可持續運作
Operating in a Sustainable Manner

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水務署致力保障、節約和保護水資源，以致市民及未來世代皆可持續地得享其用。我們充分發揮與本港及區內其他機構的合作優勢，實現可持續地運用水資源、節約能源和保護環境。

本署將貫徹達成下列目標：

- 嚴謹遵行環保規例
- 善用電力和燃料
- 限制氣體排放
- 把辦公室用品的消耗、在食水處理過程中使用的化學品減至最低
- 減少供水系統的水流失
- 把建築工程對環境所造成的影響減至最低
- 減少化驗室、工場和濾水廠的固體、液體及化學廢物
- 鼓勵節約用水；並盡可能將污水處理，循環再用
- 減少抽水運作所發出的噪音
- 提倡綠化屋頂設計

The Water Supplies Department is committed to securing, conserving and protecting water resources for current and future generations in a sustainable manner. We draw on our partnerships within Hong Kong as well as across the region to achieve a sustainable use of water resources, energy conservation and environmental protection.

The Department is committed to the following objectives to:

- maintain strict compliance with environmental regulations
- optimise the use of electricity and fuels
- limit gaseous emissions
- minimise the consumption of glossary items in offices and the use of chemicals in the water treatment processes
- reduce water loss across the distribution system
- minimise environmental impacts that can arise from construction work
- reduce the quantities of solid, liquid and chemical wastes generated by our laboratories, workshops and plant installations
- encourage water conservation and, where possible, recycle effluent as reclaimed water
- reduce noise generated by pumping operations
- encourage green roof designs

能源消耗

本署是香港電力的最大用戶之一。我們正積極推行節約能源措施，同時努力開發可再生能源。

節約成效

過去一年，我們成功把辦公室的總耗電量減少了3.2%。但另一方面，由於二零一一年的降雨量低於平均水平，我們需要使用更多能源以水泵輸水，包括東江水及本港收集所得的原水。在此情形下，我們仔細制定供水規劃及濾水廠運作方式，藉此持續推行各項節能措施。我們亦著重把愛護環境的文化及意識融入所有供水設施。因此，總耗電量僅略高於通常年份。

此外，在持續發展原則下，我們與工作夥伴致力把環保元素引入水務基礎建設內。節水裝置的推廣和使用，以及社會對節約用水和節約能源的意識日增，都有助我們達致節省能源的目的。

ENERGY CONSUMPTION

As one of Hong Kong's largest consumers of electricity, we are focusing on measures to reduce our energy consumption and developing viable renewable energy options.

ENERGY SAVING ACHIEVEMENTS

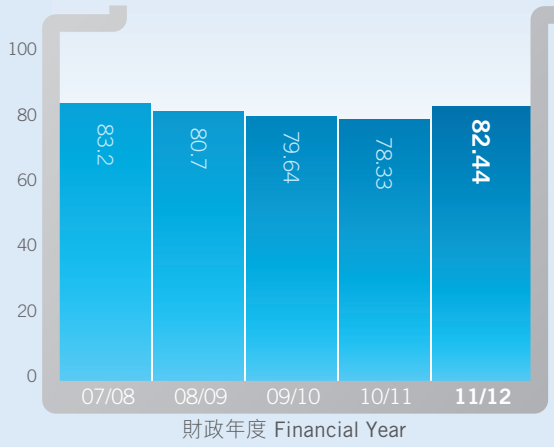
Over the past year, we have succeeded in reducing energy consumption in offices by 3.2 per cent. On the other hand, as the rainfall in 2011 was lower-than-average, more energy was required to transfer water by pumping. This applied both to water from Dongjiang and water collected locally within the territory. Against such a background, ongoing energy conservation measures have been vigilantly taken through meticulous water supply planning and plant operations. Strong emphasis has been placed on 'green' housekeeping across all installations. We succeeded in keeping the increase in total energy consumption to only slightly higher than that of a normal year.

We have also made a concerted effort with our business partners to enhance the sustainability of all water works infrastructure. The promotion and use of water saving equipment and an increasing awareness of the need for water and energy conservation within the community has also helped us meet our energy saving objectives.

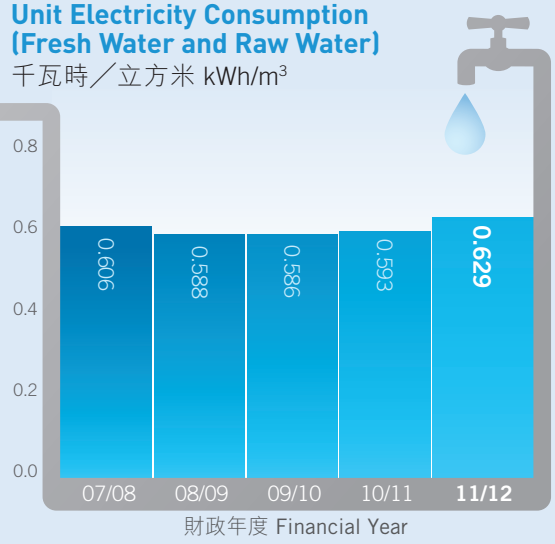
設於紅山濾水廠的直立風力發電設施。
A vertical wind turbine at Red Hill Water Treatment Works.

密切監察抽水泵組的效率。
Closely monitoring the efficiency of pumpsets.

人均耗電量（食水及原水）*
Per Capita Electricity Consumption (Fresh Water and Raw Water)*
千瓦時／每人／每年 kWh/head/year

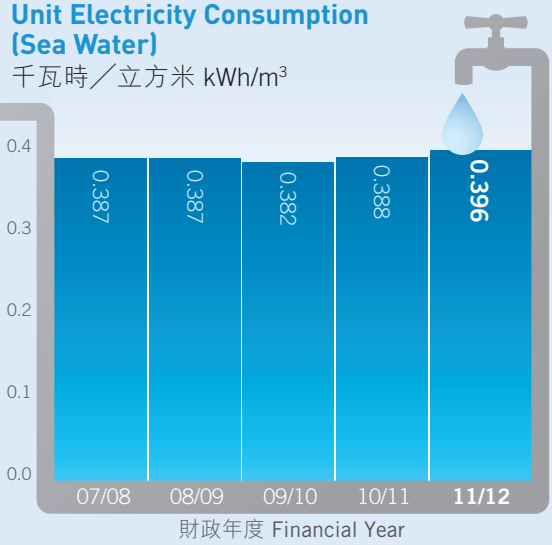


每單位耗電量（食水及原水）
Unit Electricity Consumption (Fresh Water and Raw Water)
千瓦時／立方米 kWh/m³



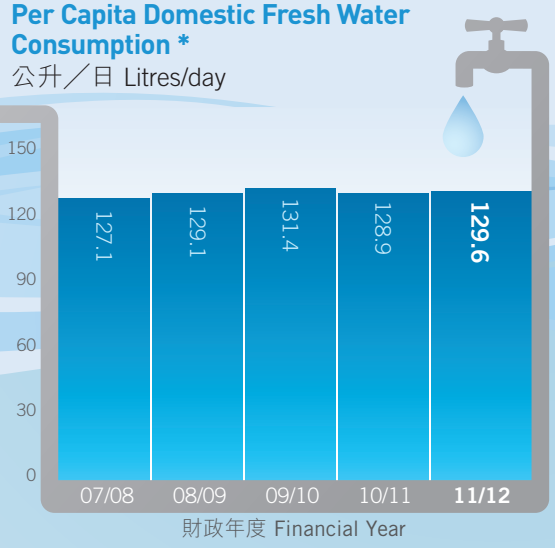
人均耗電量（海水）*
Per Capita Electricity Consumption (Sea Water)*
千瓦時／每人／每年 kWh/head/year

每單位耗電量（海水）
Unit Electricity Consumption (Sea Water)
千瓦時／立方米 kWh/m³

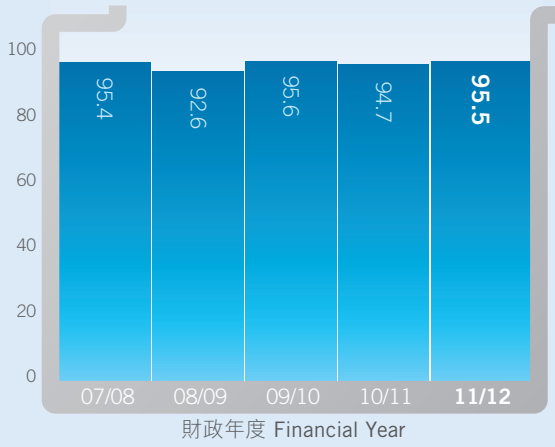


辦公室每單位樓面面積的耗電量
Office Electricity Consumption Per Unit Floor Space
千瓦時／平方米 kWh/m²

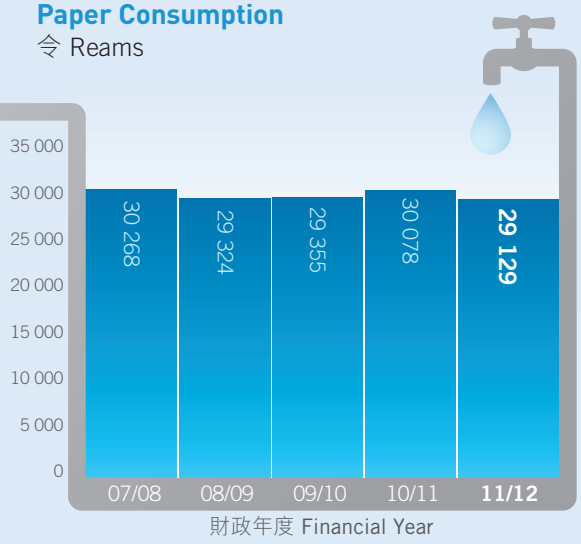
人均住宅食水耗用量*
Per Capita Domestic Fresh Water Consumption *
公升／日 Litres/day



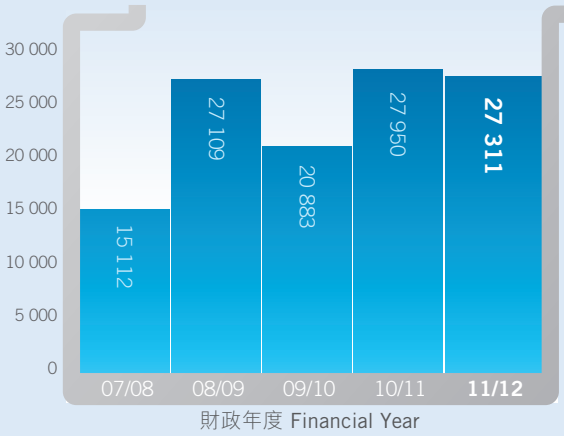
人均沖廁水耗用量（食水及海水）*
Per Capita Flushing Water Consumption (Fresh Water & Sea Water)*
公升／日 Litres/day



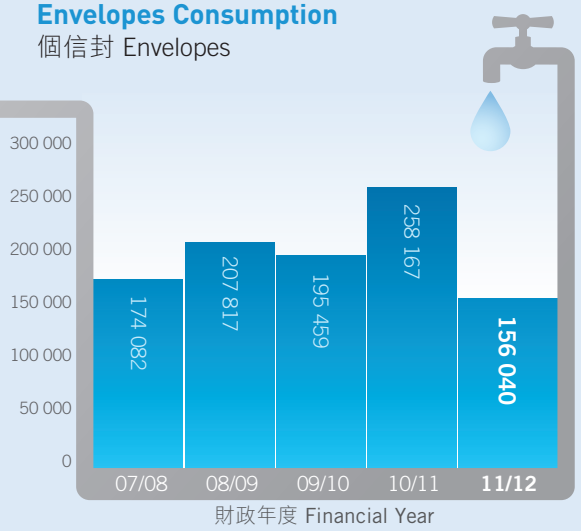
耗紙量
Paper Consumption
令 Reams



通用表格及部門表格的用量
GF and Departmental Forms Consumption
千張 1 000 sheets



信封用量
Envelopes Consumption
個信封 Envelopes



* 二零零七年中至二零一一年中的人口數據，已按二零一一年人口統計所得的人口基準作出修訂。經修訂的數據，計入了更多先前編製人口數據時尚未能提供的有關人口變化的估計數字。二零零七年以來人均耗水量數字及獲供水人口均已經作出相應的修訂。

* Based on the population benchmark from the results of the 2011 Population Census, the population figures from mid-2007 to mid-2011 have been revised. The revision has incorporated more estimates of population changes that were not yet available at the time when the previous population figures were prepared. Consequently, the per capita consumption figures and population served as from 2007 onwards have been revised as well.

嶄新技術和設備

我們在可行情況下就供水鏈沿線制訂計劃，按照壽命週期成本原理，善用資產及其運作，以達至最佳的經濟效益。變速抽水、採用電腦智能編排抽水設施的運作、在線監控供水網絡等新科技，都有效地減少能源需求。我們正在研發配水庫虹吸進水管，以替代耗電量較高的進水管。

NEW TECHNOLOGY AND EQUIPMENT

Where possible we have established programmes along the supply chain to produce better economies in the life-cycle cost of assets and service operations. Technology that involves variable speed pumping, intelligent scheduling of pump operations and online monitoring and control of the distribution network have all effectively reduced energy requirements. Siphon inlet pipes are being developed for service reservoirs, replacing inlet mains which require a higher level of energy to operate.

可再生能源措施

目前，我們正尋求發展水力、風力和太陽能發電技術，而部分技術已應用在供水鏈上。在屯門濾水廠，我們正在安裝兩台180千瓦的渦輪發電機，為濾水廠運作提供電力。第一台發電機將於二零一三年投入服務，屆時預計每年可產生1 450兆瓦時電能，相等於減少了若採用化石燃料作能源而會排放的1 000噸二氧化碳。

我們與香港理工大學合作，設計內聯閉式水力發電裝置，能為並未有供電的供水網絡監測和控制設備提供電源動力。是項創新設計於二零一一年十二月獲知識產權署授予專利，並榮獲二零一二年日內瓦發明展銀獎。

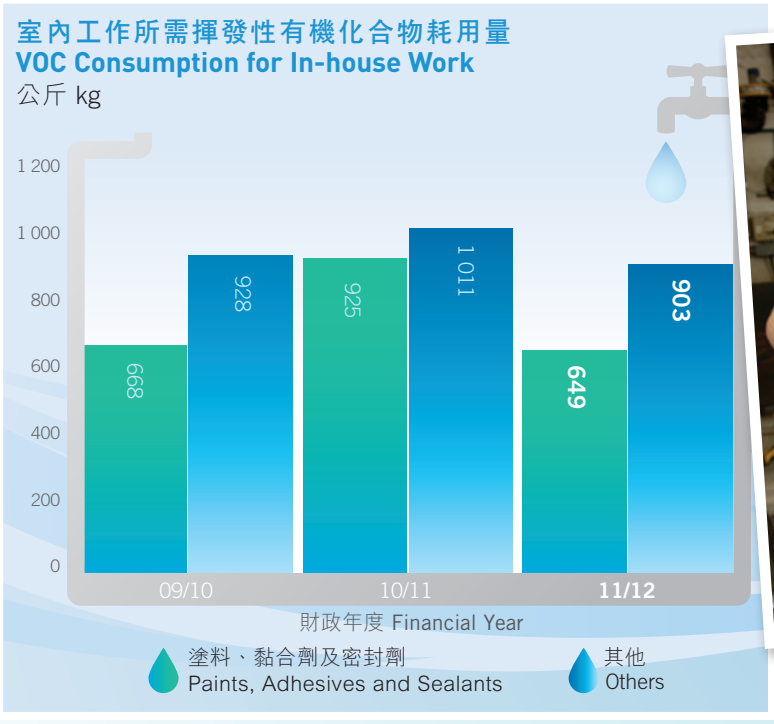
我們正在紅山濾水廠測試新設計的直立風力發電設施，與各水務設施一直使用的傳統風力渦輪機和太陽能電池板相互補足。

RENEWABLE ENERGY INITIATIVES

Currently we are pursuing the development of hydropower and wind and solar energy technologies for use along the supply chain. At the Tuen Mun Water Treatment Works we are installing two 180kW turbine generator units to generate electricity for use at the plant. The first of these generators will be ready for commissioning in 2013 to harvest 1 450 megawatt hours of electricity from renewable energy annually, which is equivalent to a reduction of 1 000 tonnes of CO_2 emissions from burning fossil fuels.

An in-line hydro power harnessing device was developed jointly with the Hong Kong Polytechnic University to supply electricity to monitoring equipment installed in areas where existing electricity supplies cannot be delivered readily. A patent was granted by the Intellectual Property Department in December 2011 and a Silver Medal was awarded at the Geneva Invention Expo 2012 in recognition of this innovative design.

At the Red Hill Water Treatment Works, we are testing a new design for a vertical wind turbine to complement the conventional wind turbines and solar panels that have been used in various waterworks installations.



內聯閉式水力發電系統的模型。
A model of an inline hydroelectric generating system operating in confined conditions.

水泵在供水和配水系統中耗用大量能源，我們繼續與英國艾克斯特大學水系統中心及本地工程界合作，就香港的情況測試電腦智能水泵監控系統，加強香港的水泵節能技術。我們亦正研究利用變速水泵，以減少現有和新建抽水站的耗電量。

Technologies that optimise the energy required to operate pumps throughout the supply and distribution systems are being studied. We continue to work with experts from the Centre for Water Systems at the University of Exeter in the UK and the local engineering sector to test the intelligent methodology of on-line pump control systems under Hong Kong conditions. We are also exploring the opportunities of using variable speed pumps to reduce energy consumption in both existing and new pumping plants.

公用集調車輛資料
INFORMATION ON POOL TRANSPORT

	公務用車數量 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)		
	09/10	10/11	**11/12**	09/10	10/11	**11/12**	09/10	10/11	**11/12**
柴油 Diesel	23	19	**18**	38 464	33 756	**30 619**	182 934	227 977	**209 738**
汽油 Petroleum	206	205	**196**	534 765	517 113	**461 144**	2 813 529	3 605 776	**3 255 439**
混合（汽油／電力） Hybrid (Petrol/Electric)	–	20	**21**	–	50 450	**53 834**	–	351 783	**376 407**
液化石油氣 LPG	6	8	**8**	28 326	29 184	**36 171**	81 221	90 403	**115 208**
電力 Electricity	–	1	**3**	–	–	**–**	–	5 709	**16 437**

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		
直接廢氣排放 Direct Emissions	09/10	10/11	**11/12**	09/10	10/11	**11/12**	09/10	10/11	**11/12**	09/10	10/11	**11/12**
公務用車（柴油） Vehicle fleet (Diesel)	100	88	**80**	–	–	**–**	1	1	**1**	–	–	**–**
公務用車（汽油） Vehicle fleet (Petrol)	1 384	1 220	**1 215**	–	–	**–**	1	1	**1**	–	–	**–**
公務用車（液化石油氣） Vehicle fleet (LPG)	47	49	**61**	–	–	**–**	–	–	**–**	–	–	**–**
間接廢氣排放 Indirect Emissions												
耗用電（九龍及新界） Electricity Consumed (Kowloon and New Territories)	340 733	324 992	**368 802**	514	220	**181**	452	313	**363**	26	16	**14**
耗用電（港島） Electricity Consumed (Hong Kong Island)	48 782	51 179	**56 179**	140	95	**27**	77	70	**58**	3	2	**1**
總量 Total	**391 046**	**377 528**	**426 337**	**654**	**315**	**208**	**531**	**385**	**423**	**29**	**18**	**15**

履行《清新空氣約章》

我們已降低濾水廠和抽水站的廢氣排放水平。同時，我們盡量減少使用城市網絡內的電力，並使用其他能源，間接減少整體廢氣排放量。

我們繼續保持高度警覺，透過嚴密監察車輛的使用量，並逐步以混燃汽車和電能車取代汽油驅動車輛來減少耗油量，嚴格控制本署車隊的直接廢氣排放量。此外，以液化石油氣車取代柴油車，同樣有助車隊減少每公里廢氣排放量。

在簽訂設計和建造各項供水設施的合約時，我們會盡量採納有助減少對環境造成影響的設計元素、材料和工作流程。我們會密切監管涉及使用含有揮發性的有機化合物的材料及化學品。

本署致力在內部培育愛護環境的文化及意識。這種文化在我們日常業務當中，隨處可見。現時辦公室已落實以電子方式溝通和文件編撰，甚至供水鏈的運作亦日趨電子化。數據記錄儀及其他電子設備，令我們得以使用方便可靠的無紙化資訊系統。

CLEAN AIR CHARTER COMMITMENTS

Air emission levels at all water treatment works and pumping stations have improved and by limiting where possible our use of electricity from the city grid and using alternative energy sources, we have indirectly assisted in the reduction of general emissions.

We are equally vigilant about the sources of direct emissions arising from our vehicle fleet by strictly controlling the use of vehicles and replacing petrol driven vehicles with hybrid and electric cars to reduce fuel consumption. By replacing diesel fuel with LPG, our transport fleet has also reduced its emissions on a kilometric basis.

In the award of contracts for the design and construction of facilities, we look for design elements, materials and work processes that, where practical, limit environmental impacts. The use of materials and chemicals containing volatile organic compounds is closely monitored.

Internally, our culture of environmental care and awareness is reflected in our day to day business from electronic communications and documentation in offices through to aspects of operations within the supply chain. Data loggers and other electronic devices have resulted in an information system that is reliable, easily accessible and paperless.

綠化環境

我們恆常地在集水區、水塘和濾水設施進行環境保護的改善工作。本署園林服務組，負責照顧已種植在水務設施內或附近的近五萬棵樹。保育原生樹和周詳的樹木管理是發展計劃的重點。配合政府指引，我們進行了全面樹木風險評估，務求找出可能存在結構或健康問題的樹木。我們會監察有關樹木，並在有需要時採取防治措施。

與此同時，我們逐步將環保設計融入水務設施。現時約30幢本署的辦公室和供水設施的上蓋已鋪上表層土，並種植了15種色彩繽紛的植物，這不僅加強了建築物的節能效果，也營造出能夠讓員工舒展身心的上蓋空間。

全程監控水質

確保公眾對食水水質的信心是重要的一環。香港的食水經嚴格處理，符合國際飲用水水質指引。然而，要確保住宅、辦公室，以及其他工作和消閒場所得享優質自來水，實賴各方各盡其責，共同維持水質。就此，樓宇業主必須妥善維修及管理其內部供水系統。

本署推行的大廈優質食水認可計劃涉及1 080 000個住戶，去年頒發金證書、銀證書和藍證書達3 400張，表揚參與人士致力保養樓宇內部供水系統，保障用戶水質安全。過去多年，本署亦聯同房屋署繼續推行樓宇孖水缸供水系統。該系統的基本原理是在傳統的單間隔設計的水箱內加設一間隔牆，並使用一些輔助管道和設備，將屋頂水缸改建為兩個水缸，此設計以微不足道的額外成本，令大廈在例行清洗其中一個水缸時，另一個水缸仍能維持供水。藉此設計，水缸可按需要隨時清洗以改善水質，而無需犧牲客戶日常生活的方便。

GREENING THE ENVIRONMENT

Across catchments and around reservoirs and treatment facilities, we have continued to implement a programme of environmental protection and enhancement. Our Landscape Services Unit cares for almost 50 000 trees which have been planted in or around water works installations and facilities. An emphasis has been placed on native trees and careful tree management. In line with Government guidelines, we have carried out a comprehensive tree risk assessment identifying trees with possible structural or health problems. These trees will be monitored and mitigation measures taken if required.

At the same time, environmental design is being increasingly incorporated into facilities. About 30 rooftops at offices and water supply installations have been covered with top soil and planted in 15 colourful plant species. This enhances the energy performance of the buildings while creating a rooftop surface that is often enjoyed by staff.

MAINTAINING QUALITY FROM SOURCE TO TAP

Public confidence in the quality of drinking water is critical. Hong Kong's treated fresh water is produced in accordance with international guidelines. However, ensuring that the same quality of water emerges from the taps of homes, offices or other places of work or recreation, places a responsibility on others as well. Building owners need to maintain and manage the operation of their private plumbing systems.

The Department's Quality Water Recognition Scheme for Buildings now covers 1 080 000 domestic households with 3 400 gold, silver and blue certificates issued last year in recognition of the efforts paid by the participants in maintaining the plumbing systems inside buildings properly for safe upkeeping of quality water up to the consumer's taps. Over the past years, the Department also worked closely with the Housing Authority on the introduction of a twin-tank water supply system for buildings. The system, which is basically a two-compartment roof tank design, facilitates cleansing of one compartment whilst maintaining water supply to residents through the other compartment. It is an enhancement of the conventional one-compartment design by the addition of a central partition wall and some ancillary pipeworks and equipment at a minimal extra cost. With such a design in place, cleansing of water tanks to improve water quality in buildings can be carried out as and when required without sacrificing the convenience of customers' daily life.