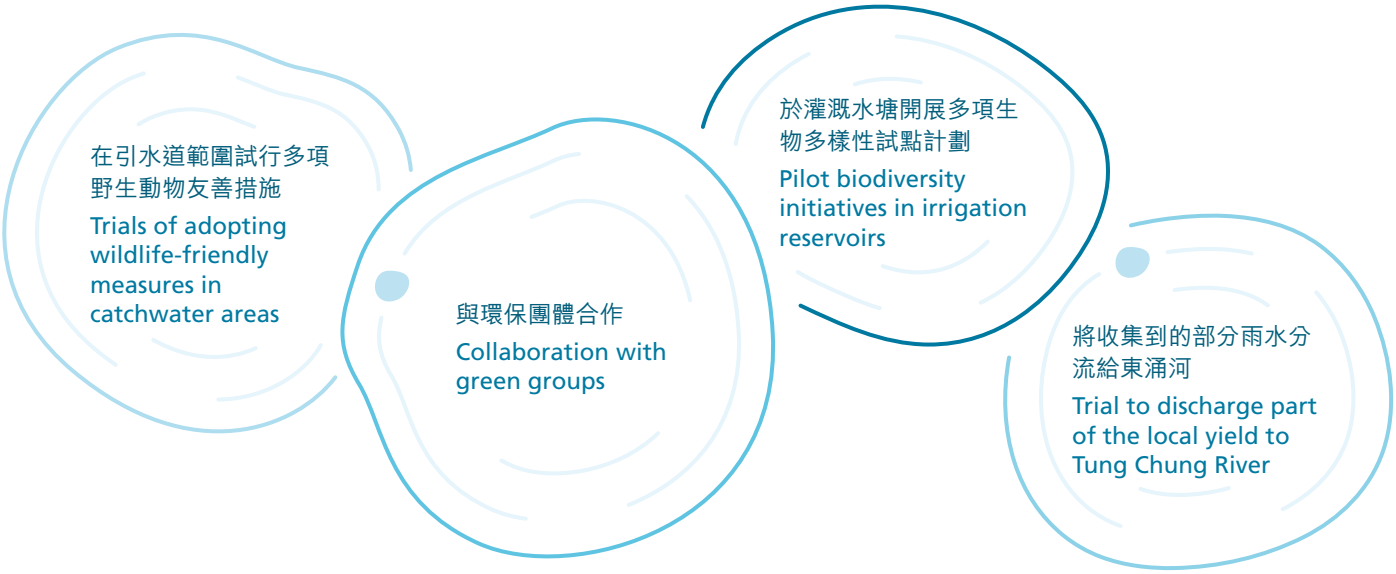
We continue to upgrade the disinfection facilities of 10 of our major Water Treatment Works, which will be completed progressively from end 2021. Upon completion, the on-site chlorine generation facilities will be commissioned, therefore eliminating the risks of chlorine leakage during the transportation and storage of liquid chlorine.

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

Concerted efforts across the society to conserving biodiversity is essential to ensuring the city's sustainable development. The WSD has participated in Hong Kong's first city-level "Biodiversity Strategy and Action Plan 2016-2021" (BSAP) formulated by the Environment Bureau. Joining hands with other government departments, we are contributing efforts to enhance conservation of natural streams and catchwaters by improving practices in and minimising ecological impacts from our maintenance works.



在漁農自然護理署的支持下，我們在引水道範圍試行多項野生動物友善措施，包括於改善工程中增設動物逃生通道和採用保護生態的物料。我們亦與環保團體合作，嘗試將收集到的部分雨水分流給下游的大嶼山東涌河，支持其生態研究。試點計劃有助恢復下游淡水生物棲息地，成果令人鼓舞。

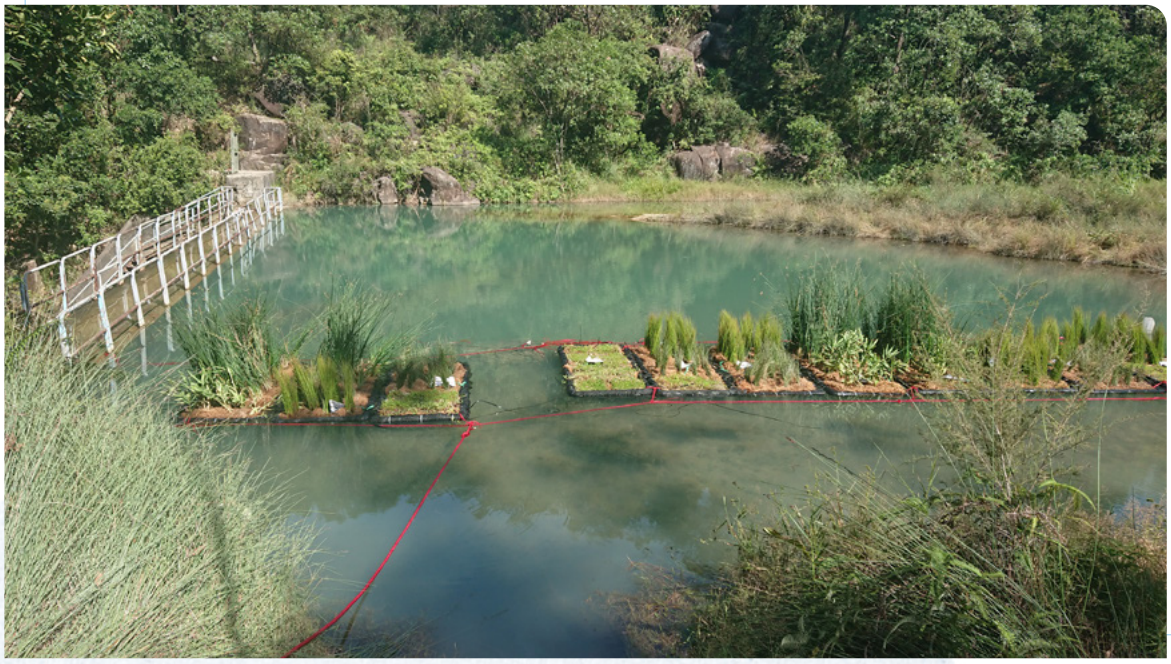
With the support of the Agriculture, Fisheries and Conservation Department, we carried out trials of adopting wildlife-friendly measures in catchwater areas, including installing animal escape routes and using ecologically friendly materials in our improvement works. In collaboration with green groups, we have also commenced a trial to discharge part of the local yield to Tung Chung River in Lantau to support their ecological study. This pilot initiative has demonstrated encouraging results in helping to revitalise freshwater habitats downstream.

為加強於水務設施的生物多樣性，我們正與多個環保團體合作，於灌溉水塘開展多項生物多樣性試點計劃。其中包括在洪水坑灌溉水塘試行生態浮島和展開生態調查。

With a view to enhancing biodiversity in waterworks, we are collaborating with various green groups on various pilot biodiversity initiatives in irrigation reservoirs. These include the ecological enhancement of Hung Shui Hang Irrigation Reservoir through pilot ecological floating platforms and an ecological survey.

我們會繼續尋找機遇，配合政府的生物多樣性保育工作和國家生物多樣性策略及行動計劃，同時提高公眾意識及鼓勵社區參與。

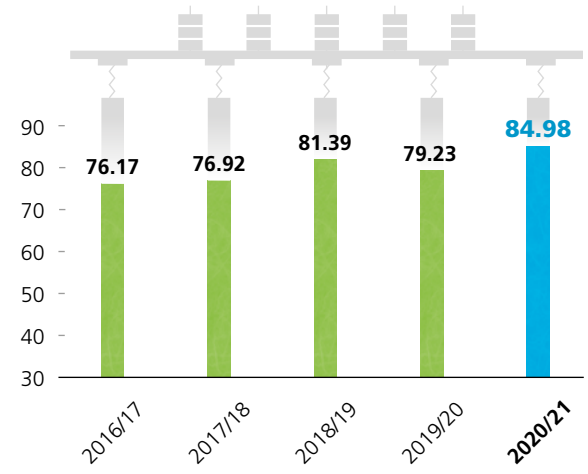
We will continue seeking opportunities to contribute to government's efforts on biodiversity conservation and to China's national BSAP while promoting public awareness and community involvement.



洪水坑灌溉水塘試行生態浮島，以加強生物多樣性。
Pilot ecological floating platform at Hung Shui Hang Irrigation Reservoir in enhancing biodiversity.

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

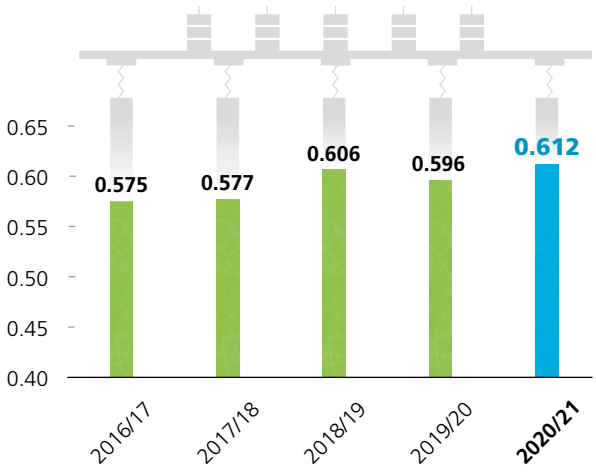
千瓦時/每人/每年 kWh/head/year



財政年度 Financial Year

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

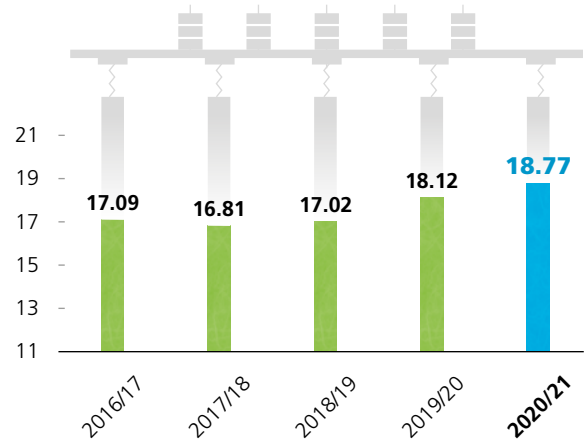
千瓦時/立方米 kWh/m³



財政年度 Financial Year

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

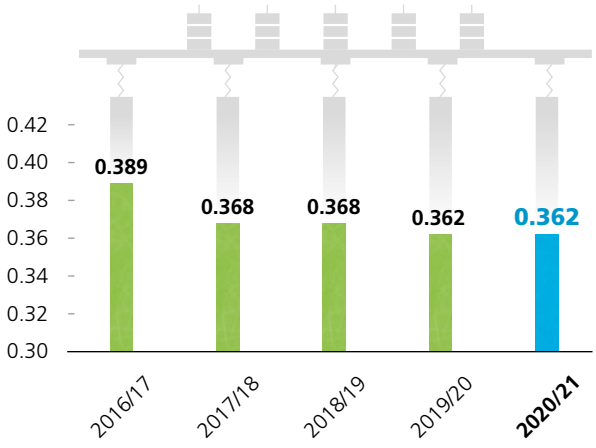
千瓦時/每人/每年 kWh/head/year



財政年度 Financial Year

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

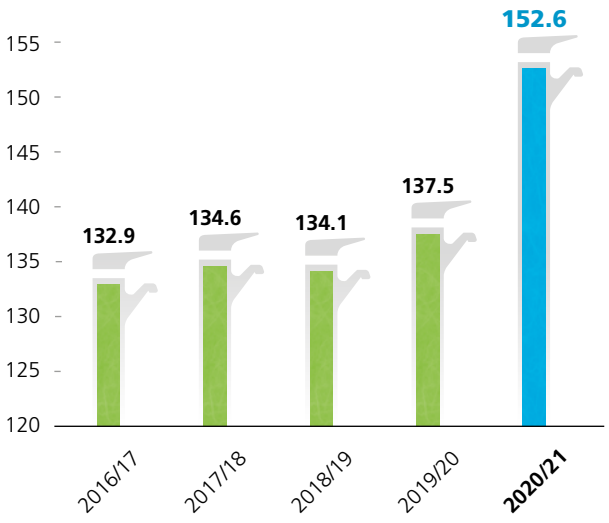
千瓦時/立方米 kWh/m³



財政年度 Financial Year

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

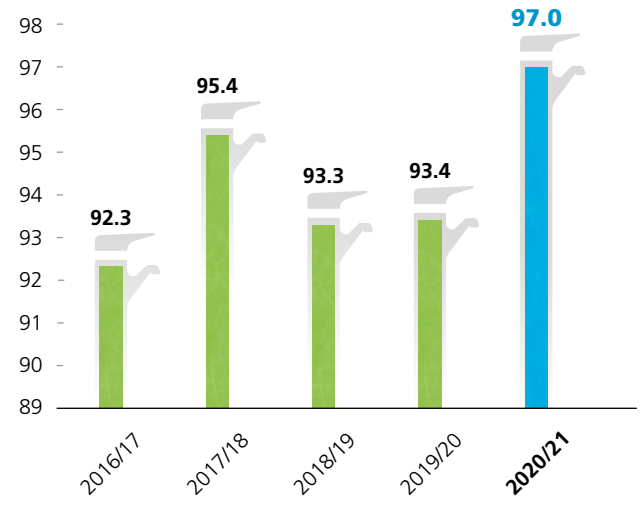
公升/日 Litres/day



財政年度 Financial Year

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

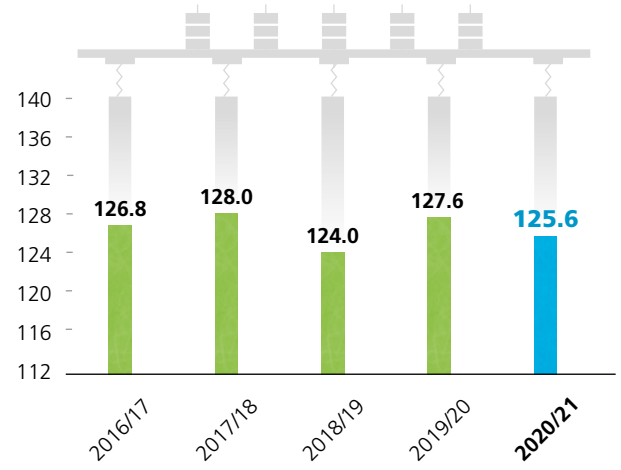


財政年度 Financial Year

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

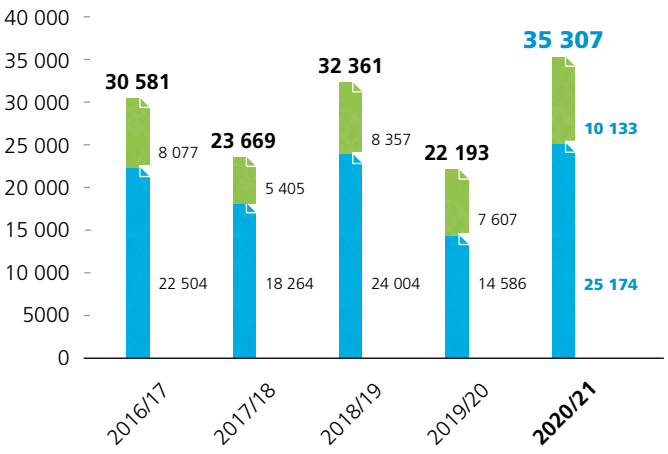
千瓦時/平方米 kWh/m²



財政年度 Financial Year

耗紙量
Paper Consumption

令 Reams

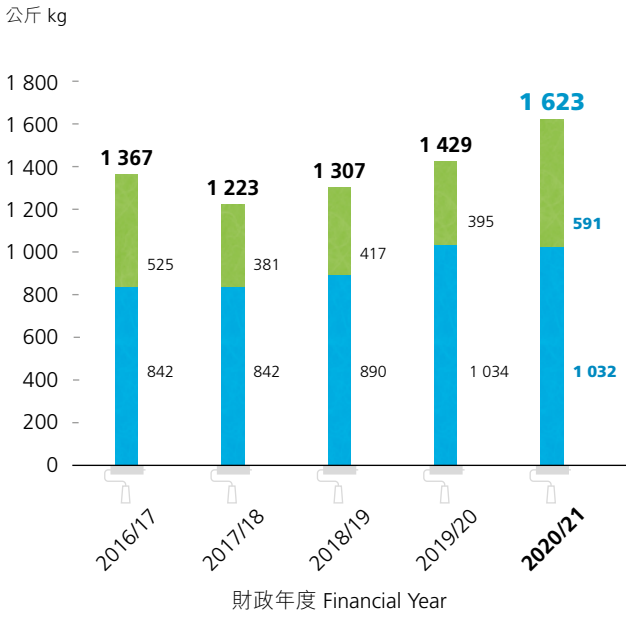


財政年度 Financial Year

無木漿紙張 Wood-free Paper　再造紙張 Recycled Paper

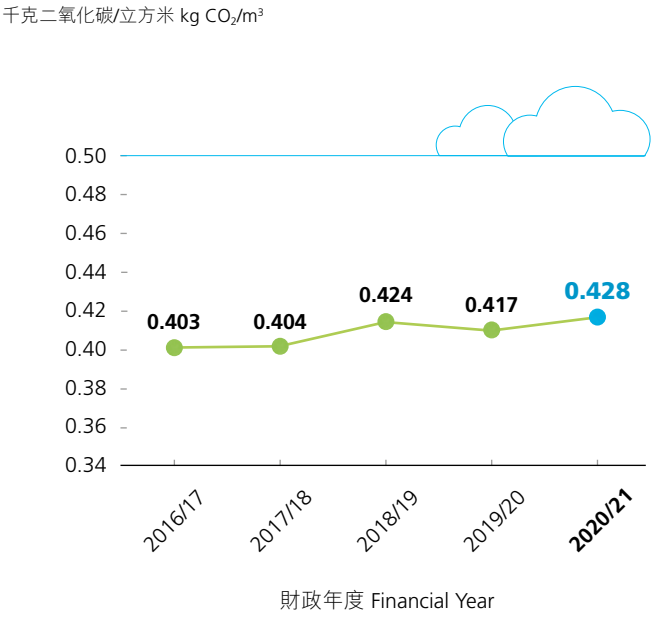
註： 由於在二零二零年第一季實施的特別上班安排，原定預計於二零一九至二零年度訂購的1 752令無木漿紙張和5 442令再造紙張延遲至二零二零至二一年度。
Note : 1 752 reams of wood-free paper and 5 442 reams of recycled paper originally planned to be ordered in 2019/20 was deferred to 2020/21 due to the special work arrangements implemented in the first quarter of 2020.

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

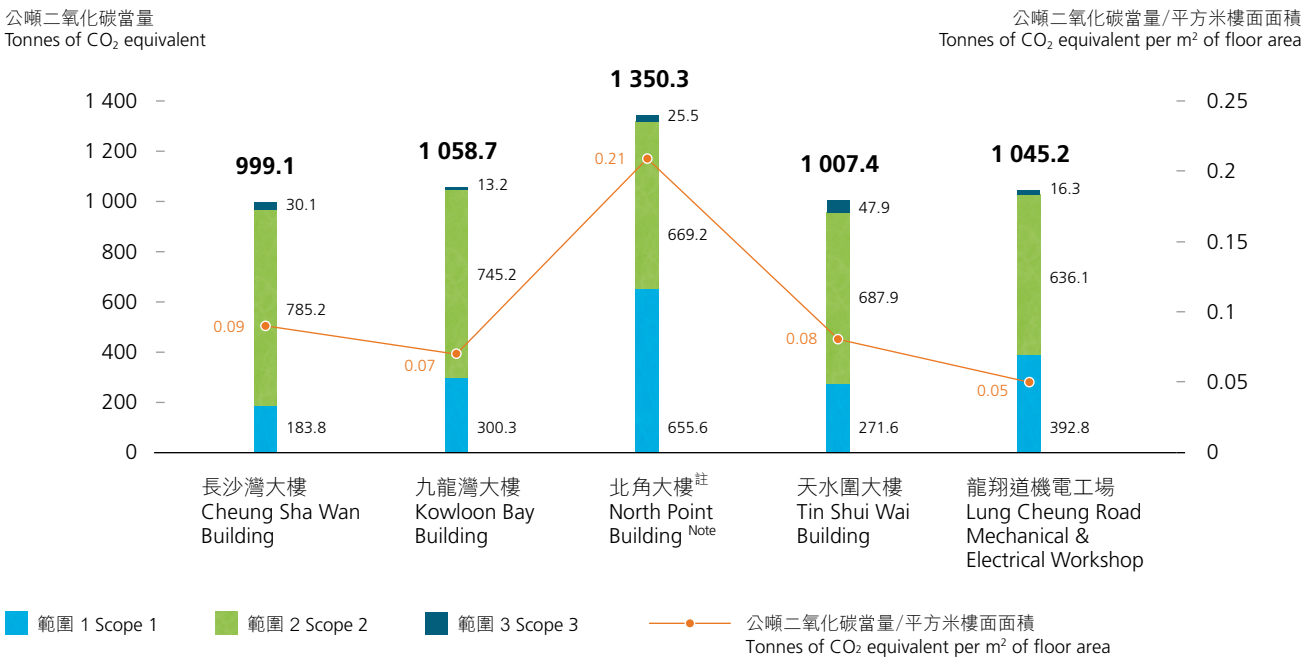


VOC：揮發性有機化合物 Volatile organic compound

水務署因使用電力處理食水而出現的溫室氣體排放
Green House Gas Emissions Due to Electricity Used for Fresh Water Processing by the WSD



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

註： 北角大樓於二零二零至二一年度內進行了涉及製冷劑替換的空調系統維修工程，導致約360公噸二氧化碳當量(或約0.05公噸二氧化碳當量/平方米樓面面積)的溫室氣體排放。

Note: Repair of the air-conditioning system in the North Point Building involving replacement of refrigerant was conducted in 2020/21, which resulted in about 360 tonnes of CO_2 equivalent (or about 0.05 tonnes of CO_2 equivalent per m^2 of floor area) of GHG emissions.

可再生能源產量
Renewable Energy Generated

財政年度 Financial Year	2016/17	2017/18	2018/19	2019/20	**2020/21**
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)	29 430	33 397	29 437	28 940	**230 257**
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)	N/A	134 857	131 328	200 428	**209 007**
濾水廠中的水力發電系統的發電量(千瓦時) Generated by Hydropower Plant at Water Treatment Works (kWh)	61 173	133 078	311 587	1 491 819	**1 478 767**
總量(千瓦時) Total (kWh)	90 603	301 332	472 352	1 721 187	**1 918 031**
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]	63 422	210 932	330 646	1 204 831	**1 342 622**

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

	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)**		
財政年度 Financial Year	2018/19	2019/20	**2020/21**	2018/19	2019/20	**2020/21**	2018/19	2019/20	**2020/21**
柴油 Diesel	85	86	**90**	144 386	199 676	**220 661**	771 660	1 062 437	**1 112 553**
汽油 Petroleum	123	116	**112**	398 065	313 666	**285 478**	1 997 606	1 599 969	**1 513 801**
混合(汽油/電力) Hybrid (Petrol/Electric)	3	1	**1**	2 067	298	**671**	38 858	6 439	**13 903**
液化石油氣 LPG	11	11	**11**	43 503	49 097	**47 122**	121 690	135 514	**126 774**
電力 Electricity	15	13	**13**	–	–	**–**	122 293	81 510	**65 975**

註： 2019/20年度汽油政府車輛總車程由1 345 504公里更正為1 599 969公里。
Note: Total mileage of petroleum government vehicles in 2019/20 has been rectified from 1 345 504 km to 1 599 969 km.

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	2018/19	2019/20	**2020/21**	2018/19	2019/20	**2020/21**	2018/19	2019/20	**2020/21**	2018/19	2019/20	**2020/21**
直接廢氣排放 Direct Emissions												
車輛(柴油) Vehicle fleet (Diesel)	347	522	**536**	-	-	**-**	4	1	**1**	-	-	**-**
車輛(汽油) Vehicle fleet (Petrol)	899	741	**565**	-	-	**-**	1	1	**1**	-	-	**-**
車輛 (液化石油氣) Vehicle fleet (LPG)	73	82	**77**	-	-	**-**	-	-	**-**	-	-	**-**
間接廢氣排放 Indirect Emissions												
耗用電 (九龍及新界) Electricity Consumed (Kowloon and New Territories)	342 785	322 807	**255 372**	94	65	**30**	310	297	**170**	8	8	**6**
耗用電(港島) Electricity Consumed (Hong Kong Island)	54 533	53 632	**50 053**	19	12	**8**	51	48	**38**	1	1	**1**
總量 Total	398 637	377 784	**306 603**	113	77	**38**	366	347	**210**	10	9	**7**