



助理署長的話 *Message from Assistant Director*

機電工程署參與亞太區經濟合作組織能源工作組的情況

- 利振球，助理署長 / 能源效益

世界各國均致力提高能源效益，香港亦不例外。我們必須蒐集全球有關能源和節省能源的資訊，並與各地有關部門保持聯繫，以便交流經驗，務求能做好提高能源效益的工作。

參與亞太區經濟合作組織能源工作組，讓我們可以知悉區內能源發展的最新情況，並有機會和其他地區交換資料。我們為香港的節能措施制定推行範疇及方向時（例如建築物能源守則、能源最終用途資料庫、能源效益標籤計劃、能源基準設定、用電需求管理），均有借鑑能源工作組所推行的相關能源措施。此外，工作組亦為我們提供了一個參與國制能源事務的好機會。

本文會簡單介紹亞太區經濟合作組織能源工作組，讓讀者加深對該組的瞭解。

亞太區經濟合作組織於 1989 年成立，旨在加強亞太區的經濟動力及區內國家的歸屬感，並一直不遺餘力，促進區內的開放貿易和經濟合作。亞太經合現時共有 21 名成員，全部來自太平洋沿岸地區。香港亦是亞太區經濟合作組織的成員，並以「中國香港」的名義參與其活動。

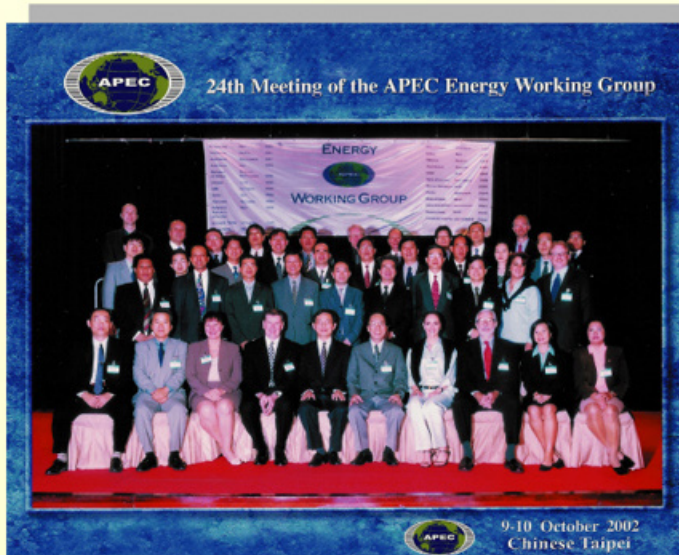
EMSD's Participation in the APEC Energy Working Group

- C. K. Lee, Assistant Director / Energy Efficiency

Energy efficiency is a world-wide undertaking. In the course of our own pursuit of energy efficiency for Hong Kong, we regularly acquire information on developments in the field of energy and energy conservation from around the world. We also interact with agencies in other parts of the world to learn from their experiences.

Our participation in the Energy Working Group (EWG) of the Asia-Pacific Economic Cooperation (APEC) also keeps us abreast of the latest regional energy developments and gives us the opportunity to exchange information with other member economies. EWG's energy initiatives have served as valuable references in shaping the scope and direction of Hong Kong's energy efficiency initiatives, such as our Building Energy Codes, Energy End-use Database, Energy Efficiency Labelling Scheme, Energy Benchmarking and Demand Side Management schemes. The EWG platform also gives us the opportunity to participate in international energy initiatives.

In this article, I would like to introduce the APEC Energy Working Group as well as the work of the EWG.



最近一次能源工作組會議 *Latest Energy Working Group Meeting*

The Asia-Pacific Economic Cooperation (APEC) was established in 1989. Its goal is to advance the economic dynamism and sense of community in the Asia-Pacific region. APEC has since become the primary vehicle for promoting open trade and practical economic cooperation in the region. It currently has 21 member economies from the Pacific Rim. Hong Kong as a member economy participates in its activities under the name of "Hong Kong, China".





亞太經合設立了十個工作組，分別處理不同綱領範圍的工作，其中一個就是能源工作組。能源工作組於1990年成立，旨在促使能源界別對區內經濟及社會民生作出更大的貢獻，並減輕能源供應及使用對環境的影響。工作組透過加強政府決策人、技術專家、商界及規管當局的合作，致力推廣「3-E」概念，即經濟發(Economic growth)、能源穩定供應(Energy security)及環境保護(Environmental protection)。

能源工作組下設5個專家小組，另外還設有能源企業網絡及能源管理者論壇。該5個專家小組為：

- 清潔化石能源專家小組
- 能源數據及分析專家小組
- 能源效率及節約專家小組
- 能礦探勘與開發專家小組
- 新及再生能源技術專家小組

此外，亞太能源研究中心亦會向能源工作組匯報其工作。該中心的研究會按能源數據及分析專家小組所定的方針來進行。除了探討區內共同關注的能源問題外，亦會制定亞太區經濟合作組織能源供求展望報告。



最近一次新及再生能源技術專家小組會議
Latest Meeting of the Expert Group on New and Renewable Energy

工作組每年召開兩次會議。機電工程署自1992年起便參加能源工作組，並定期出席能源工作組及專家小組會議。習慣上各成員經濟體會輪流提出主辦此等會議，因此我們在1996年主辦了一次能源工作組會議，及在2001年主辦了一次能源數據及分析專家小組會議。

本署負責將工作組提供的資料分發給政府內有關人士，整理並向該組反映香港政府和商界對能源問題的意見，定期向該組提交報告及參與該組的計劃和專家小組的活動。

能源工作組現正推行數項措施，涉及的範圍包括能源穩定供應、跨境電網聯網及氣體管道網絡聯網、能源標準及標籤、能源基建發展、能源問題認知等。

APEC has established ten working groups to deal with matters in various program areas. The Energy Working Group is one of these groups. Established in 1990, the EWG serves to maximise the energy sector's contribution to the region's economic and social well-being, while mitigating the environmental effects of energy supply and its use. EWG endeavors to promote the 3-Es - economic growth, energy security and environmental protection, through cooperation among government policy makers, technical specialists, business organisations and regulators.

There are five Expert Groups under the EWG, plus the EWG Business Network and the Energy Regulator's Forum. The Expert Groups are:

- Expert Group on Clean Fossil Energy
- Expert Group on Energy Data and Analysis
- Expert Group on Energy Efficiency and Conservation
- Expert Group on Mineral and Energy Exploration & Development
- Expert Group on New and Renewable Energy Technologies

The Asia Pacific Energy Research Centre (APEREC), directed by the Expert Group on Energy Data and Analysis, also reports to the EWG. The APEREC carries out research on energy issues that are of common interest to the region, and also produces the APEC Energy Demand and Supply Outlook.

The EWG meets twice a year. As a member of EWG since 1992, EMSD representatives regularly participate in EWG and its Expert Group meetings. Member economies generally offer to host EWG and associated Expert Group meetings in succession. EMSD therefore hosted an EWG Meeting in 1996 and the Expert Group on Energy Data and Analysis Meeting in 2001.

Our department serves to disseminate EWG information to relevant parties in the government, consolidate and reflect views both from the government and business sector on energy issues to the EWG, submit regular reports, and participate in its projects as well as its expert group activities.

Currently, a number of initiatives are being undertaken by EWG. They focus on the areas of energy security, cross-border interconnection of power grids and gas pipeline networks, energy standards and labelling, energy infrastructure development, energy literacy, and so on.



九一一事件發生後，亞太經合的成員對能源穩定供應的問題日益關注，制定能源穩定供應措施成為該組首要任務之一，而已開展的活動和研究包括：蒐集每月石油數據、研究海運通道的安全問題、建立即時緊急資料通報機制、鼓勵制定緊急能源應變計劃、研究能否有共同的石油貯備等。該組認為提高能源效益及節省能源，對確保能源穩定供應相當重要。此外，使用再生能源、替代燃料及節能車輛等，亦是達到這個目的的好方法。

由於提高能源效益對經濟及環境均十分重要，因此，我們參與了能源工作組的「承諾及檢討」程序，承諾推行某些能源效益計劃，並定期檢討這些計劃的進展，藉此顯示了我們的決心，提高香港的能源效益及為節約能源這項世界性事業作出貢獻。

After the 9-11 terrorist attacks, energy security has become a major concern for APEC member economies. The Energy Security Initiative has become one of the most important EWG activities. Action and studies undertaken under the initiative include: the collection of monthly oil data, studying sea-lane security issues, establishing real-time emergency information sharing, encouraging the development of energy emergency preparedness plan, studying the feasibility of joint oil stockpiles, etc. Energy efficiency and conservation are also considered a very important aspect of energy security. Additionally, renewable energy, alternative fuels, and high efficiency vehicles are also recognised as important to energy security.

Given the importance of energy efficiency improvements for economic and environmental reasons, we also participate in the Pledge and Review process, where we make pledges regarding energy efficiency programmes and review their progress. This demonstrates our commitment to ensuring that Hong Kong becomes a more energy-efficient city and highlights our contribution to the world's efforts to promote energy efficiency and conservation.



機電工程署員工同為能源效益而努力

EMSD staff work for energy efficiency and conservation with dedication

讀者不妨瀏覽能源工作組及轄下專家小組的網頁，以尋找有用的資料。以下為一些有關的網址：

- (a) 亞太區經濟合作組織秘書處 - www.apecsec.org.sg
- (b) 亞太區經濟合作組織能源工作組 - www.apecenergy.org.au
- (c) 亞太能源研究中心(閣下可在此找到2002年亞太區經濟合作組織能源供求展望報告及其他有用資料) - www.ieej.or.jp/aperc/
- (d) 亞太區經濟合作組織能源數據庫，內有亞太區經濟合作組織成員的能源數據和總體經濟數據 - www.ieej.or.jp/apec/

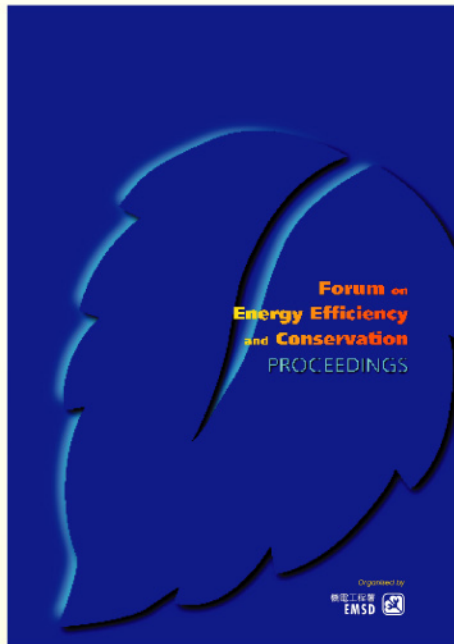
If you are interested in the work of the EWG and its Expert Groups, you can visit the EWG website to gain further information. Here are some relevant website addresses:

- (a) APEC Secretariat - www.apecsec.org.sg
- (b) APEC Energy Working Group - www.apecenergy.org.au
- (c) Asia Pacific Energy Research Centre (in this website you can find the APEC Energy Demand and Supply Outlook 2002 and other useful information) - www.ieej.or.jp/aperc/
- (d) APEC Energy Database which contains useful energy and macroeconomic data of the APEC economies - www.ieej.or.jp/apec/





最新消息 What's New



於2003年1月14日舉行的能源效益及節約能源論壇

機電工程署將於2003年1月舉辦一個「能源效益及節約能源論壇」，與會者可藉此機會，增進對亞太區以至全球能源效益及節約能源問題的認識。此外，不同地區及背景的與會者亦可就能源及可持續發展事宜交換意見，並和香港、內地及其他地區的有關機構建立聯繫。

該論壇將於2003年1月14日下午在港麗酒店舉行，預計可吸引超過180名本地及國際專家出席。

我們邀得環境運輸及工務局常任秘書長(環境)劉吳惠蘭女士主持開幕禮，並由本署署長黎仕海先生致辭。此外，4名主講嘉賓及本署助理署長利振球先生亦會在論壇上發言。4名主講嘉賓為：

- * 中華人民共和國國家發展計劃委員會基礎產業發展司副司長
王駿先生
- * 亞太區經濟合作組織能源工作組組長Mr. John Ryan
- * 美國持續發展國際中心主席Mr. John W. Spears
- * 亞太能源研究中心副所長鄭龍憲博士

發言結束後便會進行小組討論，由能源諮詢委員會主席潘樂陶先生帶領，而論壇的閉幕儀式則由本署副署長何光偉先生主持。

Forum on Energy Efficiency and Conservation, 14 January 2003

The Electrical and Mechanical Services Department (EMSD) is organising a "Forum on Energy Efficiency and Conservation" in January 2003. The Forum will provide an excellent opportunity for participants to learn about the latest development in energy efficiency and conservation with a global perspective in general and on the APEC region in particular. Participants will also be able to meet and exchange views on matters related to energy and sustainability with people from different economies and backgrounds, and to network with concerned parties from Hong Kong, Mainland China and other places.

The Forum will be held in the afternoon of 14 January 2003 at the Conrad Hong Kong and is expected to attract over 180 local and international participants.

The Forum will be opened by Mrs. Rita LAU NG Wai-lan (Permanent Secretary for the Environment, Transport and Works (Environment)), followed by a keynote address by Mr. Roger LAI Sze-hoi (Director of EMSD) as well as five presentations, made by four guest speakers and Mr. LEE Chun-kau (our Assistant Director). The four guest speakers are:

- * Mr. WANG Jun - Deputy Director, Department of Basic Industries, State Development Planning Commission, People's Republic of China
- * Mr. John RYAN - Lead Shepherd of the APEC Energy Working Group
- * Mr. John W. SPEARS - President of the U.S. International Centre for Sustainable Development
- * Dr. Yonghun JUNG - Vice President of the Asia Pacific Energy Research Centre

After the presentations, there will be a panel discussion session chaired by Mr Otto Poon (Chairman of the Energy Advisory Committee). The Forum will be closed by Mr. HO Kwong-wai (our Deputy Director).



首批車輛能源效益標籤

The First Batch of Energy Labels for Vehicles

本署最近發出首批車輛能源效益標籤，給予44款引擎容量、車身類別及傳動裝置均有所不同的汽油私家車，以便提供清晰的車輛耗油量數據，讓有意購車的人士能選購最能節省燃油的私家車。我們於2002年2月為汽油私家車推出首個車輛能源效益標籤計劃，目的是提高消費者節省燃料及改善環境的意識。有關獲發能源效益標籤的汽車型號，可瀏覽機電工程署網頁所載的註冊記錄。

We recently issued the first batch of energy efficiency labels for vehicles to a total of 44 passenger cars using petrol with different engine sizes, body types, and transmission types. The vehicle energy label provides explicit fuel consumption data on the vehicle so that car-buyers can shop for the most fuel-efficient cars. The first vehicle labelling scheme for petrol-driven passenger cars, was launched in February 2002 to raise consumer awareness of fuel efficiency and its impact on the environment. A register of the car models with energy labels is available on our EMSD website.



標籤提供耗油量資料

The label provides fuel consumption information

在灣仔政府大樓進行「附設於建築物的光伏系統」示範計劃 Building-integrated Photovoltaic (BIPV) Demonstration Project at Wanchai Tower

在上一期的「智能」中，我們曾提及在灣仔政府大樓進行「附設於建築物的光伏系統」示範計劃。該系統的安裝工程已於2002年12月完成。閣下行經大樓時，會看見大樓南面已安裝光伏板；如在附近高樓大廈的高樓層工作，必定會看見安裝在該大樓天台的光伏板。已安裝的光伏板總面積約500平方米，總額定輸出功率約55千瓦。

In our last issue, we mentioned our BIPV demonstration project at Wanchai Tower. Installation work for these BIPV systems were completed in December 2002 and if you walk by the building, you can now see the photovoltaic panels on the south side of the building. If you work on the higher floors of nearby buildings, you can probably also see the photovoltaic panels mounted on the roof. Altogether, about 500m² of photovoltaic (PV) panels with a total rated power output of about 55 kW have been installed.



安裝在天台的太陽能板

PV panels installed on the roof





新的能源效益原則互動網站

A New Interactive Website on Energy Efficiency Principles

本署現正編製新的能源效益原則互動網站，以便透過互動方式向市民灌輸能源效益的基本知識。該網站就能源基本知識、器具的能源效益、各類設備的能源效益、建築物能源效益及運輸類別能源效益等事宜提供有用的資料，並為小朋友和成年人設立遊戲區，內有互動遊戲和問答環節。該網站將於2003年首季推出，屆時，市民可透過機電工程署網址進入該網站。

We are developing a new interactive website on energy efficiency principles. The website will provide the people of Hong Kong with a basic knowledge of energy efficiency through an interactive approach. It will contain useful information on energy principles, energy efficiency of appliances, energy efficiency of different types of equipment, energy efficiency of buildings, and energy efficiency in the transport sector. The website also includes a fun zone with interactive games and quizzes for both children and adults. The website will be launched in the first quarter of 2003, when it can be accessed through EMSD's website.

進入 Enter



制定以表現為本的建築物能源守則

Development of the Performance-based Building Energy Code

我們已草擬以表現為本的建築物能源守則，擬稿現正由制定以表現為本建築物能源守則專責小組審核。該小組於2002年10月成立，成員共17人，分別來自專業機構、業界團體、學術界，以及政府決策局及部門。專責小組已於2002年11月18日舉行首次會議，成員在會上就守則提出了不少有建設性的意見。小組將於2003年年初對守則進行檢討及定稿。以表現為本的建築物能源守則擬稿，可於機電工程署網頁瀏覽及下載。成員在會上就守則提出了不少有建設性的意見。小組將於2003年年初對守則進行檢討及定稿。以表現為本的建築物能源守則擬稿，可於機電工程署網頁瀏覽及下載。



專責小組會議
Task Force Meeting

The Performance-based Building Energy Code (PBBEC) has been drafted and is being examined by the Task Force for Development of Performance-based Building Energy Code. The Task Force, established in October 2002, consists of 17 members from professional institutions, trade organisations, academia and government bureaux and departments. The Task Force's inaugural meeting, where members exchanged constructive opinions and views on the Code, was held on 18 November 2002. The Task Force will review and finalise the PBBEC in early 2003. The draft PBBEC is also available for download from EMSD's website.



新能源效益標籤計劃 New Energy Efficiency Labelling Schemes

我們已於2002年12月為鐳射打印機(辦公室設備)和抽濕機(家用器具)推出新的能源效益標籤計劃，這兩個計劃會採用「確認式」標籤而非「級別式」標籤。此外，首批共四個型號的電飯煲能源效益標籤亦已於2002年10月25日發出。

我們又計劃於2003年12月推出電視機和液晶體顯示器的新能源效益標籤計劃。

The new office equipment EELS for laser printers and the new household appliance EELS for dehumidifiers were launched in December 2002. "Recognition type" instead of "graded type" labels are being used for both schemes. Additionally, the first batch of electric rice-cooker energy labels for 4 models was issued on 25 October 2002.

In 2003, we plan to launch new schemes for televisions and LCD monitors in December.



打印機
Laser printer



抽濕機
Dehumidifier

廣泛使用淡水於節能空調系統的蒸發式冷卻塔先行性計劃

- 增加指定先行性計劃地點

Pilot Scheme for Wider Use of Fresh Water in Evaporative Cooling Towers for Energy-efficient Air-conditioning Systems

- More Designated Pilot Scheme Areas

2001年6月，我們首次將實施這項計劃的地點增加11個。2002年5月，計劃延長兩年至2004年5月31日，實施地區增至28個。於2002年12月，工作小組決定將計劃的規模再次擴大，令實施計劃的地點總數達45個。

The scheme was first expanded in June 2001 to include 11 additional areas. On 31 May 2002 the scheme was further extended for two years to 31 May 2004, covering a total of 28 designated areas. In December 2002, the working group further expanded its scope to cover a total of 45 designated areas.



氣冷轉作水冷可節省能源
Conversion of air-cooled A/C
to water-cooled A/C can achieve saving



灣仔大有大廈改裝空調系統為水冷式 Conversion to Water-cooled Air-conditioning System (WACS) At Tai Yau Building

將大有大廈原有的氣冷式空調系統改裝為水冷式空調系統的工程，已於2002年5月完成。

我們在2002年10月4日對該水冷式空調裝置進行實地考察，並與德成置業有限公司工程部高級經理馮先生會面。馮先生指出根據他對更換冷卻水塔整體費用和好處的評估，回本期為6至7年。他將來亦會為另一地盆申請參與先行性計劃。他並認為先行性計劃十分成功。

The conversion of the existing air-cooled air-conditioning system to a water-cooled air-conditioning system at Tai Yau Building in Wan Chai was completed in May 2002.

On 4 October 2002, we visited the water-cooled air-conditioning installation at Tai Yau Building in Wan Chai, and met Mr. Fung, the Senior Electrical and Mechanical Manager of Tak Shing Investment Co. Ltd. Mr. Fung reported that based on his evaluation of the overall costs and benefits of using cooling towers, the payback period would be 6-7 years. In future, he would apply to participate in the pilot scheme for another site. His view is that the scheme has been very successful.



安裝在大有大廈天台的冷卻塔
Cooling towers installed on roof of Tai Yau building



馮先生（右）與本署林先生（左）
Mr. Fung of Tak Shing Investment Co. (right) with Mr. Lam of EMSD (left)

大有大廈水冷式空調系統的技術細節

Technical Details of the Cooling Tower Installation at Tai Yau Building

總樓面面積 Gross Floor Area	23,683 平方米 23,683 m
製冷量 Cooling Capacity	4,747 千瓦 4,747 kW
新冷卻塔設備 New Cooling Tower Equipment	3台2,000 千瓦 + 1台1,480 千瓦冷卻塔 3 x 2,000 kW + 1 x 1,480 kW cooling towers
水冷式冷凍機組及相關冷水分配設備的耗電量 Electricity Consumption of Water-cooled Chillers and Associated Water Side Equipment	平均每月248,651 度電(2002年5月至9月其間) Average 248,651 kWh per month (between May - September 2002)
節省的電費 Saving in Electricity Charge	平均每月118,000 港元(2002年5月至9月) Average HK\$118,000 per month (between May - September 2002)
用水量 Water Consumption	平均每日46 立方米(2002年5月至9月) Average 46 m ³ /day (between May - September 2002)
循環再用作沖廁水的泄放水水量 Bleed-off Volume Recycled for Flushing	平均每日3.5 立方米(2002年5月至9月) Average 3.5 m ³ /day (between May - September 2002)
水費及排污費 Water Consumption and Drainage Charge	平均每月8,300 港元(2002年5月至9月) Average HK\$8,300 per month (between May - September 2002)
節省金額 Net Saving	平均每月109,700 港元(2002年5月至9月期間) Average HK\$109,700 per month (between May - September 2002)



九龍灣室內運動場的節能照明系統

Energy-efficient Lighting System at Kowloon Bay Indoor Games Hall

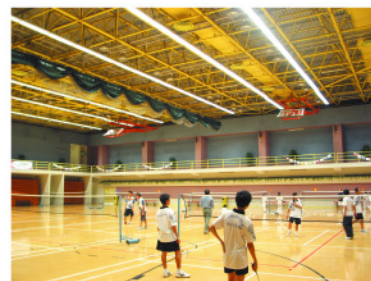
我們在2002年年初改裝九龍灣室內運動場高樓底場地的照明系統。以往採用高強度放電燈的高位照明系統，已由附有數碼調光電子鎮流器的高輸出T5熒光燈照明系統取代，燈光效果則由數碼定位照明界面系統設定。

康樂及文化事務署助理場地主管盧先生對新照明系統表示滿意，指新系統的好處多，包括可調校照明度、為場內個別球場照明、提供更舒適的視覺環境，以及可觀地節省電力開支。採用該系統及其他場地管理措施後，每月可節省逾一萬元。盧先生表示值得把這項科技推廣至其他室內運動場。

In early 2002, we retrofitted the lighting system for the high-ceilinged games hall at the Kowloon Bay Indoor Games Hall. The previous high-bay lighting system used high-intensity discharge (HID) lamps. It was replaced by a new lighting system using the latest high-output T5 fluorescent lamps, with digitally dimmable electronic ballasts, and a control system called DALI (digital addressable lighting interface) that sets the lighting scene.

The assistant venue-in-charge, Mr. Lo of the Leisure and Cultural Services Department, commented favourably on the new lighting system. He said the new system offers a number of advantages - adjustable lighting levels, the ability to provide lighting to individual courts in the hall, a more comfortable visual environment, and considerable savings in electricity expenditure.

Along with other housekeeping measures, the saving is more than \$10,000 per month. Mr. Lo said it should be worthwhile to apply this technology to other indoor games halls.



新照明系統為場地使用者提供更舒適的視覺環境
The new lighting system offers a more comfortable visual environment to players



盧先生對新的T5燈照明有良好評價
Mr. Lo was in favour of the new T5 lighting system



良好的場地管理有助節省能源
Good housekeeping can save energy



報告 Report

能源消耗量指標及基準

我們最近完成了一項研究，為商業及運輸類別的選定組別制訂能源消耗量指標及基準。本文將簡述商業類別的研究結果。至於運輸類別的研究結果，將在下一期作出簡報。

我們探索了影響商業類別中私人辦公室及商舖的能源消耗量的因素，並制訂了能源消耗量指標及基準，旨在提供資料及工具，方便商業樓宇的使用者、擁有人和物業管理人員，將其建築物的能源消耗水平，和本港其他建築物比較，以找出可以節省能源之處。

Energy Consumption Indicators and Benchmarks

We recently completed a study on the development of energy consumption indicators and benchmarks for selected groups in the commercial and transport sectors. In this issue, we look at the results of the commercial sector study. In the next issue, we will cover the results of the transport sector study.

The commercial sector study investigated the different factors affecting energy consumption in private offices and commercial outlets. The indicators and benchmarks developed will help users, owners and property management staff to compare the energy consumption of their buildings with other premises in Hong Kong and identify areas for energy savings.

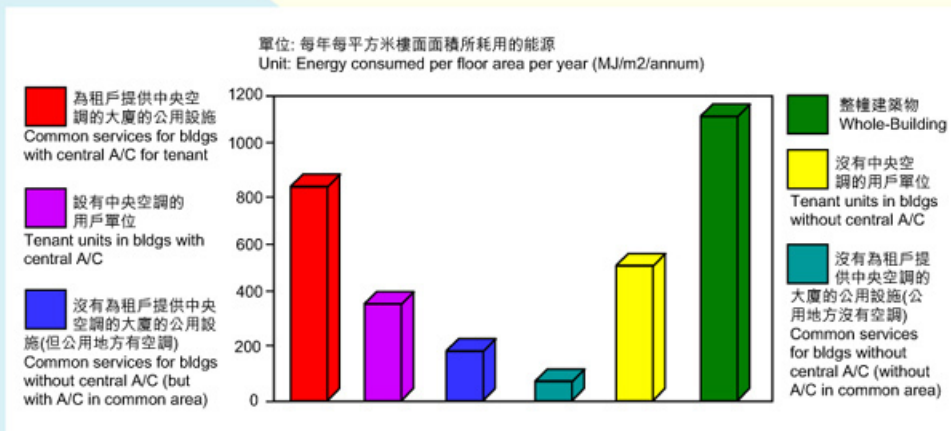


圖1 私人辦公室的能源消耗量指標平均數值

Fig. 1 Average Values of Energy Consumption Indicators for Private Offices

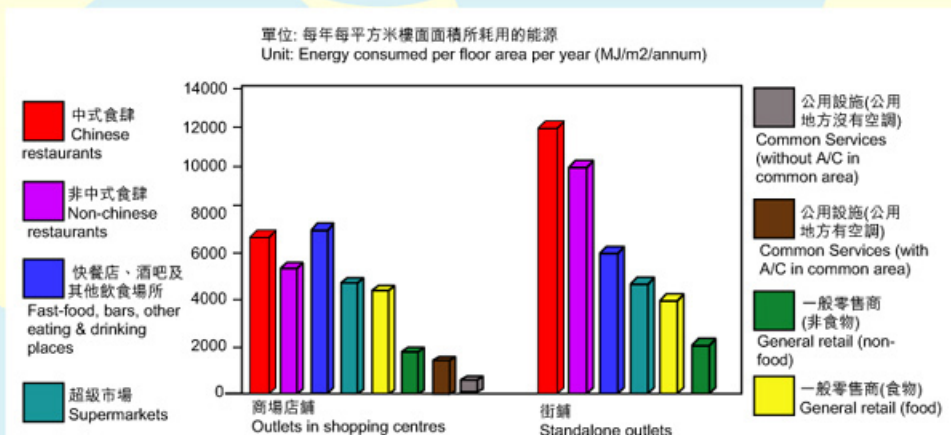


圖2 商舖的能源消耗量指標平均數值

Fig. 2 Average Values of Energy Consumption Indicators for Commercial Outlets



我們在約530幢樓宇進行實地調查、探訪及測量。其後，我們並建立了數學模型，分析能源消耗量與使用者的行為、運作和維修方法、空調及照明裝置類別等等因素的關係。利用這些分析模型，我們計算了相關的基準值。這些基準值應用在基準軟件工具中，使用者只需將資料輸入，基準軟件便會將之與其他類似建築物或車輛的資料進行比較，找出其能源消耗量水平。

我們發現影響建築物能源消耗量的主要因素，包括使用者的行為、運作及維修方法、空調系統類別、空調系統的設定溫度及照明系統的類別。我們發現只要改善運作及維修方法，並將不合能源效益標準的設備換上合標準的設備，私人辦公室及商舖可節省5%至20%能源。

與其他地區比較，本港典型辦公樓宇的能源消耗量比新加坡、馬來西亞及泰國為低，但卻比日本、韓國及菲律賓為高。

我們又開發了基準軟件工具，讓租戶、經營者或建築物管理人員將樓宇的能源消耗水平，與本港類似的樓宇比較。基準比較分兩個層面進行，第一個層面供普通使用者使用，只須輸入簡單資料，例如電費金額、樓面面積、運作時數等，有關軟件便會計算能源消耗水平，並與本港其他同類樓宇比較。至於需要較深入資料的使用者，可以作第二個層面的基準比較，俾能找出能源效益表現較差之處，並提供改善建議。

基準軟件工具載於機電工程署網頁，除了基準軟件外，在網頁內「推廣能源效益」的部分亦可找到其他關於指標及基準研究的有用資料。

Site surveys, interviews and measurements were carried out on around 530 premises. Mathematical models were developed to relate the energy consumption to factors such as occupant behaviour, operational and maintenance practices, air conditioning and lighting installations, etc. Using the models, benchmarks were computed, enabling users of the benchmarking software to identify their relative energy consumption with other similar buildings.

The study found that the major factors affecting energy consumption in buildings included occupant behaviour, operational and maintenance practices, types of air conditioning systems, the temperature set-point of the air conditioning systems, and the types of lighting systems used. It also estimated that potential energy savings of between 5% and 20% could be made by improving operational and maintenance practices and by replacing equipment with below-average energy efficiencies with average rates.

Compared with other economies, energy consumed in a typical office building in Hong Kong was found to be less than Singapore, Malaysia and Thailand, but higher than in Japan, Korea and the Philippines.

We have also developed a benchmarking software tool to enable tenants, operators or building management staff to benchmark their premises' energy consumption with other similar buildings in Hong Kong. It has two benchmarking levels. The first is targeted at general users. By entering simple data such as the energy bill amount, floor area, number of operating hours, etc, the tool will compute the energy consumption level and compare it with other similar premises in Hong Kong. For advanced users, the second benchmarking level identifies poor energy efficiency areas and offers advice on improvement measures.

This benchmarking software tool is available from EMSD's website <http://www.emsd.gov.hk> for public use. You will find this software tool together with other useful information on the indicator and benchmark study under the Promoting Energy Efficiency section of our website.



常問問題 Commonly Asked Questions

問1：有人說離開辦公室時應該關燈，但也有人說經常開關光管(熒光燈)會耗用更多能源，實在令人混淆，究竟我們應否經常開關電燈？

答案：

光管和其他電器一樣，在開啟時所需的起動功率較大(較一般額定值大數倍)，惟時間極短。根據有關理論，能源消耗量(以焦耳計算)等於電功率(以瓦計算)乘以時間(以秒計算)，例如一支40瓦的電燈持續開啟1小時會消耗144千焦耳(不包括鎮流器的能源消耗量)，因為電燈的起動時間極短，故開啟電燈所耗用的能源實在非常少。相對而言，若房間無人仍開啟電燈，則會消耗更多能源。在沒有需要使用電燈時關燈(比方說不用燈15分鐘以上)，對節省能源極有幫助。

Q1. We are often encouraged to turn off the lights when we leave our offices. On the other hand, I have heard that frequently switching fluorescent lamps on and off actually uses more energy. I find this confusing, should I or should I not switch off these lights frequently?

Answer:

Similar to other electrical appliances, fluorescent lamps do take a higher starting power (a few times the normal rate) when first lighting up, but this lasts for only a very short time. The theory is that energy consumption (in joules) is equal to power (in watts) multiplied by time (in seconds). For example, a 40W lamp running continuously for 1 hour will consume 144 kilo-joules (not counting the energy consumed by the ballast). Because of the very short starting period of the lamp, the amount of energy consumed when first switched on is actually very very small. On the other hand, leaving the lamp on when no one is in the room consumes relatively much more energy. Saving energy by switching lamps off when not required (say for over 15 minutes) is always a good energy conservation habit.





問2：零售市場上有兩種36瓦的T8光管出售，其中一款售價約為每支14元，另一款則約為25元，後者價錢較昂貴會不會是因為較省電，或者是因為生產地點不同，還是其他原因呢？



答案：

一般而言，價格較廉宜的光管是使用單色螢光粉的，而較昂貴的則使用三色螢光粉。兩種光管的外表完全一樣，但操作特性則有不同：



Q2. There are 2 types of 36W T8 fluorescent lamps available in the retail market, one costs about \$14 each and the other about \$25. Is the latter more expensive because it is more energy-efficient, or because they are manufactured in different places, or some other reasons?

Answer:

Generally speaking, the cheaper fluorescent lamps use a halophosphate coating, while the more expensive types use a triphosphor coating. The two lamp types are identical in appearance but have different operating characteristics:

操作特性 Operating Characteristics	單色螢光粉光管 Halophosphate Lamp	三色螢光粉光管 Triphosphor Lamp
流明輸出 Lumen output	2,800 流明 2,800 lumens	3,200 流明 3,200 lumens
平均額定壽命 Average rated life	8,000 小時 8,000 hours	15,000 小時 15,000 hours
顯色指數 Colour rendering index	< 60(色彩再現能力低，特別是紅色) < 60 (poor colour rendering, especially red)	> 80(顏色顯真能力較佳) > 80 (better true colour)
光量衰減 (剩餘量) Light depreciation	10,000 小時為 80% 80% at 10,000 hours	10,000 小時為 90% 90% at 10,000 hours

在能源效益方面，若電力輸入相同，三色螢光粉光管的流明輸出確較單色螢光粉光管為高。三色螢光粉光管在老化的情況下，其光量下降的比率亦會較慢。此外，由於三色螢光粉光管使用壽命較長，故亦有助減少環境污染。



As far as energy efficiency is concerned, the triphosphor lamp does produce a higher lumen output than the halophosphate lamp, for the same power input. The light output of the triphosphor lamp drops (due to aging) at a slower rate and its longer life also helps to reduce environmental pollution.

聯絡資料 Contact

任何人仕如果想就本通訊提出意見或詢問，請與我們聯絡，聯絡資料如下：

地址：香港銅鑼灣禮頓道一一一號十一樓
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 make comments or enquiries about this newsletter 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