

Sustainability Report 可持續發展報告

2009





Prof LM Chu, Chairman of the Committee on Campus Environment

校園環境委員會主席朱利民教授

PREFACE

Sustainability is more than a concept: it is also a foremost principle and direction, the process and final goal in modern environmental management by governments and private enterprises alike, on local and global fronts. This is of no exception to tertiary institutions which, as important centres of education and research, should assume a leading role in the sustainable development of the community. The Chinese University of Hong Kong has long implemented an omni-directional, strategic programme for eco-management on campus, advocating concerted efforts towards emission reduction, energy and water conservation, waste reduction and recycling, ecological preservation and landscape enhancement. Since the publication of our first Sustainability Report in 2006, we have been committed to the building of a sustainable campus, while maintaining the highest standards of integrity and transparency and striving to fulfill the new '4Rs' – 'Responsibility', 'Respect', 'Rethink', and 'Reorient'. We are encouraged by the keen support from the University's senior administration and the campus community. What we have accomplished to date has been highly encouraging, but at the same time we can see the need for further efforts and improvement by enlisting the participation of more stakeholders. Sustainability, under the modern deluge of environmental discourse, can be easily and regrettably rendered an empty catchphrase. However, small practical steps by each individual will gather enough momentum to create big and manifested changes in our environment. Let us all join hands in these efforts for our University and the community of Hong Kong, for this generation and the generations to come.

前言

持續發展並不只是個概念，也是重要的原則和方向，是現代環境管理的過程和最終目標，既適用於政府，也適用於私營企業，不僅在香港如是，在全球各地也如是。大專院校也沒有例外，大學是重要的教學和研究中心，應該帶領社會走上可持續發展的道路。香港中文大學一直實施全方位的策略性計劃，管理校園的生態，鼓勵各方同心協力，減少排放量、節能節水、減少廢物、回收廢物、保育生態、美化環境。二零零六年起出版可持續發展報告，致力構建可持續發展校園，同時維持公平與高透明度，符合新「四R」的要求：「承擔責任」、「尊重他人」、「重新思考」，以及「重定方向」。得到大學高層人員和全校師生鼎力支持，我們十分鼓舞。成績至今所見，固然令人振奮，但仍需繼續努力，鼓勵更多人參與。現今社會經常談論環保，可持續發展很容易淪為空洞的口號；但每人若能踏實地做點小事，涓滴匯流，就可為環境帶來重大而明顯的轉變。讓我們同心攜手，為大學、為香港、為這一代、為我們的後代而努力。

SUSTAINABILITY REPORT 2009

The Chinese University of Hong Kong (CUHK) has taken environmental protection as a major issue in its development and management since the early 1990s, and has been taking measures to protect the campus and its environs. In 2000, the University published its first Environmental Report based on a comprehensive environmental audit commissioned in 1999 by the University, the first of its kind among local tertiary institutions. It marked the beginning of its commitment to long-term improvements of the campus environment.

In 2006, to better reflect the University's strategic measures for ensuring environmental sustainability, a Sustainability Report was published in place of the Environmental Report. Since the new focus is on environmental sustainability, the social and economic components of sustainable development will not be discussed. Also excluded from the contents are the data from offices and activities beyond the Central Campus, as well as those of the staff quarters, student hostels and canteens as they are individually metered, the consumption of which is directly paid by staff and caterers.

This report covers the period from 1 January 2009 to 31 December 2009 and is published in electronic version on the University website for the purpose of reducing paper consumption.

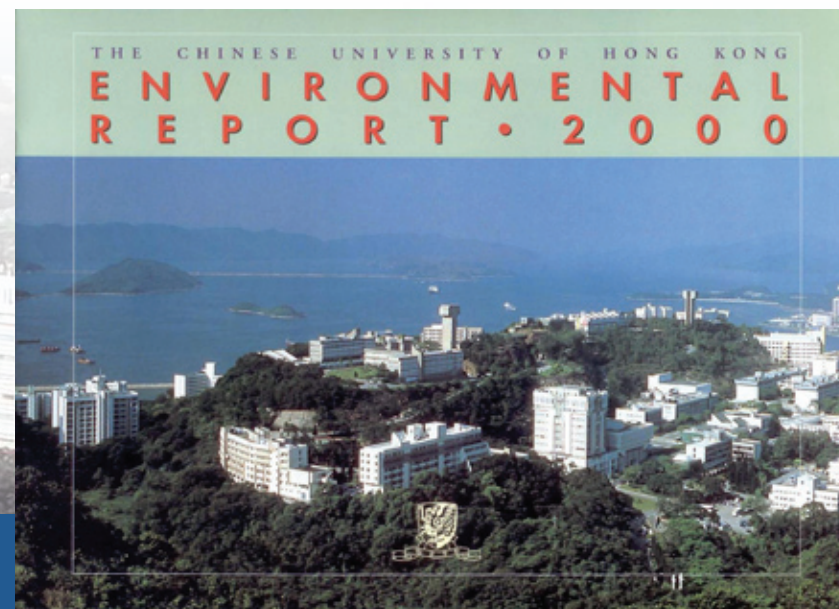
二零零九年可持續發展報告

自上世紀九十年代初起，香港中文大學（中大）就已把保護環境視為發展與管理工作中須重點處理的事項，採取種種措施，保護校園及其附近地方。二零零零年根據校方於一九九九年委託進行的一項全面環境審核，出版首份環境報告，是本地大專院校的創舉，標誌着中大開始致力長遠改善校園的環境。

為更佳地反映校方為確保環境可持續發展而實施的策略性措施，中大於二零零六年開始出版可持續發展報告，代替環境報告。由於新重點在於環境上的可持續發展，本報告內不會討論可持續發展的社會和經濟元素。報告內容也不會包括大學本部以外的辦事處和活動的數據，以及教職員宿舍、學生宿舍和飯堂的數據，因為這些地點的資源用量都獨立計算，直接由職員和營運商支付。

本報告涵蓋二零零九年一月一日至二零零九年十二月三十一日的事項。為減少耗用紙張，報告以電子形式在中大網站出版。

First Environmental Report in 2000
二零零零年首份環境報告



UNIVERSITY PROFILE

With a history of 45 years, an area of 137.3 hectares and over 150 buildings, the University has the largest campus among all tertiary institutions in Hong Kong. With the reversion to a four-year normative curriculum in 2012, it is anticipated that an extra 3,000 undergraduates will be admitted. To meet the increasing needs for space and facilities, five new colleges – Morningside College, SH Ho College, CW Chu College, Wu Yee Sun College and Lee Woo Sing College – will be added. They are at present either under construction or at a planning stage. On their completion, together with the four existing constituents – Chung Chi College, New Asia College, United College and Shaw College, there will be nine colleges on campus.

At present, the University has eight faculties - Arts, Business Administration, Education, Engineering, Law, Medicine, Science and Social Science. There are more than 6,000 academic and non-academic staff members, and the total number of postgraduate and undergraduate enrolment stands at over 22,500. In 2009, 7,136 first degrees and higher degrees were awarded and the cumulative number of alumni was 125,830.

With a view to long-term development, the University applied for a land extension in Area 39 in the northern part of the campus and worked closely with the Tai Po District Lands Office and the Civil Engineering and Development Department. Site formation works were completed in early 2009.

Table 1. Total number of full-time equivalent (FTE) students and total number of full-time staff in CUHK as at 31 December 2009

表 1. 中大相當於全日制學生總數及全職教職員總數（截至二零零九年十二月三十一日）

	Number 人數
Total number of FTE students (including UGC-funded and self-financed) 相當於全日制學生總數（包括大學教育資助委員會資助的學生及自費學生）	19,852
Total number of full-time staff 全職教職員總數	6,571

* As students of the School of Continuing and Professional Studies attended classes in the town centres, they were excluded from the above data set.

* 由於專業進修學院的學生在市區上課，以上數字不包括持續專業進修學院的學生數目。

大學概覽

中大有四十五年歷史，校園面積達一百三十七點三公頃，共有一百五十多座大樓，是香港專上學院之冠。二零一二年回復四年制後，中大將多招收三千名本科生。為應付空間和設施上的額外需求，中大將加建五個書院：晨興書院、善衡書院、敬文書院、伍宜孫書院及和聲書院。各書院正在興建，又或在籌劃中。落成以後，連同原有的崇基學院、新亞書院、聯合書院和逸夫書院，校園內將共有九個書院。

中大現有八個學院，分別為文學院、工商管理學院、教育學院、工程學院、法律學院、醫學院、理學院和社會科學院，教職員六千多名，本科生和研究生總數維持在二萬二千五百人以上。二零零九年共頒授7,136個學士及更高學位，校友數目累計125,830名。

為應付長遠發展，中大在校園北部的第三十九區申請多撥用地，現正與大埔地政處和土木工程拓展署合作。土地平整工程已於二零零九年初完成。

GOVERNANCE STRUCTURE

Currently, there are several university committees monitoring environmental issues on campus:

The Committee on Campus Environment (CCE), under the Administrative Affairs Committee (AAC), is tasked to promote awareness among staff and students in environmental protection and campus ecology, to recommend for consideration by AAC strategies and policies related to environmental protection, to investigate complaints on environmental matters and recommending actions where appropriate, and to undertake any other duties/functions in relation to environmental matters assigned by the Vice-Chancellor.

The Campus Planning Committee (CPC) oversees the development plan on campus. Under it are two subcommittees - the Steering Committee

on Campus Master Planning (SCCMP), which focuses on designing the Campus Master Plan, and the Campus Landscaping Enhancement Committee (CLEC), which focuses on landscaping and greening issues.

To help steer campus development and community safety, there are also the Standing Committee on Campus Geotechnical Matters, which monitors, and has the right to approve, slope improvement projects, and various Building Committees which are project-based, ad hoc committees dealing with construction and environmental issues related to specific building projects.

The CCE and CPC are assisted by administrative offices such as the University Safety and Environment Office (USEO), the Estates Management Office (EMO), the Campus Development Office (CDO) and the Transport Unit (TU) in implementing various sustainability plans and projects.

管治架構

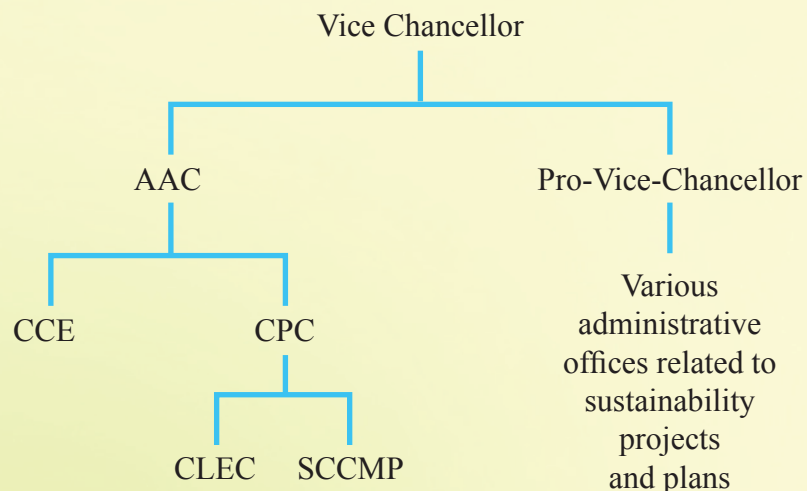
目前有幾個負責監察校園環境事宜的委員會：

「校園環境委員會」：隸屬行政事務委員會，主要職責是促進學生和教職員的環保和校園生態意識，向行政事務委員會建議環保策略，調查有關環境的投訴並建議恰當的跟進行動，以及執行校長指示的環保工作。

「校園計劃委員會」：負責監督校園發展計劃，其下再有兩個附屬委員會，即專責設計校園發展計劃的「校園發展計劃督導委員會」和專責環境美化和綠化事宜的「校園景觀美化委員會」。

為督導校園發展，促進校內社群安全，中大成立了「大學校園岩土事務委員會」，負責監察斜坡工程，有權批核斜坡改善工程；另因應個別項目而設立「建築委員會」，處理與興建項目有關的建築和環保事宜。

「校園環境委員會」和「校園計劃委員會」由多個行政辦事處輔助，包括大學安全及環境事務處、物業管理處、校園發展處和交通組，以實施各項環保計劃。



Governance structure on sustainability management

可持續發展管理的管治架構



PERFORMANCE INDICATORS

表現指標

Energy Consumption

CUHK is one of the largest electricity consumers in the Sha Tin District, according to the power company's record. In 1999, taking into consideration the annual electricity consumption of over 80,000 MWH and foreseeing the continually growing trend, the management initiated an Energy Saving Task Force to formulate strategies for energy conservation on campus.

Since 1999, the University's lighting retrofit programme has saved almost 30% of lighting energy on campus. Various technologies and infrastructures such as the water-cooled chiller plant, the Centralized Building Management System, motion sensors, use of solar shield window films and the heat exchange system have also been adopted in the past few years to further reduce electricity consumption.

More recent energy-efficient measures include the installation of LED exit signs and temperature limiting thermostats, replacement of street lighting, elimination of tungsten filament lamps and halogen lamps, and retrofitting fluorescent lamps to T4. As personal computers have become an essential part of our academic activities, we reduce energy wastage by a 'green IT' operation which sets standby modes for PC, peripherals and supporting equipment. Air-conditioning and energy requirement for data centres, server rooms, equipment rooms and computer rooms have been reset to optimal conditions.



Green plants are used as an insulation layer on the roof to reduce energy consumption such as air-conditioning during summer.

天台以綠色植物作隔熱層，以減少耗用能源，例如減少在夏天使用空調。

能源消耗

根據電力公司的紀錄，中大是沙田區耗電量最大的用戶之一，每年耗電超過八萬千瓦小時，且有持續增長趨勢。有見及此，管理層於一九九九年成立節能專責小組，制訂校園節能策略。

自一九九九年起，中大的照明系統翻新計劃已為校園節省近三成照明用電。近年亦已採用多種技術及基礎設施，例如水冷式空調系統、中央樓宇管理系統、人流感應器、太陽隔熱膜、熱交換系統等，以進一步減少耗電量。

較近期的能源效益措施，包括安裝發光二極體出路燈箱及限溫恆溫器、更換街燈、淘汰鎢絲燈和鹵素燈，以及把光管更換為T4。由於個人電腦已成為學術活動中必不可少的工具，我們實行「環保資訊科技」操作，為個人電腦、周邊設施和輔助設備設定備用狀態模式，以減少浪費能源。數據中心、伺服器室、設備室和電腦室的空調和能源需求，已重新調校至最適狀態。



Energy-wise thermostats

節能恆溫器



T4 Light retrofit project

T4光管更換計劃

Clean Energy

To harvest solar energy, the University installed solar panels in student hostels, the swimming pool and the University Sports Centre. Solar bus stops, solar gardens and solar fountains are now standard features in various parts of the campus. Retrofit works have been undertaken to install 480 main road lightings and 700 path lightings. It is estimated that about 1,100,000 kWh electricity was generated by the solar energy facilities in 2009.

Medium-sized wind turbines were installed after wind speed and direction studies had been conducted for more than a year by the EMO on campus.



Solar road lighting
太陽能路燈

綠色能源

為善用太陽能，中大在學生宿舍、游泳池和大學體育中心安裝了太陽能板。至於太陽能巴士站、太陽能花園和太陽能噴泉，在校園內已是隨處可見。校園內的照明系統已經翻新，安裝了四百八十盞幹道路燈和七百盞小徑路燈。各項太陽能設施估計在二零零九年產生了約一百一十萬千瓦小時電力。

物業管理處研究校園風速和風向一年多後，已安裝了中型風力發電機。



Wind turbine at the Water Sports Centre
水上活動中心的風力發電機

In 2009, each full-time equivalent (FTE) student consumed about 4,098 kWh of electricity per annum. Energy-efficient facilities and clean energy have successfully brought about a decreasing trend in electricity consumption in the past three years.

二零零九年，每名相當於全日制學生每年使用約4,098千瓦小時電力。由於採用多項節能設施和清潔能源，過去三年的耗電量已有下降的趨勢。

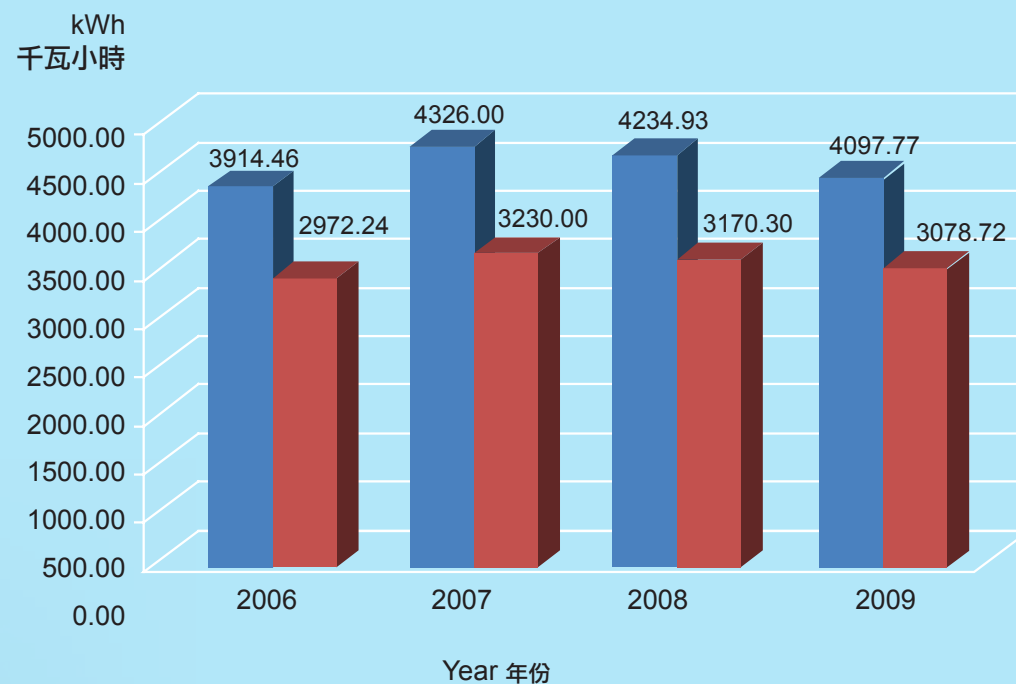
Table 2. Energy consumption in terms of FTE student and per capita

表 2. 按每名相當於全日制學生及每人計算能源消耗量

No. 編號	Indicator (Unit) 指標 (單位)	Definition / Remark 定義 / 備註	Results 結果
EN1	Electricity consumption per FTE student (kWh / FTE student) 每名相當於全日制學生電力使用量 (千瓦小時/相當於全日制學生)	Total electricity consumption / Number of FTE students 電力總耗量/相當於全日制學生數目	4,098 kWh / FTE student 千瓦小時 / 相當於全日制學生
EN2	Electricity consumption per capita (kWh / total number of FTE students & full-time staff) 每人電力使用量 (千瓦小時 / 相當於全日制學生及全職教職員總數)	Total electricity consumption / Number of FTE students & full-time staff 電力總耗量 / 相當於全日制學生及全職教職員數目	3,079 kWh / capita 千瓦小時 / 人

Graph 1: Electricity consumption of 2006 - 2009

圖 1: 二零零六至二零零九年的電力消耗



- Electricity consumption per FTE student (kWh / FTE student)
每名相當於全日制學生電力使用量 (千瓦小時 / 相當於全日制學生)
- Electricity consumption per capita (kWh / total number of FTE students & full-time staff)
每人電力使用量 (千瓦小時 / 相當於全日制學生及全職教職員總數)

Transportation

The Transport Unit owns more than 110 vehicles, amongst which there are 60 buses and mini-buses providing transportation services for staff and students within the campus. Extra services are also provided by a contractor. To control roadside emissions, a series of programmes have been implemented by phasing out old, polluting vehicles with cleaner ones, introducing electric scooters and imposing stringent vehicle emission inspections in the past years.

Pedestrian-friendly Campus

A renowned consultant was hired to assess the capacities of our existing road network and transport system against future demand in the Campus Master Planning (CMP). One of the findings was the over-dependence on the free bus service by students, some of whom preferred to wait for five minutes to take a bus journey rather than to walk to the spot which was only five minutes away. This bus service is costly to run, consumes fuel, and pollutes the environment. In view of this, efforts have been made to encourage walking within the campus. Footpaths with vegetation have been paved, and new buildings with vertical connection such as express lifts to enable fast and easy pedestrian movement up and down the hillsides have been constructed. Walking campaigns were organised by the University's Committee of Health Promotion and Protection in the past two years with routes selected to show the participants how quickly and enjoyably a journey could be covered on foot.

交通運輸

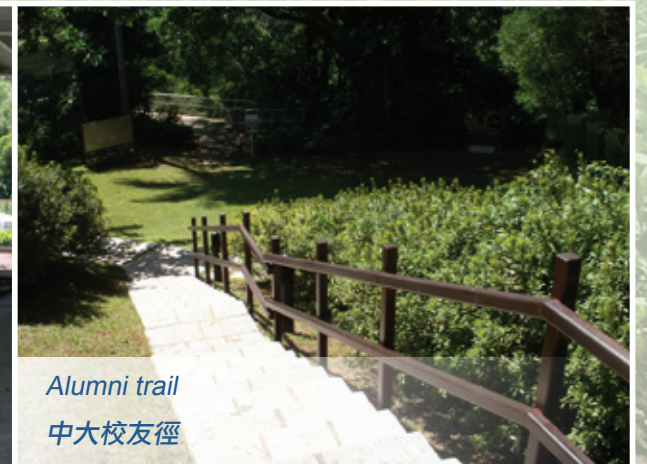
交通組目前有一百一十多部車輛，當中包括六十輛巴士和小巴，在校園內為師生提供交通服務。另外還向承判商租用巴士服務。為控制路邊排放，中大近年實施了一系列措施，包括把污染環境的舊車逐步更換為較環保的車輛、引進電動摩托車，以及嚴格檢查車輛的排放。

樂步健行校園

中大聘請了一位有名的顧問，評核校內現有的道路網絡和運輸系統是否足以應付校園發展計劃中的未來需求。研究發現學生過於倚賴免費巴士服務，有學生寧願候車五分鐘，也不願用五分鐘步行至目的地。巴士服務運作成本高，須耗用燃料，而且污染環境。有見及此，校方一直以各種方法鼓勵師生在校園內步行，例如修築綠化步行徑，並在新大樓設置快速升降機，方便行人快捷輕易地上下山。過去兩年，大學健康促進及防護委員會曾舉辦步行活動，選擇適當的路線，讓參加者體會到步行可以迅速到達目的地，步行的過程也可以很輕鬆愉快。



Regular vehicle check
定期檢查車輛



Alumni trail
中大校友徑

Park-and-Ride

Though all-campus cycling is not possible for a hilly terrain like the CUHK, parking for bicycles is provided at the rail station to facilitate students to ride on their bicycles, which is the greenest form of transport, to the nearby hostels and teaching venues.

泊車轉乘

中大地勢多山，不可能以單車走遍整個校園；但鐵路站設有單車停泊處，方便學生以最環保的交通工具，騎車前往鄰近的宿舍和教學地點。

Table 3. Coach mileage and diesel consumption in terms of FTE student and per capita

表 3. 按每名相當於全日制學生及每人計算的巴士行車里數及柴油消耗量

No. 編號	Indicator (Unit) 指標 (單位)	Definition / Remark 定義 / 備註	Results 結果
TP1	Mileage per FTE student (km / FTE student) 每名相當於全日制學生行車里數 (公里 / 相當於全日制學生)	Total mileage / Number of FTE students 總行車里數 / 相當於全日制學生數目	49.0 km / FTE student 公里 / 相當於全日制學生
TP2	Mileage per capita (km / total number of FTE students & full-time staff) 每人行車里數 (公里 / 相當於全日制學生及全職教職員總數)	Total mileage / Number of FTE students & full-time staff 總行車里數 / 相當於全日制學生及全職教職員數目	36.8 km / capita 公里 / 人
TP3	Diesel consumption by coach per FTE student (litres / FTE student) 每名相當於全日制學生巴士柴油使用量 (升 / 相當於全日制學生)	Total diesel consumption / Number of FTE students 柴油總耗量 / 相當於全日制學生數目	21.5 L / FTE student 升 / 相當於全日制學生
TP4	Diesel consumption by coach per capita (litres / total number of FTE students & full-time staff) 每人巴士柴油使用量 (升 / 相當於全日制學生及全職教職員總數)	Total diesel consumption / Number of FTE students & full-time staff 柴油總耗量 / 相當於全日制學生及全職教職員數目	16.2 L / capita 升 / 人



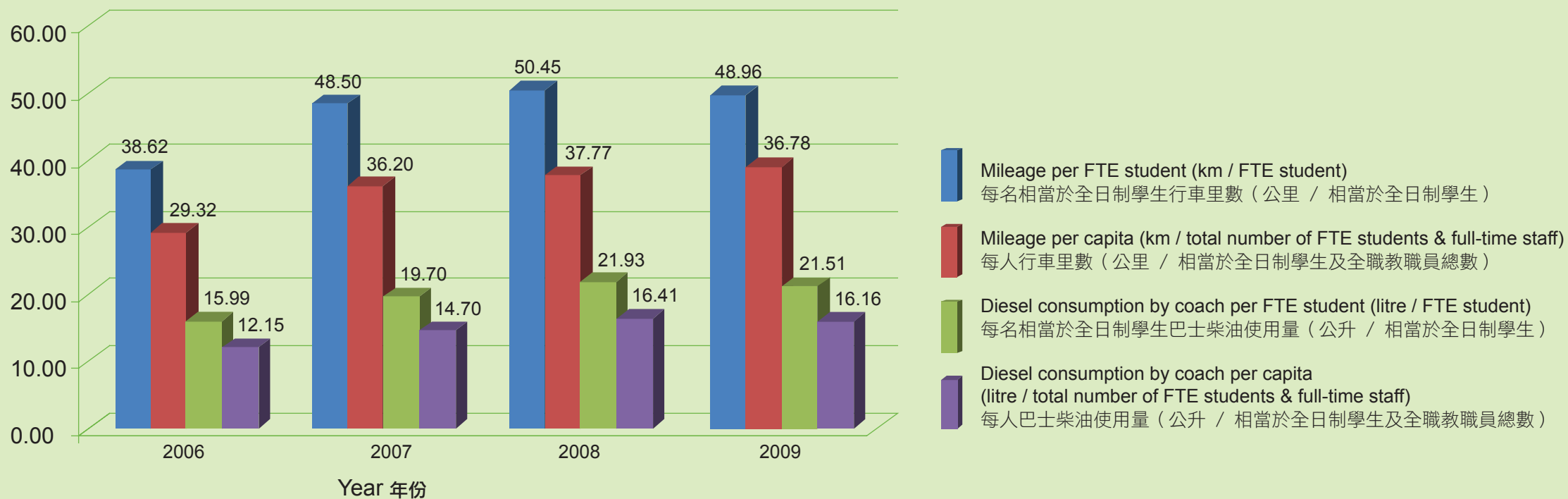
Bicycles parked at Chung Chi College

單車停泊在崇基學院

To enhance transport efficiency, the Transport Unit monitors the operation of buses and the performance of drivers. By communicating through radio-transceivers, running of empty or half-loaded buses can be reduced. Passenger surveys are also conducted regularly to address the needs of the community. Better classroom scheduling is implemented to reduce inter-zonal trips generated which may require bus service. With these measures, the coach mileage and diesel consumption per FTE student for 2009 came to 49.0 km and 21.5 litres respectively, showing a downward trend after the continuous increase of 2006, 2007 and 2008.

為加強交通運輸的效率，交通組持續監察巴士的運作和司機的表現，利用無線電通訊進行調度，減少巴士空載或載客不足的情況；又定期進行乘客調查，瞭解師生的需求。課堂的時間安排亦已改善，以減少乘搭巴士往來各區的需要。在二零零六、二零零七和二零零八年，巴士行車里數和柴油消耗量持續上升；實施上述措施後，到二零零九年，按每名相當於全日制學生計算的巴士行車里數和柴油消耗量，分別是49.0公里和21.5升，首見下降趨勢。

Graph 2: Diesel Consumption & Mileage of 2006 - 2009
圖 2: 二零零六至二零零九年的柴油消耗量和行車里數



Wastes

Municipal Solid Waste

Since the early 1990s, the University has been implementing waste reduction measures. Strategic recycling points are located on campus to facilitate waste recycling. Currently, EMO allocates a recycle bin to each floor of the EMO-managed buildings on the Central Campus and the Chung Chi Campus to collect recyclable items to support the “Source Separation of Domestic Waste” programme of the Environmental Protection Department (EPD).

廢物

都市固體廢物

自上世紀九十年代初起，中大已開始實施減廢措施，在校園有利位置設立廢物回收點，方便回收廢物再用。在中央校園和崇基校園內，由物業管理處管理的大樓，每個樓層均設置回收箱，回收可循環再造的物品，以支持環境保護署（環保署）的「廢物源頭分類計劃」。

A recycle bin is located on each building floor for source separation of domestic waste.

每個樓層設置回收箱，在廢物源頭將家居廢物分類。



In 2009, municipal solid waste generated by each FTE student was 66.8 kg and the overall recycling rate of municipal solid waste was around 17.7%. Both data show an encouraging improvement when compared with 2008. This may be due to a new incentive contract that was introduced to hire contractors who not only collect waste but also sort out the recyclables on site.

二零零九年，每名相當於全日制學生產生的都市固體廢物為66.8公斤，都市固體廢物的整體回收率約17.7%。兩項數據均較二零零八年有所進步，令人鼓舞。原因可能是使用了新的減廢獎勵合約，所聘請的承辦商不僅收集廢料，還即場把可回收再造的廢料分類。



The all-in-one photocopying machine is used to reduce the volume of paper consumption in the office.

使用多合一影印機，減少辦公室用紙量。

Table 4a. Wastes collected in 2006 – 2009
表 4a. 二零零六至二零零九年回收的廢物

Items 種類	2006	2007	2008	2009
Waste paper (kg) 廢紙 (公斤)	321,662	326,131	259,418	271,450
Plastics (kg) 塑膠 (公斤)	830	1,140	4,869	6,655
Aluminium cans (kg) 鋁罐 (公斤)	1,175	709	593	501
Metal (other than aluminium (kg) 金屬 (鋁罐除外) (公斤)	---	---	544	1,840
Printer cartridges (unit) 影印機碳粉盒 (個)	567	568	743	878
Used clothing (kg) 舊衣物 (公斤)	894	4,165	4,629	3,576
Compost (kg) 堆肥 (公斤)	---	104	160	240
Recycling Rate 回收率	---	18.0%	11.0%	17.7%



Used electrical appliances collected in hostels are delivered to charity organisations to give to those in need.

宿舍收集所得的電器送往慈善團體，轉贈有需要的人士。

Waste Electrical & Electronic (WEEE) Equipment

To avoid the pollution of heavy metals such as lead, cadmium and beryllium associated with the disposal of WEEE, a standard procedure is in place to organise auction bids and donations for computers and equipment owned by the University. All these items are sold to recycle dealers or donated to charity organisations instead of being disposed of as refuse. Computer recovery programmes are also organised by student hostels each summer. Those items collected are delivered to charity or non-profit-making organisations to give to those in need.

廢棄電器及電子設備

為免在棄置廢棄的電器及電子設備時造成鉛、鎘和鈹等重金屬污染，校方制訂了標準程序，為中大擁有的電器及電子設備籌辦拍賣和捐贈活動。這些廢棄設備均售予回收商，或捐贈予慈善機構，不會當作一般廢物般棄置。學生宿舍每年夏季亦舉辦電腦回收計劃。回收所得的物品，分別捐贈慈善團體或非牟利機構，送贈有需要的人士。

Hazardous Waste

The University has a guideline on the storage and disposal of chemical wastes, such as spent acid and alkaline, and clinical wastes, such as animal and human tissue and blood. It requires staff and students to properly dispose of these hazardous wastes which will be collected and transported by licensed collectors. In 2009, 1.91 kg of chemical wastes and 0.76 kg of clinical wastes were generated by each FTE student, indicating that the volume for both has remained stable in the past few years.

The use of radioactive chemicals has reduced in the past few years because there are new non-radioactive substitutes for similar operations and tests. For the old radioactive sources, they are sealed and returned to the manufacturers so that the radioactive substances can be reused. Those that cannot be returned to the manufacturers are sent to the purpose-built radioactive waste store managed by the USEO where, after storing for 10 half-lives by about 2 years, the short-lived radioisotopes will reduce to 1/1000 of their original activities. If the radioactive sources belong to the long half-life type, they will be stored in transit, pending shipment to the EPD's radioactive waste storage facility at Siu A Chau, an uninhabited island southwest of Lantau. All disposals are recorded and comply with the disposal limits in the radiation licenses issued by the Hong Kong Radiation Board.



Radioactive wastes are properly stored in the purpose-built radioactive waste store managed by the USEO.
放射性廢料妥善貯存於大學安全及環境事務處管理的特製放射性廢料庫。

有害廢物

中大就貯存和棄置化學廢物（如用過的酸和鹼）和生物廢物（如動物和人體組織、血液等）訂有指引，師生須妥善棄置這些有害廢物，由持牌收集商收集搬運。二零零九年，每名相當於全日制學生產生1.91公斤化學廢物、0.76公斤生物廢物，兩類廢物量在過去數年均維持穩定。

近年放射性化學品的使用已經減少，因為有了新的非放射性替代品，可作同類操作及測試之用。用過的放射源均予封存，交還製造商，以便重用放射性物質。不能送還製造商的放射源，則送往由大學安全及環境事務處管理的特製放射性廢料庫，貯存約兩年後，經過十個半衰期，壽命較短的放射性同位素的活躍程度即可降至原有活躍度的千分之一。若放射源的半衰期較長，則暫時存於放射性廢料庫，再送往大嶼山西南面一個無人居住的島嶼小鴉洲，在環保署轄下的放射性廢料庫貯存。所有放射性物質的棄置安排均有紀錄，並符合由香港輻射管理局所發出的放射性物質許可證內註明的棄置限額。

Construction & Demolition (C&D) Waste

The University requires contractors to submit a waste management plan which outlines their waste minimization measures in each project. They are required to avoid and minimize the generation of construction waste by recovery, re-use and recycling of the materials. The inert materials such as rocks and concrete are always reused by other construction sites or disposed of at the public filling facilities for reclamation. Some of the valuable materials are sent to recycling firms. Only the non-inert portion - C&D waste - is disposed of at the landfills.

To avoid irresponsible dumping, C&D wastes generated from project works are required to be disposed of in accordance with the “Trip Ticket System” laid down by the Environment, Transport and Works Bureau in 2005. In 2009, 232 kg of construction waste per FTE student were generated. As more building projects will commence in 2010 to meet the needs of the new 3-3-4 curriculum, the volume of construction waste will probably increase in the next few years.

建築廢料

中大要求承建商提交廢料管理計劃，列明每項工程的減廢措施。承建商須以物料回收、物料再用、循環再造等方法，避免和減少產生建築廢料。石塊、混凝土等惰性物質，均由其他地盤再用，或棄置在公眾填土設施，供回收使用；一些有價值的物料，則送交回收商；只有非惰性的建築廢料，才在堆填區棄置。

為杜絕不負責任地棄置建築廢料的情況，校方要求承建商把建築工程產生的建築廢料按環境運輸及工務局於二零零五年制訂的「運載記錄制度」棄置。二零零九年，每名相當於全日制學生產生232公斤建築廢料。二零一零年有更多建築工程開展，以應付三三四學制的需求，因此未來數年的建築廢料量可能增加。



Waste sorting on the construction site
在地盤內把廢料分類

To sum up, the volume of biological waste, chemical waste and C&D waste have been stable and the volume of municipal solid waste has dropped significantly as compared to the previous three years.

總括來說，生物廢物、化學廢物和建築廢料量，多年來一直維持穩定，而都市固體廢物量則較過去三年大幅減少。

Table 4b. Volume of various wastes in terms of FTE student and per capita

表 4b. 按每名相當於全日制學生及每人計算的廢物量

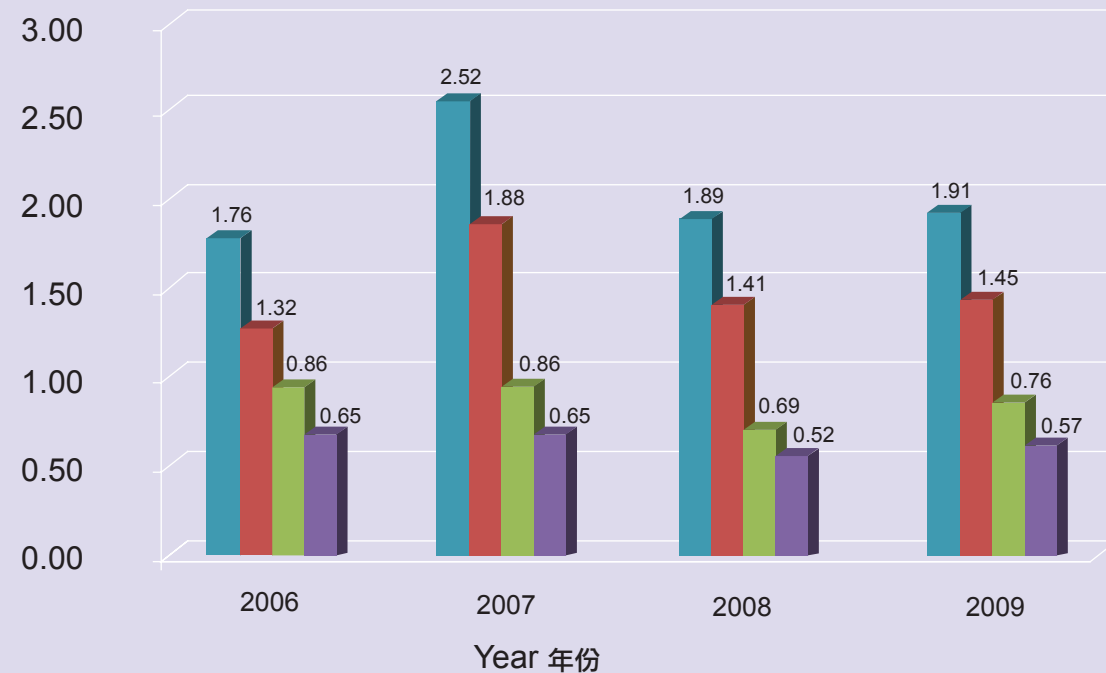
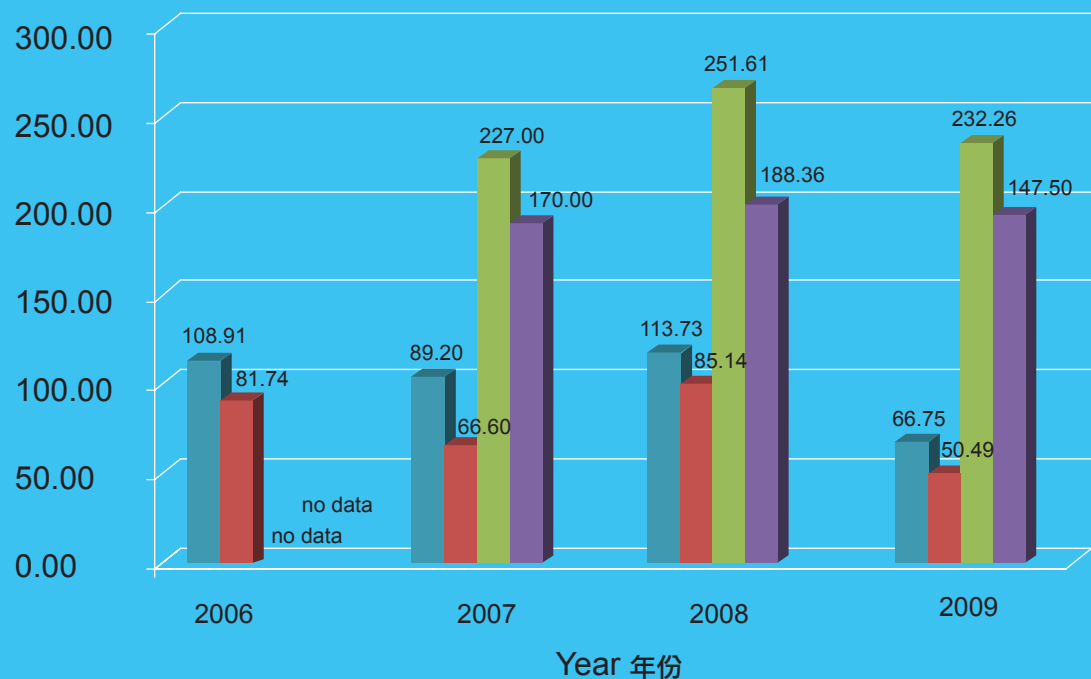
No. 編號	Indicator (Unit) 指標 (單位)	Definition / Remark 定義 / 備註	Results 結果
WM1	Municipal solid waste per FTE student (kg / FTE student) 每名相當於全日制學生都市固體廢物量 (公斤 / 相當於全日制學生)	Total municipal solid waste / Number of FTE students 都市固體廢物總量 / 相當於全日制學生數目	66.8 kg / FTE student 公斤 / 相當於全日制學生
WM2	Municipal solid waste per capita (kg / total number of FTE students & full-time staff) 每人都市固體廢物量 (公斤 / 相當於全日制學生及全職教職員總數)	Total municipal solid waste / Number of FTE students & full-time staff 都市固體廢物總量 / 相當於全日制學生及全職教職員數目	50.5 kg / capita 公斤 / 人
WM3	Chemical waste per FTE student (kg / FTE student) 每名相當於全日制學生化學廢物量 (公斤 / 相當於全日制學生)	Total chemical waste / Number of FTE students 化學廢物總量 / 相當於全日制學生數目	1.91 kg / FTE student 公斤 / 相當於全日制學生
WM4	Chemical waste per capita (kg / total number of FTE students & full-time staff) 每人化學廢物量 (公斤 / 相當於全日制學生及全職教職員總數)	Total chemical waste / Number of FTE students & full-time staff 化學廢物總量 / 相當於全日制學生及全職教職員數目	1.45 kg / capita 公斤 / 人
WM5	Biological wastes per FTE student (kg / FTE student) 每名相當於全日制學生生物廢物量 (公斤 / 相當於全日制學生)	Total biological wastes / Number of FTE students & full-time staff 生物廢物總量 / 相當於全日制學生數目	0.76 kg / FTE student 公斤 / 相當於全日制學生
WM6	Biological wastes per capita (kg / total number of FTE students & full-time staff) 每人生物廢物量 (公斤 / 相當於全日制學生及全職教職員總數)	Total biological wastes / Number of FTE students & full-time staff 生物廢物總量 / 相當於全日制學生及全職教職員數目	0.57 kg / capita 公斤 / 人
WM7	Construction and demolition waste per FTE student (kg / FTE student) 每名相當於全日制學生建築廢料量 (公斤 / 相當於全日制學生)	Total construction and demolition waste / Number of FTE students 建築廢料總量 / 相當於全日制學生數目	232 kg / FTE student 公斤 / 相當於全日制學生
WM8	Construction and demolition waste per capita (kg / total number of FTE students & full-time staff) 每人建築廢料量 (公斤 / 相當於全日制學生及全職教職員總數)	Total construction and demolition waste / Number of FTE students & full-time staff 建築廢料總量 / 相當於全日制學生及全職教職員數目	175 kg / capita 公斤 / 人





STABILITY
IMPROVEMENT
WORKS
斜坡鞏固工程





CAMPUS
DEVELOPMENT
OFFICE
校園發展處

Graph 3a & b: Waste generation of 2006 - 2009

圖 3a & b: 二零零六至二零零九年的廢料量



-  Municipal solid waste per FTE student (kg / FTE student)
每名相當於全日制學生都市固體廢物量 (公斤 / 相當於全日制學生)
-  Municipal solid waste per capita (kg / total number of FTE students & full time staff)
每人都市固體廢物量 (公斤 / 相當於全日制學生及全職教職員總數)
-  Construction and demolition waste per FTE student (kg / FTE student)
每名相當於全日制學生建築廢料量 (公斤 / 相當於全日制學生)
-  Construction and demolition waste per capita (kg / total number of FTE students & full time staff)
每人建築廢料量 (公斤 / 相當於全日制學生及全職教職員總數)

-  Chemical waste per FTE student (kg / FTE student)
每名相當於全日制學生化學廢物量 (公斤 / 相當於全日制學生)
-  Chemical waste per capita (kg / total number of FTE students & full time staff)
每人化學廢物量 (公斤 / 相當於全日制學生及全職教職員總數)
-  Biological wastes per FTE student (kg / FTE student)
每名相當於全日制學生生物廢物量 (公斤 / 相當於全日制學生)
-  Biological wastes per capita (kg / total number of FTE & full time staff)
每人生物廢物量 (公斤 / 相當於全日制學生及全職教職員總數)



Sprinklers are installed and stream water is used to enable effective watering of the plants.

設置灑水系統，利用溪水有效灌溉植物。

Water

Water shortage has posed a livelihood threat globally in recent years. In this regard, the University has been making ongoing efforts to reduce water wastage in our administrative and academic buildings by, for example, installing infra-red sensors for urinal flushing, automatic cut-off taps and faucet aerators in washrooms. Last year, about 438,000 m³ water were collected from Weiyuan Lake and Kau To Shan for irrigation, flushing and cooling. The frequency of watering is reviewed from time to time to ascertain effective irrigation. Diligent investigation and repair have been carried out to the underground water-carrying service to stop water leakage and prevent pipe bursting.

The implementation of the said measures has borne fruit. In 2009, each FTE student consumed 44.28 m³ of potable water, indicating a 15% drop as compared to 2006.



Water meters are installed in buildings to study the water usage on campus.

各大樓裝設水錶，研究校園用水的情況。

水

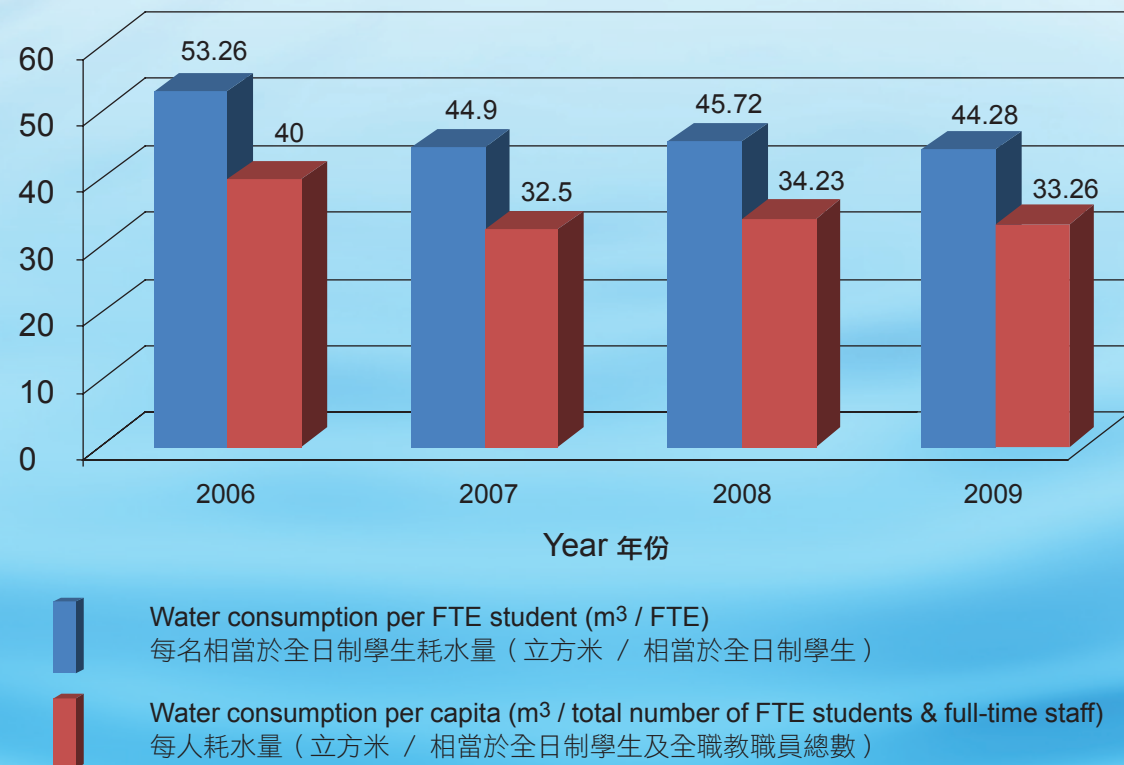
食水短缺的問題，近年已影響全球各地人民的生計。為此，中大一直努力在行政教學大樓減少浪費食水，例如在洗手間安裝紅外線感應沖廁系統、會自動關上的水龍頭、水龍頭曝氣器等。去年在未圓湖和九肚山收集得約438,000立方米水源，作灌溉、沖廁和冷卻之用。校方不時檢討灌溉的次數，以免造成浪費；又經常檢查和維修地下輸水設施，以杜絕滲漏，並防止水管爆裂。

上述各項措施已見成效。二零零九年每名相當於全日制學生的耗水量為44.28立方米，比二零零六年下降百分之十五。

Table 5. Water consumption in terms of FTE student and per capita
 表 5. 按每名相當於全日制學生及每人計算的耗水量

No. 編號	Indicator (Unit) 指標 (單位)	Definition / Remark 定義 / 備註	Results 結果
WA1	Water consumption per FTE student (m ³ / FTE) 每名相當於全日制學生耗水量 (立方米 / 相當於全日制學生)	Total water consumption / Number of FTE students 總耗水量 / 相當於全日制學生數目	44.3 m ³ / FTE student (立方米 / 相當於全日制學生)
WA2	Water consumption per capita (m ³ / total number of FTE students & full-time staff) 每人耗水量 (立方米 / 相當於全日制學生及全職教職員總數)	Total water consumption / Number of FTE students & full-time staff 總耗水量 / 相當於全日制學生及全職教職員數目	33.3 m ³ / capita (立方米 / 人)

Graph 4: Water consumption of 2006 - 2009
 圖 4: 二零零六至二零零九年的耗水量



COMPLIANCE AND MONITORING

To ensure environmental compliance, the University periodically conducts audits to monitor effluent discharge, stream water quality, hazardous waste management and environmental noise. In 2009, only ten complaints about vehicle exhaust and construction noise were received.

Environmental Management Plan

The main contractor of each building project is required to submit an Environmental Management Plan (EMP) which illustrates all possible environmental impacts such as noise, air emission and effluent discharge, and the associated mitigation measures. As part of the EMP requirements, the contractor is required to appoint a designated environmental officer to oversee the EMP and implement specific environmental mitigation measures such as dust suppression, wastewater recycling, waste sorting and on-site monitoring. The contractor is audited for effectiveness by the University staff.



The site with asbestos demolition work is properly sealed according to the occupational safety and environmental requirements.

清拆石棉瓦時，須按職業安全及環保要求，把地盤妥為密封。

遵守法規與監察

為確保符合環保要求，中大定期審核和監察污水排放、河溪水質、有害廢物處理和噪音情況。二零零九年只收到十宗有關汽車廢氣污染和建築噪音的投訴。

環境管理計劃

中大要求每項建築工程的總承建商提交環境管理計劃，說明所有可能造成的環境影響，例如噪音、氣體排放、污水排放等，以及相應的緩解措施。為符合環境管理計劃的要求，承建商須委派指定的環境主任，執行環境管理計劃，實施特定的緩解措施，如抑制塵埃、廢水循環再用、廢物分類、現場監察等。中大職員亦會進行審核，檢查承建商管理環境的效果。

Protection of Natural Watercourses

To protect the surrounding water bodies in the University compound and environs, wastewater generated from residences, student hostels, offices and canteens is discharged to sewers, while discharge from laboratories with chemical residues is conveyed to underground storage tanks for dilution and neutralization. All discharges are finally conveyed to the Sha Tin Sewage Works for treatment.

As the Chung Chi Stream comes from Chek Lai Ping and the storm drains on Tai Po Road, the water quality is greatly affected by the upper stream. In 2009, a comprehensive water monitoring plan was implemented by the USEO to monitor the water quality of Chung Chi Stream, Weiyuan Lake, and the discharge of the construction sites along the catchment.



The Chung Chi Stream was polluted by the wastewater from the upper stream, Tai Po Road, last December.
去年十二月，小橋流水受上游大埔公路的廢水污染。

保護天然水道

為保護中大校園內外的天然水體，中大師生宿舍、辦公大樓和食堂產生的污水，均排放至污水管，而實驗室排放的含有殘餘化學物質的廢水，則排放至地下貯水箱作稀釋及中和。所有廢水最終均輸送至沙田污水處理廠。

小橋流水源自赤泥坪和大埔道的雨水渠，因此水質很受上游水質影響。二零零九年，大學安全及環境事務處實施全面水質監察計劃，監察小橋流水、未圓湖和集水區一帶地盤流出的污水的水質。



The water quality of Weiyuan Lake and Chung Chi Stream is monitored regularly.
未圓湖和小橋流水的水質受到定期監察。

Monitoring of Air Quality

Many building projects are going on around the campus to cater for the new 3-3-4 curriculum. In order to monitor outdoor air quality, the USEO has set up dust samplers at Chung Chi College and Circuit Road to measure the dust level.

The current indoor air quality (IAQ) monitoring is divided into three tiers. For new buildings, the CDO requires contractors to hire a consultant to monitor the IAQ in the first year of the contract term, which will then be handed over to the University in the second year. EMO regularly inspects and maintains the air-conditioning system on campus and measures the level of carbon dioxide. USEO and the external consultant will conduct the IAQ monitoring based on the twelve parameters required by EPD for selected buildings.

To maintain high IAQ, the air exchange and ventilation rates have been increased, building materials and furniture with low emission of air pollutants are chosen, newly decorated areas are ventilated before occupation, indoor moisture content is controlled by air dehumidifiers, and pesticides are applied only outside normal working hours, in tandem with a temporary exhaust system. The Security Unit also enforces the total smoking ban within the boundary of the University and regular patrol is carried out to warn anyone smoking on campus.



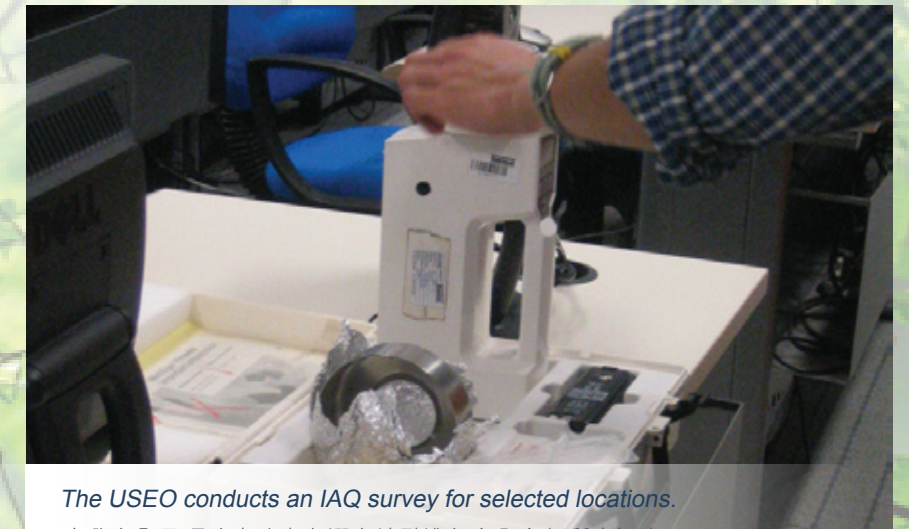
TSP sampler is installed to monitor the roadside dust level.
裝設總懸浮微粒取樣器，監察路邊塵埃水平。

監察空氣質素

校園正大興土木，配合三三四學制的需要。為監察戶外空氣質素，大學安全及環境事務處在崇基學院和環迴路裝設了取樣器，量度塵埃水平。

目前的室內空氣質素監察工作共分三層。新大樓方面，大學校園發展處要求承建商聘請顧問，在合約期首年內監察室內空氣質素，第二年則交由校方監察。物業管理處定期檢查維修校園內的空調系統，量度二氧化碳水平。此外，大學安全及環境事務處亦聯同外聘顧問，按環保署指定的十二個參數監測選定大樓的室內空氣質素。

為保持良好的室內空氣質素，中大提高了換氣率及通風率、選用空氣污染物釋放量低的建築材料和家具、新裝修地點經過通風後才入伙、以抽濕機控制室內濕度，以及在正常辦公時間以外才配合臨時排氣系統噴灑殺蟲劑等。保安組亦執行校內全面禁煙的工作，定期巡視校園，警告在校園範圍內吸煙的人士。



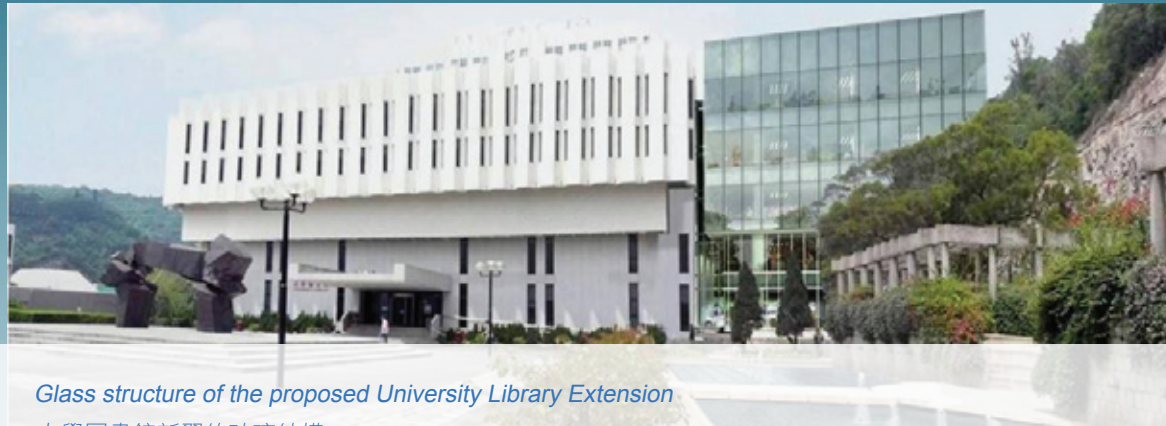
The USEO conducts an IAQ survey for selected locations.
大學安全及環境事務處在選定地點進行室內空氣質素調查。

ENVIRONMENTAL PERFORMANCE OF BUILDINGS

Steering towards the 4-year normative curriculum, new buildings were being planned and constructed on campus. These included academic, amenity and hostel buildings. One of the planning parameters is to address sustainability in buildings with due considerations on energy efficiency and environmental sustainability. The design of buildings, responsiveness to the natural surroundings, the choice of internal facilities and their construction will all meet rigorous environmental standards, including the Government's Building Energy Codes and Building Environmental Assessment Method (BEAM) requirements.

The design of the University Library Extension consists of a glass structure annexed to the north side of the Library building, which will provide a fluid continuum to the existing block. The design will maximize natural light in the rooms and reduce electricity use. Great care has also been taken to incorporate the needs of the house swifts which build their nests in the vicinity. A number of preservation measures such as the use of non-reflective glass with fritted strips as pattern on the surface to prevent birds from flying near were also considered.

Efforts have been made to promote a pedestrian-friendly campus. Situated next to Fong Yun Wah Hall, the proposed Two Integrated Teaching Buildings will provide a series of escalators to connect the University Station and the University Avenue to overcome the vertical height. Occupancy sensors will be used to slow down the escalators when the frequency of usage is low.



Glass structure of the proposed University Library Extension
大學圖書館新翼的玻璃結構

環保建築

隨着四年標準學制的推行，校園正籌劃和興建多座新大樓，包括教學樓、文娛設施和宿舍。策劃時須兼顧的因素之一，就是考慮能源效益和環境可持續性。大樓的設計、與天然環境的配合、內部設施的選擇及建造，均符合嚴格的環保標準，包括政府的建築物能源效益守則和建築環境評審法的要求。

大學圖書館的新翼，以玻璃結構連接圖書館大樓北部，與現有的大樓自然相連，可加強室內自然採光，減少耗電。建造新翼時，亦小心考慮在附近築巢的家燕的需要，採取多項保育措施，例如使用表面有條紋的不反光玻璃，以防止鳥類飛近。

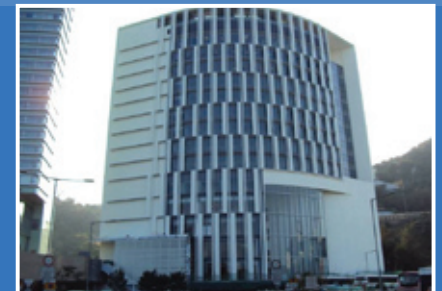
中大致力營造樂步健行的校園。方潤華堂隔鄰擬建的綜合教學大樓二期，將設置多道電動樓梯，連接大學站和山上的大學道。電動樓梯還安裝感應器，在使用量小的時候減慢電動樓梯速度。



Escalators of the proposed Two Integrated Teaching Buildings
擬建綜合教學大樓二期的電動樓梯



Building insulation of the Teaching Building at Chak Cheung Street
澤祥街教學大樓的隔熱裝置



The building façade is designed with a low thermal value to have a higher resistance to heat, resulting in a low electricity demand from air-conditioning and emission of greenhouse gases. An example is the use of sun shading panels to block the heat transmission at the new Teaching Building at Chak Cheung Street.

Energy conservation and pollutant abatement measures are planned for the new buildings by adopting energy-efficient features in air-conditioning, exhaust, lighting and water supply systems. Renewable energy and recycling facilities will be installed wherever possible and practicable. Solar panels are planned to heat the water for showering in hostel buildings and photo voltaic panels will be located on the roof of one of the Two Integrated Teaching Buildings to generate electricity. Vertical greening has been planned for some buildings as well.

Subsequent to the on-site survey and detailed review by the BEAM Society, the Centralized Science Laboratories Building has been awarded a “Gold” rating in terms of its environmental design supremacy and sustainability. To encourage the contractors to demonstrate a good environmental performance at site during the course of construction, all the sites have joined the “Considerate Contractor Site Award Scheme” organised by the Development Bureau of the SAR Government.



Solar panels and roof greening at the proposed Integrated Teaching Buildings
擬建綜合教學大樓的太陽能板和綠化天台



The BEAM award for the Centralized Science Laboratories Building
科學實驗室專門大樓榮獲環保建築協會獎項



大樓表面設計為低熱值，以期提高耐熱度，從而減低空調耗電量，減少排放溫室氣體。例如澤祥街的新教學大樓，就利用遮陽板，阻止傳熱。

新大樓設計時均採用節能及消滅污染物措施，在空調、廢氣排放、照明及供水等系統加入節能裝置，在適當時盡可能裝設可再生能源及回收設施。宿舍大樓均計劃安裝太陽能板，把水加熱作淋浴用途；兩座綜合教學大樓中的一座天台上，將安裝光伏板，以產生電力。一些大樓也計劃綠化外牆。

經香港環保建築協會實地視察和詳細評估後，科學實驗室專門大樓憑藉在環保設計和可持續性方面的卓越表現而獲評為「金」級別。為鼓勵承建商在施工期間注重環保，所有地盤均已參加香港特區政府發展局主辦的公德地盤嘉許計劃。

EXAMINING OUR FOOTPRINTS

Carbon footprint is a measure of the impact of our activities on the environment by calculating the amount of greenhouse gases (GHG) produced in our daily lives through burning fossil fuels for electricity, heating and transportation. The primary footprint is a measure of our direct emissions of CO₂ from the burning of fossil fuels including domestic energy consumption and transportation. The secondary footprint is a measure of the indirect CO₂ emissions from the whole lifecycle of products we use from their manufacturing to eventual breakdown. The University will help fight global climate change by reducing our carbon footprints until we are carbon neutral. But at this stage, our very first step is to calculate and audit the amount of GHG released by the University.

A Sustainability Ambassador Programme, sponsored by the Hang Seng Bank, was launched in May 2009. A full-day workshop was held for a total of 102 ambassadors from 88 teaching and administrative departments, plus three student helpers, to enable them to learn about climate change, GHG and carbon auditing, and to share their experiences of carbon reduction on campus with experts and speakers.



The programme was officially launched by (from left) Mr Benny Tam Pit-shing, Director, Estates Management Office, CUHK; Prof Fung Tung, Associate Pro-Vice-Chancellor; Prof Chu Lee-man, Chairman, Committee on Campus Environment, CUHK; Mr Chan Chun Wing Terence, Convener, Energy Saving Task Force, CUHK; and Mr Tse Lim Chung, Sponsor's Representative, Hang Seng Bank, on 14 May 2009.

持續發展環保大使計劃於二零零九年五月十四日正式啟動，主禮嘉賓為（左起）中大物業管理處處長譚必成先生、協理副校長馮通教授、中大校園環境委員會主席朱利民教授、中大節能專責小組召集人陳鎮榮先生，以及贊助人恒生銀行代表謝廉忠先生。

檢查碳足印

碳足印是量度人類活動對環境的影響的一種方式，方法是計算日常生活中燃燒礦物燃料以提供電力、熱力和運輸所產生的溫室氣體。主足印量度燃燒礦物燃料（包括家居耗能和交通運輸）直接產生的二氧化碳，次足印量度我們所用的物品由生產至分解的整個生活週期內間接排放的二氧化碳。中大將減低碳足印至碳中和，幫助抵禦全球氣候變化的趨勢。但在這階段，我們的第一項工作，是計算和審核中大排放的溫室氣體。

我們於二零零九年五月推行持續發展環保大使計劃，由恒生銀行資助，為一百零二位來自八十八個教學和行政部門的環保大使和三名學生助手舉辦一整天的工作坊，幫助他們認識氣候變化、溫室氣體和碳審計事宜，並讓他們與專家和講者分享校園內的減碳經驗。



Training for ambassadors
培訓大使

After the training, the ambassadors went back to their workplaces to gather the data related and the Estates Management Office (EMO) then calculated the GHG emission and prepared the carbon auditing report accordingly based on the “Guidelines to Account for and Report on Greenhouse Gas Emissions and Removals for Buildings (Commercial, Residential or Institutional Purposes) in Hong Kong, 2008 Edition” issued by the EPD. In 2009, each FTE student emitted 2.22 tonnes of CO₂ equivalent.

完成培訓後，持續發展環保大使返回工作崗位，收集相關數據，然後由物業管理處計算溫室氣體排放量，按環保署發出的《香港建築物（商業、住宅或公共用途）的溫室氣體排放及減除的審計和報告指引》（二零零八年版）擬備碳審計報告。二零零九年，每名相當於全日制學生產生2.22公噸二氧化碳當量。

Table 6. GHG emission in terms of FTE student and per capita
表 6. 按每名相當於全日制學生及每人計算的溫室氣體排放量

No. 編號	Indicator (Unit) 指標（單位）	Definition / Remark 定義 / 備註	Results 結果
GHG1	GHG emission per FTE student (tonnes / FTE) 每名相當於全日制學生溫室氣體排放量（公噸 / 相當於全日制學生）	Total GHG emission / Number of FTE students 溫室氣體排放總量 / 相當於全日制學生數目	2.22 tonnes of CO ₂ equivalent / FTE student 公噸二氧化碳當量 / 相當於全日制學生
GHG2	GHG emission per capita (tonnes / total number of FTE students & full-time staff) 每人溫室氣體排放量（公噸 / 相當於全日制學生及全職教職員總數）	Total GHG emission / Number of FTE students & number of full-time staff 溫室氣體排放總量 / 相當於全日制學生及全職教職員數目	1.67 tonnes of CO ₂ equivalent / capita 公噸二氧化碳當量 / 人



Group photo of ambassadors
大使合照

LANDSCAPE ENHANCEMENT

The University campus is the largest among local tertiary institutions. About 60% of the campus is green, covered by natural woodlands and landscaped areas. In 2009, a total of 221 trees, 10,199 shrubs, 3,688 floral plants, 12,191 ground cover, 61 seedlings and 5,065 m² of lawn were planted on campus to maintain the greenery. In addition, 3,400 seedlings of native species were planted on Grassy Hill to combat climate change. Due to either development works or health problems, 247 trees were removed last year.

Table 7. Number of flora planted in the past four years

表 7. 過去四年種植的植物

Year 年份	Trees (No.) 樹木 (棵)	Shrubs (No.) 灌木 (棵)	Flowering Herbs (No.) 花卉植物 (株)	Ground Cover (No.) 地被植物 (株)	Lawn (m ²) 草地 (平方米)
2006	414	26,255	10,684	15,400	5,665
2007	106	8,344	5,275	3,285	27,508
2008	351	6,832	3,803	2,539	13,265
2009	221	10,199	3,688	12,191	5,065

10,000 seedlings were planted on Grassy Hill in the past three years.

過去三年在草山共種植一萬株樹苗。



景觀美化

在本地的大專院校中，中大校園佔地最廣。校園約六成是綠化地帶，有天然樹林，也有園景美化區。二零零九年校園內共種植221棵樹、10,199棵灌木、3,688株花卉植物、12,191處地被植物、61株樹苗和5,065平方米青草。此外，中大在草山種植3,400株原生品種樹苗，抵禦氣候變化。去年共移除了247株樹木，當中部分有欠健康，部分則受發展工程影響。



A tree is transplanted by the landscape consultant.
景觀美化顧問移植樹木。



Protection of tree trunk from physical damage in a construction site

在地盤內保護樹幹免受損害。

Plant Element in Building Design

During the tree survey and design stage of the Two Integrated Teaching Buildings (TITB) located at the old Bamboo Lodge, a bamboo bush of a rare species, *Bambusa chunii*, was found. A declared unique species in Hong Kong, it was first found in 1980 and named *Bambusa chunii* after Professor Woon-Young Chun, founder and the late Director of South China Institute of Botany, for his tremendous contribution to the advancement of botanical science in China.

To preserve the rare bush, the University requested the architect to re-design the layout so as to include it as an element of the new building. The resulting new design included a piazza with a bamboo bush at the entrance, a perpetuation of both the University's commitment to preservation and the architect's humanistic approach to building design.

During the construction phase, the contractor will be reminded to protect the bamboo bush by closely observing the instructions of the landscape consultants employed by the University.

大樓設計的植物元素

在為兩座綜合教學大樓（位於竹苑原址）作樹木調查和設計期間，我們發現了一片竹林，全是罕有的煥鏞籜竹。這品種是香港獨有，最早在一九八零年發現。品種名稱是以華南植物研究所創辦人兼前所長陳煥鏞教授命名，以紀念他對推動中國植物科學研究所作的重大貢獻。

為保育罕有竹林，中大要求建築師重新設計大樓佈局，以保留竹林作為新大樓的元素。最後的設計有一個廣場，入口處有竹林，既貫徹了中大致力保護環境的承諾，也體現了建築師在建築物設計上的人文精神。

在施工階段，中大將提醒承建商嚴格遵守校方聘請的景觀美化顧問的指示，保護竹林。



The rare bamboo bush at the construction site of TITB
綜合教學大樓地盤中罕見的竹林

Rehabilitation on University Mall

Some trees along the University Mall were seriously damaged by a typhoon in 2008. CLEC planned to choose some new trees with appropriate species, morphology and characteristics to replace the declining trees. The EMO's Landscaping Section has been keeping an eye on the conditions of the University's trees by performing regular health checks. Two Rain Trees (*Samanea saman*) flanking the University logo at the Science Centre were withering due to the prolonged cold weather the previous winter and root fungus. Consultation with plant pathologists from Guangzhou led to a rehabilitation programme for the trees, which included renewing the soil, expanding the soil area, adding organic nutrition, installing a pipe to prevent water-logging in the soil and applying a root-strengthening agent, a leaf fertilizer and an anti-cold agent to encourage robust growth.

林蔭大道上的復健計劃

林蔭大道上的一些樹木，在二零零八年的一場颱風中損毀。校園景觀美化委員會計劃選定種類、形態和特點合適的新樹種，取代受損的樹木。物業管理處園藝組定期檢查校園內的樹木，留意樹木的健康狀況。科學館的大學校徽對開兩側的兩棵雨樹，由於上一個冬季持續寒冷，而且根部受真菌感染，正逐漸枯萎。校方諮詢廣州的植物病理專家後，為這兩棵樹制訂了復健計劃，包括換上新泥土、擴大泥膽、施以有機養分、安裝透氣袋以免淤泥阻塞供水，並添加根部護養劑、葉面肥和抗冷劑，讓樹木茁壯生長。



Experts from Guangzhou scanning the diseased tree with a special device.

來自廣州的專家，以特別儀器觀察病樹。



Rehabilitation programme of the Rain Trees

雨樹的復健計劃

Promoting a Pedestrian-friendly Campus

To make the campus convenient and enjoyable to walk through by installing new routes and express lifts, improving existing pedestrian links and constructing a cycling track on campus;

Conserving Places of Value

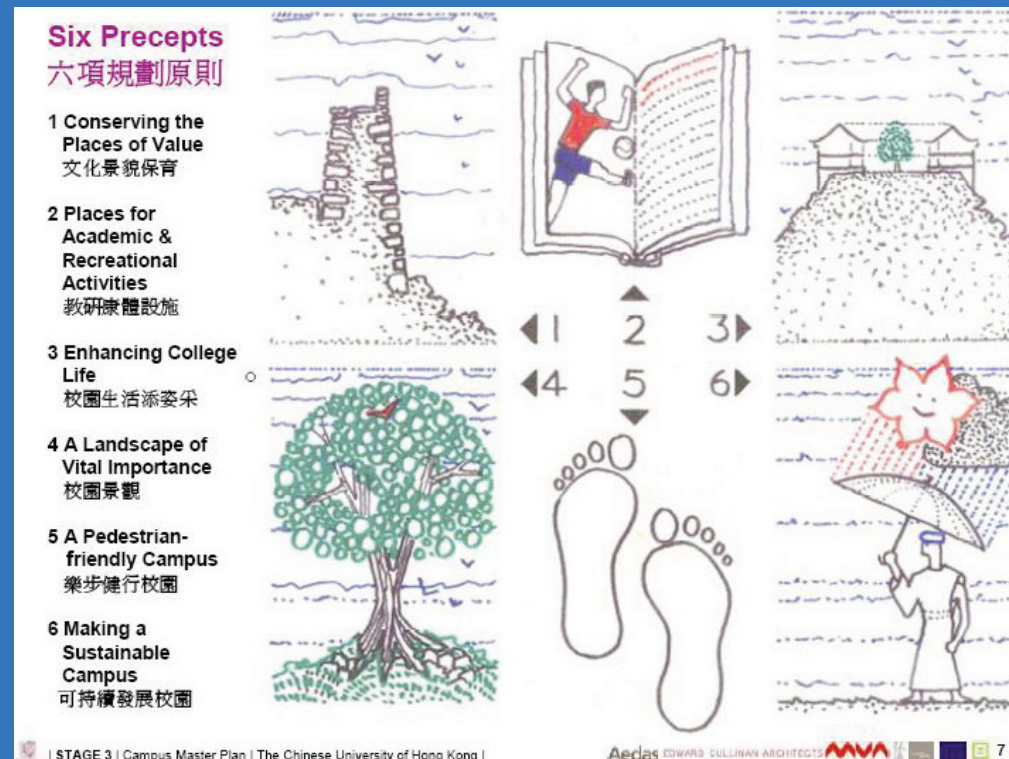
To inscribe a list of structures and places on campus which contribute to the University's image and identity, or which have special architectural or historical value;

Creating a Landscape of Vital Importance

To create open spaces around areas commanding views of the sea or wooded hills, the building of attractive planted roofs, and shaded courtyards apart from conserving the campus's fauna, water streams and trails;

Building a Sustainable Campus

To set up guidelines for developing a practically achievable model for a sustainable campus with a 25% cut in energy use and a 20% reduction in greenhouse gas emissions per capita by 2025.



Six Precepts of CMP
校園發展計劃六大原則



Stage 4 Synoptic Report
第四階段報告書概要

倡導健步文化

開闢新步行路線，增設快速升降機、改良現有的行人通道，並在校園內修築單車徑，方便師生步行往來校園，也讓步行更有樂趣；

保存具價值的地標

列出校園內具代表性、建築設計獨特或具歷史價值的建築和地點，予以保育；

優化校園景色

除保育校園內的鳥獸、溪流和步行徑外，另於有海景或林景的地點關設休憩處，並綠化天台，增建有蓋庭院；

建構可持續發展校園

制訂切實可行的指引，據之以可持續的概念建設校園，目標是在二零二五年把人均能源消耗減少百分之二十五，人均溫室氣體排放減少百分之二十。

CAMPUS ECOLOGY

The Chung Chi Stream and Weiyuan Lake are not only famous for their scenic beauty, they also have ecological value because they are habitats for certain aquatic animals and plants. When Chung Chi College decided to build its new chapel on the stream next to the Theology Building, University members were very concerned about the water quality and environment. An external consultant was hired to conduct a study in 2009, which covered both dry and wet seasons, upstream, downstream, and areas adjacent to the construction site so as to assess the potential impacts associated with the works.

In addition to the survey on Chung Chi Stream, a survey on terrestrial wildlife was also conducted to study the species and their distribution on campus. Data on butterflies, dragonflies and birds such as their population, distribution and species diversity can serve as good indicators of the ecological values of different areas of the CUHK campus. The surveyor walked along the designated routes on a monthly basis and recorded the species and number of wildlife by observing and listening to animal calls. Traps or other harmful collection methods were not used in the survey. Preliminary data show that certain areas of Chung Chi Campus and Campus Circuit North had higher levels of biodiversity because of better preserved natural woodland.

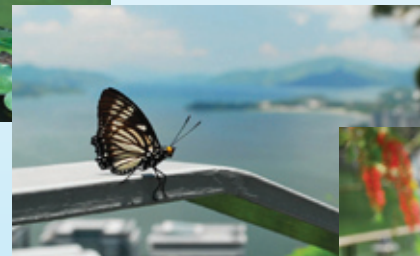
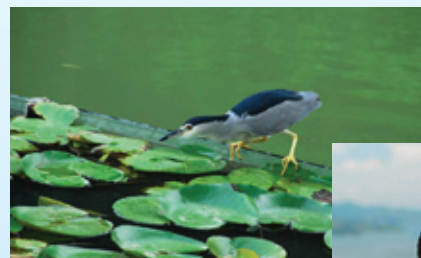


Freshwater species in Chung Chi Stream
小橋流水的淡水生物樣本

校園生態

小橋流水和未圓湖不僅風景優美，而且具有生態價值，是一些水生動植物的棲息之所。崇基學院決定在神學樓旁的小溪上興建新教堂時，中大師生均對水質和環境表示關注。校方於二零零九年聘請顧問，評估工程可能產生的影響，研究範圍涵蓋雨季、旱季、上游和下游，以及地盤鄰近地區的情況。

除對小橋流水進行調查外，中大還調查了校園內陸上野生生物的生態，研究他們的品種和在校園內的分佈情況。有關蝴蝶、蜻蜓和雀鳥的數據，例如總數、分佈情況和品種多樣性等，是中大校園內不同地區的生態價值的有用指標。專家每月沿指定路線巡察，透過觀察和聆聽動物的叫聲，記錄野生生物的品種和數量。調查期間不會設置捕捉器，或採用其他有害的採集方式。初步數據顯示崇基校園部分地區和校園環迴北路的天然樹林保存得較完整，因此生物多樣性也較高。



Birds and butterflies on campus
校園內的鳥類和蝴蝶

The University Library is home to the largest swift colony in Hong Kong. At least 200 house swifts, *Apus nipalensis*, have built their nests there, accounting for nearly 30 per cent of their entire population in the city. The coarse surface, high and hidden eaves, and abundant supply of nesting materials and food by the natural surroundings make the University Library an ideal nesting site for house swifts, attracting a large group to build about 150 to 220 nests distributed along the eastern and southern walls of the building. As the house swifts which feed on flying insects are top consumers of the food chain and play an important role in maintaining the ecological equilibrium of the CUHK campus, an ecologist was hired to study and monitor their population size, breeding ecology, brood-feeding rate, area utilization rate, nest and nest cluster counts, and preferences for selection of nesting site.

The University adopted the recommendations to take mitigation measures to deal with disturbances of the construction of the library extension. Artificial nests were installed on the southern façade of the University Library and Sir Run Run Shaw Hall to facilitate on-site migration. A buffer zone was set and nylon canvas was used to prevent the swifts from being trapped. During the construction phase, eco-friendly machines will be used to minimize noise and air pollution impact, and counting will be conducted every month to monitor the swift population. Furthermore, large glass panels will be minimized in the Library Extension while eave-like structures will be incorporated to compensate for the swift nesting area previously lost.

大學圖書館是香港最大群燕子居住的地方，在這裏築巢的家燕，起碼有二百隻，佔全港家燕總數近三成。大學圖書館的外牆粗糙，屋簷高聳隱蔽，四周的自然環境又提供豐富的築巢材料和食物，使這裏成為家燕築巢的理想地點，吸引大批家燕在圖書館朝東和朝南的牆上修築約一百五十至二百二十個鳥巢。家燕捕食飛蟲，是食物鏈的上層消費者，對維持中大校園的生態平衡起着舉足輕重的作用；校方特別聘請生態學家研究和監察家燕的數目、繁殖生態、哺育率、面積使用率、鳥巢和鳥巢群數目、選擇築巢位置的模式等。

專家建議採取緩解措施，處理興建圖書館新翼對家燕造成的滋擾。校方採納了建議，在大學圖書館和邵逸夫堂朝南外牆上裝設人工巢箱，方便家燕原地遷徙。現場設置緩衝區，並架上尼龍布帳，防止家燕受困。在建築階段，將使用環保機器，以減少噪音和空氣污染。每月將計算家燕的數目，監察其數量變化。此外，圖書館新翼將盡量減少安裝大片的玻璃，並將建設屋簷般的結構，以補償失去的築巢面積。



Artificial nests to facilitate on-site migration
人工巢箱方便家燕原地遷徙

EDUCATION & TRAINING

Education in environment, energy and sustainability spreads across almost all faculties and colleges of the University. There are more than ten undergraduate programmes related to the environment, for both major and minor studies. They include environmental science, earth system science, food and nutritional science, architecture, geography and resource management, sustainable energy, mechanical and automation engineering, anthropology, liberal studies and public health. Our university general education is divided into four categories and every student is required to take one course from each category. In both category B (Nature, Science and Technology) and C (Society and Nature), a wide range of environment-related courses is being offered, covering aspects related to science, technology and society. At college level, there has been an increasing component of service learning to expose students to different regions of the world, in particular learning among the less privileged. At postgraduate level, there are eight research-based programmes leading to MPhil and PhD degrees, and ten coursework programmes leading to Master's degrees on subjects of environment, energy and sustainability.

教育及培訓

中大幾乎所有學院和書院均推動有關環境、能源和可持續發展的教育。與環境有關的本科主修及副修課程超過十個，包括環境科學、地球系統科學、食品及營養科學、建築學、地理與資源管理學、可持續能源、機械與自動化工程、人類學、通識教育及公共衛生。中大的通識課程劃分為四個範疇，學生須於每一範疇選修一科。在範圍B（自然、科學與科技）和範圍C（社會與文化）中，均有多項與環境有關的課程，涵蓋科學、科技與社會層面。在書院方面，服務學習的成分越來越多，目的是讓學生多接觸不同社群，特別是弱勢社群。在研究生階段，與環境、能源和可持續發展相關的哲學碩士及博士課程共有八個，修課式碩士課程有十個。



Mr Lam Chiu-ying lectures on 'Sustaining What?' to kick off the 'Sustainable Engineering Seminar Series'.

林超英先生的「可持續發展？」講座，為「可持續發展工程講座系列」揭開序幕。



An experienced arborist from the States is invited to provide a series of tree training for the staff.

經驗豐富的美國樹木專家應邀為員工提供一系列有關樹木的訓練。

The University is strongly supportive of research that contributes to protecting our environment and achieving sustainable development. Centres and laboratories have been established to provide faculty members with financial support and facilities for conducting a number of environmental research projects on different environmental issues, including environmental toxicology, environmental impact assessment, conservation biology, biofuels, coral studies, urban geography, environmental and resource management as well as geoinformation science.

Conferences, seminars and trainings with speakers from all over the world are regularly organised to deliver ideas for sustainable development. In mid-October 2009, Mr Lam Chiu-ying, former Director of the Hong Kong Observatory, gave a lecture entitled 'Sustaining What?' to kick off the 'Sustainable Engineering Seminar Series' co-organised by the Faculty of Engineering and the Faculty of Social Science. During the lecture, Mr Lam shared his observations on the changes of the Earth. He also questioned the concept of 'sustainable development' and discussed alternative directions for the evolution of human society. Six seminars were held under the series, which aimed at promoting environmental knowledge among CUHK teachers and students, and encouraging more engineering research projects to contribute to the finding of green solutions to pollution and energy over-consumption.

中大鼎力支持有助保護環境和推動可持續發展的研究項目。我們設立了多個中心和實驗室，為教職員提供財政支援及相關設施，以從事環境研究項目，主題涉及不同的環境議題，包括環境毒理學、環境影響評估、保育生物學、生物燃料、珊瑚研究、城市地理、環境與資源管理，以及地理訊息科學等。

中大定期舉辦研討會、講座和培訓課程，邀請世界各地的專家主講，宣揚可持續發展的概念。二零零九年十月中，工程學院和社會科學學院合辦「可持續發展工程講座系列」，首位演講嘉賓為香港天文台前台長林超英，講題是「可持續發展？」。林先生分析地球的變化，又提出對「可持續發展」概念的疑問，以及人類社會未來演化的種種可能。整個系列共有六場講座，旨在提升中大師生的環保知識，從而推動校內開展更多關於環保的工程學研究項目，提供更多綠色方案，以減少污染，節約能源。

ENHANCING AWARENESS

Other eco-concept activities were organised by colleges and green student societies, such as the Environmental Week, seminars, an energy- and water-saving competition, organic farming, tree planting, an ecotour and a recycling programme, with the purpose of enhancing environmental awareness among staff and students and helping them to develop an eco-conscious lifestyle.



Ecological tour to Fung Yuen Butterfly Reserve
鳳園蝴蝶保育區生態遊



Organic farming activity
有機耕種活動

增強環保意識

各書院和綠色學生組織也舉辦其他生態概念活動，如環保週、講座、節能節水比賽、有機耕種、植樹、生態遊、回收計劃等，藉以提升師生的環保意識，建立關注生態的生活方式。



Tree planting activity on Grassy Hill
草山植樹活動

中大的綠色刊物《可持續校園》，於二零零六年十月創刊，每季出版一次，以再造紙印製，並在網上發表。刊物向中大師生和校友介紹中大的環保政策，以及綠化校園和可持續發展方面的努力。



為響應世界自然基金會香港分會的「地球一小時二零零九」行動，中大於二零零九年三月二十八日參加熄燈一小時活動，以引起各界人士關注全球暖化的現象，認識節能的重要性。

Green publication "Sustainable Campus"

綠色刊物《可持續校園》

The University has its own green publication, *Sustainable Campus*, which was launched in October 2006. This quarterly newsletter, printed on recycled paper and uploaded to the website, introduces to staff, students and alumni of the University our environmental policies and our efforts at campus greening and sustainable development.

To echo the "WWF Earth Hour 2009" initiated by the World Wild Fund (WWF) Hong Kong held on 28 March 2009, the University joined the 'lights-off' campaign to arouse awareness on global warming and energy saving.

ACHIEVEMENTS

In March 2009, CUHK was conferred the silver award in the 2008 Hong Kong Awards for Environmental Excellence (HKAEE) - Sectoral Awards, under the category of Public Sector and Non-Government Organisations, for its comprehensive and excellent environmental management. The 2008 HKAEE was jointly organised by the Environmental Campaign Committee, the Environmental Protection Department and other organisations. It aims to promote environmental awareness within the community and to recognize organisations that contribute to environmental protection. This year no gold prize was awarded under this category. A total of 366 entries competed for the Sectoral Awards in the 2008 HKAEE, and CUHK came to the fore as the only award-winner among tertiary institutions. The accolade is a recognition of the University's excellence in sustainable development over the years.



環保成就

二零零九年三月，中大榮獲「二零零八香港環保卓越計劃」公共機構及非政府機構組別的「界別卓越獎」銀獎，以表揚其全面而卓越的環境管理。二零零八香港環保卓越計劃，由環境保護運動委員會、環保署和其他機構合辦，旨在促進香港人的環保意識，表揚對環保有貢獻的機構。今年的公共機構及非政府機構組別沒有頒發金獎。二零零八年，共有三百六十六家機構競逐「界別卓越獎」，而中大是唯一獲獎的大專院校。這次獲獎，肯定了中大多年來推動可持續發展的傑出成就。

From left: Mr. Benny Tam Pit-shing, Director, Estates Management Office, CUHK; Prof. Lam Kin-che, Chairman, Advisory Council on the Environment, HKSAR government; Prof. Chu Lee-man, Chairman, Committee on Campus Environment, CUHK; Mr. Edward Yau Tang-wah, Secretary for the Environment, HKSAR Government; Prof. Fung Tung, Associate Pro-Vice-Chancellor, CUHK; Mr. Godwin Lai Kwok-wing, Senior Manager, Building Services & Administration, Estates Management Office, CUHK; and Mr. Lam Shi-kai, Director, University Safety and Environment Office, CUHK

左起：中大物業管理處處長譚必成先生、香港特區政府環境諮詢委員會主席林健枝教授、中大校園環境委員會主席朱利民教授、香港特區政府環境局局長邱騰華先生、中大協理副校長馮通教授、中大物業管理處屋宇設備組高級經理黎國榮先生，以及中大大學安全及環境事務處處長林樹佳先生。

TARGETS

Long Term

GHG Reduction

To develop a practically achievable model for a sustainable campus with a 25% cut in energy use and a 20% reduction in greenhouse gas emissions per capita by 2025.

Grey Water Treatment in Weiyuan Lake

To erect a treatment plant to treat grey water for usage, which can reduce our potable water consumption by 1,000m³ daily.

Tree Renewal Plan

To develop a planting plan to renew aging trees on campus.

目標

長遠目標

減少排放溫室氣體

制訂切實可行的模式，據之以可持續的概念建設校園，目標是在二零二五年把人均能源消耗減少百分之二十五，人均溫室氣體排放減少百分之二十。

未圓湖洗盥污水處理

設立污水處理設備，經處理後的洗盥污水可供使用，每天可節省飲用水一千立方米。

樹木更新計劃

制訂植樹計劃，更新校園內老化的樹木。

Short Term

Carbon Reduction Plan

To prepare carbon reduction plans for various departments after the first carbon audit.

Solar LED street lighting

To replace the old Low Pressure Sodium (SOX) lamps with LED lamps as street lighting.

短期目標

減碳計劃

在第一次碳審計後，為各部門制訂減碳計劃。

太陽能發光二極體街燈

把原有的低壓鈉 (SOX) 街燈更換為發光二極體街燈。



Lamp testing of electrodeless induction lamp, LED lamp & SOX lamp.

無電極感應燈、發光二極體燈和低壓鈉燈測試。

Feedback

This Sustainability Report represents the University's commitment to building a green campus and outlines the University's plans to seek continual improvement. We have incorporated the basic elements of the Global Reporting Initiative (GRI) G3 Guidelines into this report. To help us improve our performance, please let us have your comments and suggestions. You are most welcome to contact us via our hotline, email or website.

回應

本「可持續發展報告」顯示了中大致力建設綠色校園的努力，並概括說明中大持續改善環境的計劃。在報告中，我們採納了「全球報告倡議組織：G3指南」的基本元素。為使本校的環保工作更臻完善，請不吝惠賜意見和建議，幫助我們提升環保表現。歡迎透過熱線、電郵或網站聯絡我們。

University Safety & Environment Office / 大學安全及環境事務處

Phone / 電話: 2609 7958

Email / 電郵: uls@cuhk.edu.hk

Environmental Hotline / 環保熱線: 2609 8666

Website / 網址: <http://www.cuhk.edu.hk/useo/>