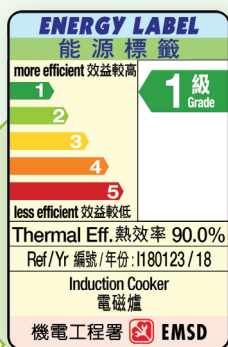


智能 EnergyWits

強制性能源效益標籤計劃第三階段 正式全面實施

Full Implementation of the Third Phase of Mandatory Energy Efficiency Labelling Scheme



強制性能源效益標籤計劃第三階段
已於2019年12月全面實施

Full Implementation of the Third Phase
of Mandatory Energy Efficiency Labelling
Scheme from December, 2019

於啟德發展區的區域供冷
系統採用建築信息建模
Adoption of Building Information
Modelling (BIM) for District Cooling
System at the Kai Tak Development

區域供冷系統獲C40認為「我們想要的
未來」~「綠色科技」

The Future We Want - Recognition of
District Cooling System by C40 as
Green Technologies

認識及預防退伍軍人病
Understanding and prevention of
Legionnaires' disease

光伏板在香港的實際發電表現
Actual Electricity Generating
Performances of Photovoltaic
Panels in Hong Kong

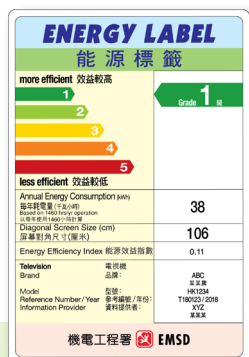
同行25載 節能創未來
Energy Efficiency Office
25th Anniversary

「重新校驗培訓課程及從業員
註冊計劃」已於2019年底推出
"Retro-commissioning Training
and Registration Scheme"
launched in late 2019

「採電學社」
EnergyWits

強制性能源效益標籤計劃第三階段已於2019年12月1日全面實施

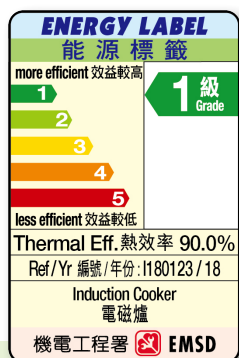
Full Implementation of the Third Phase of Mandatory Energy Efficiency Labelling Scheme from 1 December, 2019



■ 電視機能源標籤
Energy Label for Televisions

本地製造商或進口商在本港供應的訂明產品必須屬已獲機電工程署編配參考編號的表列型號，及貼上指定格式的能源標籤。而零售商及批發商亦須確保供應的產品附有能源標籤，才可在本港供應。任何人如供應沒有適當貼上能源標籤或條例下非表列型號的訂明產品，即屬違法，一經定罪，可處罰款10萬元。

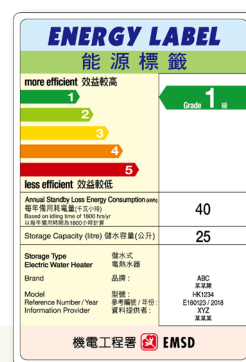
A prescribed product being supplied by local manufacturers or importers shall be a listed model having a reference number assigned by the Electrical & Mechanical Services Department (EMSD) and bearing an energy label that complies with the specified requirement. Retailers or wholesalers shall ensure that a prescribed product being supplied by them is a listed model and bears an energy label. Any person who supplies a prescribed product that does not properly bear an energy label or is not a listed model under the Ordinance will commit an offence and is liable to a fine of \$100,000 upon convictions.



■ 電磁爐能源標籤
Energy Label for Induction Cookers

強制性能源效益標籤計劃第三階段已於2019年12月1日起全面實施。第三階段涵蓋三種新電氣產品，包括電視機、儲水式電熱水器及電磁爐，亦擴展了兩類現有產品的涵蓋範圍，包括具製冷和供暖功能的逆轉循環型空調機及洗衣量超過7公斤但不超過10公斤的洗衣機。

The third phase of the Mandatory Energy Efficiency Labelling Scheme (hereinafter called MEELS) has been fully implemented since 1 December, 2019. The third phase of MEELS has extended the coverage to three more types of prescribed products, namely televisions, storage type electric water heaters and induction cookers. The scope of two types of existing prescribed products has also been extended to include reverse cycle type room air conditioners (both cooling and heating performance) and washing machines with rated washing capacity from exceeding 7kg to not exceeding 10kg.



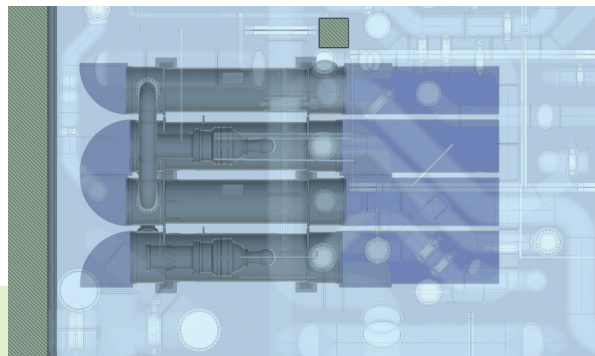
■ 儲水式電熱水器能源標籤
Energy Label for Storage Type Electric Water Heaters

具能源效益的產品不但消耗較少能源，亦有助保護環境，長遠更可幫助市民節省電費開支。能源標籤把產品的能源效益分為五級，方便消費者選擇具能源效益的產品。獲得第一級能源標籤的產品，表示其能源效益最高。如欲瞭解更多強制性能源效益標籤計劃的詳情，可瀏覽機電工程署的「能源標籤網」，網址為<https://www.emsd.gov.hk/energylabel>。如本地製造商或進口商希望查閱有關各類訂明產品能源標籤的規定和技術細則，也可參考已上載於「能源標籤網」的《產品能源標籤實務守則2018》。

Energy efficient products consume less energy and help protect the environment. They also help save consumers' cost in electricity. To help consumers choose energy efficient products, MEELS classifies the energy performance of products into five grades. A product with Grade 1 energy label means that it is the most energy efficient. For details of MEELS, please visit the EMSD's "Energy Label Net" at <https://www.emsd.gov.hk/energylabel>. Local manufacturers and importers can also obtain technical details and requirements of energy labels for the prescribed products from the "Code of Practice on Energy Labelling of Products 2018", which is also available at the "Energy Label Net".

於啟德發展區的區域供冷系統採用建築信息建模

Adoption of Building Information Modelling (BIM) for District Cooling System at the Kai Tak Development



■ 樓宇廠房的空間規劃（區域供冷系統北廠）（圖1）
Building plant space planning (NDCS plant) (Fig. 1)

能源效益事務處自2009年開始分階段為啟德發展區落實區域供冷系統，現已陸續投入使用中。啟德發展區的總規劃面積超過三百二十公頃，已規劃的公共和私人非住宅發展項目空調樓面面積合共約170萬平方米，所需供冷量約為284兆瓦。因應啟德發展區2017年落實的最新發展情況，啟德發展區內用戶樓宇供冷量需求將大幅增加，（當中包括新急症醫院，在《2017年施政報告》中公布因提升發展密度而增加約400,000平方米的商業樓面總面積，以及啟德體育園等），我們現正計劃為啟德發展區新增一個供冷量約為178兆瓦的區域供冷系統，為這些額外新增的供冷量需求提供供冷服務。

區域供冷系統是大型環保基建項目，向用戶樓宇提供冷凍水。為了實現這目標，能源效益事務處的區域供冷系統團隊一直與時俱進，採用新的技術協助執行區域供冷系統的合約工程。採用建築信息建模正是其策略之一。

建築信息建模於不同的建築階段具有以下主要優點：

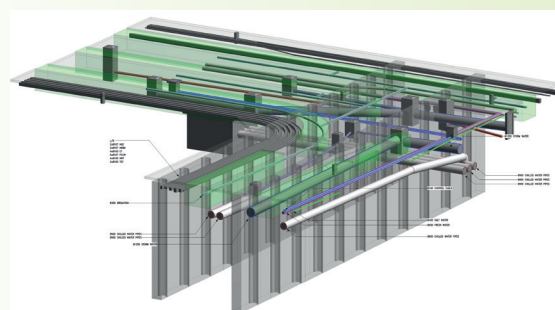
- 監察及控制工程費用及建造計劃表；
- 促進不同建築工種項目的協調及工地規劃，例如樓宇廠房的空間規劃及區域供冷系統管道的敷設；和
- 便於將來的操作和維修。

通過採用建築信息建模，樓宇廠房的空間得以優化，從而為操作和維修留出足夠的空間（圖1）。另外，材料成本、數量和施工程序均會輸入到建築信息建模模型中，以便

在施工過程中不時監察相關的成本和施工程序，從而幫助管理層跟進施工進度和支出。在一些擁擠的範圍，區域供冷系統管道的鋪設也採用了建築信息建模。通過衝突檢測，它可以促進包括區域供冷系統管道在內的地下公用設施的協調（圖2）。越早檢測到設施之間的衝突，可以節省更多的時間和成本。最終，這將有利於整個項目的成本和建造計劃表。

另外，建築信息建模參考了機電工程署（BIM-AM）標準。BIM-AM為機電設備（如制冷機組、水泵和風櫃（AHU）等）的資產管理提供了一個框架。它列明了機電設備的資料（例如產品目錄、規格書、操作及維修手冊、機組尺寸、保養及性能數據、維修記錄和設備的歷史等等），以便在建築信息建模模型中輸入這些資料。通過輸入上述的資料，建築信息建模能夠提供竣工情況和裝置路線的全面記錄；提供維修時間表，以便跟進組件的使用、性能和維修記錄；並能便於提取相關信息用於將來的翻新及加改工程，協助和評估因更改和升級工程所帶來的成本影響。這些都便利於將來的操作和維修。操作員可以使用射頻識別閱讀器（圖3）來檢測射頻識別標籤（圖4），從而輕鬆地取出該設備的操作歷史和手冊。這有助於減少搜索相關文檔的時間和能迅速地回應問題。

總括而言，在區域供冷系統採用建築信息建模是非常成功。能源效益事務處會繼續在其他採用區域供冷系統的新發展區（NDAs）推廣應用建築信息建模。我們會繼續努力不懈，致力規劃新發展區的區域供冷系統，為節能和減排作出貢獻。



■ 地下公用設施的協調（圖2）
Coordination of underground utilities (Fig. 2)



■ 射頻識別閱讀器 (圖3)
RFID Reader (Fig.3)

EEO has been striving for over ten years since 2009 for phased implementation of District Cooling System (DCS), to serve consumer buildings in Kai Tak Development (KTD), with development spanning a total area of over 320 hectares. The cooling capacity of the DCS is about 284 megawatt of refrigeration (MW_r) for serving total non-domestic air-conditioned floor area of about 1.73 million m². In addition, according to the latest development at KTD as at 2017, the growth in projected cooling demand of consumer buildings will be increased significantly (including the New Acute Hospital, the addition of total commercial floor area of about 400 000 m² arising from the increase in development intensity of KTD as announced in the 2017 Policy Address, and Kai Tak Sports Park). We are planning to build an additional DCS, with cooling capacity of about 178 MW_r, to meet the additional cooling demands from such development sites.

The DCS is a large-scale environmental infrastructure, providing chilled water to the consumer buildings. To achieve such goal, the DCS team of EEO has been keeping works abreast of new technologies to carry out DCS contract. Adoption of BIM is one of the strategies.

BIM offers major advantages to as below for the constructions in different phases:

- To monitor and control the project cost and construction programme;
- To facilitate the coordination of different construction activities and site planning such as building plant space planning and pipe laying of DCS pipe; and
- To facilitate the ease of operation and maintenance in the future.

Through the adoption of BIM, the building plant space is optimized to allow adequate space for operation and maintenance (Fig.1). In addition, the material cost, quantities and construction programme are inputted

to the BIM model in order to monitor the related cost and construction sequence from time to time during construction, assisting the management in tracking the construction progress and expenditure. It is also adopted in some congested area for pipe laying of DCS pipes. This facilitates the coordination of the underground utilities including DCS pipeline by clash detection (Fig.2). The earlier the clash is detected, the more the time and cost can be saved. Ultimately, it is beneficial to the entire project cost and construction programme.

In addition, the BIM model is made reference to the EMSD (BIM-AM) Standards. BIM-AM provides a framework for asset management of E&M equipment such chiller, pump and air handling unit (AHU) etc. It specifies the asset information (e.g. product catalogues, specifications, O&M manuals, physical dimensions, warranty and performance data, maintenance record and history of equipment etc.) for E&M equipment to be input in the BIM model. By inputting the said information, the BIM is able to provide comprehensive records of the as-built conditions and service routing; maintenance scheduling for tracking the use, performance and maintenance records of components; and extract the relevant information easily for future refurbishment, AA&I works in assisting and evaluating the cost implications for changing and upgrading works. All these facilitates the operation and maintenance in the future. Operators can use the RFID reader (Fig.3) to detect the RFID tag (Fig.4) to easily take out the operating history and manual of that equipment. This helps reduce the time for searching the relevant document and respond the problem promptly.

All in all, the adoption of BIM is very successful for DCS. EEO would keep promoting application of BIM in other New Development Area (NDAs) using DCS. We would make every best endeavor for dedication to planning of large-scale environmental infrastructure of DCS for HK; and would make best contribution on energy saving and carbon reduction.



■ 射頻識別標籤 (圖4)
RFID Tag (Fig.4)

香港的區域供冷系統獲C40認可為「我們想要的未來」-「綠色科技」 “The Future We Want” - Recognition of District Cooling System in Hong Kong by C40 as “Green Technologies”



■ 在2019年C40彭博慈善基金會頒獎典禮上，機電署提交有關香港的區域供冷系統成功入選「綠色科技」組別最後。

At the C40 Bloomberg Philanthropies Awards Ceremony, the EMSD's submission of DCS in Hong Kong was shortlisted among the three finalists in the Green Technologies category.

機電署提交題為「香港的區域供冷系統」的項目獲得2019年C40城市氣候領導聯盟（C40）認可，成功入選C40刊物《城市100》的100個氣候行動方案。

C40全球市長峰會及其指導委員會會議於2019年10月在哥本哈根舉行，匯集了全球城市決策者、商界領袖、科學家及其他持份者，分享應對氣候危機的對策，包括減碳行動。

「香港的區域供冷系統」闡述啟德發展計劃區域供冷系統項目的發展及成功（例如能源效益比傳統氣冷式空調系統可提升高達35%、在應對氣候變化、減低碳排放和污染及增加綠化空間等方面），並介紹其他新發展區規劃的區域供冷系統，如東涌新市鎮和古洞北等規劃區域供冷系統。啟德發展計劃區域供冷系統是大型空調系統利用海水在中央供冷站製造冷凍水，再通過配水管網絡把冷凍水輸送到啟德發展計劃的用戶樓宇作空調之用。此項目成功入選是對我們的方案的肯定，在應對氣候變化危機、實現可持續發展，以及確保市民享有更優質生活上，所起的示範作用。

在本屆C40彭博慈善基金會頒獎典禮另一鼓舞的結果是：區域供冷系統項目成功獲大會表揚為「綠色科技」組別最後三強。是次C40彭博慈善基金會頒獎典禮大會主題為「我們想要的未來」，通過展示城市的成功項目，啟發其他城市，並向氣候行動中發揮領導作用的城市給予認可。



The project "District Cooling System (DCS) in Hong Kong" submitted by the Electrical and Mechanical Services Department (EMSD) was recognised by the C40 Cities Climate Leadership Group (C40) and featured in Cities100, a C40 publication showcasing 100 solutions for climate actions by cities (<https://www.cities100report.com/>).

The C40 World Mayors Summit 2019 and the C40 Steering Committee meeting was organized in Copenhagen, Denmark in October 2019. It brought together global decision makers for cities, business executives, scientists and other stakeholders to showcase their strategies to tackle the climate crisis, including decarbonization actions.

Our DCS submission in C40 focused on achievements at Kai Tak District (KTD), as well as planning for other new development areas, such as Tung Chung New Town and Kwu Tung North. This system at KTD utilizes sea water to produce chilled water at the central plants and distributes the chilled water to consumer buildings in the district, achieving up to 35% higher energy efficiency as compared to traditional air-cooled air-conditioning systems. The DCS enhances carbon and pollution reduction and climate adaptation, as well as increase in greenery space. The recognition showcased our solution in tackling climate crisis, achieving sustainable development, and ensuring better quality lives for the public.

Another encouraging result was that this project was also shortlisted among the three finalists in the Green Technologies category at the C40 Bloomberg Philanthropies Awards Ceremony with the theme "The Future We Want" this year. The award aimed at recognising cities which play a leading role in climate action, and inspiring other cities by showcasing awardees' success stories.



■ 機電署提交有關香港的區域供冷系統入選C40刊物《城市100》的氣候行動方案，詳情可瀏覽<https://www.cities100report.com/>，下載有關刊物。

The EMSD's submission of DCS in Hong Kong was showcased by the C40 publication, Cities100, as a solution for climate actions. Please visit <https://www.cities100report.com/> and download the publication.

認識及預防退伍軍人病 Understanding and prevention of Legionnaires' disease

退伍軍人病在1976年7月首次被發現。當時，一羣退伍軍人出席在美國費城召開的美國退伍軍人大會時，有二百多人染病並有3人因而死亡。經醫學調查後，發現引致該病症的細菌是一種之前未為人知的品種，該細菌其後被命名為「嗜肺性退伍軍人桿菌」(Legionella pneumophila)，患者會出現發燒、頭痛、乏力、肌肉疼痛、咳嗽及氣促等病徵，並可能會引致呼吸衰竭。

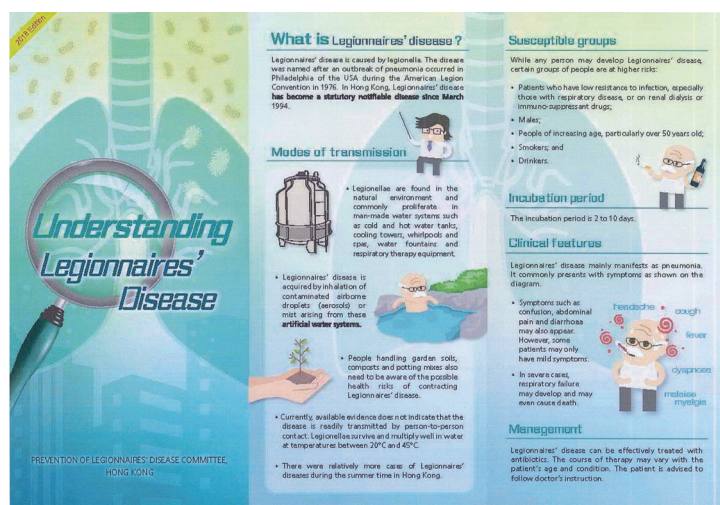
為預防退伍軍人病，機電工程署出版了認識退伍軍人病及預防退伍軍人病的良好做法和措施小冊子，提供給公眾認識及預防退伍軍人病。

此外，該小冊子並上載於機電工程署網址，欲知詳細資訊，請瀏覽下列網址：<http://www.emsd.gov.hk>

Legionnaires' disease (LD) was first recognised in July 1976 when an outbreak occurred among delegates attending an American Legion Convention in Philadelphia, USA in which more than two hundred cases were reported and 34 people died. After medical investigations, it was identified that the responsible bacterium of the disease was previously unknown, and was subsequently given the name Legionella pneumophila. Patients may have fever, headache, fatigue, muscles Symptoms such as pain, cough, and shortness of breath may cause respiratory failure.

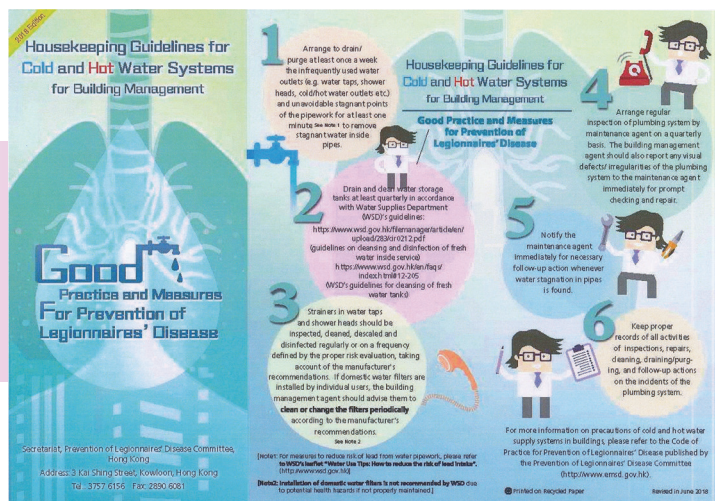
In order to prevent LD, the Electrical and Mechanical Services Department has published a leaflet on good practices and measures to understand and prevent LD. The leaflet is raised public awareness for prevention of LD.

In addition, the leaflet has been uploaded to the EMSD website. For details, please visit the following website: <http://www.emsd.gov.hk>



認識退伍軍人病 Understanding Legionnaires' Disease

適用於樓宇管理的冷熱水系統內務管理指引- 預防退伍軍人病的良好做法和措施 Housekeeping Guidelines for Cold and Hot Water Systems for Building Management - Good Practice and Measures for Prevention of Legionnaires' Disease



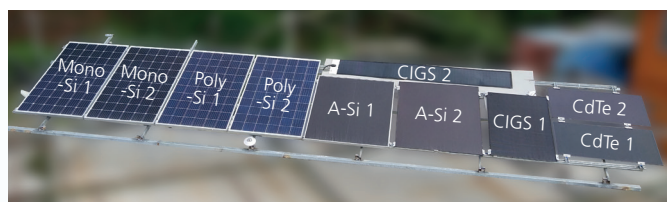
太陽能板在香港的實際發電表現

Actual Electricity Generating Performances of Photovoltaic Panels in Hong Kong

與本港兩家電力公司簽訂的2018年後《管制計劃協議》中，政府引入了「上網電價」，為個人及機構投資可再生能源提供誘因。太陽能板市場近年改變很大，太陽能板的能源轉換效率不斷提升，而價格則不斷下降。

為推廣更廣泛應用太陽能板，機電工程署委託香港理工大學進行有關太陽能板在本港環境的實際發電表現的研究。研究結果有助公眾和業界選擇合適的太陽能板類型及設計太陽能發電系統。

由2018年10月起，我們透過安裝市場上5款不同類型的太陽能板（每款分別有2個不同品牌）（圖1）組成的10塊太陽能發電系統，收集了整整一年實際發電表現的數據。測試的太陽能板類型包括單晶硅（Mono-Si）、多晶硅（Poly-Si）、非晶硅（a-Si）、銅銦鎵硒（CIGS）和碲化鎘（CdTe）。研究發現，單晶硅技術在能源轉換效率和每平方米全年發電量都有最佳的表現，而太陽能板的最佳安裝位置為向南傾斜20度（圖2），但傾斜14至22度的全年發電表現的分別只為0.5%。



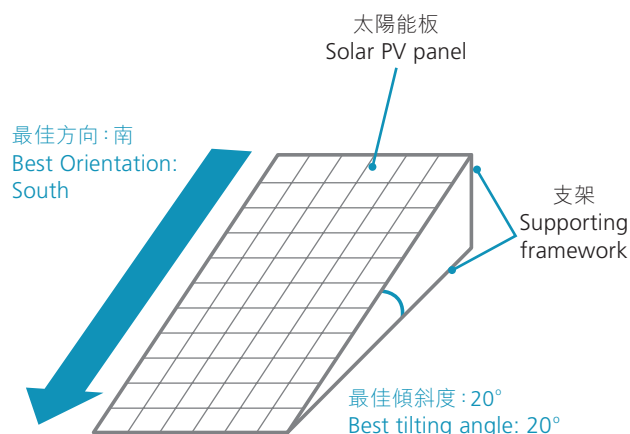
■ 測試5款不同類型的太陽能板（圖1）
Five different types of solar PV panels under testing (Fig.1)

■ 太陽能板最佳安裝方向和傾斜度（圖2）
Best orientation and tilting angle for installing PV panels (Fig.2)

In the post-2018 Scheme of Control Agreements with the two power companies in Hong Kong, the Government has introduced the Feed-in Tariff (FiT) scheme that provides incentives for individuals and organisations to invest in renewables. The solar Photovoltaic (PV) panel market is rapidly changing in recent years. The energy conversion efficiencies of solar PV panels are rising, whilst the panel prices are on the decreasing trend.

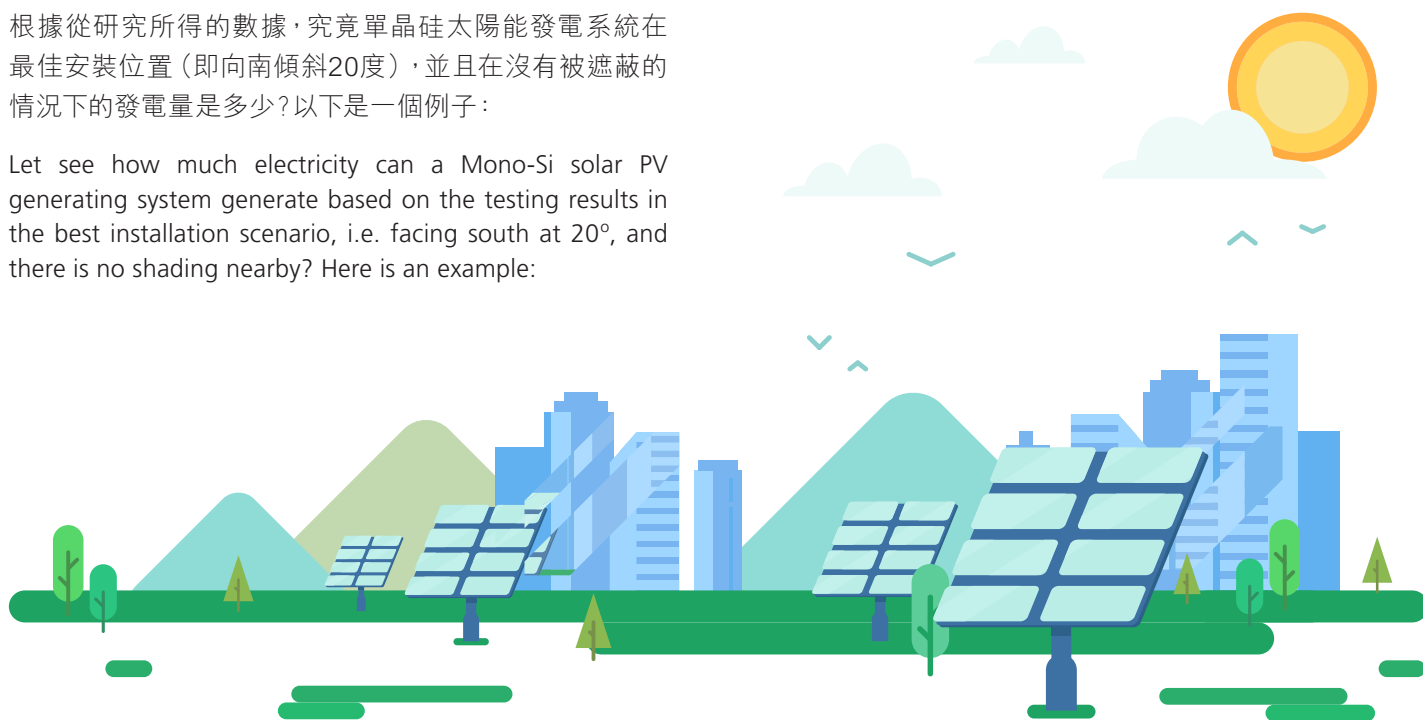
In order to promote wider application of solar PV panels in Hong Kong, the EMSD has engaged the Hong Kong Polytechnic University to carry out a study on the actual electricity generating performances of solar PV panels in the environment of Hong Kong. The study results facilitate the public and trades in the selection of suitable type of solar PV panels and design of their solar PV generating systems.

A 10-panel solar PV generating system consisting of five different types of commercially available solar PV panels (two different makes for each type) (Fig.1) was installed to reveal the actual performances of each panel for a whole-year period from October 2018. The five types of solar PV panels under testing included Mono-crystalline Silicon (Mono-Si), Poly-crystalline Silicon (Poly-Si), Amorphous Silicon (a-Si), Copper Indium Gallium Selenide (CIGS) and Cadmium Telluride (CdTe). The study revealed that the Mono-Si solar PV panels had the highest energy conversion efficiencies and their annual electricity generation per square meter were the best. It also revealed that the best facing orientation for the solar PV panels was south, and the best tilting angle was 20° (Fig.2). However, the annual electricity generation between tilting angles of 14° to 22° only resulted in a difference of 0.5%.



根據從研究所得的數據，究竟單晶硅太陽能發電系統在最佳安裝位置（即向南傾斜20度），並且在沒有被遮蔽的情況下的發電量是多少？以下是一個例子：

Let see how much electricity can a Mono-Si solar PV generating system generate based on the testing results in the best installation scenario, i.e. facing south at 20°, and there is no shading nearby? Here is an example:



例子：本港典型村屋 Example: A typical village house in Hong Kong	
天台面積 Rooftop area	700平方尺 (65平方米) 700 ft ² (65 m ²)
可安裝太陽能板的面積 Available area for installing solar PV panels	350平方尺 (32.5平方米) 350 ft ² (32.5 m ²)
單晶硅太陽能板數量 Nos. of Mono-Si solar PV panels	20 - 30
系統最大輸出功率 Maximum system output power	6.1 - 9.15千瓦 6.1 - 9.15 kW
估計每年發電量 Estimated annual electricity generation	7,086 - 10,575千瓦時 (度電) 7,086 - 10,575 kWh
適用的上網電價 Applicable FiT rate	每度電港幣5元 HK\$5 / kWh
估計每年可獲的「上網電價」金額 Estimated annual FiT earning	港幣35,430 - 52,875元 HK\$35,430 - 52,875

研究報告已上載至本署的「香港可再生能源網：re.emsd.gov.hk」，以供有關的專業人士參考。為方便公眾及業界估算太陽能發電系統的每年發電量，我們正根據研究結果製訂一個網上互動工具，使用者可選擇太陽能板的類型，以及輸入天台面積、太陽能板的安裝方向和傾斜度，以便估算每年發電量。此網上互動工具預計於本年底推出。

The study report has been uploaded onto the “HK RE Net” website of the EMSD at re.emsd.gov.hk for reference by the relevant professionals. With a view to facilitating the public and trade in estimating the annual electricity generation of a solar PV generating system, we are developing an online interactive tool based on the testing result. The users will be allowed to select the panel type, and input the rooftop area and the orientation and tilting angle of solar PV panels for estimating the annual electricity generation. The online tool is expected to be available on the EMSD website by the end of this year.

同行25載 節能創未來 Energy Efficiency Office 25th Anniversary

機電工程署的能源效益事務處於1994年成立，除提供專業技術服務外，亦積極舉辦促進能源效益及節約能源的活動。多年來，能源效益事務處一直表現出色，致力為香港市民建立更節能和更美好的可持續發展城市。

能源效益事務處在成立初期，著重推廣節約能源訊息；從自願性能源效益標籤計劃開始，逐步融入市民日常生活之中。邁進千禧年代後，能源效益事務處開始從本地立法著手，並聯同相關持份者提升社會整體的節能意識，以至發展大型的環保基建項目「區域供冷系統」持續推廣節能減排。

展望未來，我們可透過創新和借助先進的科技的，例如：利用人工智能控制不同節能裝置，令我們日常生活中實踐節能也變得輕而易舉。參考外國經驗可提升本地節能技術。為求減少能源消耗，機電工程署期望與社會各階層繼續攜手同行，全民節能創未來。

Energy Efficiency Office (EEO) of the EMSD was established in 1994. Apart from providing professional technical services, it also actively organizes activities to promote energy efficiency and energy conservation. In the past 25 years, EEO has been making persistent efforts and is committed to build a more energy-efficient and sustainable city for Hong Kong people.

At initial establishment, the EEO focused on promoting the message of energy conservation. From the commencement of Voluntary Energy Efficiency Labelling Scheme, it gradually integrated into the daily life of the public.

Looking forward to the future, we can make it easier to practice energy saving in our daily lives through innovation and application of advanced technology, such as the use of artificial intelligence to control different energy-saving devices. Reference to foreign experience can enhance local energy-saving technologies. Public support and involvement is very important in reducing the energy consumption in Hong Kong. We forward to working hand in hand with the community to build an energy-saving future.



■ 黃錦星先生 環境局局長
Mr. WONG Kam Sing
*Secretary for
the Environment*



■ 薛永恒先生 時任機電工程署署長
(現任創新及科技局局長)
Mr. SIT Wing Hang, Alfred
*The then Director of Electrical
and Mechanical Services (currently Secretary for
Innovation and Technology)*

在2019年製作的一段25周年紀念短片，並特別邀請了環境局局長黃錦星先生與時任機電工程署署長薛永恒先生帶領機電署一眾嘉賓回顧了能源效益事務處自1994年成立以來在提倡能源效益、節約能源和使用再生能源的工作成果。

A 25th anniversary commemorative short video produced in 2019. We are honored to invite Mr. Wong Kam Sing - Secretary for the Environment and EMSD guests led by Mr. SIT Wing Hang, the then Director of Electrical and Mechanical Services to review EEO's efforts and achievements in the promotion of energy efficiency and conservation, and the use of renewable energy since its establishment in 1994.

25周年紀念短片網址 / EEO 25th Anniversary Video web site :

https://www.emsd.gov.hk/filemanager/video/en/upload/71/EMSD_EEO_25th_online.mp4

「重新校驗培訓課程及從業員註冊計劃」已於2019年底推出 “Retro-commissioning Training and Registration Scheme” launched in late 2019

香港綠色建築議會（簡稱「議會」）於2019年11月26日正式推出「重新校驗培訓課程及從業員註冊計劃」（簡稱「計劃」），藉此為業界提升重新校驗的專業人士及從業員的整體水準。

重新校驗是一個具成本效益的系統性測試過程，用作適時檢查既有建築物的效能表現，以找出操作時可優化節能的地方，從而減低能源費用和提高室內環境質量。為增加重新校驗從業員的供應，專門培訓、持續進修及相關的專業認證尤其重要，同時支持業界採納重新校驗為既有建築物節能，並令香港成為一個更加可持續發展的城市。

「計劃」是由香港綠色建築議會轄下的註冊委員會管理，成員包括各不同持份者及專業團體：

- 香港工程師學會 — 屋宇裝備分部
- 英國屋宇裝備工程師學會（香港分會）
- 美國供暖製冷及空調工程師學會（香港分會）
- 美國能源工程師學會（香港分會）
- 屋宇設備運行及維修行政人員學會
- 香港能源工程師學會
- 能源學會（香港分會）

「計劃」將以專工專責制推行，並分為「重新校驗從業員（級別一）」、「重新校驗從業員（級別二）」及「重新校驗專家」。重新校驗從業員課程會傾向學習操作和保養上的知識，而重新校驗專家課程則會集中在整個重新校驗過程中各項細節，包括數據分析、機械診斷及量測和驗證方面的知識，以便從業員為不同建築物進行重新校驗。

合符資格者完成培訓課程，並通過相關考試後，將可達至註冊計劃的要求，更可註冊成為計劃下認可的專業人員。另外，物管公司、顧問公司及承辦商若滿足特定條件，例如公司擁有足夠數量之重新校驗從業員或專家，則可註冊為「重新校驗服務供應商」。

The “Retro-commissioning (RCx) Training and Registration Scheme” (Scheme) was formally launched by Hong Kong Green Building Council (HKGBC) on 26 November 2019, which is designed to build greater capacity among the RCx professionals and practitioners.

RCx is a cost effective systematic examination of an existing building's energy performance to identify areas of operational improvement for reducing energy costs and improving the indoor environment. Specialised training, continuous development and professional recognition are critical for increasing the supply of RCx professionals to support extensive implementation of RCx in existing buildings to save energy, as well as to foster a more sustainable city.

The Scheme is overseen by the Registration Committee under HKGBC with collaboration of various stakeholders and professional bodies including:

- The Hong Kong Institution of Engineers – Building Services Division
- Chartered Institution of Building Services Engineers (Hong Kong Branch)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (Hong Kong Chapter)
- Association of Energy Engineers (Hong Kong Chapter)
- Building Services Operation and Maintenance Executives Society
- Hong Kong Association of Energy Engineers, and
- Energy Institute (Hong Kong Branch)

The Scheme offers individual courses with specific focuses for different tiers of practitioners, including RCx Practitioner (Level 1), RCx Practitioner (Level 2), and RCx Professional. The practitioner courses are geared towards operational and maintenance knowhow. The professional course focuses on the details of the RCx process which includes data analytics, machine diagnosis, measurement and verification to perform specific functions.

Upon completing a designated course and passing the relevant examination, eligible trainees can register as RCx Practitioners or Professional under the scheme. Facilities management companies, consultants and contractors that meet certain criteria, such as having a required number of RCx practitioners and professionals, will be eligible to register as RCx Services Provider.



「採電學社」 Solar Harvest

「採電學社」自2019年3月推出至今反應踴躍，接獲超過210份合資格學校及非政府福利機構的申請。我們計劃於2019-20年度可為約50間學校及機構的處所天台上安裝小型太陽能發電系統（發電容量約為10kW，上網電價為\$5/kWh），有關的安裝工程正全速進行中。其中完成安裝上網電錶的學校，我們記錄到平均每月的發電量約為800度電，即每月學校能收到約4,000元上網電價收入，足以用作系統的保養維修費用以及支持學校於環保方面的教學上的開支，以提升學生和青少年對探索科學的興趣，並推廣低碳生活。



“Solar Harvest” has received an enthusiastic response since its launch in March 2019. More than 210 applications have been received from eligible schools and welfare non-Governmental Organisations (NGOs) in Hong Kong. In 2019-20, we plan to install solar photovoltaic (PV) system at premises rooftop of about 50 schools and welfare NGOs (with installed capacity of about 10kW and Feed-in Tariff (FiT) of \$5/unit(kWh)), and the installation works are being carried out in full speed. For those schools which have installed with FiT meters, we have recorded that the monthly electricity generation amounted to some 800 units on average. Schools will receive about \$4,000 monthly to cover the costs associated with on-going operation, maintenance of the solar PV system as well as organizing educational activities to promote environmental education for students, and arouse the interest of our young generation in exploring science and promoting low-carbon living.

上水鳳溪創新小學是首批參加「採電學社」的學校，環境局局長黃錦星先生及時任機電工程署署長（現任創新及科技局局長）薛永恒先生於一月二十日一同前往學校天台視察並正式啟用的太陽能發電系統。黃錦星先生同場與學生交流，並欣悉學生透過「採電學社」，有機會親身認識怎樣生產可再生能源，而學校亦將太陽能發電系統融入教學，提升學生的環保意識以及探索科學的興趣。

Fung Kai Innovative School (FKIS) in Sheung Shui is the first batch of schools participating in Solar Harvest. The Secretary for the Environment, Mr Wong Kam-sing and the then Director of Electrical and Mechanical Services (currently Secretary for Innovation and Technology), Mr SIT Wing-hang, Alfred visited FKIS and officiated the opening of the solar PV systems on the 20th of January. Mr Wong interacted with students and pleased to learn that they have got hands-on experience on how renewable energy was generated through Solar Harvest, and that the school also planned to integrate the solar PV system into the curriculum to enhance students' environmental awareness and their interest in science.



■ 鳳溪創新小學太陽能發電系統啟動日
Launching ceremony of the Solar PV System at FKIS



■ 環境局局長黃錦星與同場學生交流
The Secretary for the Environment,
Mr Wong Kam-sing interacts with students of FKIS

為了有效地在社區推廣「採電學社」，我們在太陽能板布局設計上花了不少心思。除提供基本設計外，年青設計師亦提出「像素設計」及「採電公園」等特別概念。「像素設計」是將每一塊太陽能板當作為一格像素 (pixel)，拼湊出字母、圖案，甚至簡單訊息，令太陽能發電系統更能融入社區之中。當附近居民從高處觀看太陽能發電系統時，能感受到創意以及所帶出的綠色訊息。以中華傳道會李賢堯紀念中學為例，它以其英文縮寫作為太陽能板的設計布局。

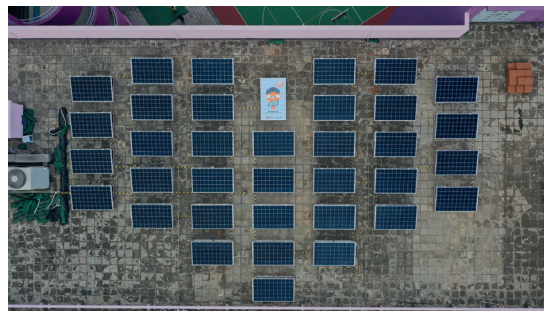
To promote “Solar Harvest” in the community, we paid special effort on the designing the layout of the PV panels. In addition to the basic layout, our young designer proposed the “Pixel Design” and “Solar Harvest Park” concepts to blend an interactive design into the society. For “Pixel Design”, words, icons or a simple message can be formed by treating each PV panel as a “pixel”. Through an aerial view of the PV panels, nearby residents can appreciate the creativity as well as the green message behind. CNEC Lee I Yao Memorial Secondary School chose its English abbreviation to design its PV panels layout.

計劃亦鼓勵參加學校及機構提出設計建議。以基督教粉嶺神召會小學為例，他們運用太陽能板砌成一個心形圖案。

Schools and welfare NGOs are welcome to propose their PV panel layouts under the scheme. Fanling Assembly of God Church Primary School built a "Heart" icon with the aid of PV panels on its rooftop.



■ 英文縮寫設計：中華傳道會李賢堯紀念中學
English Abbreviation Pixel Design : CNEC Lee I Yao Memorial Secondary School



■ 心形設計：基督教粉嶺神召會小學
Heart Shape Design Fanling Assembly of God Church Primary School

另一方面，我們的設計師連同學生及老師活用天台上的空間，在太陽能板旁邊預留位置放置盆栽，以及以環保物料製成的座位，構建一個「採電公園」。這概念已為高雷中學所採用，學生可以在教師陪同下，坐在天台上近距離了解太陽能發電系統的運作原理

In another school, through the collaboration of the designer, students and teachers, they built a "Solar Harvest Park" on the roof. Dedicated spaces, next to the PV panels, were decorated with potted plants and equipped with sitting benches made from environmentally friendly materials. This concept was adopted in the Ko Lui Secondary School. Students can gather on the roof and learn from their teachers about the theory of solar PV systems.



■ 「採電公園」設計：高雷中學
Solar Harvest Park Design: Ko Lui Secondary School

機電署作為政府的工程部門，可藉「採電學社」與學校及機構分享我們的專業知識，真是一次難得的機會。而學生、年青設計師及老師一起參與設計過程，除增加對自己學校及機構的歸屬感外，亦同時加深對綠色建築的理解和應用可再生能源，實踐低碳生活，可謂一舉多得。

「採電學社」第二輪申請剛展開，有意參加「採電學社」的非官立和非牟利學校及獲社會福利署津助的非政府福利機構可到機電署網站 (re.emsd.gov.hk) 下載申請表格。如有查詢，請致電3155 3977或電郵至solarharvest@emsd.gov.hk與機電署活動秘書處聯絡。

It is a great opportunity for us, an engineering department in the government, to share our professional knowledge with participants from schools and organizations in the Solar Harvest. Students, young designers and teachers actively participated in the system design have increased their sense of belonging to the school and organization. This also enhanced their knowledge on green buildings, and how to practice low-carbon living through the application of renewable energy.

The second round of application for Solar Harvest has just been opened and interested non-government and non-profit-making schools and welfare NGOs which are receiving recurrent subvention from the SWD can download the application forms from the EMSD's website (re.emsd.gov.hk). For enquiries, please contact the Event Secretariat of EMSD by telephone at 3155 3977 or by email (solarharvest@emsd.gov.hk).



第二輪申請現已展開！

上 re.emsd.gov.hk 了解吓啦！