OUR LIGHTING QUIZ 靈光小測驗

1 下列哪一項並非板載晶片發光二極管技術的好處？
(a) 體積細小
(b) 由於組裝的密度高，故燈光的光度較強
(c) 即使在近距離照明，燈光的亮度亦非常均勻
(d) 價格非常便宜

2 下列哪一種燈的壽命最長？
(a) 鎢絲燈
(b) 鎢絲鹵燈
(c) 感應式電燈
(d) 緊湊型節能熒光燈

3 緊湊型節能熒光燈與鎢絲燈比較，下列哪一項不成立？
(a) 價錢較便宜
(b) 更加節能
(c) 壽命較長
(d) 表面溫度較低

4 下列哪一種燈一般不會用作街燈？
(a) 高壓鈉燈
(b) 鎢絲鹵燈
(c) 高壓水銀燈
(d) 金屬鹵化物燈

5 關於數碼定位照明界面系統，下列哪一項屬實？
(a) 屬專利標準
(b) 除控制燈光外，亦可控制屋宇設備
(c) 採用雙向數據流動方式。送往照明設備的指令及由照明設備送出的數據反饋以相反方向傳送
(d) 使用四芯線

6 哪些是光纖照明系統的特點？
i. 在照明器使用顏色鏡或顏色輪，可令光纖線及光纖末端變換顏色
ii. 光纖線只發出少量熱力或不會發出熱力，故適用於酒架、陳列櫃等需要考慮熱力問題的用具，亦可在水中或附近有水的地方應用
iii. 照明點沒有電氣零件
(a) 全部
(b) (i)
(c) (ii) 及 (iii)
(d) (i) 及 (ii)

7 下列哪一種燈的顯色特性最佳？
(a) 金屬鹵化物燈
(b) 緊湊型節能熒光燈
(c) 高壓鈉燈
(d) 鎢絲燈

8 下列哪一種燈可在 220 伏特、50 赫茲及單相供電的情況下操作？
(a) 金屬鹵化物燈
(b) T5 熒光燈
(c) 鎢絲燈
(d) 高壓鈉燈

1 Which of the following is NOT an advantage of chip-on-board LED technology?
(a) Compactness
(b) High intensity due to packing density
(c) Good illumination uniformity even at close working distances
(d) Very low cost

2 Which of the following has the longest lamp life?
(a) Tungsten filament lamps
(b) Tungsten halogen lamps
(c) Induction lamps
(d) Compact fluorescent lamps

3 Which of the following is NOT true about compact fluorescent lamps as compared to tungsten filament lamps?
(a) Cheaper
(b) More energy-efficient
(c) Longer lamp life
(d) Lower surface temperature

4 Which of the following lamps is NOT normally used for street lighting?
(a) High pressure sodium lamps
(b) Tungsten halogen lamps
(c) High pressure mercury lamps
(d) Metal halide lamps

5 Which of the following is true about Digital Addressable Lighting Interfaces (DALI)?
(a) It is a proprietary standard
(b) It can be used to control building equipment other than lighting
(c) Information flow is bidirectional. Commands to and information feedback from fittings can flow in opposite directions
(d) The cabling consists of four-wire cables

6 Which of the following are features of fibre optic lighting ?
i. Using a colour filter or colour wheel in the illuminator, the cable fibre and fibre ends can change colour
ii. Fibre optic cable emits little or no heat, thus it is suitable for applications where heat is a concern such as for wine racks, display cases, and in or around water
iii. There are no electrical parts at the lighting points
(a) All three
(b) (i)
(c) (ii) and (iii)
(d) (i) and (ii)

7 Which of the following lamps has the best colour rendering properties?
(a) Metal halide lamps
(b) Compact fluorescent lamps
(c) High pressure sodium lamps
(d) Tungsten filament lamps

8 Which of the following lamps can operate directly on 220V, 50 Hz, single-phase supply?
(a) Metal halide lamps
(b) T5 fluorescent lamps
(c) Tungsten filament lamps
(d) High pressure sodium lamps

答案於下期公佈。有興趣的本港市民可以在十月一日前以書面方式向能源效益事務處遞交答案，全中者將有小禮物一份。
Answers will be published in next issue. Interested Hong Kong citizens can submit answers to the Energy Efficiency Office in written form before 1 October. A small present will be given to anyone correctly answering all questions.

聯絡資料 Contact
任何人士如欲就本通訊提出意見或詢問，請與我們聯絡，資料如下：
香港銅鑼灣禮頓道 111 號 11 樓機電工程署能源效益事務處
電話：(852) 2881 1651　傳真：(852) 2890 6081　電郵：eepublic@emsd.gov.hk
Anyone wishing to make comments or enquiries about this newsletter can contact us at:
Energy Efficiency Office, Electrical and Mechanical Services Department, 11/F, 111 Leighton Road, Causeway Bay, Hong Kong
Telephone : (852) 2881 1651　Facsimile : (852) 2890 6081　Email : eepublic@emsd.gov.hk

機電工程署 EMSD

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能源效益及相關事項通訊
A Newsletter on Energy Efficiency and Related Matters

EnergyWits 智能

Experience Sharing in Achieving Building Energy Efficiency
建築物節能經驗分享

二〇〇四年八月 AUGUST 2004
第六期 ISSUE NO. 6

機電工程署 EMSD

SYMPOSIUM 研討會

「安全及有效使用能源研討會」
Symposium on the Safe and Efficient Use of Energy

推廣能源效益和執行機電安全法例乃機電工程署規管服務的兩大要領。（至於營運服務則為政府不同部門及公共機構提供機電設施的操作保養及設計興建等服務。）機電署與香港工程師學會氣體及能源分部合作，於2004年2月26及27日舉辦「安全及有效使用能源研討會」，共吸引了300多人參加。

廖秀冬局長致開幕詞
Dr Sarah LIAO presenting Opening Address

我們邀請了內地、日本、美國及香港的知名專家和商界領袖出席研討會，和與會者分享其專門知識和經驗。研討會的議題相當廣泛，包括亞太區新及可再生能源的發展、國內電力事業的發展、本港電力法例、電力安全和能源效益的發展、本港氣體安全方面的成就、電廠輔機節能、本港的節能工作、新節能科技的應用等等。

我們邀得環境運輸及工務局局長廖秀冬博士致開幕詞，而除了本署署長黎仕海先生外，我們亦很榮幸能邀請到一些與香港機電安全及能源效益發展息息相關的人士致基調辭，包括：

- 能源諮詢委員會主席潘樂陶先生
  Mr Otto POON, Chairman of the Energy Advisory Committee
- 能源效益及節約小組委員會主席 Peter HILLS 教授
  Professor Peter HILLS, Chairman of the Energy Efficiency and Conservation Subcommittee
- 香港中華煤氣有限公司董事陳永堅先生，以及
  Mr Alfred CHAN, Managing Director of Hong Kong and China Gas Limited, as well as
- 立法會議員（工程界別）何鍾泰博士
  Dr. Raymond HO, Legislative Councillor for the Engineering Functional Constituency

Promoting energy efficiency & conservation and enforcing E&M safety–related legislation are the two key areas of responsibility for the Electrical and Mechanical Services Department's regulatory arm. (Our trading fund arm serves government departments and public organizations with a variety of E&M operations, maintenance and project engineering services.) As such, in conjunction with the Gas and Energy Division of the Hong Kong Institution of Engineers, we organized the "Symposium on the Safe and Efficient Use of Energy", which took place on the 26th and 27th of February 2004, and attracted over 300 participants.

A number of international specialists and business leaders from the Mainland, Japan, the United States and Hong Kong, were invited to share their expertise and experience at the symposium. The event covered a diverse range of topics, ranging from developments in new and renewable energy in the APEC region, the power sector on the Mainland, electricity legislation and electrical safety and energy efficiency in Hong Kong to achievements in gas safety, power plant energy efficiency improvements as well as new energy-saving technologies around the world.

優良的場地及豐富的內容令與會者興趣盎然
Good venue and rich contents raised the interest of the participants

FEATURE 重點分享

香港能源效益及節能獎 HONG KONG AWARDS FOR ENERGY EFFICIENCY & CONSERVATION 政府機構 IN GOVERNMENT

經驗分享工作坊
EMSD's Experience Sharing Workshop

來自公營及私營機構的講者，回答台下發問
Speakers from public and private sectors answering questions from the floor

2003年8月，本署舉辦「香港能源效益及節能獎（政府機構）」比賽，以響應環境運輸及工務局向各決策局及部門發出的減少用電呼籲。比賽共有3個獎項類別 — 以個別場地為評審單位的場地節能獎，和以決策局/部門為評審單位的星級節能獎及最佳節能方法獎。我們會將2003年10月至2004年9月全年的用電量與去年比較，以作評估。

各決策局及部門的反應熱烈，共有超過190支隊伍參與。在首半個評審階段完結後，部分參賽者的用電量明顯減少。本署決定於2004年5月25日舉辦經驗分享工作坊，邀請比賽中領先的隊伍和私人機構出席，分享節能的實際經驗。共有280名政府決策局和部門的同事及私人機構的嘉賓出席工作坊，交流實際節能做法。本文將撮要介紹工作坊中分享的其中6個成功故事。

本署亦借這個機會，頒發註冊證書給12個最近按香港建築物能源效益註冊計劃註冊的建築物擁有人和管理公司。

In support of the Environment, Transport and Works Bureau's call to government bureaux and departments to cut down their electricity consumption, EMSD launched an energy saving competition – the "Hong Kong Awards for Energy Efficiency and Conservation in Government" in August 2003. The competition consists of three award winning categories, ranging from the venue-based Venue Saver Awards to the bureau/department-based Star Saver Awards and Best Practice Awards. Assessment will primarily be based on the electricity consumption of the venue, bureau or department concerned for a full-year period from October 2003 to September 2004, in comparison to the previous year.

The response has been extremely encouraging, with over 190 teams participating in the event. In fact, assessments carried out in the first half of the competition period show that significant savings have already been achieved. In view of these positive results, we hosted an experience-sharing workshop on 25 May 2004, inviting both the leading competitors as well as organizations in the private sector to share their successful energy saving experiences with participants. A total of around 280 participants from the government and the private sector attended the event, exchanging views on the latest energy saving practices and gaining an insight into the activities of others. Highlighting the many success stories presented at the workshop, a brief summary of six of the best stories have been included in this article.

During the workshop, we also took the opportunity to present Registration Certificates to 12 building owners and management agencies who recently received registration under the Hong Kong Energy Efficiency Registration Scheme for Buildings.

講者分享寶貴經驗，與會者獲益良多
Workshop participants benefited greatly from the experiences shared by the speakers

以行政措施令學校節省可觀數量能源
School Celebrates Remarkable Savings through Improved Administration

屯門官立小學的校長鄭迪思女士介紹該校在監察及減少用電方面所採取的措施。校方採取了一系列的行政措施，例如會先考慮天氣、活動類別和出席人數等，然後才決定批准使用學校禮堂的空調，並在非繁忙時間關上升降機，把電腦及辦公室設備設於省電模式等。學校亦透過舉辦課外活動，教導學生節能知識，例如標語創作比賽、無空調日、綠化校園運動、環保時裝展、參觀濕地公園等。比賽期首季和上一年相比，該校節省了達 60% 的耗電量。

Ms D S CHENG, Headmistress of Tuen Mun Government Primary School, briefed on the measures taken by her school to monitor and reduce the use of electricity. The school introduced a number of administrative measures which included taking the weather, type of activity and attendance into consideration when using the air-conditioning system in the school hall, shutting down lifts during non-peak hours and setting all computers and office equipment to their energy saving modes. The school also promoted energy savings among students, organizing extracurricular activities such as a slogan competition, no-AC day, a "greening the school environment" campaign, an environment-friendly fashion show, visits to the wetland park, and so on. In the first quarter of the competition period, the school achieved a 60% saving in electricity consumption, as compared to the corresponding period in the previous year.

令消防處建築物節省能源 - 由高層推動的重要性
Energy Savings in Fire Services Buildings – the Importance of Commitment from the Top Management

消防處的李耀輝先生強調高層的積極推動對在該處場地實施節能措施的重要性。要培養節能文化，必須不斷推廣節能意識，並要得到員工的充分合作，採用良好的內務管理方法。此外，新的消防局亦加入節能設計，例如以較大窗戶增加日光、以自然通風減少空調需求、在天台裝設光伏板以利用太陽能、以及使用感應器將無人使用地方的燈關掉等。比賽期首季和上一年比較，該部門整體節電達 35%。

Mr Y F LEE of the Fire Services Department stressed the importance of the commitment of the top management in implementing energy saving initiatives in Fire Services buildings. He drove home the message that the continuing promotion of energy savings, hand-in-hand with the cooperation of staff in carrying out good housekeeping practices, are crucial to the creation of an energy saving culture. He also discussed the energy-efficient design features which have been incorporated into new fire stations. Larger windows maximizing daylight, natural ventilation reducing air-conditioning requirements, photovoltaic panels on roofs utilizing solar energy, and occupancy sensors turning off lighting in unoccupied areas are just some of these examples. The department as a whole achieved a 35% saving in electricity consumption in the first quarter of the competition period, as compared to the same period in the previous year.

妥善劃分設施的分區，為運動中心節省能源
Squash Centre Benefits from Better Zoning of Facilities

本署的佘少權先生介紹了香港壁球中心的節能改裝工程。過去，即使部分壁球場無人使用，但所有壁球場仍須開動空調，令冷空氣擴散至走廊。但自從為走廊安裝獨立的系統後，場館人員便可以關上無人使用的壁球場的空調。這是透過妥善劃分設施分區，從而節省大量電力的典型例子。就以壁球場為例，通過採用這類工程方案，加上良好的內務管理，其用電量減少了 50% 以上。

EMSD's Mr Kenneth SHE talked about the energy saving retrofits carried out at the Hong Kong Squash Centre. In the past, air-conditioning for all the squash courts had to be kept on throughout the day, even when some of the courts were not being used, to keep the corridors cool. However with the installation of a package unit serving the corridors alone, air-conditioning in the empty squash courts can now be turned off. This is an excellent example of how the proper zoning of facilities can lead to significant savings in electricity. In this particular case, the engineering solution together with good housekeeping practices adopted by the staff, more than halved the electricity consumption at the Centre.

香港能源效益及節能獎
HONG KONG AWARDS FOR ENERGY EFFICIENCY & CONSERVATION
政府機構 IN GOVERNMENT

透過改裝令多用途建築物節省能源
Multi-purpose Building Demonstrates Retrofit Benefits

香港生產力促進局的方湛樑先生談及該局大樓的節約能源計劃。建築物管理系統經改善後，加入了盤管式風機時間控制及電度量度等能源管理措施，室內照明裝置亦已改用電子鎮流器，並正計劃更換現有的照明器，取而代之用只需較少熒光管的照明器。該局亦正考慮將現有的氣冷式冷凍機組改為水冷式機組，這樣做可以節省總用電量約 6%。

Mr Raymond FONG of the Hong Kong Productivity Council spoke about the HKPC Building's energy conservation programme. The building management system has been enhanced to include energy management features such as fan-coil unit schedule control and metering while the interior lighting installation has been retrofitted with electronic ballasts. Planning is also underway to replace existing lighting with new fitments which use less fluorescent tubes. The organization is also looking into converting its existing air-cooled chiller plant into a water-cooled system which will save around 6% of the building's total energy consumption.

以良好設計令住宅樓宇節省能源
Energy Savings Achieved with Innovative Building Design

康業服務有限公司的郭世平先生和胡德生先生，向出席者講解一個有 1,600 多個單位的住宅發展項目的節能措施。該發展項目的停車場利用數個位於天花板的通氣口，以提供自然通風，令停車場的抽氣扇運作時間減至一年只須運作兩個月。通風口亦令停車場的人工照明需求減少。其他有效的節能措施包括：在載客升降機閒置 5 分鐘後自動關閉其通風扇和照明裝置、於水泵中使用可變頻驅動器以減少頻繁開關所需的啟動電流。

Mr S P KWOK and Mr T S WU of Hong Yip Service Co. Ltd. discussed the energy saving features in a 1,600-unit residential development. The car-park was specifically designed to make use of the ventilation openings on the roof to benefit from natural ventilation. As such, the exhaust fans in the car-park only need to be used for two months in the entire year. The openings have also reduced artificial lighting needs within the car-park. Further innovations include the automatic shutdown of ventilation fans and lighting in passenger lifts, when they have been left unused for 5 minutes, and the use of variable frequency drives in the water pumps to cut down the starting current required during their frequent on/off operation cycles.

以良好內務管理令辦公大樓節省能源
Office Building Saves Energy through Good Housekeeping

土木工程署的余惠明女士介紹該署大樓所實施的節能措施，該大樓是一幢有 24 年樓齡的政府辦公大樓，內有約 1000 名員工。該署在照明及空調開關掣附近貼上「節省能源」的貼紙，以作提示。員工已養成良好習慣，若為最後一個離開辦公室的人，必定會檢查和關掉所有設備。護衛員會在辦公時間後巡視公眾地方和工作地方，確保所有不需要的設備均已關上。事實上，良好的節能內務管理習慣已成為該署的機構文化。比賽期首季和上一年比較，該大樓節電達 17%。

Miss Andromeda YUE of the Civil Engineering Department introduced the many energy saving measures taken in the Civil Engineering Building, a 24 year-old government office building accommodating about 1000 staff. "Save energy" stickers were placed near lighting and AC switches as reminders to staff to conserve energy. Staff also developed the excellent practice of switching off all equipment if they were the last person to leave the office. Additionally, security guards inspected public and work areas after office hours to ensure that all unused equipment was switched off. These positive energy-saving housekeeping measures have now become an intrinsic part of the organization's culture. A 17% saving in electricity consumption was recorded in the first quarter of the competition period, as compared to the corresponding three months in the previous year.

SPECIAL TOPIC 專題

Cooling Towers 冷卻塔 for Energy-efficient Air-conditioning Systems

工作原理 Working Principles

蒸發式冷卻塔是水冷式空調系統普遍採用的一種排熱設備。起著冷凝作用的水被泵到冷卻塔的頂部，在塔內經填充物料往下流動，在這個過程中，水流會轉化為水滴。當水滴滴下時，水會受空氣的上升氣流影響而冷卻，再而掉入冷卻塔底部的水漕內，然後泵回冷凍機組，再次發揮其冷凝的作用。在冷卻塔內，水溫可被降低約 5 至 10°C。

冷卻塔須使用水來操作，其總耗水量包括被蒸發的水、泄放水和漂水。蒸發率視乎進入空氣的性質條件而定；泄放率視乎所選擇的水處理方法而定；漂水率則可透過安裝滅霧器和進風百葉從而降低。

Evaporative cooling towers act as heat rejection equipment and are commonly used in water-cooled air conditioning systems. Water, acting as the condensing agent within the chiller, is pumped to the top of the cooling tower structure. It then flows down through the fill materials inside the system. During this process the stream of water is turned into droplets. As it falls, the water is cooled under the influence of an upward current of air, collecting in a basin at the base of the tower where it is pumped back once again to serve as the condensing agent. In the cooling tower, the water cools down by 5 to 10°C.

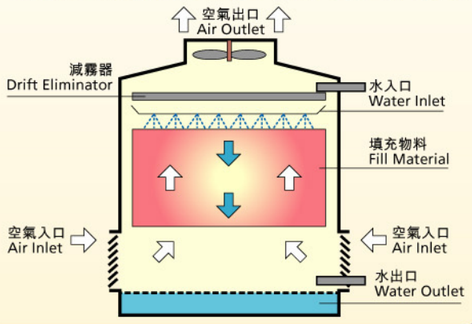
Some water, consisting of evaporation, bleed-off and drift from the cooling tower, is used during the cooling tower's operation. The rate of evaporation depends on the psychometric conditions of the entering air, the bleed-off rate depends on the type of water treatment method selected, while the drift rate can be reduced by installing drift eliminators and intake louvres.

冷卻塔分類 Classification of Cooling Towers

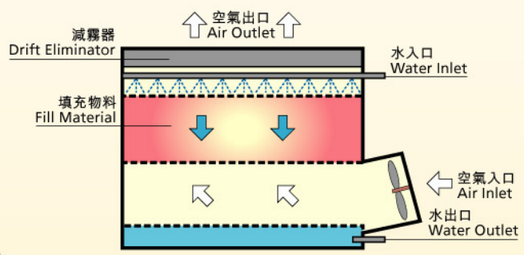
我們可按風扇的位置和流體的流動方式把冷卻塔分為4類：

Depending on the disposition of the fan and the flow pattern of the fluids, cooling towers can be classified into four main types:

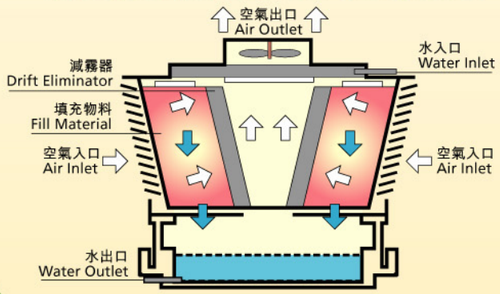
1 抽風式反向流動冷卻塔 Induced Draught Counter Flow Cooling Towers



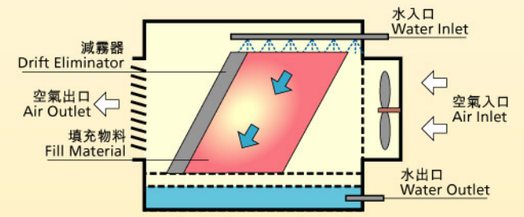
2 鼓風式反向流動冷卻塔 Forced Draught Counter Flow Cooling Towers



3 抽風式橫向流動冷卻塔 Induced Draught Cross Flow Cooling Towers



4 鼓風式橫向流動冷卻塔 Forced Draught Cross Flow Cooling Towers



安裝、操作及保養 Installation, Operations and Maintenance

在空調系統內使用冷卻塔無疑可節省能源，不過，為確保冷卻塔的操作安全有效，妥善的安裝方法以及良好的操作及維修方式，至為重要。

應小心選擇安裝冷卻塔的位置。從冷卻塔排出的空氣不應太接近其他進風口（例如空調系統的新鮮空氣進風口或打開的窗戶）。另一方面，冷卻塔本身的進風口應遠離排氣口（例如廚房或洗手間的排氣口）。冷卻塔的安裝位置應與患重病者或長者聚集的地點或人群通常聚集的地點保持合理距離。

妥善操作及維修亦十分重要。應處理冷卻塔系統內的冷卻水，以防止金屬部分被腐蝕、銹皮的形成、生物膜滋長和細菌滋生。對付這些問題，市面上有多種物理性和化學性的產品可供選擇，但當中沒有一個處理方法比其他方法特別優勝。要有效控制腐蝕及防止銹皮形成，可加入適量的抗腐蝕劑。要抑制生物膜及細菌滋生，可選用物理方法（例如使用紫外線或過濾器）或化學方法（例如使用適量的氧化殺菌劑、非氧化殺菌劑或臭氧），來處理冷卻水。

冷卻塔應定期清潔和消毒。《預防退伍軍人病症工作守則 2000》已定出清潔和消毒的最少次數，清潔和消毒次數亦當因應水質和冷卻塔安裝位置而增加。此外，應定期測試冷卻水的異營性菌落數目（Heterotrophic Colony Count）和是否含有退伍軍人病菌。

Without a doubt, using cooling towers for air-conditioning systems can save energy. However, proper installation, responsible operations and careful maintenance practices are essential for their safe and effective operation.

Locations for cooling towers need to be chosen carefully. Discharged air from cooling towers should not be too close to air entry points, such as the fresh air intake point of an air conditioning system or an open window. At the same time, air inlets for cooling towers should also be kept away from air exhaust, such as kitchen exhaust or toilet exhaust. Cooling towers should also be located a reasonable distance from where acutely ill or elderly people live or gather, or where crowds are usually present.

Proper operation and maintenance is also extremely important. A cooling tower system needs to have its cooling water treated to prevent corrosion of metallic parts, the formation of scale or the growth of biofilm, or bacteria. Combatting these problems, several physical and chemical treatment products are available in the market, but no single method stands out above the others. To control corrosion and scale formation, using corrosion inhibitors have proven to be effective. To suppress the growth of biofilms or bacteria, physical treatment methods such as the use of ultra-violet light or filtration, or chemical treatment methods such as oxidizing biocides, non-oxidizing biocides or ozone, can be applied to treat the cooling water.

Cooling towers also need to be cleaned and disinfected regularly. The baseline frequency is included in the *Code of Practice – Prevention of Legionnaires' Disease 2000*, with the necessary frequency increasing where the water quality or the location of the cooling tower requires it. The cooling water should also be tested regularly for Heterotrophic Colony Count (HCC) and Legionella.

建築物能源守則及香港建築物能源效益註冊計劃

Hong Kong's Building Energy Codes & Energy Efficiency Registration Scheme for Buildings


The Hong Kong Energy Efficiency Registration Scheme for Buildings

Certificate of Registration

This is to certify that

"Energy Efficient Building" (specimen)

has participated in this scheme under this registration no. "1000" and is in compliance with the "Performance-based Building Energy Code" (specimen).

Date of issue 1 April 2004

(Original will be signed)
(UY Tat-ping)
for Director of Electrical and Mechanical Services

EMSD

在香港，建築物耗用了大量能源。因此，具能源效益的建築物對整體節約能源十分重要。建築物能源守則為建築物及屋宇裝備設計者提供指引，幫助他們設計出減少用能的樓宇。符合一本或多本能源守則所列規定的建築物，可根據香港建築物能源效益註冊計劃進行註冊。註冊的效用在於向公眾宣告該建築物為具能源效益的建築物。

With buildings in Hong Kong consuming so much energy, energy-efficient buildings will be able to help protect the environment and conserve energy for a sustainable future. Building Energy Codes have therefore been drawn up to provide guidance on how to construct buildings and other building services installations that will use less energy. If a building complies with one or more requirements under Hong Kong's Building Energy Codes, it can be registered under the Hong Kong Energy Efficiency Registration Scheme for Buildings. Registration under the Scheme establishes that the building has been designed and built as an energy-efficient structure.

建築物能源守則

現時能源效益事務處出版了五本守則。其中四本被稱為規範守則，因為守則中規範了某些特定項目的最低能效標準。特定項目的例子有：照明裝置中的照明功率密度及電燈控制器損耗、空調裝置中的冷凍機性能系數及風機功率損耗等。

以下規範守則於 1998 年至 2000 年間陸續推出：

- **照明裝置能源效益守則**
- **空調裝置能源效益守則**
- **升降機及自動梯裝置能源效益守則**
- **電力裝置能源效益守則**

規範守則中所列規定直接而且具體，因此要判斷是否符合某一規定並無特別困難之處。但是規範的方法並不能顧及建築物不同的組成部份之間的相互關係（例如窗戶類型的改變引致照明及空調上的改變）。此外，這些守則亦往往未能把新科技和創新設計納入其中。

因此，本署於 2003 年推出了**成效為本建築物能源效益守則**（簡稱成效守則）。在成效為本的方法下，我們必須利用建築物能源模擬軟件（例如 CarrierHAP、TRACE700 及 VisualDOE 等），計算設計中建築物及參考建築物的每年能源消耗量。參考建築物乃是一棟和設計中建築物結構上相似，且符合四本規範守則的建築物。若果設計中建築物的能耗表現比參考建築物為佳，則可視之為符合了成效守則。這方法的好處是會顧及建築物能源消耗量的所有因素及其相互關係，容許各屋宇裝備系統在能源表現上取長補短，並可以容納創新的設計。

不少國家已在其建築物能源守則中採用以成效為本的方法，例如美國、加拿大、英國、瑞士、瑞典、挪威、澳洲和新西蘭等。

除了本署負責的守則外，屋宇署亦出版了另一能效守則，即樓宇總熱傳送值守則。該守則是以法定方式，依據建築物（能源效益）規則而施行。

Building Energy Codes

Currently, five Codes have been established and published by our Energy Efficiency Office. Four are "Prescriptive Codes" with minimum energy efficiency standards being prescribed for various "controlled items" listed under the Codes. Examples of "controlled items" include lighting power densities and lamp controlgear loss in the case of lighting installations, as well as chiller coefficient-of-performance and fan power loss in the case of air-conditioning systems.

The four Prescriptive Codes were implemented between 1998 to 2000 and consist of the:

- Code of Practice for Energy Efficiency of Lighting Installations
- Code of Practice for Energy Efficiency of Air Conditioning Installations
- Code of Practice for Energy Efficiency of Lift & Escalator Installations
- Code of Practice for Energy Efficiency of Electrical Installations

助理署長 / 能源效益黃達平先生向香港中華煤氣有限公司的陳達雄先生頒發註冊證書
Mr UY Tat-ping, Assistant Director / Energy Efficiency, presenting Registration Certificate to Mr Ronald CHAN of Hong Kong and China Gas Co. Ltd.

Requirements listed in the Prescriptive Codes are specific and explicit, and it is relatively straightforward to judge whether a particular requirement is in compliance with the Code. However, the prescriptive approach does not take the interaction between different building system components into account, for example a change in window type can affect both lighting and air-conditioning requirements. Similarly, new technology and design developments are not addressed by the Codes.

This therefore led to the development of the **Performance-based Building Energy Code** which was published in 2003. Under this performance-based approach, the total annual energy consumption of the building being designed, must be computed using building energy simulation software (such as CarrierHAP, TRACE700, VisualDOE, etc), together with a "reference building". The "reference building" must be similar to the building being designed while also complying with the four Prescriptive Codes. If the energy performance of the building being designed provides improvements over the reference building, the Performance-based Code is deemed to be complied with. The advantage of this approach is that it takes into account the various elements of the building's energy consumption, addresses their interrelationships, allows trade-offs to be made between them, and provides room for more innovative design.

Many countries around the world have already adopted this performance approach in their building energy codes, with systems in place in the US, Canada, the UK, Switzerland, Sweden, Norway, Australia and New Zealand, among others.

In addition to the Codes published and managed by the Energy Efficiency Office, a further Building Energy Code is managed by the Buildings Department – the Code of Practice for Overall Thermal Transfer Value in Buildings. This Code acts as a statutory requirement under Hong Kong's Building (Energy Efficiency) Regulations.

香港建築物能源效益註冊計劃

該自願參與的計劃在 1998 年推出。建築物設計者要就每一項的申請向能源效益事務處提交相關資料，証明所設計的建築物符合了一本或多本能效守則所列的規定。經批核後，有關建築物會獲發註冊證書。註冊證書確認該建築物能源效益所達的水平。凡與註冊建築物有關的文具和宣傳品，均可展示計劃的標誌，從而提高該建築物的環保形象，亦帶出負責機構對環保不苟的形象。註冊建築物列表亦會在本署網站向公眾發佈。

截至 2004 年 6 月為止，我們已為 234 棟建築物發出了 355 張註冊證書。當中 68% 是政府建築物，其餘為私人建築物。該計劃的累計節約量估計值達 1.15 億港元。估計日後會有更多建築物符合能效守則所列的規定，並按計劃進行註冊，可以節省的能源數量將會十分可觀。

本署會定時檢討能效守則。下一次的檢討將於 2004 年年底進行。我們亦正考慮以法定的方式規定建築物必須符合能效守則。此外，我們亦考慮把註冊計劃擴展至涵蓋能源審核，即按指定程序進行能源審核，並証實節能數額的建築物將獲發註冊證書。

The Hong Kong Energy Efficiency Registration Scheme for Buildings

This voluntary Registration Scheme was launched in 1998. To join the Scheme, the building's designer must provide the Energy Efficiency Office with relevant information demonstrating the building's compliance with one or more of the Building Energy Codes. Upon approval, a Registration Certificate is issued for the building. The Certificate recognizes the building's energy efficiency achievements. Recognition also means that the building's stationery, marketing and promotional materials can display the Scheme's logo, promoting its environmental awareness and responsible corporate image. The full list of registered buildings is also publicized on our EMSD website.

As of June 2004, 355 registration certificates for 234 buildings had been issued 68% of which are government buildings. The cumulative energy savings resulting from the Scheme have been estimated at HK$115 million. The potential for energy savings is even greater in the future as more and more buildings are designed to comply with the Codes and are registered under the Scheme.

The Building Energy Codes are reviewed regularly with the next round of reviews to be conducted at the end of 2004. The Energy Efficiency Office is also considering the regulatory possibility of making it a legal requirement for buildings to comply with the Codes. Looking at the Registration Scheme, consideration is currently being given to extend the Scheme to also cover energy auditing. With this development, buildings having completed energy audits according to recognized guidelines and procedures and with demonstrable energy savings would receive a Registration Certificate.

房屋委員會的彩明商場是首幢根據成效守則註冊的建築物
Housing Authority's Choi Ming Shopping Centre is the first building making use of the Performance-based Building Energy Code for registration under the Scheme

梁偉敏先生及李偉興先生以成效守則為主題作演說後接受香港電器工程商會關新全先生致送紀念品
Mr. Welman LEUNG and Mr. David LI accepting souvenir from Mr KWAN Sun-chuen of the Hong Kong Federation of Electrical & Mechanical Contractors, after making a presentation on Performance-based Building Energy Code

至於計劃及守則的詳細資料，以及相關刊物，都可在本署網站免費下載：**http://www.emsd.gov.hk/emsd/chi/pee/eersb.shtml.**
Detailed information on the Scheme and the Codes, together with associated publications, is available, together with free downloads of the information, on our web-site at: **http://www.emsd.gov.hk/emsd/eng/pee/eersb.shtml.**

能源標籤印上本署企業標誌
Energy Labels Now Carry the EMSD Logo

本署為能源標籤的設計作出了些微改動，加入了本署的企業標誌。有關改動已於 2004 年年初生效，我們已通知有關的家庭電器及辦公室設備製造商、進口商和本地代理。

Energy labels now bear a new look, with a design revision incorporating the EMSD logo onto the new labels. Manufacturers, importers and local agents of household appliances and office equipment have been informed of this change, which took place in early 2004.

Energy Labels

節能空調系統的蒸發式冷卻塔廣泛使用淡水先行性計劃 - 再延長兩年並增加指定地區
Pilot Scheme for Cooling Towers Extended for Further Two Years with Coverage to More Designated Areas

2004 年 5 月，該計劃的工作小組決定將計劃延長兩年，直至 2006 年 5 月 31 日為止，而範圍則增至共 57 個指定地區。

該計劃於 2000 年 6 月 1 日首次推出，於 6 個指定地區推行，為期兩年。其後延長兩年至 2004 年 5 月 31 日，並加入新的指定地區。任何人士如對計劃有興趣或想得悉其建築物是否位於計劃的推行地區內，可瀏覽以下機電工程署網頁，網址為：**http://www.emsd.gov.hk/emsd/chi/pee/wacs.shtml.**

由於與使用氣冷式冷凝器比較，使用冷卻塔能大大減低空調系統的用電量，故參與計劃並轉用冷卻塔，實在是裝置擁有人節省電費的良機。改裝後數年內，所節省的錢已將足以抵銷改裝費用，而之後所省下的錢會成為淨賺的數目。

In May 2004, the Working Group of the Pilot Scheme for Cooling Towers made the decision to extend the scheme for a further two years to 31 May 2006 while also expanding its scope to cover a total of 57 designated areas.

The scheme was first launched on 1 June 2000 for two years in six designated areas. It was subsequently extended to 31 May 2004, with the addition of several new areas. If you would like more information on the scheme or to find out whether your building falls within the scheme's designated areas, please just visit our website at the following address: **http://www.emsd.gov.hk/emsd/eng/pee/wacs.shtml.**

As cooling towers significantly reduce electricity consumption in air-conditioning systems when compared to air-cooled condenser systems, the scheme offers an excellent opportunity for building owners to switch from air-cooled systems, and save on their electricity bill. The savings made will cover all conversion costs within a few years, with savings then turning into net earnings.

Pilot Scheme for Cooling Towers

電視機及液晶體顯示器的能源效益標籤計劃
Energy Efficiency Labelling Schemes for TV Sets and LCD Monitors

電視機及液晶體顯示器自願參與能源效益標籤計劃已於2003年12月推出。

現時，我們共為13種電器推出能源效益標籤計劃，當中包括家用電器及辦公室設備：雪櫃、冷氣機、洗衣機、電動乾衣機、慳電膽、儲水式電熱水爐、電飯煲、抽濕機、電視機、影印機、多功能辦公室設備、鐳射打印機和液晶體顯示器，而氣體用具的標籤計劃亦會於今年年底時推出。

能源標籤的作用，是讓消費者能得悉個別產品的用電量和節能資料，從而作出選擇，並令節能產品能廣獲接納。

Voluntary Energy Efficiency Labelling Schemes (EELSs) for TV sets and LCD monitors were launched in December 2003.

EELSs now covers thirteen different electrical appliances, including both household appliances and office equipment: refrigerators, room coolers, washing machines, electric clothes dryers, compact fluorescent lamps, electric storage water heaters, electric rice-cookers, dehumidifiers, TV sets, photocopiers, multifunction devices, laser printers, and LCD monitors. At the end of 2004, gas appliances will also be included on the list.

The energy labels keep customers informed of the product's energy consumption and efficiency, enabling them to make informed choices while also ensuring that energy-efficient products gain wider acceptance within the community.

Energy Efficiency Labelling Schemes

機電工程署科技展
Our EMSD Technology Exhibition

我們於2004年4月26至27日於中央圖書館舉行了首個機電工程署科技展，向其他政府部門介紹本署應用的新科技。能源效益事務處在活動中展出水冷式空調系統、區域性供冷及可再生能源的展品，參觀者對這些展品深感興趣。

We organized the first EMSD Technology Exhibition on 26th~27th April 2004 at the Central Library. The exhibition introduced new technology applications to other government departments. Displays arranged by the Energy Efficiency Office included exhibits on water-cooled air-conditioning and district cooling systems, as well as the latest developments on renewable energy. Visitors showed a great interest in these exhibits.

EMSD Technology Exhibition

「晴朗的天空」贏得ASTRID獎
"The Story of Lang" Wins ASTRID Award

能源效益事務處的宣傳DVD影碟「晴朗的天空－探索能源效益的旅程」贏得美國MerComm Inc.主辦的第十四屆國際ASTRID比賽教育錄影帶類別銀獎。

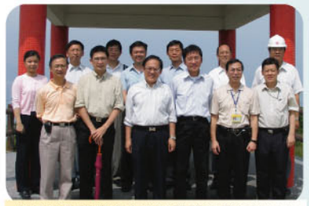
有關獎項是頒發給具創新意念及製作質素一流的參賽作品。多年來，共有來自40多個國家及地方超過3,600件作品參賽。對能源效益事務處來說，這次得獎實屬莫大鼓舞。

EEO's promotional DVD "The Story of Lang – A Journey to the World of Energy Efficiency" won the Silver Award for educational videos at the 14th International ASTRID Awards Competition organized by MerComm Inc. in the United States .

Winners are judged for the excellence of their concept creativity, clarity and production quality. Over the past few years, over 3,600 entries from more than 40 countries and locations around the world have participated in the competition. Winning this prestigious award has provided tremendous encouragement to our Energy Efficiency Office.

ASTRID AWARD

第二個測風站及未來的風力發電機組
EMSD's Second Wind Monitoring Station and the Introduction of Prospective Wind Turbines



能源效益事務處人員視察南丫島未來風力發電機選定地點
Energy Efficiency Office staff visiting the chosen wind turbine site at Lamma Island

機電工程署已於6月底在咪甸乍山建立第二個風力監測站，該監測站設有一個50米高的管狀塔，由數條纜索固定位置，塔身不同高度均設有風速計和風向計。這個風力監測站會蒐集一年多的風力資料，以供評估該區的風力發電潛力。我們的首個監測站是一個10米的高塔，設於政府物料營運中心天台，已投入運作超過6個月時間，為我們提供寶貴數據，供進一步分析。

同樣令人興奮的，是香港電燈有限公司將會在南丫島北部興建一座商業級風力發電機，和中華電力有限公司亦已著手為一座商業級風力發電機進行選址的研究。

2004年5月17日，本署人員到訪南丫島香港電燈有限公司為其風力發電機選定的地點。在風力發電機建成後，大家將可以由鴨脷洲看到這個設施，且定必和其他地方的風力發電機一樣，成為南丫島的旅遊景點。

In late June, EMSD saw the erection of its second wind monitoring station, at Pottinger Peak. The station consists of a 50-metre tubular tower, stabilized by guy wires. Anemometers and wind vanes, installed at different levels of the tower, will gather wind data over the next year, to assess the wind's energy potential in the region. The first station, consisting of a 10-metre tower located on the roof of the Government Logistics Centre, has been in operation for the past six months, yielding valuable data for analysis and evaluation.

Equally exciting is the news that Hongkong Electric Co. Ltd. will be building a commercial wind turbine in the northern part of Lamma Island, while CLP Power Hong Kong Ltd. is also looking into identifying suitable sites for a commercial wind turbine.

On 17 May 2004, EMSD visited the site for Hongkong Electric's wind turbine. When erected, the turbine will be visible from Ap Lei Chau, and is expected to become a major tourist attraction, following in the footsteps of many other wind turbines around the world.

咪甸乍山風力監測站的塔桿
Tower pole of Pottinger Peak Wind Monitoring Station

EMSD's Second Wind Monitoring Station
The Introduction of Prospective Wind Turbines

新刊物
New Publications

本署推出了幾本關於能源效益和可再生能源的新刊物，這些刊物可於能源效益事務處免費索取，亦可於本署網頁下載。此外，耗油量計算尺亦在各油站、各區民政處及運輸署各牌照事務處派發。

We recently released a number of new publications on both energy efficiency and renewable energy. Copies of these publication are available free of charge from our Energy Efficiency Office while softcopies can also be downloaded from our website. A free "Fuel Economy Calculator" is also being handed out at petrol stations, District Offices, and Licensing Offices of the Transport Department.

建築物能源效益及節約指南
Energy Efficiency and Conservation for Buildings

這本小冊子載有關於如何減少建築物能源消耗量的資料和貼士，包括建築物座向和外牆、空間設計、外部遮光裝置、照明裝置、小功率及辦公室設備、空調裝置等，題材廣泛，應有盡有。本刊物以各行各業的讀者為對象，包括發展商、建築師、屋宇裝備工程師、設施管理人及住戶。

This booklet provides useful information and tips on how to reduce energy consumption in buildings. It covers such diverse aspects as building orientation and the building envelope, the planning of space, external shading devices, lighting installations, low voltage and office equipment, air-conditioning installations, and so on. The publication targets a wide spectrum of readers, ranging from developers, architects, and building services engineers to facility managers and tenants.

感應電燈指引
Guidelines on Energy Efficiency Equipment Induction Lamps

齊來認識可再生能源
Know More About Renewable Energy

這本小冊子主要講解為何要採用可再生能源、可再生能源科技的種類、適合本港採用的可再生能源科技、本港現時應用這些科技的情況，以及有關社會及經濟方面的問題。

This booklet addresses the reasons for adopting renewable energy, the different renewable energy technologies and their suitability for Hong Kong, the present status of these renewable energy technologies in Hong Kong, together with related social and economic issues.

能源審核指引
Guidelines on Energy Audit

我們於 2004 年 5 月出版新的「能源審核指引」，以取代由能源諮詢委員會於 1993 年出版的舊版本。新指引的內容比舊版本更為豐富，題材也較廣泛，例如如何進行能源審核、能源審核報告的格式、如何實施已認定的能源管理機會，以及有關管理、培訓和宣傳等事宜。此外，指引亦包括了不少記錄表、表格和檢查清單，令指引更實用。

The new edition of our "Guidelines on Energy Audit" was published in May 2004, replacing the previous version issued by the Energy Advisory Committee in 1993. The new Guidelines are more comprehensive than the earlier version, covering topics such as how to conduct energy audits, format of energy audit reports and how to implement identified energy management opportunities, while also including related management, training and publicity information. Providing practical tools for users, log sheets, forms and checklists have also been incorporated into the Guidelines .

T5 熒光燈指引
Guidelines on Energy Efficiency Equipment T5 Fluorescent Lamps

理想的家庭電器應貼有能源標籤
Your Ideal Household Appliances Should Have Energy Labels

這本小冊子最近更新，涵蓋了目前已納入標籤計劃的所有家庭電器種類。

This booklet has been revised to include all household appliance types currenty covered by the Labelling Scheme.

節省燃油 保護環境
Save Fuel, Save the Environment

耗油量計算尺
Fuel Economy Calculator

「耗油量計算尺」是一份連帶有計算尺的袋裝記錄卡。記錄卡用來記錄行車里數及燃油耗用量資料，而計算尺則可用來找出車輛的耗油率及二氧化炭排放率。

The "Fuel Economy Calculator" is an integrated pocket-size record card and slide rule. The record card records the fuel consumption and mileage of the vehicle, while the slide rule helps to calculate the car's fuel consumption and CO_2 emission rates.