



完善 食水供應

Optimising **Water Supplies**

我們的目標，是要妥善管理香港的供水，
並確保水質時刻達到及保持國際標準。

Our objective is to properly manage the supply of water in
Hong Kong and to ensure that international standards of
quality are achieved and maintained around-the-clock.







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管理食水的需求，同時確保有效的供應，是本署長久以來面對的挑戰。

供水

香港的原水有兩個主要來源：廣東省的東江，以及遍佈全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，以及少量主要用作灌溉的再造水。

去年，本港平均七至八成用水由東江輸入。除了每年例行的停水期外，每日輸港的東江水量約相當於本港的每日食水耗用量。輸入的原水會貯存於本港的水塘。海水經由沿海的抽水站，經適當處理後，供應給本港約八成人口作沖廁用途。

The Department's on-going challenge is to manage demand for water and ensure that supplies are delivered efficiently.

Water Supplies

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

Over the past year, between 70 and 80 per cent of Hong Kong's raw water was piped from the Dongjiang. Except during the annual shut down period, this supply roughly equals the territory's daily consumption. Imported raw water is stored in the fresh water impounding reservoirs. Sea water is extracted by pumping stations located in coastal areas, treated and supplied to some 80 per cent of the population for toilet flushing.

香港在制定長遠的水資源運用政策時，除顧及本身需求外，也會考慮珠江三角洲地區持續增長的人口和經濟發展的需要。與此同時，亦將繼續拓展飲用水及非飲用水的其他供水來源，以減少對東江水的需求。

In terms of our long term supply strategy, we look beyond the water demand of Hong Kong and consider the needs of the Pearl River Delta which continues to grow in both population and economy. At the same time, alternative sources of both potable and non-potable water continue to be explored to lessen the territory's reliance on the Dongjiang water.

東江供水

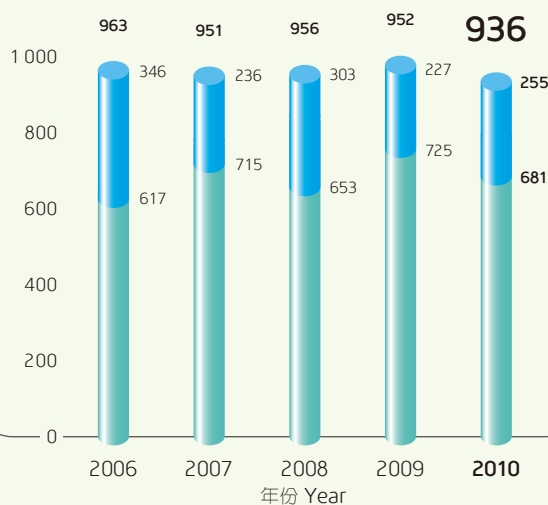
目前與廣東簽訂的東江水輸港協議，足以應付至二零三零年的預計用水需求。實際的供水量按月參照雨水收集量而定，以免浪費。依照目前機制，東江水的價格每三年進行一次檢討，二零一零年及二零一一年，東江水支付的費用分別為31.46億元及33.44億元。有關費用已計算人民幣兌港元匯率大幅升值，以及兩地通脹率不斷上升所帶來的影響。雖然東江水的費用較二零零九年有所增加，但向客戶收取的水費並沒有調高。

Dongjiang Water Supply

With the current water supply arrangement with Guangdong, the supply of water from Dongjiang is sufficient to cope with the present estimated demand up to 2030 and beyond. The actual draw-down is determined on a monthly basis taking into account the amount of rainfall to optimise the use of resources. While the prices are reviewed as part of an exercise undertaken every three years, current prices were fixed at \$3,146 million for 2010 and \$3,344 million for 2011. This price regime takes into account the substantial appreciation of China's RMB against the Hong Kong dollar and the escalating rates of inflation of Guangdong and Hong Kong. Although the purchase prices are higher than those before 2009, there has been no increase in water charges to the consumer.

全年供水量
Annual Quantity of Water Supply

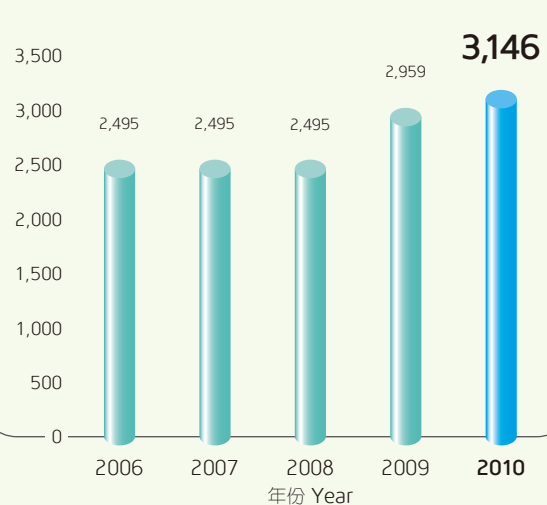
百萬立方米 million cubic metres



■ 廣東省 Guangdong
 ■ 香港集水區 Hong Kong Water

東江水價格
Price of Dongjiang Water

百萬元 \$million



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沙田濾水廠內的水質化驗室。
Laboratory for water quality testing in Sha Tin Water Treatment Works.

我們與廣東當局保持緊密溝通，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。

廣東省致力保護水源環境，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、建設專用輸水管道接駁東江取水點至深圳水庫，以及調走石馬河的污水。原水的高質量也相應節省了食水處理的費用。

為確保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。

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 also implemented measures to protect the Dongjiang's 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 constructing new sewage treatment plants, removing polluting factories, building a bio-nitrification plant at the Shenzhen Reservoir, constructing a dedicated aqueduct from Dongjiang intake to Shenzhen Reservoir and diverting polluted water from the nearby Shima River away from the Dongjiang. As a result, we have been able to keep the treatment costs for fresh water supply low while maintaining a consistent level of quality for customers.

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

本地雨水

香港的集水區網絡約佔300平方公里，收集的雨水和東江輸入的原水如非即時使用，均儲存於遍佈全港的17個水塘。存水雖然大多不受污染，然而，我們仍會恆常地加強防污措施，包括定期巡查、維修和清除垃圾等。

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，均會在整個食水收集、處理及供應過程中，進行包含了物理、化學、輻射學、生物學及細菌化驗的綜合性檢測項目。從供水系統中指定及隨機的地點定期抽取水質樣本，並採用先進及認可的技術，按嚴格品質保證方案進行分析。

透過品質監察計劃，本地供水得以從化學原理上獲得安全保證，及免受隱孢子蟲及賈第蟲等有害微生物的影響。水質化驗數據均符合國際認可準則和保證方案，並在本署網站公布，供公眾查閱。

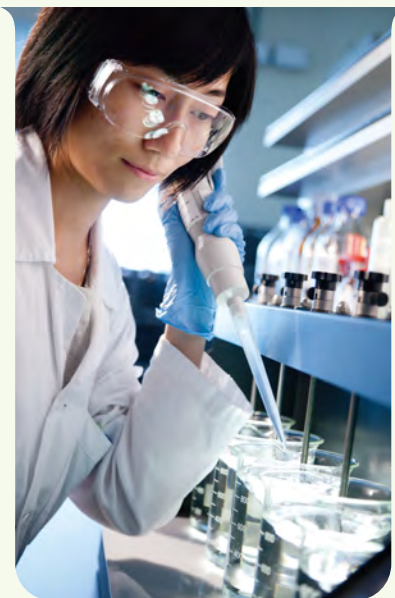
Domestic Rain Water

Hong Kong has a network of catchments which covers some 300 square kilometres. The rainwater, together with the water pumped from the Dongjiang, is stored in 17 impounding reservoirs across the territory if not being immediately used. Although locally collected water is largely uncontaminated, we have continued to undertake the protection measures to the collection system including regular inspection, maintenance, and removal of debris etc.

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 collected 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.

Through compliance monitoring programmes, the treated water is confirmed to be chemically safe and free of harmful organisms such as Giardia and Cryptosporidium. All test data of water quality conform to internationally accepted guidelines and protocols and are available for public viewing on the Department's website.



水質化驗數據均符合國際認可準則。
All test data of water quality conform to internationally accepted guidelines.



在木湖抽水站、船灣淡水湖、城門水塘和大欖涌水塘安裝的聯機水質監察系統，有效測量東江來水和水塘的水質，此系統將擴展到其他水塘。本署於指定配水庫安裝聯機氯分析儀進行先導測試，大大加強了水質監察的檢定工作。

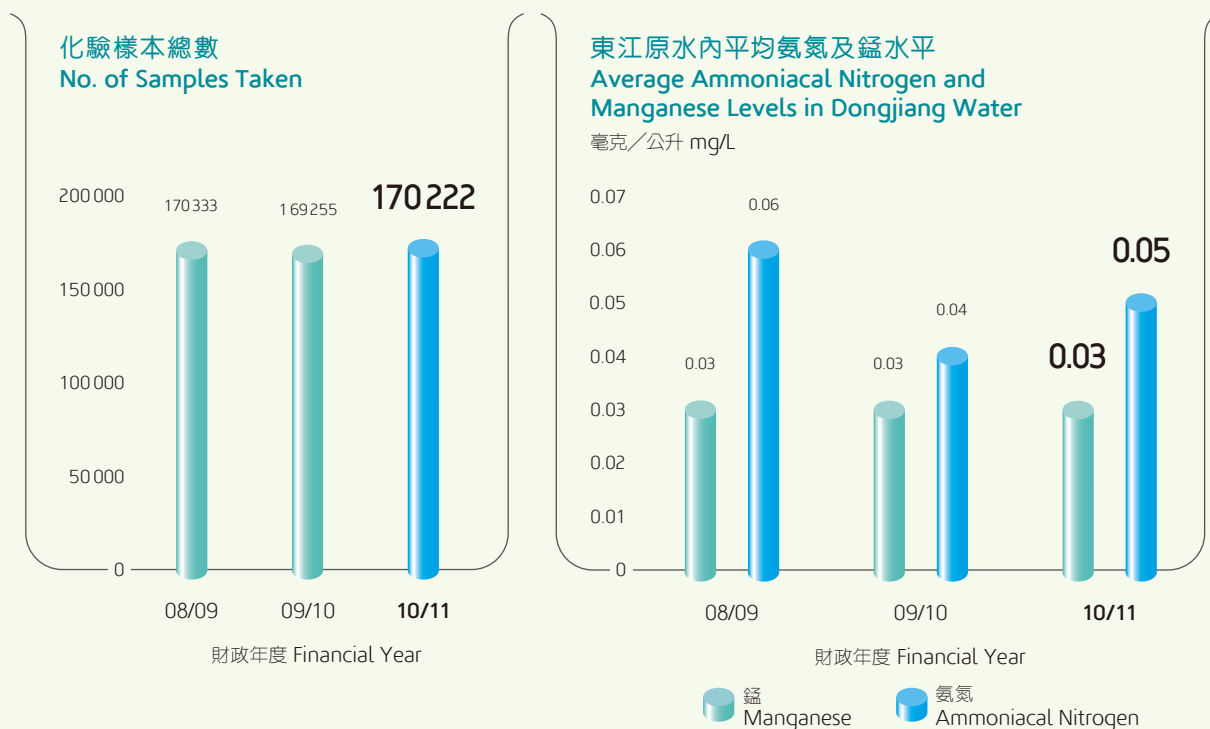
輻射甄別中心時刻保持警覺，並定期監測供水的輻射水平。本署在三月日本福島發生核事故後，隨即加強監測原水和供水。所有監測系統繼續發揮作用，確保供水的質量與安全。

水質事務諮詢委員會的成員定期到東江流域進行考察，以多方面了解其輸水設施的運作。二零一零年，代表團沿東江河檢視水質監測系統，並得悉廣東當局投放大量資源，加強水質監測的能力。

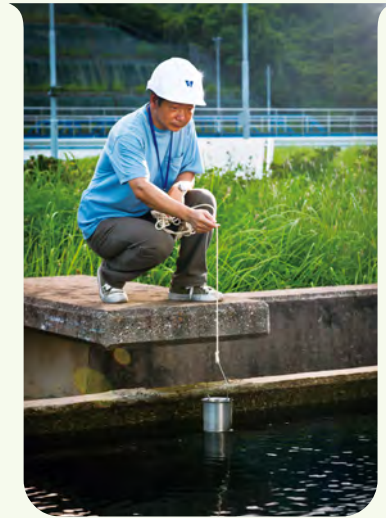
The on-line Water Quality Monitoring Systems installed at Muk Wu Pumping Station, Plover Cove Reservoir, Shing Mun Reservoir and Tai Lam Chung Reservoir for gauging the quality data of the Dongjiang water and impounding reservoirs have proven a success and the system coverage will be extended to other impounding reservoirs. Pilot trials using on-line chlorine analysers at selected service reservoirs have also enhanced the overall quality control.

Being constantly maintained in a state of emergency preparedness, the radiation screening centres routinely monitor the radiological quality of water. The Department has also stepped up its monitoring of raw and treated water supplies in March following the nuclear incident at Fukushima, Japan. All monitoring systems continue to assure the quality and safety of Hong Kong's fresh water.

Members of the Advisory Committee on Quality of Water Supplies (ACQWS) visit various operational aspects of the Dongjiang water transfer facilities on a regular basis and in 2010 inspected water quality monitoring systems along the Dongjiang. The committee found that the Guangdong authorities have invested heavily on enhancing monitoring capabilities.



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員工定時於各取水點抽樣化驗，確保食水安全。
Regular sample taking from different sampling points for testing to ensure the water quality.

我們的水安全計劃採用多重屏障方法，預防及減少污染風險。計劃應用於整個供應鏈，涵蓋本地集水區和東江原水這兩大水源，到濾水處理、分配系統，以至客戶的水龍頭。計劃採用世界衛生組織（世衛）發布的《飲用水水質準則》。該準則為食水中與人體健康相關的化學項目訂定接受的水平，以及制定危機管理框架，確保穩定而安全的食水。

為保護貯存於水塘的水質，本署定期實施魚苗放養計劃。去年，本署把30萬尾魚苗（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。

選用淡水替代水源

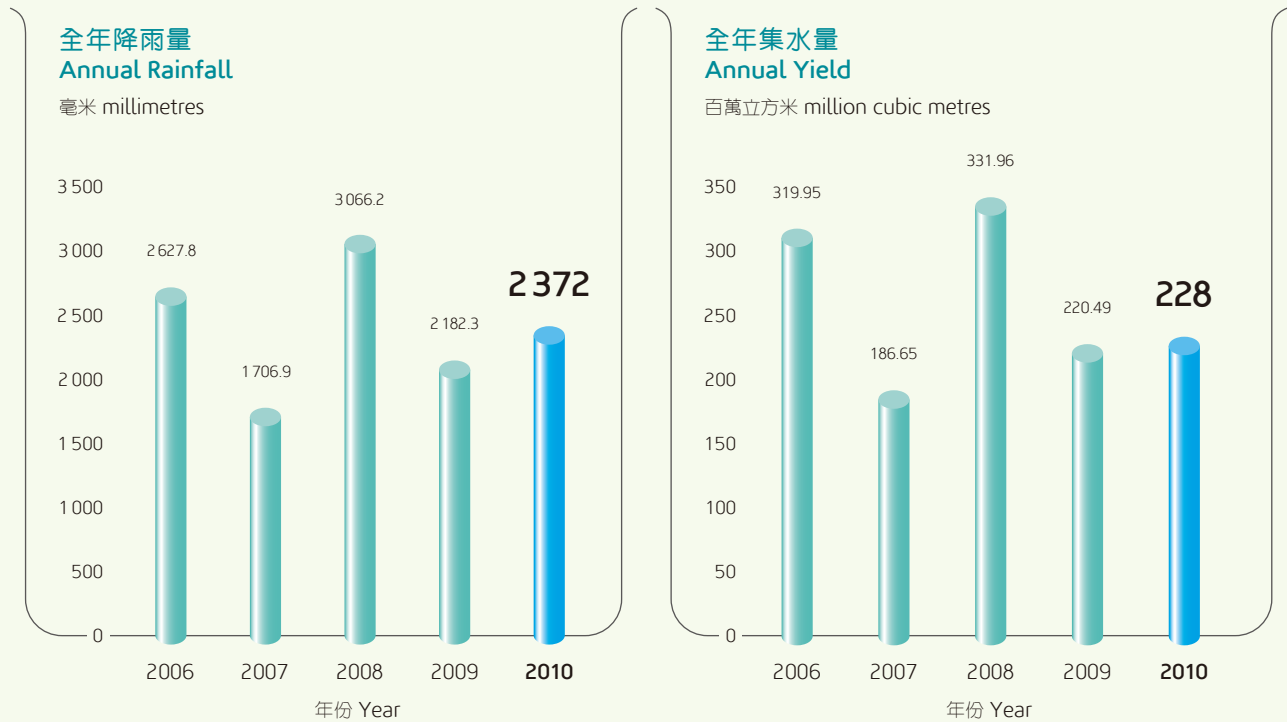
我們不斷尋找適合飲用的和非飲用水（例如沖廁和灌溉用水）的替代水源，務求盡量節約食水。

Our Water Safety Plan (WSP) adopts a multi-barrier approach to prevent and reduce the potential risks of water contamination. The plan covers the entire length of the supply chain from sources including domestic catchment and Dongjiang water, through water treatment and the distribution network to consumers' taps. Its integrated system of procedures and processes is based on the requirements set out in the World Health Organization's (WHO) Guidelines for Drinking-water Quality. The guidelines set out permissible levels of individual chemicals of health significance that may be present in drinking water and also outline a risk management framework to ensure the sustainable supply of safe drinking water.

To protect the quality of stored water, we regularly introduce fish fry into impounding reservoirs. Over the past year, about 300 000 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.

Adopting Fresh Water Alternatives

We continue to explore the potential of alternative sources of water fit for human consumption and for secondary uses such as toilet flushing and landscaping. The objective is to conserve as much fresh water as possible.



海水供應

現時，本港約八成人人口使用海水沖廁。我們正繼續拓展沖廁用的海水供應系統和基礎建設系統改善工程，預期將海水供應至全港八成半的人口。主要工程項目包括薄扶林、元朗及天水圍地區的全新海水供應系統，擴展東涌地區海水供應系統的策劃亦進展得如火如荼。此外，灣仔海水供應系統正進行更新及擴充，以滿足更多市民的需要。與此同時，長沙灣將設置環形水管系統。

Sea Water Supply

Currently about 80 per cent of Hong Kong's population use sea water for toilet flushing. We are continuing to extend the sea water supply network and improve the existing system with the aim of extending the sea water supply to 85 per cent of the population. Major projects include provision of new sea water supply to Pok Fu Lam, Yuen Long and Tin Shui Wai. Planning for an extension to the Tung Chung area is at an advanced stage. The Wan Chai sea water supply system is being upgraded and extended to meet the needs of more people while a ring main system is being planned for implementation in Cheung Sha Wan.

海水化淡

我們繼續探索海水化淡技術，作為替代用水。許多國家，包括澳洲、美國和杜拜，都積極發展海水化淡工程項目，將海水化淡變成可飲用水。我們會繼續密切留意這方面的發展，期望新開發的技術能加強能量回收設施，從而降低海水化淡的生產成本。我們在將軍澳預留了土地用作興建海水化淡廠，並已有初步計劃，預備在有需要時把海水化淡項目推展。

Desalination as a Water Source

We continue to explore desalination as an alternative source of fresh water supply. Many countries, including Australia, the United States and Dubai, have developed desalination schemes that yield drinkable water. New technologies are being developed to enhance energy recovery and to lower water production costs through desalination. We will continue to monitor the development overseas. We have also set aside land at Tseung Kwan O as a potential site for a desalination plant. Planning work is in hand so that we can readily take forward the desalination project if required.

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使用再造水

使用再造水是把經過不同程度處理的污水，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。成功的再造水計劃是利用一些質素較低的水，來代替現時使用的質素較高的食水。例如從浴室、洗手盆和廚房洗滌盆等地方收集得來的洗盥污水，經處理後用作沖廁、灌溉等非飲用用途。本署委託專家檢討洗盥污水的水質標準，以及日後全港廣泛使用時實施的應用守則和指引。預期於二零一一至一二年就專家報告向公眾諮詢。

政府在石湖墟污水處理廠推行試驗計劃，生產再造水，供應給上水及粉嶺地區作沖廁及灌溉用途，成效顯著，用戶反應積極正面。昂平污水處理廠也推行了類似

Water Reclamation

Water reclamation or recycling is the treatment of municipal wastewater for either potable or non-potable use, depending on the extent of the treatment process. This practice is being implemented or under consideration in many countries and cities as an answer to water shortages. Successful schemes can replace high quality water being used for non-potable purposes such as toilet flushing and landscape irrigation, with lower quality water. This lower quality water is treated for reuse from what is referred to as 'grey water' collected from baths, showers, wash basins and kitchen sinks. The Department has commissioned a consultancy study to review the quality standard for the grey water to be used and to develop a code of practice and guidelines for its use in Hong Kong. Relevant stakeholders will be consulted on the study's recommendations in 2011-12.

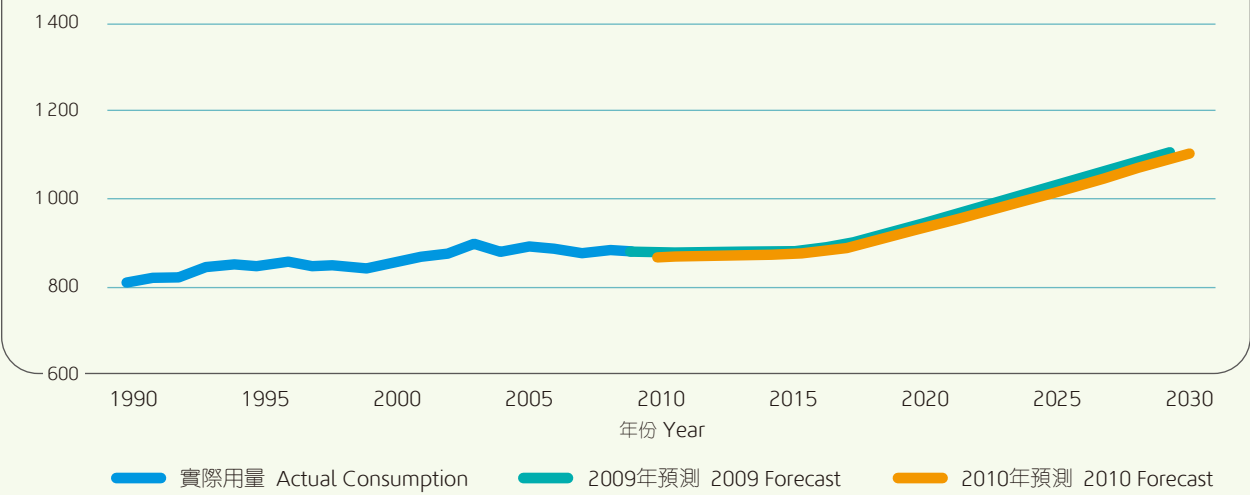
A pilot scheme at the Shek Wu Hui Sewage Treatment Works where water is recycled for toilet flushing and gardening in the Sheung Shui and Fanling areas is a success with positive

擴建大埔濾水廠正進行得
如火如荼。
*The expansion of Tai Po
Water Treatment Works
is well under way.*



二零一零年至二零三零年食水需求預測 Fresh Water Demand Forecast Projection 2010-2030

百萬立方米 million cubic metres



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沙田濾水廠內的澄清池。
One of the accelerators in Sha Tin Water Treatment Works.

計劃，利用再造水灌溉和沖廁，成效亦令人滿意。本署正策劃為新界東北地區的居民推出以再造水作沖廁和其他非飲用用途的項目。預計項目全面推行後，每年可為香港節省2 100萬立方米的食水，相等於香港總用水量的1.5%。目前，本署正聯同其他有關部門成立跨部門工作小組，共同探討減低再造水供應成本的各種方法。

非法用水

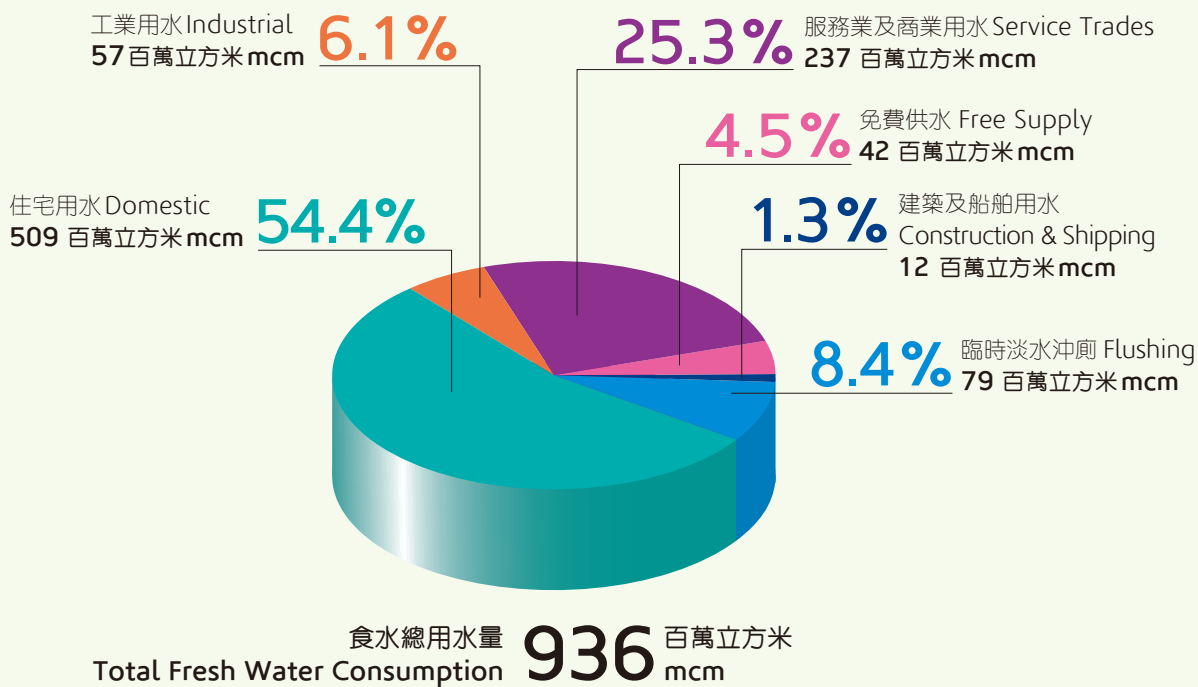
根據水務設施條例的規定，未經水務監督的水錶量度，而從水務設施取水即屬違法。本署負責有關條例的行政工作，並對違例者採取法律行動。本署在一些現有大型屋邨及鄉郊地區安裝總水錶，以監察耗水量、偵查滲漏和非法用水的情況。在過去12個月，本署檢控組向90個非法取水個案作出檢控行動，該等個案的被告全被裁定罪名成立。傳媒的報道亦有助遏止此等非法行為。

response from the public. A similar scheme in use at the Ngong Ping Sewage Treatment Works has produced positive results with reclaimed water produced for irrigation and toilet flushing. Reclaimed water schemes are also being considered for new development areas in the North East New Territories. It is estimated that once the new schemes are completed, 21 million cubic metres of fresh water will be saved annually. This is equivalent to 1.5% of total fresh water use across Hong Kong. Meanwhile, an inter-departmental working group has been established to look at how the cost of producing and supplying reclaimed water can be reduced.

Illegal Water Use

It is an offence under the Waterworks Ordinance (WVO) to draw water illegally from the waterworks without a metered measurement by the Water Authority. The Department is responsible for administering the Ordinance and for taking enforcement action against infringements. Bulk meters have been installed at some existing large housing estates and in rural villages to monitor consumption and identify leakage and unauthorised use. Over the past 12 months, the Department's Prosecution Unit instituted 90 prosecutions against illegal use of water with convictions in all cases. The associated media attention has helped curb illegal water use.

二零一零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 2010 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 Water Consumption (by sectors)

百萬立方米 million cubic metres

	2006	2007	2008	2009	2010
住宅用水 Domestic	513	509	519	524	509
工業用水 Industrial	69	64	59	55	57
服務業及商業用水 Service Trades	243	242	241	238	237
免費供水 Free Supply	43	44	45	44	42
建築及船舶用水 Construction & Shipping	13	12	11	11	12
臨時淡水沖廁 Flushing	82	80	81	80	79
食水總用水量 Total Fresh Water Consumption	963	951	956	952	936