



副署長的話 *Message from Deputy Director*

由於市民日益重視節約能源和保護環境，本署於1994年成立能源效益事務處，以促使香港成為善用能源的頂級城市為目標。該事務處成立後，推出了一連串能源效益計劃及推廣活動，藉此提高經濟效益，並增強本港社會的生產力。

在眾多能源效益計劃中，其中一個很成功的例子是針對屋宇裝備而編寫的一系列建築物能源守則和指引。當建築師和發展商建造新樓宇及為舊樓宇進行改裝時，可參考這些守則和指引，以提高能源效益。

放眼未來，我們預計若在空調裝置廣泛使用水冷式冷凝器及採用區域性冷卻系統，將會帶來更可觀的節能效果。因此，我們已於近數年積極推廣採用這些系統。

下文的「能源效益事務處服務回顧」詳述更多能源效益方面的計劃。現在，讓我先介紹我們目前正在進行的一些主要計劃：



副署長/ 規管服務
何光偉先生
Deputy Director/Regulatory Services
Mr. K.W. Ho



With growing public interest in energy conservation and environmental protection, the Department established the Energy Efficiency Office (EEO) in 1994 with the vision of transforming Hong Kong into a top-ranking city in the economic use of energy. Since then, a number of sustainable energy efficiency initiatives and promotional programmes have been launched to achieve economic benefits and improve productivity for the community of Hong Kong.

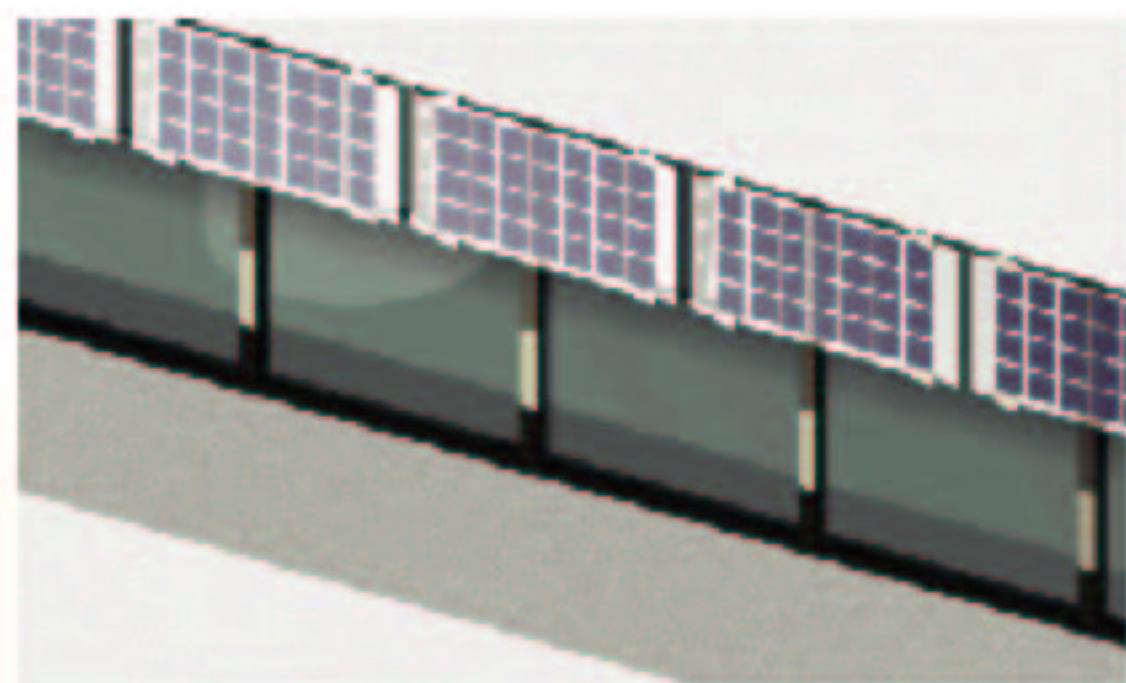
One of the well-recognised initiatives is the publication of a series of Building Energy Codes and Guidelines on building services installations. These Codes and Guidelines serve as a useful reference for the building industry, allowing architects and developers to work towards a more energy-efficient environment as they design and build new structures and retrofit existing ones.

Looking into the future, we foresee substantial energy savings resulting from widespread use of water for cooling condensers in air-conditioning installations, as well as the adoption of district cooling systems, and we have been vigorously promoting these types of systems in recent years.

In the following pages, you will learn more about our energy efficiency initiatives under the "EEO Services Review". Here, I would highlight some current major initiatives undertaken by our office:



- 研究本港採用節能水冷式空調系統及區域性供冷系統的可行性(研究顯示，採用海水冷卻的空調系統和區域性供冷系統可分別減低能源消耗量達24%和35%)；
- 為汽油載客車輛引入能源效益標籤計劃；
- 研究應用太陽能和風能等再生能源的可行性；以及
- 研究運用能源總用量預算方法，以制訂表現為本建築物能源守則。



除了不斷提高市民的節約能源意識，從而獲取無形的經濟效益外，我們預計透過近年推行的各項節能措施，每年可節省能源1,330太焦耳，相等於減少185,000部冷氣機一年的耗電量。

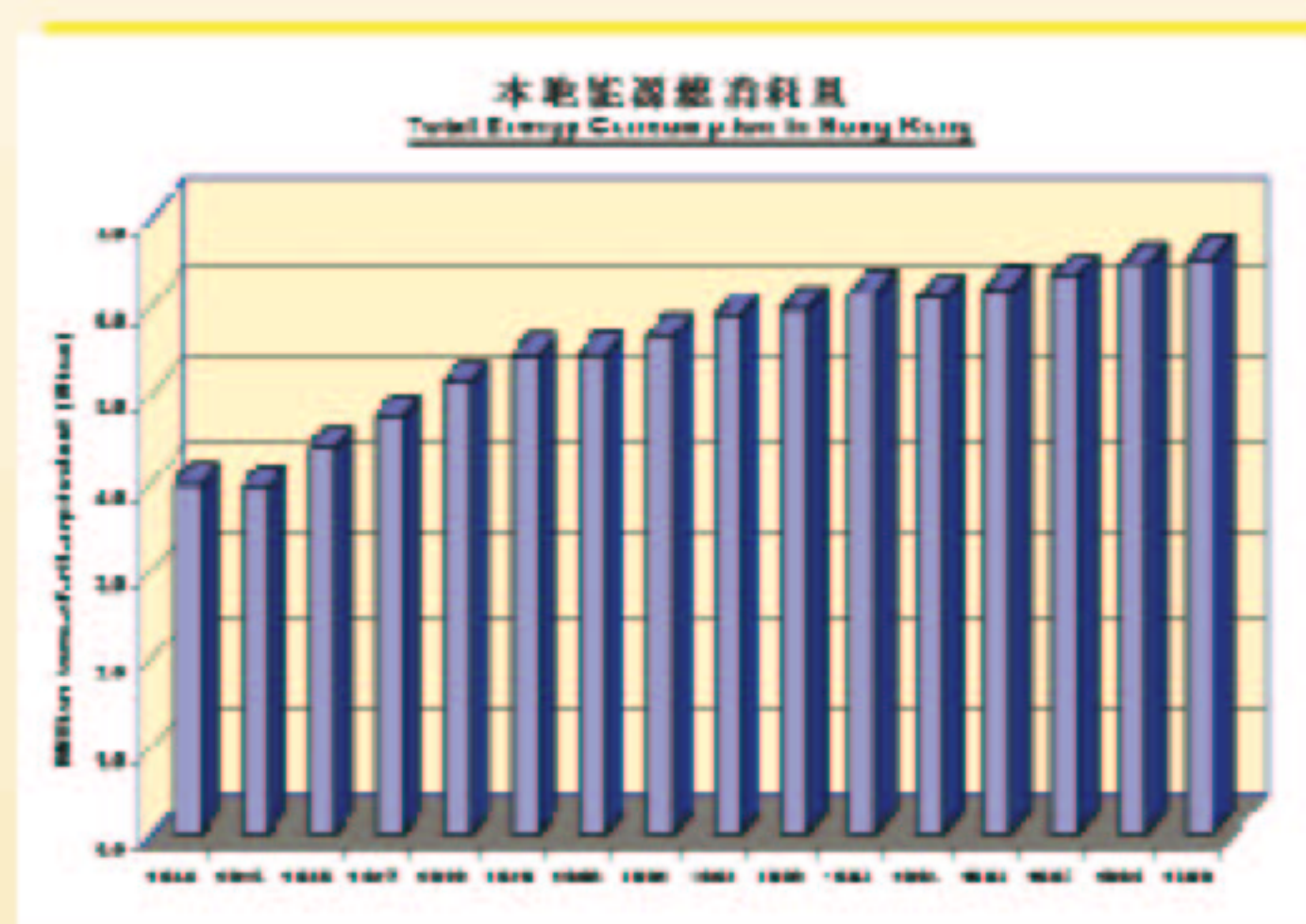
作為一個負責任的政府部門，我們會繼續以積極的態度，確保在未來的日子裏所採用的能源科技均符合經濟及環保原則，藉以提高香港市民的生活質素。

- studies on the application of energy- efficient water-cooled air-conditioning systems (WACS) and district cooling systems (DCS) in Hong Kong (studies revealed that the application of sea water cooling for air-conditioning systems and DCS could reduce energy consumption by up to 24% and 35% respectively);
- the introduction of an energy efficiency labelling scheme (EELS) for petrol passenger cars;
- a study of the application of potential renewable energy resources - solar energy, wind power, etc.; and
- a study on the feasibility of introducing a performance-based building energy code, using the total energy budget approach.



Apart from intangible economic benefits derived through continuous promotion of energy conservation to the public, we estimate that an annual energy saving of 1,330 terajoules (TJ) equivalent to the electricity consumption of 185,000 air-conditioners has been achieved through the implementation of energy efficiency measures in recent years.

As an accountable government body, we will continue to play an active role in enhancing the quality of life of the general public of Hong Kong by ensuring that the energy technologies are harnessed in an economical and environmentally friendly manner in the years ahead.





能源效益事務處服務回顧 *EEO Services Review*

早於1979年，政府已開始制訂屋宇裝備的節能指引，以應用於公共建築物的設計上。在八十年代這方面的工作繼續順利進行。

1992年在里約熱內盧舉行的地球峰會，引起世界各國對可持續發展的關注。隨後能源效益事務處於1994年成立。

透過各項能源效益計劃、推廣活動、示範工程和自願參與的計劃，能源效益事務處致力提高公眾的能源效益意識，提倡採用符合能源效益的設計和設備，及刺激節能設備的市場需求以降低這些設備的成本。



進行能源審核所費無幾，但效益顯著。根據有關報告，單靠良好的屋宇管理措施，已可節省達10%的能源。因此，能源效益事務處便在1994年推出公共建築物能源審核計劃，至今已為154幢公共建築物完成能源審核，節省了大量能源。

為了向公眾展示如何在本港應用節能設備，能源效益事務處自1995年起便進行多項試驗計劃，為現有公共建築物加裝市場可提供的創新節能設備。在照明方面，已進行試驗的系統和設備包括供熒光燈使用的電子鎮流器、節能熒光燈(T8及T5管)、數碼定位照明控制系統等。在空調方面，我們已試驗的設備包括電動機的變速驅動器、用來處理鮮風的間接蒸發式冷卻設備、改裝氣冷式冷凝器成為蒸發式冷凝器、冷凝器管道自動清潔系統等。此外，我們還試驗了能源優化裝置、自行發光的出口標誌等。與傳統設備比較，上述設備所節省的能源消耗量由10%到45%不等。我們已透過研討會、講座、報告、指引和本署網頁廣泛宣傳上述試驗結果。

As early as 1979, the government started to produce guidelines for energy conservation of building services installations for use in the design of public buildings. Similar efforts continued into the 1980's.

In 1992, the Earth Summit held in Rio de Janeiro focused global attention on sustainable development. The Energy Efficiency Office was then established in 1994.

Through various energy efficiency initiatives, promotional programmes, demonstration projects and voluntary schemes, EEO aims to promote public awareness of energy efficiency, encourage the adoption of energy-efficient design principles and these equipment, and stimulate the market for these equipment to drive down their costs.

Although energy audits involve comparably little cost, it has been reported that the savings achievable with good housekeeping alone can be as much as 10%. Naturally, EEO started an energy audit programme for public buildings in 1994. Since then, energy audits for 154 public buildings have been completed and substantial savings have been achieved.

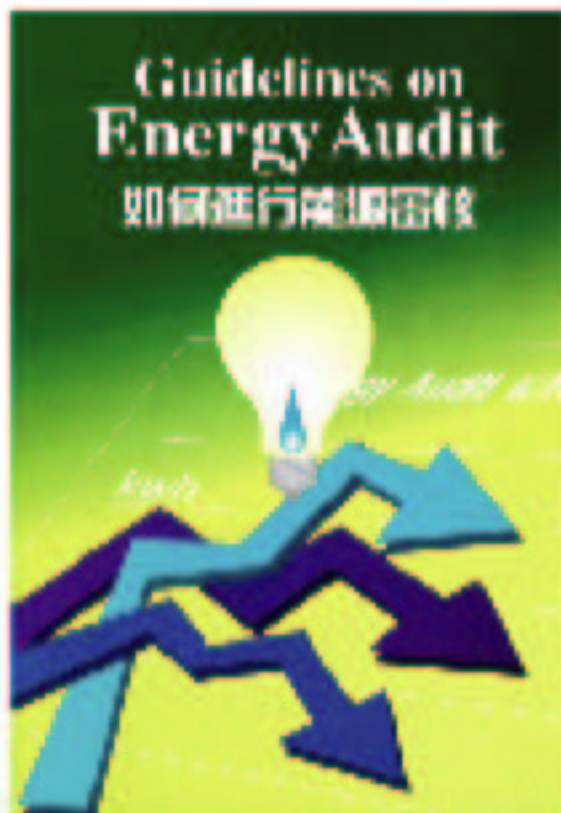
For the sake of demonstrating to the public how energy-efficient equipment can be applied in the local context, EEO has carried out extensive trials in retrofitting existing public buildings with innovative, locally available energy-efficient equipment since 1995. The types of lighting systems and equipment already evaluated include electronic ballasts for fluorescent lamps, energy-efficient fluorescent lamps (T8 & T5 tubes), digital addressable lighting control systems. Examples of air-conditioning equipment already evaluated are: variable speed drives for electric motors, indirect evaporative cooling (of primary air), evaporative cooling of air-cooled condensers, automatic condenser tube cleansing systems. Other equipment such as self-luminous exit signs and energy optimisers were also tested. The energy savings arising from these installations have ranged from 10% to 45% compared with traditional equipment. The results of our trials had been widely disseminated through seminars, talks, reports and guidelines, and our departmental website.





此外，我們在1998年至2000年期間亦先後出版了一些關於照明裝置、空調裝置、電力裝置、升降機和自動梯裝置的建築物能源守則及指引。我們現正考慮制訂新的表現為本建築物能源守則。在1998年，我們推出了「香港建築物能源效益註冊計劃」，至2002年5月為止，已有67座建築物根據上述計劃註冊。

In addition, we have also published a number of Building Energy Codes and Guidelines covering various building services installations: lighting (1998), air conditioning (1998), electrical (1999), and lift and escalator (2000). A new performance-based code is now being contemplated. In 1998, we launched the Hong Kong Energy Efficiency Registration Scheme for Buildings." Up to May 2002, 67 buildings were registered under the scheme.



A series of Energy Efficiency Labelling Schemes (EELS) for appliances has been launched. The EELS for refrigerators was launched in 1995. Schemes were subsequently introduced for room coolers, washing machines, compact fluorescent lamps, electric clothes dryers, electric storage water heaters and rice cookers.

在電器方面，我們推出了一系列能源效益標籤計劃。繼1995年推出雪櫃能源效益標籤計劃後，我們先後推出冷氣機、洗衣機、緊湊型節能熒光燈、電動乾衣機、儲水式電熱水器和電飯煲的能源效益標籤計劃。

In 2000, we extended the schemes to cover office appliances - firstly photocopiers, and then multifunction devices in 2001. As of May 2002, more than 1,400 labels had been approved by the EEO. More schemes are coming on-stream.



在2000年，我們將標籤計劃擴展至辦公室電器。首先是影印機，其後多功能裝置亦在2001年納入上述計劃。至2002年5月為止，能源效益事務處共批出超過1,400張標籤。日後還會推出更多的標籤計劃。

Besides buildings and appliances, the transport sector also consumes a lot of energy in Hong Kong, mainly in the form of oil products. Targeting this particular sector, the EELS for Petrol Passenger Cars was launched early this year.



除了建築物和電器外，本港的運輸業亦使用大量能源，並且是以石油產品為主。針對此一界別，我們於今年初推出了汽油載客車輛能源效益標籤計劃。

In 1998, we conducted a preliminary study of water-cooled air-conditioning systems (WACS) in Hong Kong. The study was completed in April 1999. The benefits identified by the study were compelling enough to warrant a number of new initiatives in this area, which are now being actively pursued. The aim is to encourage widespread adoption of water-cooled systems, and to promote the gradual replacement of existing air-cooled units with the new systems.

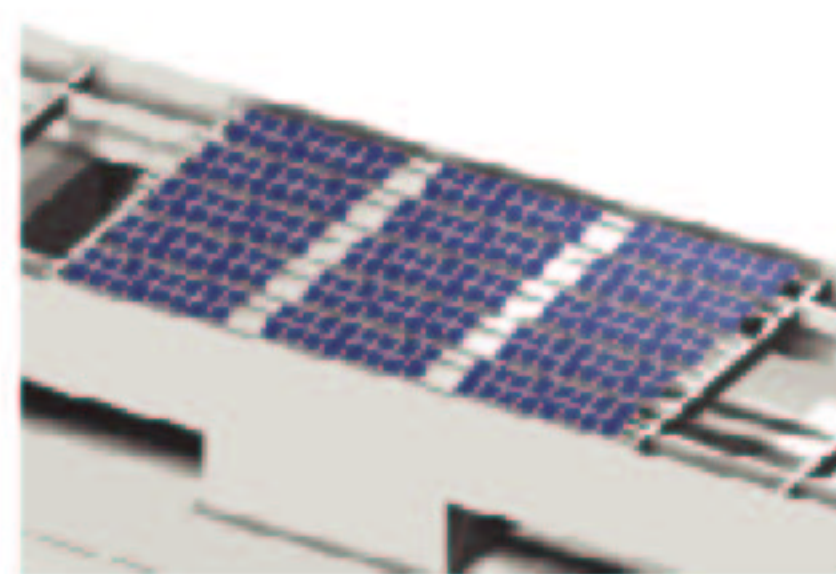
我們於1998年就本港採用水冷式空調系統進行了一項初步研究。這項研究於1999年4月完成。由於研究發現這種空調系統的好處不少，我們正積極在這方面推行多項推廣活動，目的是鼓勵廣泛採用水冷式系統，逐步取代現時流行的氣冷式系統。





在開發再生能源方面，我們在2000年委託顧問公司就本港使用新能源及再生能源科技的可行性進行研究，並正進行一項試驗計劃，在灣仔政府大樓安裝附設於建築物的光伏板。這項計劃將於2003年初完成。

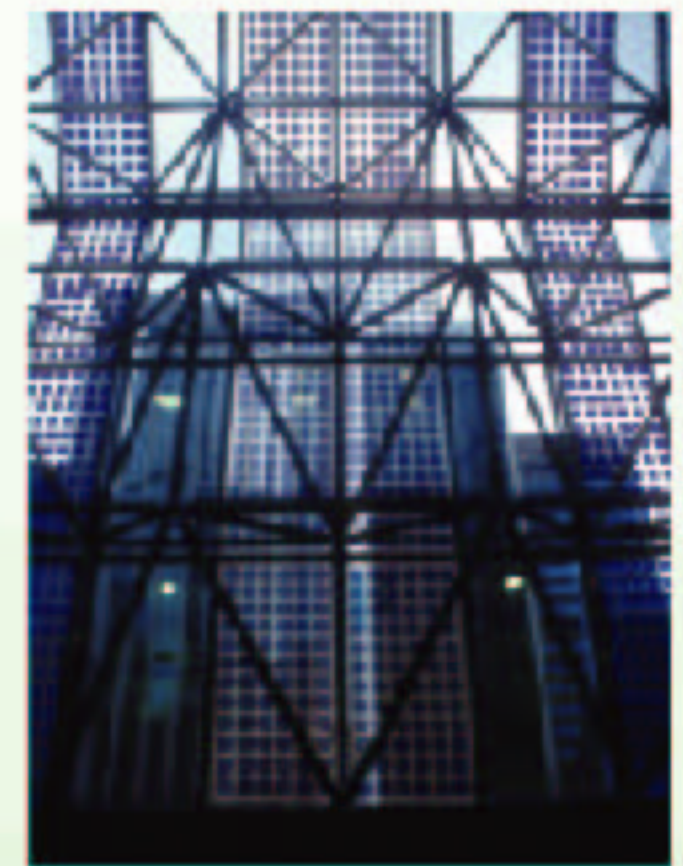
On the development of renewable energy, we commissioned a consultancy study in 2000 to investigate the viability of using new and renewable energy technologies in Hong Kong. A pilot project to introduce building-integrated photovoltaic cells at Wanchai Tower is now under construction and will be completed by early 2003.



In addition to these initiatives, the office also established the Hong Kong Energy End-use Database in 1997. Providing information to support various energy management programmes, the database is updated on a year-by-year basis. In 2001, consultancy studies on energy benchmarking and indicators as well as on renewable energy were commissioned.

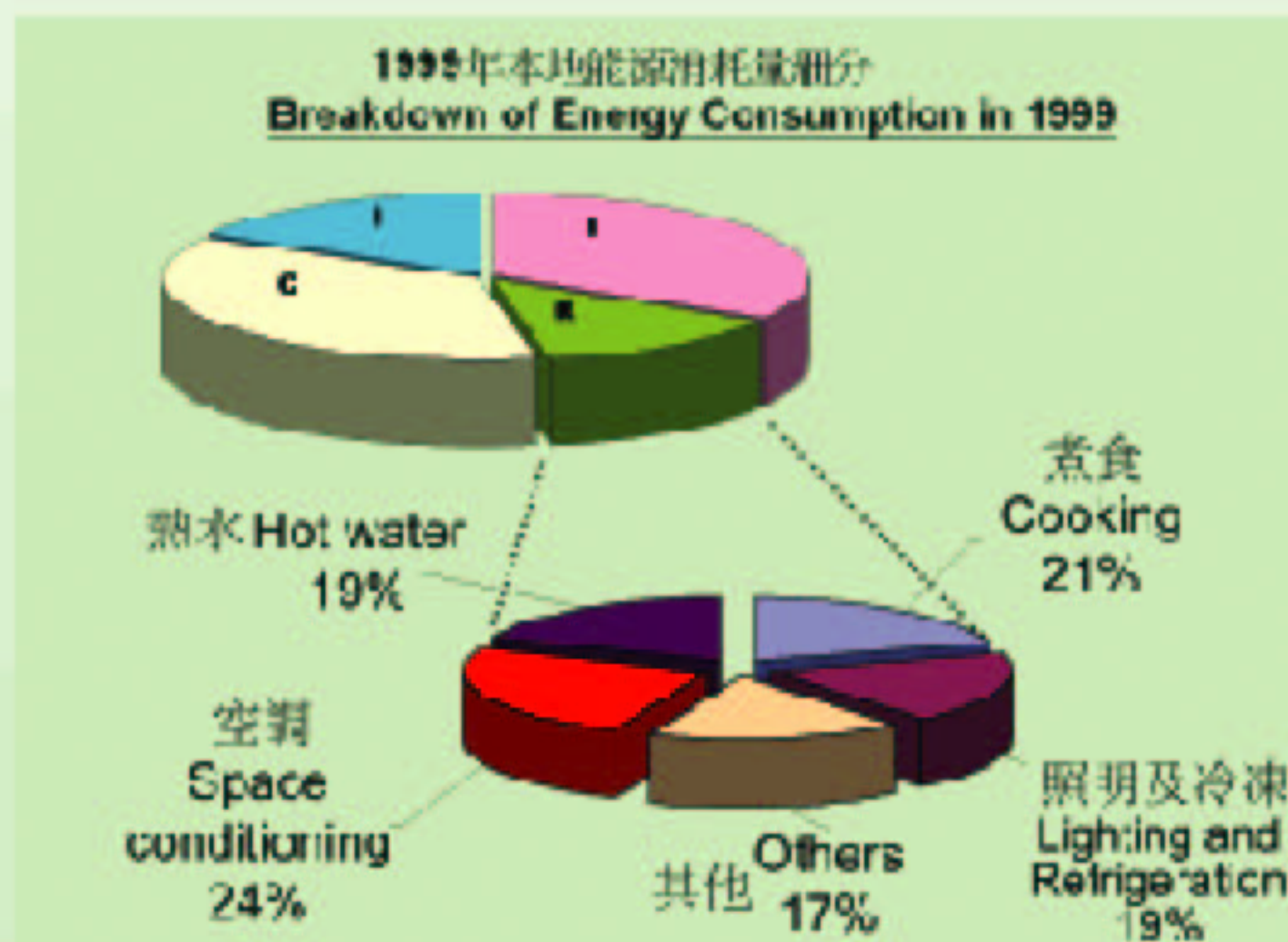
除此之外，本處亦在1997年建立了一個香港能源最終用途資料庫，以提供資料，協助推行各種管理能源的計劃。該資料庫每年均會更新和整理。在2001年，我們委託顧問公司就能源基準和指標，以及再生能源進行研究。

The mandate of the office goes beyond energy efficiency alone. We carried out an Indoor Air Quality (IAQ) survey trial scheme at 72 government venues in 2000 and advised the inter-departmental IAQ Management Group on establishing IAQ objectives. In addition, the office has also been monitoring the technical performance and development plans of Hong Kong's two electricity supply companies as well as their implementation of demand-side management programmes, according to the Scheme of Control Agreements.



能源效益事務處的職權範圍並不限於能源效益。我們於2000年在72個政府場地進行室內空氣質素測量試驗計劃，並就訂定室內空氣質素指標向跨部門的室內空氣質素管理小組提供意見。此外，本處亦按照管制法則協議，監察本港兩間電力公司的技術表現及發展計劃，包括實施用電需求管理計劃。

總括而言，提高和推廣能源效益是一項有意義和值得推行的工作。這些工作會為我們的環境和經濟以至下一代帶來各種好處。在你們的支持下，能源效益事務處會繼續努力，創造一個更加環保和更具能源效益的社會。



In summary, the pursuit of energy efficiency is indeed a meaningful and worthwhile undertaking, with the power to bring about environmental and economic benefits for us today as well as future generations. With your support, EEO will continue in its endeavours to create a greener and more energy-efficient society.





本港的水冷式空調系統

Water-cooled Air-conditioning Systems in Hong Kong

1. 引言

空調是本港最大的電力最終用途之一。隨著本港的不斷發展，預期空調方面的能源需求量會不斷增加。1999年4月完成的「在香港推廣水冷式空調系統的初步顧問研究」指出數種適合本港廣泛採用的基本水冷式空調系統。本文會探討使用區域性供冷系統及廣泛使用蒸發式冷卻塔的好處和必須考慮的問題。



2. 區域性供冷系統

區域性供冷系統是水冷式空調系統的一種，透過地下輸送管，由一個或幾個中央冷凍水機組為區內的建築物提供冷凍水。典型的區域性供冷系統包括：

- 一個或多個中央冷凍水機組，用以產生空調用的冷凍水；
- 輸送網絡，用以將冷凍水輸送至使用區域供冷服務的建築物；
- 熱交換器，有關設備安裝於使用區域供冷服務的建築物內，與建築物本身的空調回路連接。

1. Introduction

Air-conditioning is one of the largest segments of electricity end-use in Hong Kong and the SAR's continuing development is expected to boost the air-conditioning demand. The Preliminary Phase Consultancy Study on Wider Use of Water-cooled Air-conditioning Systems (WACS) in Hong Kong was completed in April 1999 and identified certain types of WACS as having potential for wider adoption. This article will examine the benefits and concerns associated with district cooling system and the wider use of evaporative cooling towers.

2. District Cooling System (DCS)

DCS is a form of Water-cooled Air-conditioning System in which one or several centralised chiller plants provide chilled water, via underground distribution pipes, to a number of buildings within a district. A typical DCS consists of:

- centralised chiller plants for generating chilled water for cooling purposes;
- distribution network for distributing chilled water to buildings subscribing to the DCS cooling service; and
- heat exchangers installed inside subscribing buildings to interface with the buildings' own air-conditioning circuits.





2.1 區域性供冷系統的好處

區域性供冷系統是一種環保及創新的供冷方法，建築物發展商、樓宇業主、租戶及整體社會均受惠，其主要好處包括：

(a) 節省能源

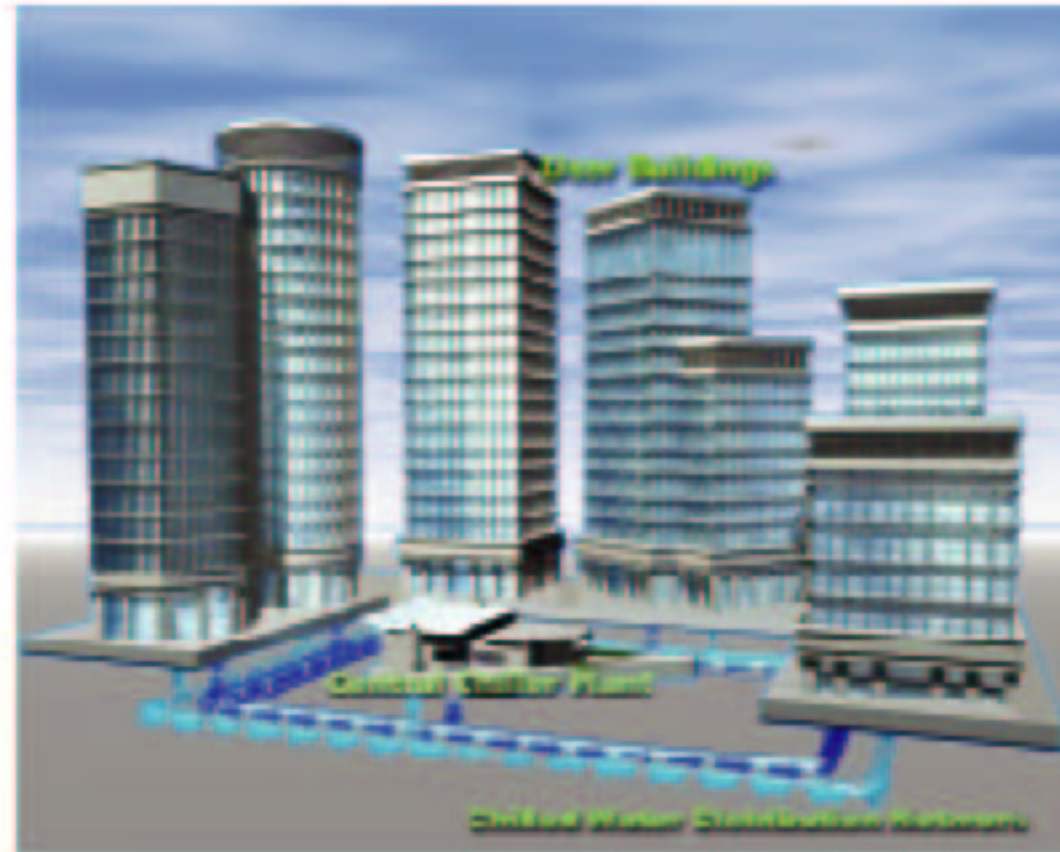
由於利用了規模效益及不同建築物冷氣負荷的時間分散性，加上比較高的機組維修水準及比較精確的監察，區域性供冷系統誠是一種非常節省能源的供冷方法。雖然所節省的能源量會因應不同的系統配置安排而有所差異，但若與分散使用氣冷式空調系統比較，一般來說，區域性供冷系統可以節省約35%的電力。若機組採用熱電合產的技術，所節省的能源量可以更多。

(b) 環保

減少能源消耗便能減少發電廠的溫室氣體排放。此外，由於冷凍水機組及散熱用冷凝器均位於中央機房，故噪音、震動及廢熱污染的問題亦會集中於該處，故能採用更有效的隔音、減震和廢熱舒緩措施。

(c) 節省地方

因為冷凍水機組無需設於建築物內，故此使用區域性供冷系統的服務可以大量節省機房面積。研究顯示，若與傳統的冷卻設備比較，使用區域性供冷系統，平均可節省75%的機房面積。且仍未計算因製冷的電力需求降低，而令電力公司變壓房及電力用戶總電掣房面積得以縮小所節省的地方。



2.1 Benefits of DCS

DCS is an environmentally friendly and innovative cooling solution that creates a win-win situation for building developers, building owners, tenants and society as a whole. The main benefits of DCS include:

(a) Energy-saving

DCS is a very energy-efficient cooling solution as it takes full advantage of economies of scale, load diversity for different buildings, high standards of plant maintenance and accurate plant monitoring. Although energy savings arising from DCS vary according to the system configuration in use, a typical saving of around 35% can be achieved over decentralised air-cooled air-conditioning system. Plants using co-generation technology will save even more energy.

(b) Environmentally Friendly

The reduction in energy consumption leads to a reduction of greenhouse gas emissions from power plants. Additionally, noise, vibration and waste-heat pollution problems are also localised as chiller plants and condensers are located at the centralised plant room, enabling adoption of better acoustic, vibration and waste-heat mitigation measures.

(c) Space-saving

Using the DCS service can save a remarkable amount of plant room area, since chiller plants no longer need be installed inside the building. Studies show that an average of 75% of plant room space could be saved when compared with traditional cooling plants. This calculation does not take into account the space saving realised in the power company's transformer room and consumer main switchroom as a result of reduced electricity demand from the chiller plant.





(d) 更可靠及靈活的服務

區域性供冷系統由專業隊伍負責操作及維修，確保有關服務持續不斷。由於不必操作及維修冷凍水機組，故個別樓宇業主的設施管理工作因而大為簡化。在非工作時間提供冷氣或甚至24小時提供冷氣，均十分容易做到。這樣，樓宇業主便可以把精力集中於其核心業務上。

(e) 節省費用

由於不必設置冷凍水機組、機房及相關的供電設備，樓宇的建造及維修費用得以大大減低。

2.2 採用區域性供冷系統須考慮的問題

儘管採用區域性供冷系統有上述好處，但卻有一些問題需要考慮。

(a) 從服務提供者方面來看

提供區域性供冷系統是一項龐大的投資，特別是在營運初期，投資者必須興建各項基本設施。有關係統的回本期通常頗長，且極受製冷量銷售量所影響，而銷售量又須視乎地區的發展而定。



(b) 從客戶方面來看

客戶使用服務提供者的製冷服務，或須簽署長期的訂購合約或協議。部分客戶或會關注到服務的收費機制是否完善。此外，如果樓宇在興建時並未預留地方安裝機房設施，客戶若想日後轉用傳統的獨立空調，便可能會遇到地方不足的問題。

(d) More Reliable and Flexible Service

DCS is operated and maintained by a specialised professional team to ensure uninterrupted service. Individual building owners find that facilities management is greatly simplified since the building has no chiller plant to operate and maintain. Flexibility in meeting cooling demand during non-working hours or even 24-hour operation can be easily achieved. Building owners can therefore focus more on their core businesses.

(e) Cost-saving

With the elimination of the chiller plant, plant room and associated electricity supply equipment, construction and maintenance costs can be significantly reduced.

2.2 Key Concerns

In spite of the above benefits, there are also concerns connected with the implementation of DCS.

(a) To the Service Provider

DCS is a capital-intensive investment, especially at the earliest stage of the business when the infrastructure is being established. The payback period is usually long and depends heavily on the sales volume of the cooling capacity, which hinges upon the development of the district it serves.

(b) To the Customers

Customers subscribing to cooling services from a Service Provider may be required to sign a long-term purchase contract or agreement. There may also be concern about the service charging mechanism. Furthermore, the DCS customer may have difficulty reverting to the conventional way of installing individual air-conditioning equipment if space for such purpose has not been reserved.





2.3 進行中的工作

鑑於採用區域性供冷系統有上述好處，機電工程署開展了兩項顧問研究：一項在一個新發展地區(即東南九龍發展區)進行，另一項則在現有地區(即灣仔及銅鑼灣區)進行。這兩項研究旨在確定及界定技術、環境及機制等各方面的要求，包括立法、規管、財務、經濟及土地使用等事宜，並制定在這些地區採用區域性供冷系統的具體計劃。東南九龍發展區的研究已差不多完成，而灣仔及銅鑼灣區的研究則將於2003年中完成。



2.3 Work In Progress

In view of the benefits of DCS, EMSD is charged with carrying out two consultancy studies on the implementation of DCS: one in a new, developing district, South East Kowloon Development (SEKD), and the other in an existing district, Wan Chai and Causeway Bay (WCCB). The studies will ascertain and define the technical, environmental, and institutional requirements, taking into account legislative, regulatory, financial, economic and land-use issues, and will draw up plans for the implementation of DCS in these districts. The study for SEKD is nearing completion, while that for WCCB is scheduled to be completed in mid 2003.

3. 在空調系統廣泛採用蒸發式冷卻塔

在引言提及的初步顧問研究所指出數種適合本港廣泛採用的水冷式空調系統中，對樓宇業主來說，最方便及容易採用的，便是應用蒸發式冷卻塔的系統。

3. Wider Use of Evaporative Cooling Tower in Air-conditioning Systems

Among the types of Water-cooled Air-conditioning Systems identified by the preliminary phase study as mentioned in the introductory paragraph, use of evaporative towers was found to be the easiest and most convenient way for building owners to adopt WACS.

3.1 蒸發式冷卻塔的好處

與氣冷式空調系統比較，在水冷式空調系統使用蒸發式冷卻塔可節省約7%至17%的電力。以一個面積800平方米的辦公室為例，全年約可節省9,600元的電費，減除用水、廢水排放及處理所需的費用後，全年約可節省4,000元。而由於減少以化石燃料發電，溫室氣體的排放亦會明顯地降低。

3.1 Benefits of Evaporative Cooling Towers

The electricity saving when using evaporative cooling tower in a water - cooled air - conditioning system is about 7% to 17% when compared with the air-cooled air-conditioning system. Considering an office of 800 m², the annual electricity tariff saving is about \$9,600. Deducting the costs of water consumption, waste water discharge and water treatment, the annual saving will be about \$4,000. As a consequence of reduced consumption of fossil fuels for electricity generation, greenhouse gas emissions can also be appreciably reduced.





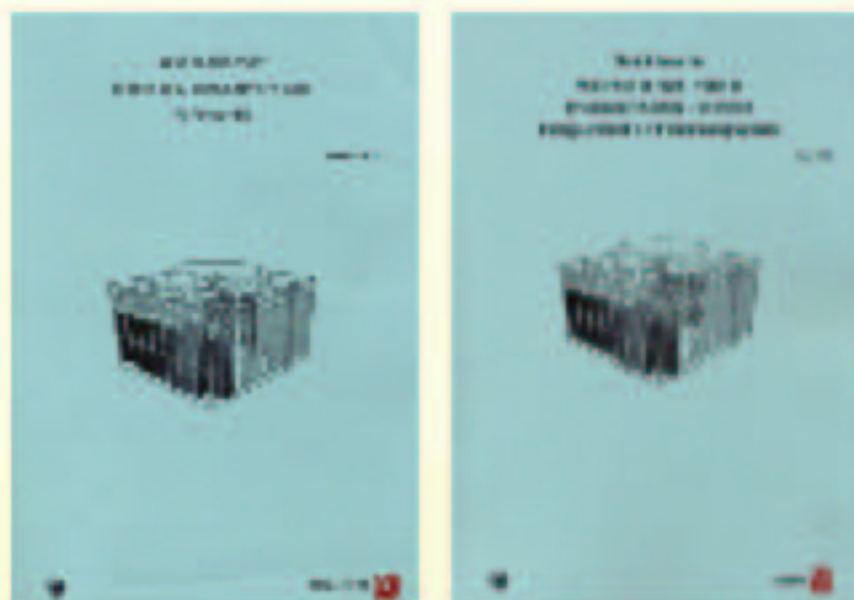
3.2 廣泛使用蒸發式冷卻塔須考慮的問題

引致退伍軍人病症的細菌曾在冷熱水系統、游泳池、牙科水管、噴水池，以及在保養不善的淡水冷卻塔中找到。此問題或會令人在考慮安裝有冷卻塔的水冷式空調系統時或有猶豫。不過，預防退伍軍人病症委員會與本署合作出版了一本工作守則，內有關於空調系統設計、操作及維修的良好作業方法，務求有效地控制及減少退伍軍人病菌的滋生。

3.3 進行中的工作

本署於2000年6月開始推行「節能空調系統的蒸發式冷卻塔廣泛使用淡水先行性計劃」。在該計劃涉及的本港28個區內，不論是新的或舊的非住宅建築物，均可以獲准使用淡水來冷卻空調裝置。該計劃的主要目的，是推廣使用節能的水冷式空調系統。

先行性計劃所涉及的地區的位置圖已載於機電工程署網站(<http://www.emsd.gov.hk>)。樓宇擁有人、發展商、物業管理公司、建築及機電工程顧問、空調及機電工程承辦商等，均可為其樓宇、發展項目或裝置，向水務署申請參與這計劃。



3.2 Key Concerns

The bacteria causing Legionnaires' Disease has been found in poorly maintained fresh-water cooling towers, along with other places such as hot and cold water systems, swimming pools, dental water lines, and fountains. This may cause hesitation when considering to adopt WACS with cooling towers. On the other hand, the Prevention of Legionnaires' Disease Committee has published a Code of Practice in collaboration with EMSD. It recommends good practices to be followed in the design, operation and maintenance of air-conditioning systems for the effective control and prevention of Legionnaires' Disease.



3.3 Work in Progress

A Pilot Scheme for Wider Use of Fresh Water in Evaporative Cooling Towers for Energy-efficient Air-conditioning Systems was launched in June 2000. The scheme now involves 28 areas in Hong Kong, where new or existing non-domestic buildings are permitted to use fresh water for cooling their air-conditioning installations. The major objective of the scheme is to promote the use of energy-efficient water-cooled air-conditioning systems.

The location plans for all designated areas under the pilot scheme can be viewed at EMSD website (<http://www.emsd.gov.hk>). Premise owners, property developers, property management companies, architectural and E&M consultants, or air-conditioning and E&M contractors may submit applications to the Water Supplies Department, to participate in the scheme for individual premises, developments or installations.



特寫 Feature Articles



新的汽油載客車輛能源效益標籤計劃

New Energy Efficiency Labelling Scheme for Petrol Passenger Cars

在1999年裡運輸類別的能源耗用量佔全港總本地能源耗用量的36%。鑒於運輸類別的能源使用量較多，而本港的登記汽車中又以汽油載客車輛為主，機電工程署遂於2002年2月為汽油載客車輛推出新的自願參與能源效益

In 1999, the transport sector accounted for 36% of total local energy consumption in Hong Kong. Noting the sector's high energy usage, the Electrical and Mechanical Services Department (EMSD) launched a new voluntary Energy Efficiency Labelling Scheme (EELS) in February 2002. The new EELS covers petrol passenger cars, which



標籤計劃。

參與這個計劃的商戶，可以在本港發售的全新汽油載客車輛上展示能源標籤，註明車輛的商標和型號、市內行車周期和公路行車周期耗燃油量、估計全年耗燃油量及其他重要的相關數據。有關標籤不會列出能源效益級別或最低能源效益要求，而是會提供有用的燃料耗用數據，供消費者在選購車輛時作出比較。

要符合計劃的註冊資格，車輛必須取得車輛廢氣排放及耗油量的測試報告。測試須由負責「國家類型設計批准測試」的實驗所發出。此外，若汽車製造商自設實驗所，而測試設施和標準已獲國際認可的核證機構評估及審定，則其測試結果亦會獲得本署考慮。本署會先評估測試報告，然後才會把測試結果視為正式紀錄。

本署歡迎所有汽油載客車輛的製造商、入口商和本地代理商參與本計劃。在註冊申請獲接納後，參與者便會獲准在每部新車的擋風玻璃或其告示牌上張貼能源標籤。

本署會對註冊車輛進行隨機查驗，以確保其符合規定，從而使這個計劃維持良好的信譽，並繼續維繫消費者的信心。參與者若未能履行義務或有車輛未能符合規定，將會被本署除名。

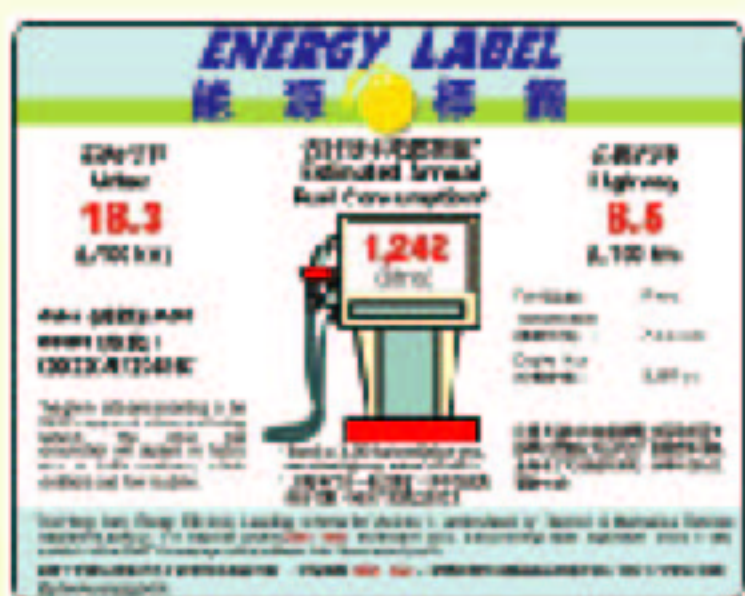
我們希望在本計劃推行後，汽車製造商及入口商會將供應給本港的載客車輛的能源效益提高，把市場上能源效益較低的汽車型號淘汰，並提高市民的節省燃料和改善環境意識。由於這個計劃以統一的測試標準為基礎，消費者在購買車輛時可比較不同車輛的耗油量，挑選耗用較少燃料的車輛，從而節省燃料費用，並為減少排放空氣污染物及溫室氣體盡一分力。

make up the majority of registered vehicles in Hong Kong.

Those companies joining the scheme are entitled to display energy labels on new petrol passenger cars sold in Hong Kong. The label shows the make and model of the car, fuel consumption for both urban and highway use, estimated annual fuel consumption and other important relevant data. There is no energy efficiency grade or minimum energy efficiency requirement associated with this EELS. Instead, the label will provide useful fuel use data for consumers to make comparisons when choosing new cars.

To qualify for registration under the scheme, cars should have test reports issued by laboratories that are responsible for national type-approval tests with regard to vehicle emissions and fuel consumption. Alternatively, test results obtained from car manufacturers' in-house laboratories where testing facilities and standards have been evaluated and certified by internationally recognised third-party certification organisations, will also be considered. EMSD will assess the test reports before accepting the test results as official records.

All manufacturers, importers and local agents of petrol passenger cars are welcome to participate in the scheme. Registered participants are able to affix an energy label to the windscreen of each new car, or place it on a display board about the car.



EMSD will carry out random compliance checks and inspections on registered cars to uphold the credibility of the scheme and to maintain consumer confidence. EMSD will de-register participants who allow non-compliant cars to be labelled or who otherwise fail to fulfil their obligations under the scheme.

With the implementation of the scheme, it is hoped that car manufacturers and importers will improve the energy efficiency of passenger cars that they supply to Hong Kong and that car models of lower energy efficiency will be phased out gradually from the market. Public awareness of fuel economy and environmental improvement needs will also be increased. As the scheme is based on a unified test standard, consumers can compare fuel consumption among different cars before purchase and therefore select cars that use less fuel, saving costs and contributing to a reduction of emissions of atmospheric pollutants and greenhouse gases.



新的能源效益標籤計劃

New EELS

為多功能裝置而設的辦公室設備能源效益標籤計劃及為電飯煲而設的家用電器能源效益標籤計劃，已於2001年12月28日開始推行。這兩個計劃均會以「確認式」標籤制度來運作。我們已於2002年2月27日發出第一批共17個型號的多功能裝置能源標籤。此外，我們計劃於今年12月推出新的家用抽濕機及鐳射打印機能源效益標籤計劃。

The new office equipment EELS for multifunction devices (MFD) and the new household EELS for rice cookers were launched on 28 December 2001. Both schemes are operated under the 'recognition type' labelling system. Furthermore, the first batch of MFD energy labels for 17 models was issued on 27 February 2002. For this year, we plan to launch EELS for household dehumidifiers and laser printers in December.



附設於建築物上的光伏系統

Building-integrated Photovoltaic Systems

我們已把灣仔政府大樓的「附設於建築物上光伏系統」工程合約批給一間由關電工株式會社及三馬工程有限公司組成的合營公司，以進行設計和建築工作。我們透過有關工程，向市民展示再生能源科技的應用，並藉此提高市民的環保意識。是項工程會安裝三種光伏板，即天台的支架式光伏板、外牆的遮光罩式光伏板及玻璃入口的天窗式光伏板。

安裝工程完成後，我們會監察該系統表現，為期十二個月，所蒐集的技術資料會用於評估該系統在本港氣候環境下發電的能力。

We have awarded a contract to the joint-venture company formed between Kandenko Co. Ltd. and Samba Engineering Ltd. to undertake a design-and-build project to install Building-integrated Photovoltaic (BIPV) systems in Wanchai Tower. The project will demonstrate to the general public the applicability of renewable energy technologies and will also help to promote public awareness of environmental protection. Three types of BIPV system will be installed - rack-type on the roof-top, sunshade screen-type on the external façade and skylight-type at the glass entrance.



When the installation work is completed, we will monitor the performance of the BIPV systems over a 12-month period. The technical data collected will be used to assess the effectiveness of BIPV systems to generate electrical power under Hong Kong's climatic conditions.





能源表現合約

Energy Performance Contract

在機電工程署的協助下，根德公爵夫人兒童醫院(客戶)與中電工程有限公司(服務提供者)已於2001年12月簽訂一份能源表現合約，以進行改裝工程。在這項工程中，服務提供者會負擔起全部改裝費用，並保證每年可在能源開支上節省150,000港元。該份合約為期四年，其後院方將可獨享因該改裝工程而節省的能源開支。

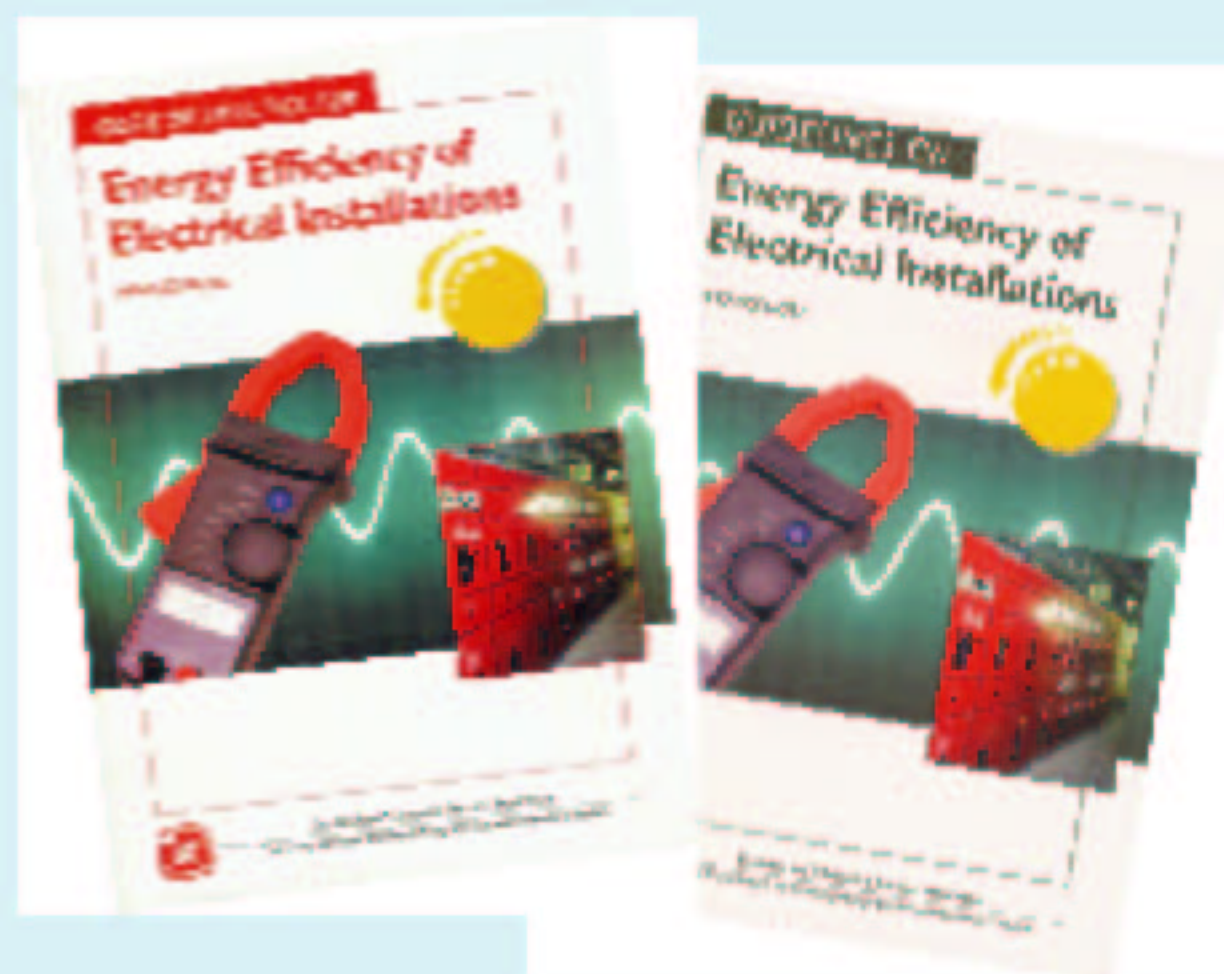
With the support of EMSD, a retrofit project in the form of an Energy Performance Contract was agreed by the Duchess of Kent Children's Hospital (the client) and CLP Engineering Limited (the service provider) in December 2001.

Under the contract, the service provider is responsible for all the retrofit cost and will guarantee an annual energy saving of \$150,000. The contract period is four years, after which the Hospital will enjoy all the cost savings resulting from the retrofit.



將《電力裝置能源效益工作守則》及有關指引加進美國電機暨電子工程師學會的241標準內 Inclusion of the Code of Practice for Energy Efficiency of Electrical Installations and the Associated Guidelines in IEEE's Std. 241

美國電機暨電子工程師學會曾聯絡本署，希望將《電力裝置能源效益工作守則》及相關的指引加進新修訂的241標準《商業建築物電力系統的建議守則》第17章「電力能源管理」中。該會會在最終通過的標準中提及本署。



The Institute of Electrical and Electronics Engineers (IEEE) of the U.S.A. has approached EMSD for permission to include the Code of Practice for Energy Efficiency of Electrical Installations and the associated Guidelines in the new revision of Standard 241 "Recommended Practice for Electrical Systems in Commercial Buildings" - Chapter 17, Electrical Energy Management. Recognition to EMSD will be given in the final approved Standard.





： 會議、研討會、展覽會 *Conference, Seminars, Exhibitions*

亞洲太平洋區經濟合作組織

Asia Pacific Economic Co-operation (APEC)

亞太經合組織旨在在其位於太平洋兩岸的21個會員經濟體當中推廣自由及開放貿易與及經濟合作。經合組織中的能源工作組負責監察的項目包括：潔淨化石燃料、新及再生能源、礦產及能源勘探及發展、能源數據及分析、以及能源效益及節約。能源效益事務處的助理署長及其他同事分別出席了於2001年9月在巴布亞新幾內亞及2002年5月在曼谷舉行的能源工作組會議。

APEC is tasked with the promotion of free and open trade and economic co-operation among its 21 member economies around the Pacific Rim.

The Energy Working Group monitors programmes in the areas of: clean fossil energy, new and renewable energy technologies, mineral and energy exploration and development, energy data and analysis, and also energy efficiency and conservation. The Assistant Director and other officers from the Energy Efficiency Office attended the Energy Working Group meetings held in September 2001 in Papua New Guinea and May 2002 in Bangkok respectively.



步向可持續發展環境研討會

Symposium on "Towards Environmental Sustainability"

在2001年11月20日的「2001年度步向可持續發展環境聯合研討會」中，我們講述了本港的能源發展概況，並與與會者交流在照明技術方面所獲得的經驗。該項活動由香港能源效益及節約小組、香港工程師學會、英國特許屋宇裝備工程師學會，以及美國供暖製冷及空調工程師學會合辦。



On 20 November 2001, we presented our view of Hong Kong's energy prospects and shared our experience in lighting technology at the "Towards Environmental Sustainability" Joint Symposium 2001, organised jointly by the Energy Efficiency and Conservation Sub-committee of Hong Kong, the Hong Kong Institution of Engineers, the Chartered Institution of Building Services Engineers, and the American Society of Heating, Refrigerating and Air-conditioning Engineers Inc.





室內空氣質素及節能技術研討會

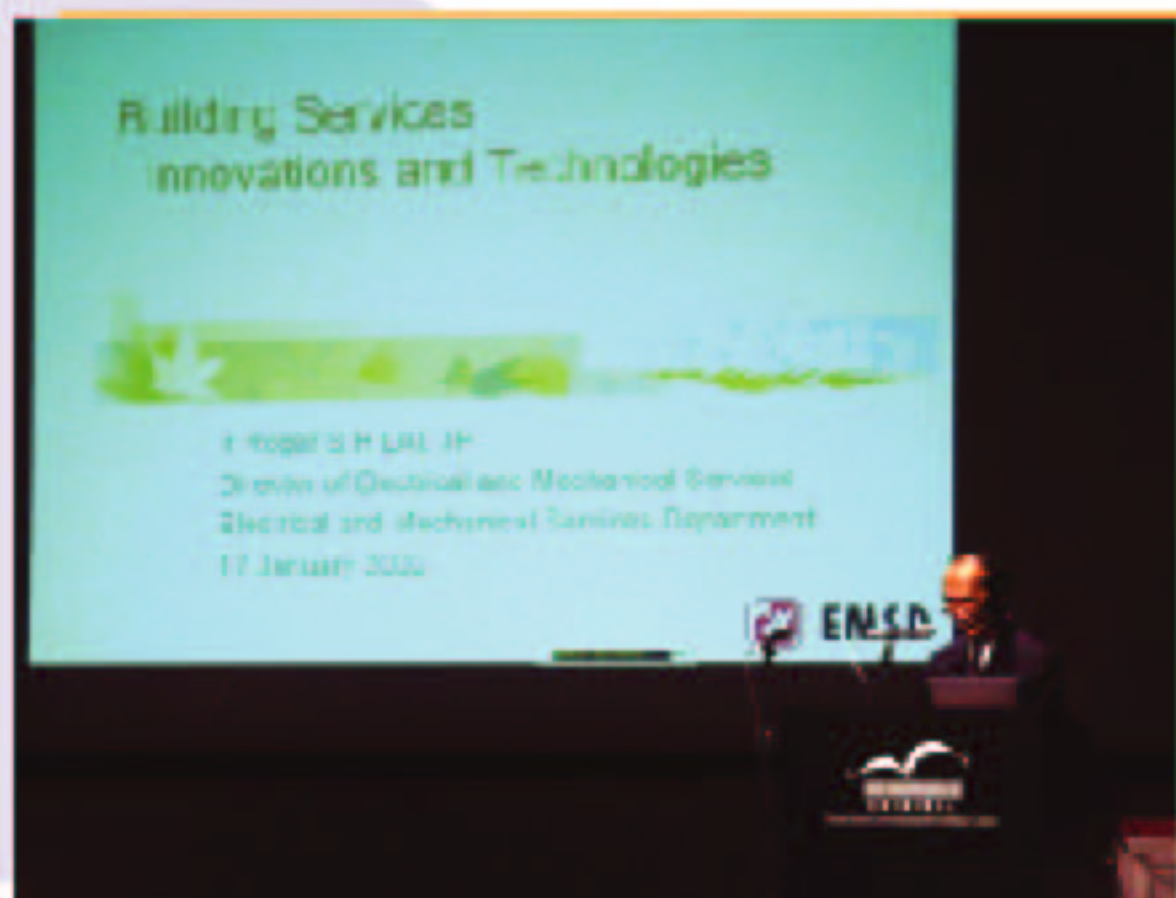
Symposium on Indoor Air Quality & Energy-Efficient Technology

在2001年11月29日舉行的「室內空氣質素及節能技術研討會」中，我們介紹了在改善室內空氣質素方面所獲得的經驗。該研討會由美國機械工程師學會、香港城市大學、環保促進會、香港工程師學會、機械工程師學會、香港理工大學及香港科技大學合辦。

Our experience in improving indoor air quality was presented at the "Symposium on Indoor Air Quality & Energy-efficient Technology" on 29 November 2001. It was jointly organised by the American Society of Mechanical Engineers, the City University of Hong Kong, the Green Council, the Hong Kong Institution of Engineers, the Institution of Mechanical Engineers, the Hong Kong Polytechnic University and the Hong Kong University of Science and Technology.

創新樓宇研討會

Symposium on Innovative Buildings



在2002年1月17日的「創新樓宇研討會」上，署長發表了主題演講，跟著我們便講解醫院的中央控制及監察系統，並介紹區域性供冷系統。該研討會由香港工程師學會主辦。

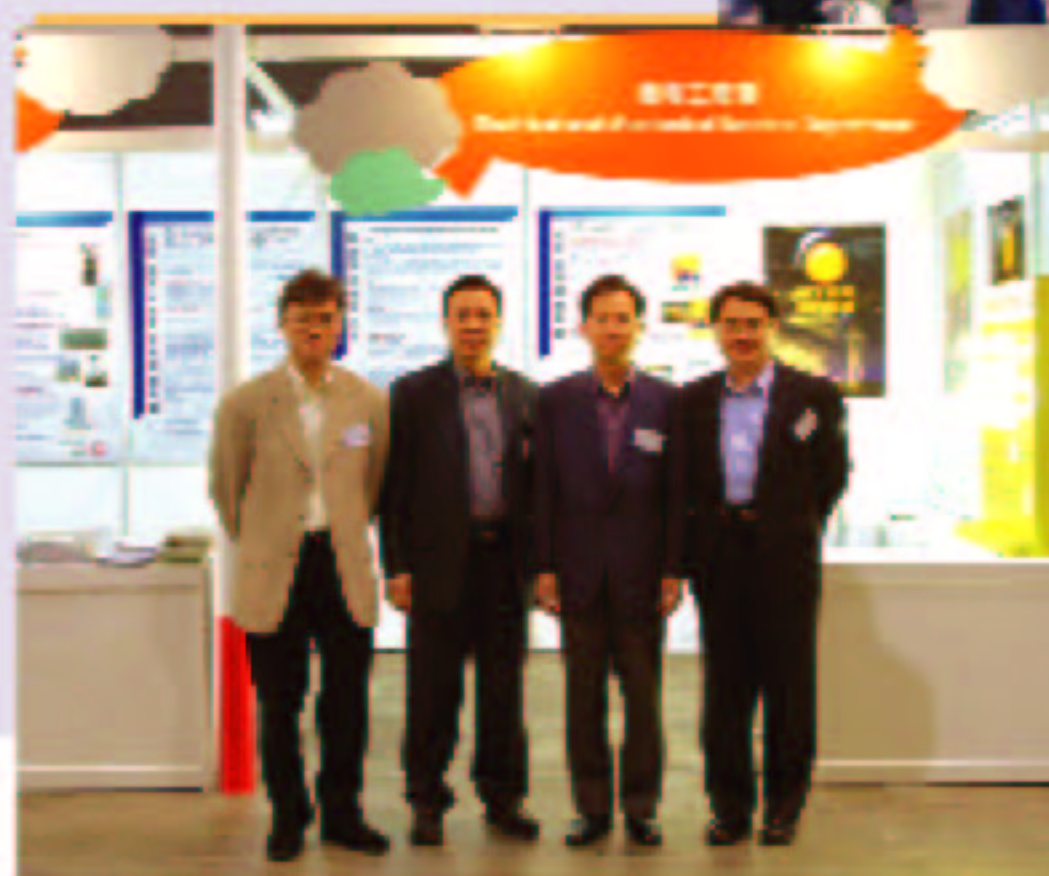
On 17 January 2002, following the keynote speech given by our Director, we gave talks on Central Control & Monitoring Systems for Hospital and District Cooling Systems in the "Symposium on Innovative Buildings". The symposium was organised by the Hong Kong Institution of Engineers.

清新空氣展覽會

Clean Air Expo

我們參與了由環境保護署主辦在2002年3月10日舉行的「清新空氣展覽會」。會中我們展示了部分創新照明用具及設備，不少參觀人士對這些展品大感興趣。

On 10 March 2002, we participated in the "Clean Air Expo" organised by the Environmental Protection Department (EPD). We showcased some innovative lighting kits, generating great interest among visitors.





小測試 Quiz

- 「用電需求管理」的主要目標是甚麼？
(a) 長遠而言，減低高峰時間的用電需求和能源消耗
(b) 改善電力系統的可靠性
(c) 增加發電機組的效率
(d) 提高客戶的電力安全意識
- 下列哪一個方法能最有效地節省住宅樓宇的電能和成本？
(a) 使用改善功率因素的裝置
(b) 使用減低電壓的裝置
(c) 利用時間控制裝置減少器具的操作時間
(d) 使用節能設備/器具，例如附有好等級能源標籤的器具
- 平均來說，一級能源標籤的雪櫃比三級能源標籤的雪櫃節省多少能源？
(a) 約15% (b) 約25%
(c) 約35% (d) 約50%
- 《國際能源局(IEA)主要世界能源統計2001年版》載列了國家/經濟體在1999年按本地生產總值每元(購買力平價計)計算的「一次能源總供應量」數字(單位: toe/ '000 at 95US\$ PPP)。請以遞增方式排列下列國家/經濟體(即先排列按本地生產總值每元計算的一次能源總供應量最低的國家/經濟體)。
(a) 英國 (b) 美國
(c) 香港 (d) 日本
- 下列哪一項是汽油載客車輛能源效益標籤計劃內計算燃料消耗量的公式中，所指定的市區道路行駛里數和公路行駛里數的比率？
(a) 0.4 : 0.6 (b) 0.5 : 0.5
(c) 0.6 : 0.4 (d) 0.7 : 0.3
- 一般而言，區域性供冷系統比起傳統的氣冷式空調系統能可以節省多少能源？
(a) 10% (b) 25%
(c) 35% (d) 50%
- 下列影響室內空氣質素的物質之中，若果濃度超出一定限額，哪些會危害健康？
(a) 二氧化碳 (b) 一氧化碳
(c) 揮發性的有機化合物 (d) 氡氣
- 一幢商業樓宇如採用蒸發式冷卻塔於水冷式空調系統，平均來說該塔的年耗水量，以每單位樓面面積單計為多少？
(a) 每年每平方米1.55立方米 (b) 每年每平方米2.55立方米
(c) 每年每平方米3.55立方米 (d) 每年每平方米4.55立方米
- What is the major objective of Demand Side Management?
(a) reduce electricity peak demand and energy consumption in the long term
(b) improve power system reliability
(c) increase the efficiency of generating plants
(d) enhance consumers' awareness of electricity safety
- Which of the following methods can save electrical energy most effectively in residential buildings?
(a) use power factor improving devices
(b) use voltage reduction devices to reduce supply voltage
(c) use time-control devices to reduce operating time of appliances
(d) use energy-efficient equipment/appliances at home, e.g. appliances with good-grade energy labels
- On average, how much energy can be saved by using a "Grade 1" refrigerator as compared to using a "Grade 3" refrigerator?
(a) about 15% (b) about 25%
(c) about 35% (d) about 50%
- The 2001 Edition of Key World Energy Statistics from the International Energy Agency includes a listing of the total primary energy supply (TPES) per GDP (unit: toe/'000 at 95US\$ PPP) for countries/economies in year 1999. Can you rank the following countries/economies in increasing order (i.e. lowest TPES/GDP first)?
(a) United Kingdom (b) USA
(c) Hong Kong (d) Japan
- Which of the following is the ratio of usage of urban roads to usage of highways as stipulated in the equation for calculating fuel consumption in the EELS for petrol passenger cars?
(a) 0.4 : 0.6 (b) 0.5 : 0.5
(c) 0.6 : 0.4 (d) 0.7 : 0.3
- In general, how much energy can be saved by adopting DCS when compared with a conventional air-cooled air conditioning system?
(a) 10% (b) 25%
(c) 35% (d) 50%
- Which of the following substance(s) affecting indoor air quality is/are hazardous to health, if concentration exceeds certain limit?
(a) Carbon dioxide (b) Carbon monoxide
(c) VOC (volatile organic compounds) (d) Radon
- What is the average annual water consumption per unit floor area for evaporative cooling tower used in water-cooled air-conditioning system for commercial building?
(a) 1.55 m³/m²/year (b) 2.55 m³/m²/year
(c) 3.55 m³/m²/year (d) 4.55 m³/m²/year

小測試答案 Answers to Quiz

1 (a); 2 (d); 3 (c); 4 (c); (d), (a), (b) (香港Hong Kong (0.12), 日本Japan (0.17), 英國UK (0.19), 美國USA (0.26)); 5 (a); 6 (c); 7 (b), (c), (d); 8 (a)

聯絡資料 Contact

任何人仕如果想就本通訊提出意見或詢問，又或者想加入本通訊的寄件名單內，請與我們聯絡，聯絡資料如下：

地址：香港銅鑼灣禮頓道——號十一樓

機電工程署能源效益事務處

電話：(852)28811651 傳真：(852)28906081

電郵：eepublic@emsd.gov.hk

Anyone wishing to comment or make any enquiries in relation to this publication or would like to be included on the publication's mailing list can contact us at:

Address : Energy Efficiency Office

Electrical and Mechanical Services Department

11/F, 111 Leighton Road, Causeway Bay, Hong Kong

Telephone : (852)28811651 Facsimile : (852)28906081

Email : eepublic@emsd.gov.hk

