

# 供水管理

## Water Supply Management



### 全面水資源管理

於二零零八年發佈的「全面水資源管理策略」為我們持續使用珍貴的水資源提供堅實基礎。此策略強調控制用水需求增長及加強供水，以令香港能更好地應對未來的不明朗因素及挑戰。本署一直多管齊下，採取軟硬兼備的策略，向住宅用戶及非住宅用戶推廣節約用水。除控制用水需求外，我們亦已完成為期15年的老化水管更換及修復的計劃，大幅減少水管滲漏情況，並逐步建立「智管網」，持續監測供水網絡狀況，以便及時採取適當行動。上述措施讓我們成功開創管網管理新紀元。

### Total Water Management

The Total Water Management strategy released in 2008 provides a firm foundation for us to move toward sustainable use of our precious water resources. This strategy places emphasis on containing the growth of water demand and strengthening supply to better prepare Hong Kong for future uncertainties and challenges. Our Department has been implementing a multi-pronged approach to promote water conservation in the domestic and non-domestic sectors, applying both hardware and software strategies. On the other front of controlling water demand, we have achieved significant reductions in water main leakage through the completion of a 15-year programme of replacement and rehabilitation for aged water mains, and are progressively establishing the Water Intelligent Network (WIN) to continuously monitor the health of water supply networks in order to respond with timely and appropriate actions, bringing network management into a new era.

## 策略回顧

本署深知水資源所面臨的挑戰，因此，本署於二零一四年底聘請顧問，對全面水資源管理策略進行檢討。檢討仍在進行中，而檢討結果將用於提出新措施加強本署的處變能力，為應對不明朗因素及挑戰（氣候變化的潛在影響、廣東省多個城市對東江水的競爭，以及本港的預期人口增長）做好準備。

## 六管齊下的供水結構

目前，香港供水系統有三個分支，包括本地集水區收集的雨水、從廣東輸入的東江水及沖廁用海水，於二零一五年分別佔12.45億立方米總耗水量（包括沖廁用水需求）的16%、62%及22%。憑藉這三個水源，香港多年來一直擁有可靠的供水。

然而，為使香港能充分應對氣候變化，人口及經濟快速增長帶來的食水需求增加，以及廣東省城市對東江水的競爭等挑戰，本署致力透過用水流失管理及節約用水控制用水需求增長，並探索受氣候影響較少的海水化淡及再造水作為可替代水源。隨著該等措施的推行，本署正致力建設六個分支的供水結構，該結構由現有三個來源—本地集水、輸入的東江水及沖廁用海水，以及三個新增來源，（即海水化淡、再造水和中水重用及集蓄雨水）構成。這六個供水來源將成為提升香港穩健供水及適應性的重要支柱。

## Strategy Review

The Department fully recognises the challenges faced by our water resources. With this in mind, we appointed consultants in late 2014 to conduct a study to review our Total Water Management Strategy. The review is still on-going and its results will be used to develop new initiatives to strengthen our resilience and preparedness against uncertainties and challenges, including the potential impact of climate change, as well as the competition among various cities in Guangdong Province for Dongjiang water resources and the projected growth of Hong Kong's population.

## 6-Pronged Water Supply Structure

Currently, Hong Kong has a 3-pronged water supply system, comprising rainwater from local catchments, imported water from Dongjiang in Guangdong, and the use of sea water for toilet flushing. The share breakdown of total water consumption (including flushing water demand), 1,245 million cubic metres in 2015, came to 16%, 62% and 22% respectively. These three water sources have provided Hong Kong with a reliable water supply over the decades.

Nevertheless, to better prepare Hong Kong for the challenges of climate change and the increasing demand for fresh water due to rapid population and economic growth, as well as competition for Dongjiang water among the cities in Guangdong Province, we have been striving to contain water demand growth through water loss management and water conservation and to exploit alternative water resources which are less susceptible to climate change, including sea water desalination and water reclamation. With the implementation of these measures, the WSD is moving toward the establishment of a 6-pronged water supply structure, comprising the existing three sources -- local yield, imported Dongjiang water and sea water for flushing, supplemented by three new sources i.e. desalinated water, reclaimed water, plus recycled grey water and rainwater harvesting. These six water supply sources will become the pillars supporting Hong Kong with enhanced water security and adaptation into the future.



## 本地集水

遍佈全港17個水塘的集水區佔香港面積近三成。一般而言，收集的雨水大多不受污染，然而，為安全起見，本署採取額外措施，包括進行定期巡查、檢查水質及對集水區進行必要維修和清除泥石等。本地雨水收集約佔總食水用量二至三成。

## 海水沖廁

除飲用水源外，本署同樣重視海水沖廁應用。薄扶林及新界西北（包括屯門東、元朗及天水圍）海水供應水務基礎設施完成後，海水供水網絡覆蓋的人口已由八成上升至八成半。有關地區的海水沖廁轉換工作正在逐步進行。

## 海水化淡

除雨水、東江水及沖廁用海水外，本署一直積極開發新的供水來源，包括海水化淡、再造水及中水重用及集蓄雨水。

氣候變化可能影響香港的供水穩健，因此我們應用先進的逆滲透技術，開始在將軍澳興建海水化淡廠。我們於二零一五年十一月聘請顧問進行將軍澳擬建設施的初步設計。於設計過程中，我們將參考海外經驗並研究濾水程序方面的創新設計。這些設計可減少能源消耗，並提供先進的能量回收系統等設施，從而提升濾水廠的整體能源效益。

設計階段預期大概將於二零一七年年底完成。本署的目標於二零一八年初啟動化淡廠的建造。化淡廠的目標產量預期可滿足香港約半成的食水需求，日後產量可擴大至滿足本港約一成的食水需求。

## Local Yield

All across Hong Kong, covering nearly 30% of the Territory, are rainfall catchment areas with 17 impounding reservoirs. In general, rainwater is largely uncontaminated. However, as additional measures for safety, the Department makes regular inspections, checks water quality, carries out necessary maintenance and removes debris in the catchwaters. Local yield generally accounts for about 20% to 30% of our total fresh water consumption.

## Sea Water for Flushing

In addition to potable water sources, we also place great importance on the application of sea water for toilet flushing. Following completion of the waterworks infrastructure for the supply of sea water to Pokfulam and North West New Territories (Tuen Mun East, Yuen Long and Tin Shui Wai), the population coverage has increased from 80% to 85%. Conversion of flushing supply to sea water in these areas is now underway.

## Sea Water Desalination

Apart from rainwater, Dongjiang water and sea water for flushing, we have been actively developing new sources of water supply, including sea water desalination, water reclamation and grey water recycling/rainwater harvesting.

In order to counter the possibility that climate change could disrupt the security of our water supply in Hong Kong, we have embarked on the construction of a desalination plant in Tseung Kwan O (TKO), using advanced reverse osmosis technology. We hired consultants in November 2015 to proceed with the design of the first stage of the proposed facility in TKO. During the course of the design, we will make reference to overseas experiences and will look into the introduction of suitable innovative designs in terms of treatment processes that require less energy consumption as well as offer advanced energy recovery systems etc. to enhance the plant's overall energy efficiency.

The design phase is anticipated to be completed by about the end of 2017. We aim to begin construction of the plant early by 2018. The target output is expected to meet about 5% of the fresh water demand in Hong Kong with provisions for expanding its capacity in the future to meet about 10% of the Territory's total fresh water needs.

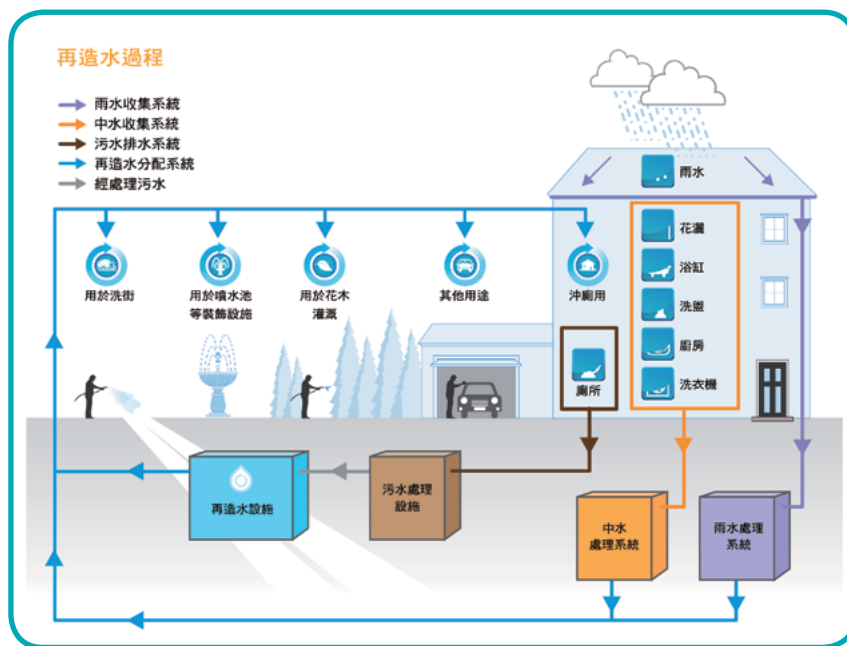


## 再造水

本署亦計劃分階段向上水、粉嶺及古洞北和粉嶺北新發展地區提供石湖墟污水處理廠經三級處理的再造水作非飲用用途，其中上水及粉嶺將於二零二二年起率先使用。本署已開始設計配水庫及輸水幹管，預計向上述地區全面供應再造水最終可望每年節省約2,100萬立方米的食水。同時，本署正在研究再造水供應的各種財務及法律事宜。

## Water Reclamation

We also plan to effect the supply of reclaimed water converted from tertiary treated sewage effluent at the Shek Wu Hui Sewage Treatment Works to Sheung Shui, Fanling and New Development Areas in Kwu Tung North and Fanling North for non-potable uses in phases starting with Sheung Shui and Fanling from 2022 onwards. We have begun the design of a service reservoir and associated trunk mains and anticipate that the full-fledged reclaimed water supply to the above areas will ultimately save up to 21 million cubic metres of fresh water each year. Concurrently, we are studying the various financial and legal aspects of reclaimed water supply.



## 中水重用及集蓄雨水

從浴室、洗手盆和廚房洗滌盆等地方收集得的水稱為中水，中水與收集的雨水經處理後可予重用，作非飲用用途。

本署一直在探索更廣泛地應用中水重用及集蓄雨水系統，並在合適的新政府項目中加以安裝。發展局和環境局發出的環保政府大樓聯合技術通告已納入詳細指引，讓新建政府大樓在盡可能在合理的情況下安裝處理和再造設施，通過中水重用或集蓄雨水系統減少以食水作非飲用用途。

## Grey Water Recycling and Rainwater Harvesting

Water collected from baths, showers, wash basins and kitchen sinks is known as grey water. Along with harvested rainwater, these supplies can be treated and reused for non-potable purposes.

We have been exploring the wider use of grey water recycling and rainwater harvesting systems by installing them in suitable new government projects. Detailed guidelines have been incorporated into the Joint Development Bureau and Environment Bureau Technical Circular in Green Government Buildings so that new government buildings with the potential of reducing their fresh water demand for non-potable applications through rainwater harvesting or a grey water recycling system will be able to install on-site treatment and recycling facilities as much as is reasonably possible.

在規劃大規模新項目時，本署將與相關政府部門通力合作，考慮在適當情況下預留空間及所需款項，以便日後引進中水重用及集蓄雨水系統。

就此而言，水務署正計劃在安達臣道石礦場用地發展項目中建設中水重用系統。該系統由政府集中營運，主要處理在發展項目內從用戶收集的中水作沖廁用途。該系統將包括一個抽水機組的中水處理廠、一個經處理中水的配水庫、收集及輸送中水的管道。水務署已對處理廠進行初步設計，現時正在進行顧問遴選程序。

## 供水危機管理

為確保全港供水可靠及充足，本署須時刻作好準備應對任何影響供水的不可預見問題。為此，我們已制訂一個危機管理計劃、乾旱應變計劃和多個其他應變計劃，以隨時準備快速調配資源及協調各個緊急行動。

此外，本署已透過各種溝通途徑與其他政府部門保持緊密聯絡，以便在發生危機的情況下，協調各方緊急應變措施以確保持續供水。

When planning large-scale new projects, we will, in collaboration with relevant government departments, consider reserving space and necessary provisions where appropriate to facilitate the introduction of grey water recycling and rainwater harvesting systems in the future.

In this regard, the WSD plans to construct a grey water recycling system at the Anderson Road Quarry site, which is a centralised government-operated system treating grey water collected from end users within the development for flushing use. This system will comprise a grey water treatment plant with associated pumpsets, a treated grey water service reservoir, pipes for grey water collection, delivery and distribution of the treated grey water to the service reservoir and consumers respectively. The WSD has carried out a preliminary design of the treatment plant and the consultant selection process is currently in progress.

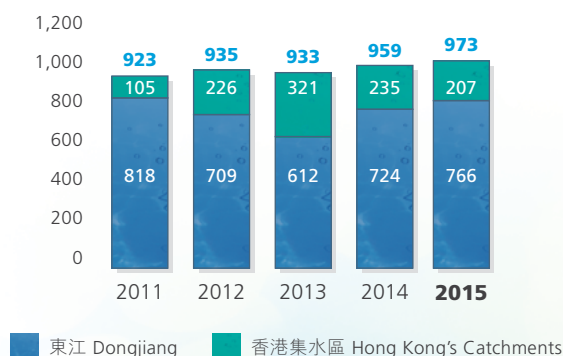
## Water Supply Crisis Management

To ensure a reliable and adequate water supply for Hong Kong, it is essential for the Department to prepare for any unforeseen problems in the water supply system. For this reason, we have a crisis management plan, drought contingency plan and several other contingency plans in place to maintain a state of readiness for the rapid mobilisation of resources and coordination of emergency actions.

In addition, we have maintained close contact with other government departments through various communication means in order to coordinate emergency responses to maintain continuous water supplies in the event of crises.

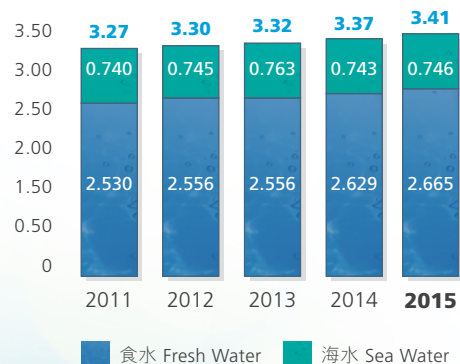
二零一一年至二零一五年全年供水量  
Annual Quantity of Raw Water Supply 2011 - 2015

百萬立方米 million cubic metres



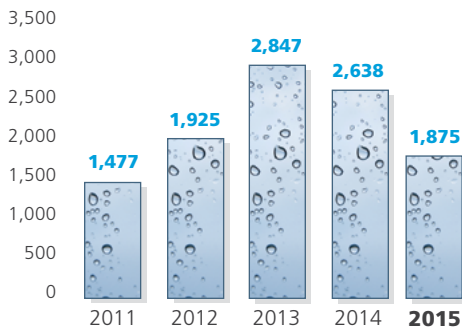
二零一一年至二零一五年總平均日耗水量（食水及海水）  
Total Average Daily Consumption (Fresh water and sea water) 2011-2015

百萬立方米 million cubic metres



二零一一年至二零一五年全年降雨量  
Annual Rainfall 2011-2015

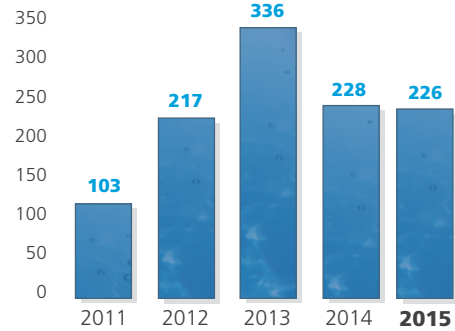
毫米 millimetres



註：長期平均降雨量為2,399毫米  
Note: Long Term Mean Rainfall is 2,399 millimetres

二零一一年至二零一五年全年集水量  
Annual Yield 2011 - 2015

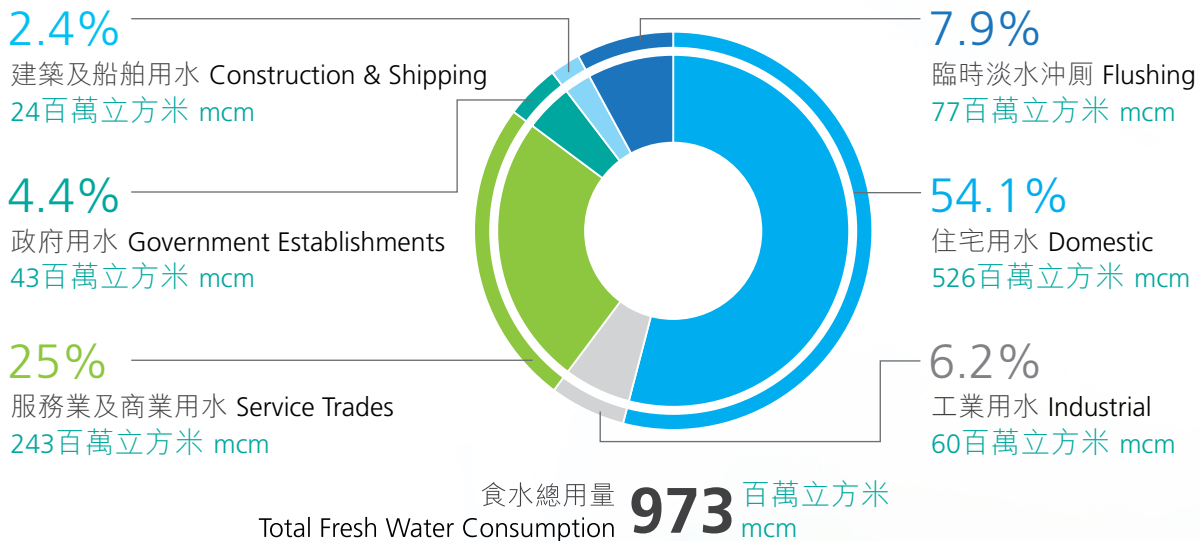
百萬立方米 million cubic metres



註：長期平均集水量為295百萬立方米  
Note: Long Term Mean Yield is 295 million cubic metres

二零一五年按用水類別劃分的食水用量（百萬立方米）佔總量百分比  
Annual Fresh Water Consumption 2015 by Sectors in Million Cubic Metres (MCM) and Percentage of Total

百萬立方米 million cubic metres



二零一一年至二零一五年按用水類別劃分的全年食水用量  
Annual Fresh Water Consumption (by Sectors) 2011 - 2015

百萬立方米 million cubic metres

年份 Year	2011	2012	2013	2014	2015
住宅用水 Domestic	498	505	504	516	526
工業用水 Industrial	58	59	58	60	60
服務業及商業用水 Service Trades	236	236	234	240	243
政府用水 Government Establishments	41	41	41	44	43
建築及船舶用水 Construction & Shipping	14	18	20	23	24
臨時淡水沖廁 Flushing	76	76	76	76	77
食水總用量 Total Fresh Water Consumption	923	935	933	959	973