





確保穩定供水 Securing Our Water Supplies

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本署一如既往管理香港對食水的需求，確保不論是本地收集或由東江輸入的食水，均會獲得妥善處理，達至規定的水質標準，並有效率地供應至港九新界各地。

食水供應

香港的原水有兩個主要來源，分別是：廣東省的東江，以及遍佈本港郊野公園和鄉郊地區的降雨集水區網絡。除此之外，輔以海水用作沖廁，以及目前少量主要用作灌溉的再造水。

於2011年，本港89%的用水由東江專用輸水管道輸入。除了每年例行的管道維修停水期外，每日輸港的東江水量只是輕微低於本港的每日食水耗用量。如輸入的東江水在滿足直接用水需求後仍有餘額，會與本地收集所得的原水一同貯存於本港的水塘。海水抽取自沿海各處的抽水站，經適當處理後，供應給本港約八成人口作沖廁用途。

The Department continues to manage Hong Kong's demand for water to ensure that water supplies - whether collected domestically or imported from the Dongjiang - are treated to prescribed quality standards and delivered efficiently across the territory.

FRESH WATER SUPPLIES

Hong Kong's raw water supply comes from two principal sources: the Dongjiang (or East River) in Guangdong and a network of domestic rainwater catchments located across the territory's extensive country parks and rural areas. These fresh water supply sources are supplemented by sea water used for toilet flushing and, a small amount, at this stage, of recycled water used primarily for irrigation and landscaping.

In 2011, 89 per cent of Hong Kong's supply of raw water was transported by a dedicated aqueduct from the Dongjiang. Apart from the period when the aqueduct is closed for annual maintenance, the daily supply from this source is only slightly less than the city's daily consumption. Imported Dongjiang water surplus to immediate needs is stored with locally collected raw water in impounding reservoirs. Sea water is extracted by pumping stations located at various points of the seafront, treated and then supplied to 80 per cent of the population for toilet flushing.

香港在制定長遠的水資源供應政策時，除顧及本身需求外，也考慮珠江三角洲地區持續增長的人口和工業發展的需要。我們正在拓展飲用水及非飲用水的替代供水來源，以減少對東江水的倚賴。

In terms of our long term supply strategy, we are looking beyond Hong Kong's water demand to take note also of the needs of the Pearl River Delta which continues to grow in terms of both population and industry. Alternative sources of both potable and non-potable water are being explored to lessen our reliance on the Dongjiang.



位於上水的大直徑水管用來輸送東江原水。
Large diameter pipelines located in Sheung Shui transfer Dongjiang water.

東江供水

若珠三角地區的食水並非嚴重短缺，目前與廣東簽訂的東江水輸港協議所訂明的最終供水量，足以應付至二零三零年本港的預計用水需求。實際的供水量按月參照每季雨水收集量而定，此舉有助用得其所，以免浪費。最近於二零一一年底簽署的三年期供水協議規定，把二零一二年、二零一三年及二零一四年購買東江水所需支付的費用分別定為35.39億元、37.43億元及39.59億元。有關議定價格已計算人民幣兌港元匯率大幅升值，以及兩地通脹率不斷上升所帶來的影響。雖然東江水的價格較二零零九年前有所增加，但截至目前向客戶收取的水費並沒有調高。

DONGJIANG WATER SUPPLY

The ultimate quantity stipulated in the current water supply agreement with Guangdong means that the supply of water from the Dongjiang is sufficient to meet estimated demand of Hong Kong up to 2030 and beyond if there is no acute water shortage in the Pearl River Delta area. The actual draw off is determined on a monthly basis taking into account seasonal rainfall. This helps us to optimise the overall use of water resources. The latest three-year agreement signed at the end of 2011 sets the cost of the water at \$3,539 million for 2012, \$3,743 for 2013 and \$3,959 for 2014. The negotiated price regime takes into account the substantial appreciation of China's RMB against the Hong Kong dollar and escalating rates of inflation in Guangdong and Hong Kong. Although the purchase costs are higher than the pre-2009 charges, they have not, to date, been reflected in any increase in water charges to our consumers.

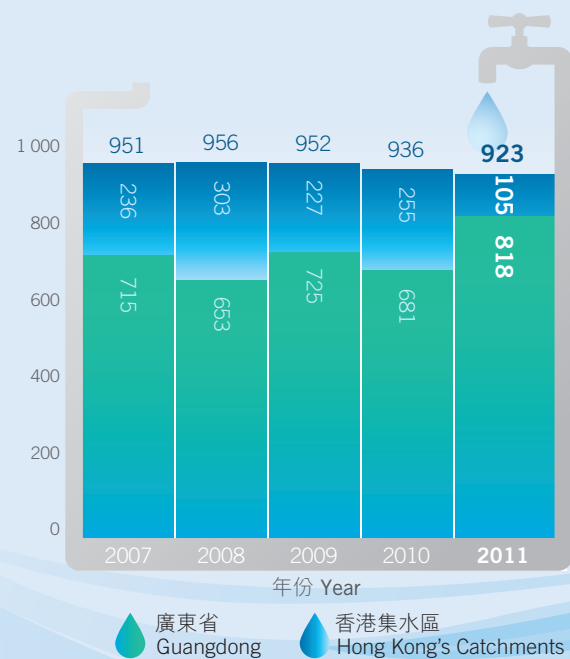
我們與廣東當局繼續保持緊密溝通，了解省內對東江水的需求，同時控制本地水塘貯存水平，以減少浪費和節省抽水成本。

廣東省致力保護水環境，確保輸港的原水水質符合國家地表水環境質量標準。措施包括：興建污水處理廠、遷走具污染性的工廠、在深圳水庫設立生物硝化廠，以及鋪設專用輸水管道接駁東江取水點至深圳水庫，直接對港供水，從而避免供水途中可能夾雜的污染物。由此，我們能恆常地維持高質量原水的同時，相應也節省了食水處理的費用。

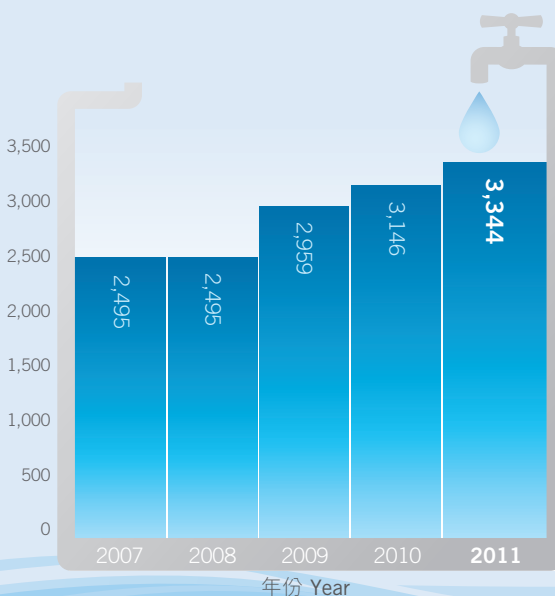
We have continued to maintain close communication with the Guangdong authorities on their provincial water requirements and have controlled storage levels in local impounding reservoirs to minimise waste and optimise pumping costs.

The Guangdong authorities have implemented measures to protect the Dongjiang's water environment and to ensure that the quality of water pumped to Hong Kong meets the relevant national environmental quality standards for surface water. These measures include new sewage treatment plants, removal of polluting factories and building a bio-nitrification plant at the Shenzhen Reservoir. A dedicated aqueduct directly transfers river water from the Dongjiang intake to the Shenzhen Reservoir bypassing possible pollution sources along the supply route. As a result, we have been able to keep the treatment costs for fresh water supplies low while maintaining a consistently high level of water quality for consumers.

全年供水量
Annual Quantity of Water Supply
百萬立方米 million cubic metres



廣東省供水價格
Price of Guangdong Water
百萬港元 HK\$million



為維持市民對東江水水質的信心，粵港雙方一向攜手合作，就監察東江水事宜保持高透明度和警覺。

To maintain public confidence in the quality of the Dongjiang water, the Hong Kong and Guangdong authorities oversee together the water transfer operations with a high degree of transparency and vigilance.

香港水質事務諮詢委員會成員每年應邀考察東江集水區的水污染控制設施及東江供水系統。成員返港後隨即舉行簡報會，向傳媒匯報考察結果及觀察情況。

Members of Hong Kong's Advisory Committee on Quality of Water Supplies (ACQWS) are invited to visit the water pollution control facilities in the Dongjiang catchment and the Dongjiang water supply system on an annual basis. Members have reported their findings and observations at media briefings held upon their return to Hong Kong.



利用先進倒置顯微鏡，並通過精密的圖像採集和分析器材，監測在水塘中藻類的活動。
Monitoring of algal activities in impounding reservoirs by using advanced inverted microscope with sophisticated image capture and analysis tools.

本地雨水

香港的集水區網絡的覆蓋面積約有300平方公里，收集的雨水和東江輸入的原水，可儲存於遍佈全港的17個水塘。收集的雨水雖然大多不受污染，然而，本署仍在集水系統實施防污措施，包括定期巡查、維修和清除垃圾等。

DOMESTIC RAINWATER

Hong Kong has a network of catchments covering some 300 square kilometres. Rainwater collected from these catchments, together with the water pumped from the Dongjiang, can be stored in 17 impounding reservoirs across the territory. Although collected water is largely uncontaminated, the Department has undertaken protection measures along the collection system with regular inspections, maintenance and the removal of debris.

維持水質 符合健康標準

不論是源自東江或香港本身集水區的原水，均會在收集、處理及供應食水的過程中，進行物理、化學、輻射、生物及細菌化驗的綜合性檢測。我們從供水系統中指定及隨機的地點定期抽取樣本，並以先進及認可的技術，按嚴格品質保證方案進行分析。我們亦不斷強化及提升實驗所使用的分析技術與設備。我們運用多項先進技術，包括使用碰撞反應池的新技術檢測水中微量金屬，以及使用自動微粒影像分析系統，快速評估水藻

MAINTAINING QUALITY AND HEALTH STANDARDS

A comprehensive programme involving physical, chemical, radiological, biological and bacteriological testing is applied throughout the collection, treatment and supply processes of water, irrespective of whether it is sourced from the Dongjiang or is collected from within the territory's catchment areas. Samples are taken regularly from both pre-determined and randomly selected points along the supply chain and analysed using advanced and proven technologies with rigorous quality assurance protocols. The analytical techniques and equipment used in our laboratories are continuously enhanced and upgraded. Advances including a new



研發一套具備遙距、實時及自動監控功能之「斑馬魚水質生物監察系統」以提升持續監測原水水質之能力。

Research and development of an innovative "Zebrafish Water Quality Bio-monitoring System" with remote, real-time monitoring and automatic reporting functions to enhance the capability of continuous monitoring of raw water quality.

數量，藉此提升監測水質的能力。市民可登入本署網站<http://www.wsd.gov.hk>瀏覽有關東江水及供港食水水質的詳情。

我們採納的綜合品質管理系統，覆蓋整個從原水收集、食水處理至向客戶供水、配水及提供客戶服務的供水流程，當中包括監控地表水情況，確保水處理過程除污方面達標，以及執行污染監測標準。我們亦制定機電廠房及設備維修、供水及配水操作以及客戶服務方面的運作程序。自二零零九年以來，我們的品質管理系統每年均獲得 ISO 9001:2008 認證。

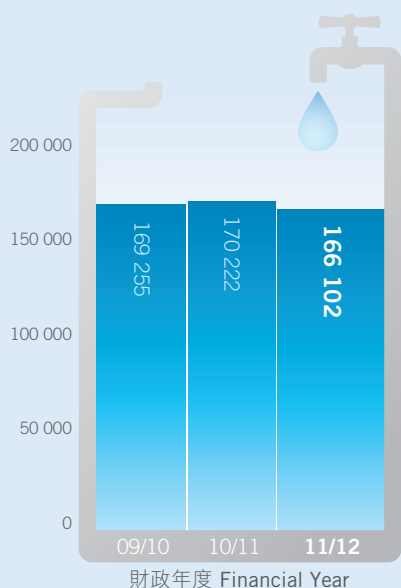
我們在木湖抽水站、船灣淡水湖、城門水塘和大欖涌水塘範圍，安裝了在線聯機水質監察系統，嚴密測量東江來水和水塘貯水的水質。此外，我們將擴大監控及資料收集系統，納入從石壁水塘開始分階段設置在其他水塘的水質聯機分析儀。

collision cell technique used to detect trace metals in water and an automated imaging particle analysis system which enables us to quickly assess the algal population in water, have enhanced our ability to monitor the water quality. Details about the quality of the Dongjiang water and our drinking water supply are available for public viewing on the Department's website <http://www.wsd.gov.hk>.

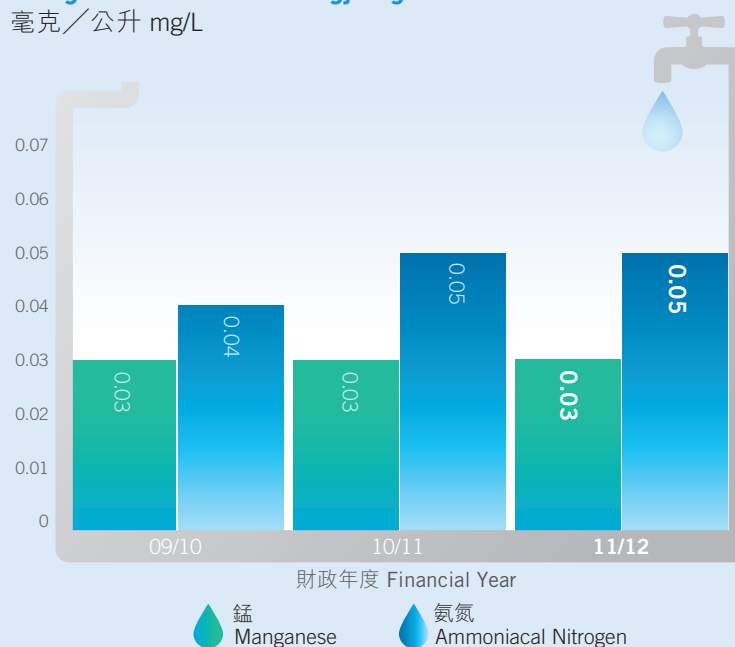
An Integrated Quality Management system (IQMS) operates to cover the service quality of our supply line, from raw water collection and treatment to supply, distribution and provision of customer services. This involves monitoring of surface water, maintaining treatment targets for removal of pollutants in drinking water and enforcing pollution standards. Operating procedures are also set for maintenance of mechanical and electrical plant and equipment, supply and distribution operation, and customer services. The system has been awarded ISO (International Organisation for Standardisation) 9001:2008 certification annually since 2009.

Our on-line Water Quality Monitoring Systems installed at Muk Wu Pumping Station, Plover Cove Reservoir, Shing Mun Reservoir and Tai Lam Chung Reservoir gauge closely the quality of the water we receive from the Dongjiang and the water we store in reservoirs. In addition, our Supervisory Control and Data Acquisition (SCADA) system will be extended to include the on-line water quality analyser being set up in phases at our impounding reservoirs starting with the Shek Pik Reservoir.

化驗樣本總數
No. of Samples Taken



東江原水內平均氨氮及錳水平
Average Ammoniacal Nitrogen and
Manganese Levels in Dongjiang Water



我們定期進行輻射監測，確保供港飲用水安全。由於時刻保持警覺，本署能夠在日本福島發生核事故後，於二零一一年三月至六月期間隨即加強監測原水和供水，確保供港飲用水安全。所有輻射監測系統繼續運作，以確保供水的質量與安全。

本署的水安全計劃，採用風險管理原則及多重屏障方法，以減少污染風險。這計劃應用於整個供水鏈，涵蓋從水源，到濾水處理、供水，以至向客戶配水等環節。箇中的程序基於世界衛生組織（世衛）發布的《飲用水水質準則》，為食水中與人體健康相關的化學項目訂定準則值，以及制定整體框架，確保食水穩定而安全。

Radiological monitoring is routinely carried out to ensure the safety of our supplies of drinking water. Because it is in a constant state of emergency preparedness, the Department was able to promptly implement enhanced radiological monitoring of raw and treated water supplies between March and June 2011 following the nuclear incident at Fukushima in Japan to reassure the safety of drinking water supply. All radiological monitoring systems continue to protect the quality and safety of Hong Kong's fresh water.

The Department's Water Safety Plan applies the principle of risk management and a multiple-barrier approach to address the risk of water contamination. The plan covers the entire water supply chain from water sources through water treatment to supply and distribution. The integrated system of procedures and processes is based on the World Health Organization's (WHO) Guidelines for Drinking-water Quality which set out guideline values for individual chemicals of health significance that may be present in drinking water and outline a holistic framework to ensure the sustainable supply of safe drinking water.



為保障水塘的水質，本署定期實施魚苗放養計劃。去年，本署把約40萬尾魚苗（主要是鯪魚及大頭魚）放養於船灣淡水湖、大欖涌、九龍及城門等水塘，以確保水體生態平衡。除此之外，我們還設立研究項目，探討利用班馬魚監測預警水質問題技術上的可行性。

To protect the quality of reservoir water, we regularly introduce fish fry into impounding reservoirs. Over the past year, about 400 000 fish fry, primarily silver carp and big head, were transferred to reservoirs at Plover Cove, Tai Lam Chung, Kowloon and Shing Mun to help maintain an ecological balance. We have also established a research project to investigate the technical feasibility of using zebra fish as a biomonitor to give an early alert of potential water quality problems.

選用淡水替代水源

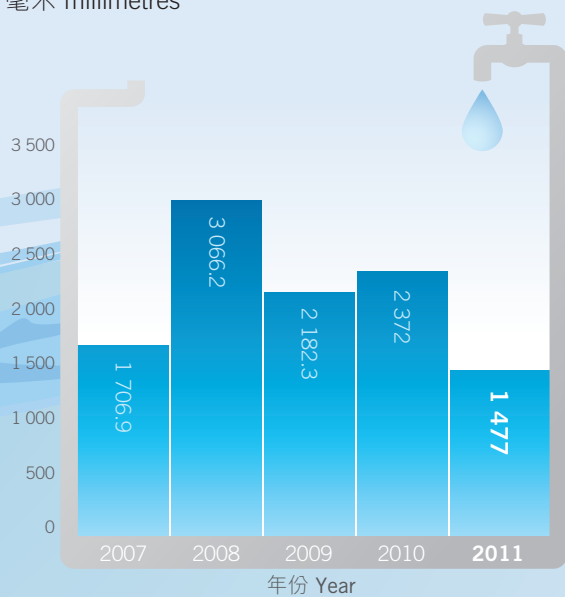
本署不斷尋找適合飲用的和非飲用水（例如沖廁和灌溉用水）的替代水源，務求盡量節約食水。

ADOPTING FRESHWATER ALTERNATIVES

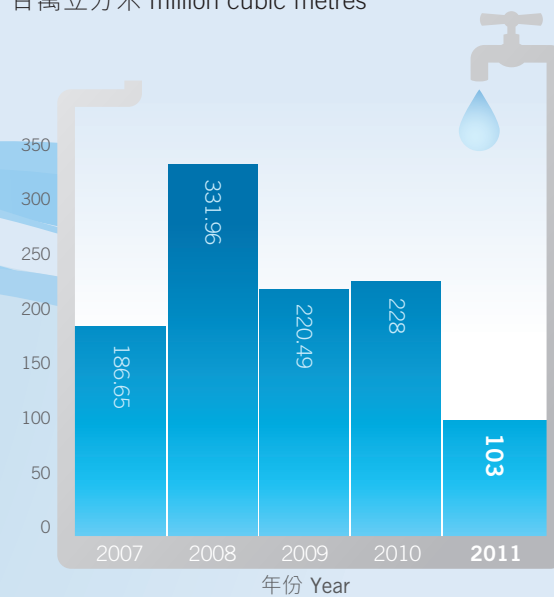
The Department continues to explore the potential of alternative sources of water suitable for potable supply and for non-potable uses such as toilet flushing and landscape irrigation. The objective is to conserve as much fresh water as possible.



全年降雨量
Annual Rainfall
毫米 millimetres



全年集水量
Annual Yield
百萬立方米 million cubic metres



海水供應

在擴建沖廁用的海水供應系統方面，我們正延伸供水網絡，同時為現存的系統作改善工程，務求把獲供海水沖廁的人口由八成提高至八成半。現時薄扶林、元朗及天水圍地區的新海水供應系統項目正在動工，而東涌地區現有系統的擴展計劃亦已落實。此外，灣仔海水供應系統正進行更新及擴充，以滿足該區日益增長的人口需要。與此同時，將設於長沙灣的環形水管系統，現正在設計中。

SEA WATER SUPPLIES

We are extending the sea water supply network and improving the existing sea water systems aiming to boost the population served with sea water for toilet flushing from 80 per cent to 85 per cent. Plans for a sea water supply system for Pok Fu Lam, Yuen Long and Tin Shui Wai are being implemented while those for an extension to the existing system in the Tung Chung area have been finalised. Wan Chai's system is also being upgraded and extended to meet the needs of the district's increasing population. A ring system is being designed for Cheung Sha Wan.



擴建沖廁用的海水供應系統，以節省珍貴食水。
Saving fresh water by extending the sea water supply network for flushing.



九肚海水配水庫。
Kau To Salt Water Service Reservoir.

海水化淡

海水化淡可望成為本港日後的新水源。早於二零零七年，我們已完成試驗研究，確認了在香港環境之下，利用逆滲透技術進行海水化淡，生產符合世界衛生組織《飲用水水質準則》飲用技術的技術可行性。為了滿足人口增長導致對食水的需求持續的增加，同時讓本港作好準備，應對氣候變化、雨量下降，以及珠三角經濟區用水需求增加所帶來的各種不明朗因素，我們需要未雨綢繆，確保在需要之時能夠利用海水化淡這個新水源。我們已在將軍澳第137區預留約10公頃土地，用作興建海水化淡廠，年產量初步為50百萬立方米，並可於未來擴充到90百萬立方米，相當於本港約一成的用水量。

DESALINATION AS A WATER SOURCE

Desalination could be a promising new water resource in Hong Kong. We completed a pilot study in 2007 which confirmed the technical feasibility of desalination in the Hong Kong environment using reverse osmosis technology to produce potable water that complies with the WHO Guidelines for Drinking-water Quality. To cope with the continued increase of fresh water demand due to population growth and to better prepare Hong Kong for uncertainties associated with climate changes, low rainfall and increasing water demand across the Pearl River Delta Economic Zone, we need to plan ahead so that this new water resource can be readily tapped when needed. We have reserved a site of about 10 hectares at Tseung Kwan O Area 137 for the construction of a desalination plant with an initial output capacity of 50 million cubic metres per annum, with provisions for future expansion to an ultimate capacity of 90 million cubic metres per annum. This will meet about 10 per cent of Hong Kong's fresh water demand.

二零一二年六月，立法會財務委員會批准撥款3,430萬元，用於規劃和研調建造海水化淡廠及相關食水輸送設施。我們計劃聘請顧問，於二零一二年底前開始研究，至二零一四年結束前完成有關工作。我們將會根據研調所得結果及意見，申請進一步的撥款，進行詳細調查與設計，並於供求趨勢顯示有此需要時，申請興建海水化淡廠。按照目前情況，我們預計需要海水化淡廠投入生產的日子，最早要待二零二零年。

In June 2012, the Finance Committee of the Legislative Council approved the funding of \$34.3 million for the planning and investigation study for the construction of the desalination plant and the associated fresh water transfer facilities. We plan to engage consultants to commence the study by late 2012 and target completion by the end of 2014. Subject to the findings and recommendations of the study, we plan to seek further funding for detailed investigation, design and subsequent construction of the desalination plant at a time that will be dictated by demand and supply trends. Given the current situation, we envisage an earliest commissioning date of 2020.

洗盥污水再造和雨水收集

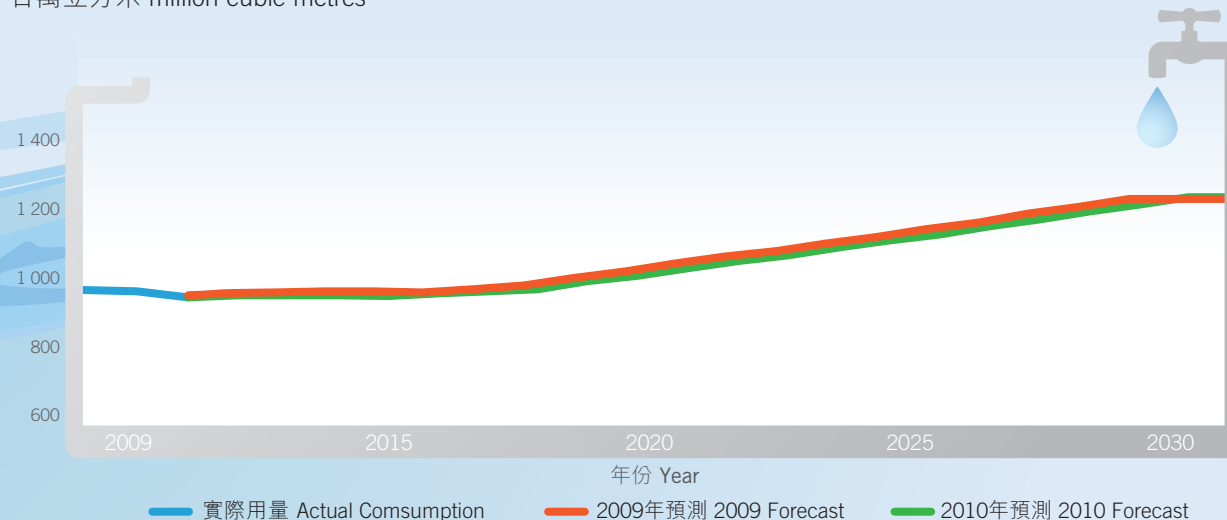
使用再造水的目的是利用再造水代替質素較高的食水，用作沖廁、清洗街道、洗車及灌溉用途。在本港，我們正研究城市污水和雨水收集的處理。經過不同程度處理的污水和收集到的雨水，將變作可飲用或非飲用水。多個國家和城市已引入或試驗再造水計劃，來應付水資源短缺的困境。從浴室、洗手盆和廚房洗滌盆等地方收集得來的質素較低的水（也稱洗盥污水），經處理後可以再用作沖廁、灌溉等非飲用用途。本署委託專家檢討洗盥污水再用及雨水收集的水質標準，以及日後全港廣泛使用時實施的應用守則和指引。我們已於二零一二年一月就專家報告向公眾諮詢。

WATER RECLAMATION AND RAINWATER HARVESTING

Water reclamation targets the use of recycled water to replace high quality fresh water in toilet flushing, street cleaning, car washing and landscape irrigation. In Hong Kong, we are studying the treatment of municipal wastewater and harvested rainwater. The treated water can be used as either potable or non-potable water, depending on the extent of treatment. This process is in use or under consideration in many countries and cities as an answer to water shortages. Lower quality water, referred to as grey water, can be collected from baths, showers, wash basins and kitchen sinks, treated, and then reused. The Department has commissioned a consultancy study to review the quality standard for the reuse of grey water recycling and rainwater harvesting with a view to developing a code of practice and guidelines for its use in Hong Kong. Relevant stakeholders were consulted on the study's recommendation in January 2012.

二零一一年至二零三零年食水需求預測 Fresh Water Demand Forecast Projection 2011-2030

百萬立方米 million cubic metres



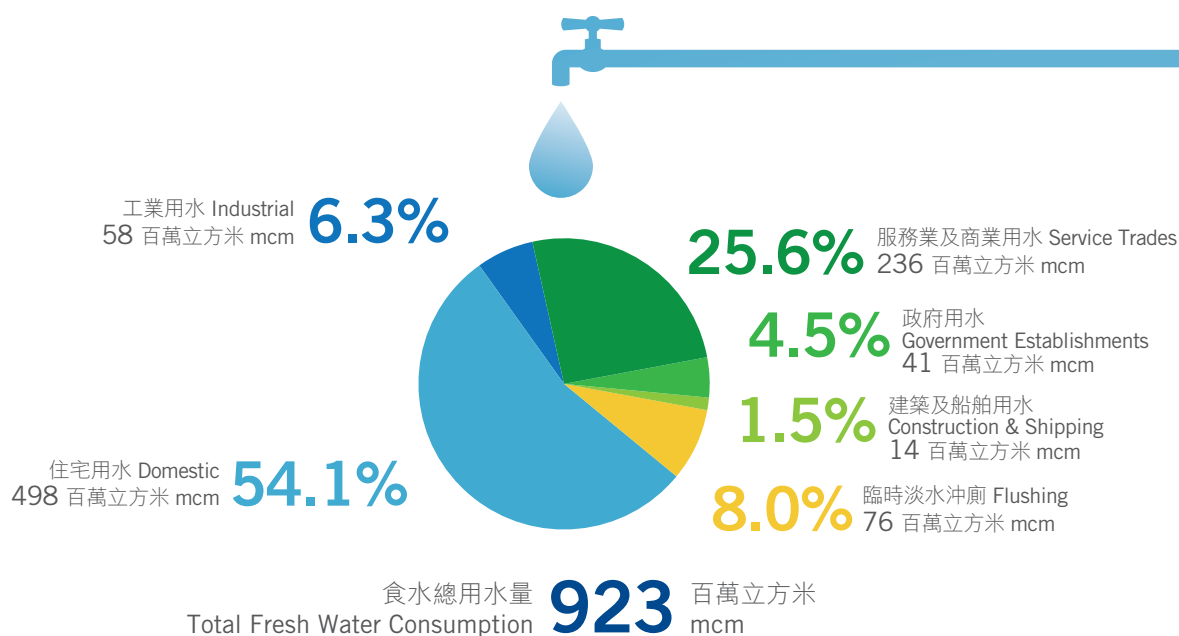
昂平和石湖墟污水處理廠污水再造試驗計劃顯示，在本港使用再造水作非飲用用途技術上可行。我們已聯同其他有關部門成立跨部門工作小組，共同探討再造水生產及供應的具體細節，預期將會向上水、粉嶺和新界東北地區的居民供應再造水，作沖廁和其他非飲用用途。此外，我們亦正聯絡其他部門，透過他們推行的項目實施洗滌污水再造和雨水收集試驗計劃。

The pilot schemes for the recycling of treated effluent in Ngong Ping and Shek Wu Hui Sewage Treatment Works have demonstrated that the use of reclaimed water for non-potable applications is technically feasible in Hong Kong. We have formed an inter-departmental working group that will explore the details of producing and supplying reclaimed water. We anticipate providing this water to residents in the Sheung Shui, Fanling and the North East New Territories New Development Areas for toilet flushing and other non-potable uses. Apart from this, we are also liaising with other departments to implement trial schemes on recycling of grey water and harvesting rainwater under their projects.



二零一一年按用水類別劃分的食水用量(百萬立方米)(及佔總量百分比)

Annual Fresh Water Consumption 2011 by sectors in million cubic metres (mcm)
(and percentage of total)



全年食水用水量(按用水類別劃分)

Annual Fresh Water Consumption (by sectors)

百萬立方米 million cubic metres

	2007	2008	2009	2010	2011
住宅用水 Domestic	509	519	524	509	498
工業用水 Industrial	64	59	55	57	58
服務業及商業用水 Service Trades	242	241	238	237	236
政府用水 Government Establishments	44	45	44	42	41
建築及船舶用水 Construction & Shipping	12	11	11	12	14
臨時淡水沖廁 Flushing	80	81	80	79	76
食水總用水量 Total Fresh Water Consumption	951	956	952	936	923