

智能 EnergyWits



國際環保博覽 2023 Eco Expo Asia 2023



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二零二四年三月 March 2024

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國際環保博覽2023

Eco Expo Asia 2023



第十八屆國際環保博覽於2023年10月26日至29日在香港機場博覽館順利舉行。機電工程署亦應邀到現場設置展覽攤位，向業界及市民分享及推廣本署在對能源效益及節能的相關工作及成效，當中包括《強制性能源效益標籤計劃》、《建築物能源效益條例》、《可持續區域供冷系統》、《氫燃料電池雙層巴士及重型車輛試驗》、《海上液化天然氣接收站》及其他創新節能科技等。

The 18th Eco Expo Asia was successfully held at the Hong Kong Asia World Expo from 26th to 29th October 2023. The Electrical and Mechanical Services Department (EMSD) was invited to set up an exhibition booth to share and promote the Department's effort to the trade and the general public on energy efficiency and energy conservation and the related works, including the "Mandatory Energy Efficiency Labelling Scheme", "Buildings Energy Efficiency Ordinance", "Sustainable District Cooling System", "Testing Out Hydrogen Fuel Cell Electric Double-deckers and Heavy Vehicles", "Offshore LNG Terminal" and other innovative energy-saving technologies, etc.



環境及生態局副局長 黃淑嫻女士(左四)、環境保護署署長 徐浩光博士(左三)、香港貿發局副總裁 張淑芬(左二)、機電工程署署長彭耀雄先生(左五)與一眾機電工程署代表及機智啤啤合照留念。

The Under Secretary for Environment and Ecology, Miss Diane WONG Shuk-han, JP, (4th left), Director of Environmental Protection, Dr Samuel CHUI Ho Kwong, JP, (3rd left), Acting Executive Director of Hong Kong Trade and Development Miss Sophia Chong, (2nd left), Director of Electrical and Mechanical Services, Mr Eric PANG Yiu-Hung, JP, (5th left), representatives from EMSD and Witty Bear, EMSD's promotion ambassador at EMSD's booth of Eco Expo Asia 2023

為期四天的博覽會吸引眾多業界人士及公眾參與，環境及生態局副局長 黃淑嫻女士以及一眾嘉賓於展覽開幕當日更親臨現場參觀本署展覽攤位，並由能源效益事務處的同事介紹展覽內容。

The four-day expo had caught numerous eyes from the trade and the public. On the opening day of the exhibition, the Under Secretary for Environment and Ecology, Miss Diane WONG Shuk-han together with other guests, visited our exhibition booth and was greeted by EMSD's colleagues from the Energy Efficiency Office to showcase the exhibition contents.

署長 彭耀雄先生、副署長/規管服務 潘國英先生亦親力親為，聯同本署宣傳大使的機智啤啤，到現場為我們的展覽團隊打氣。公眾日當日亦有不少學生到機電署的攤位參觀及了解本署就能源效益及節能的工作。

The Director, Mr Eric PANG and the Deputy Director/Regulatory Services, Mr Raymond POON together with our promotion ambassador Witty Bear, also visited the Expo and showed support to the EMSD's exhibition team. School students visited our booth and learnt about the Department's efforts in promoting energy efficiency and conservation on the Public Day.



機電工程署副署長/規管服務潘國英先生(左一)、及機電工程署同事與機智啤啤一起推廣碳中和。

The Deputy Director/Regulatory Services, Mr Raymond POON Kwok-ying, (back row, 1st left), EMSD colleagues and Witty Bear promoted carbon neutrality.



「公眾日」當日有不少學生到機電署的攤位參觀，並樂在其中在攤位前踴躍拍照。

On the Public Day, many school students visited and took photo at the EMSD's booth.

亞太區經濟合作組織能源數據及分析專家小組第三十五次會議 The 35th Meeting of APEC Expert Group on Energy Data and Analysis

亞太區經濟合作組織(亞太經合組織)能源數據及分析專家小組第三十五次會議於2024年1月17日及18日在香港舉行。

逾四十名來自九個亞太經合組織成員經濟體及兩個國際組織的專家及代表聚首一堂，與同儕就能源數據及分析分享見解和交流經驗。專家小組第三十五次會議的討論議題包括年度數據收集的工作進度、亞太經合組織的能源供需概況和目標進展，以及新能源技術數據收集等。在2024年1月19日亦安排與會代表參觀啟德區域供冷系統(北廠)和香港賽馬會沙田通訊及科技中心，分享中國香港在能源效益及數據的發展。

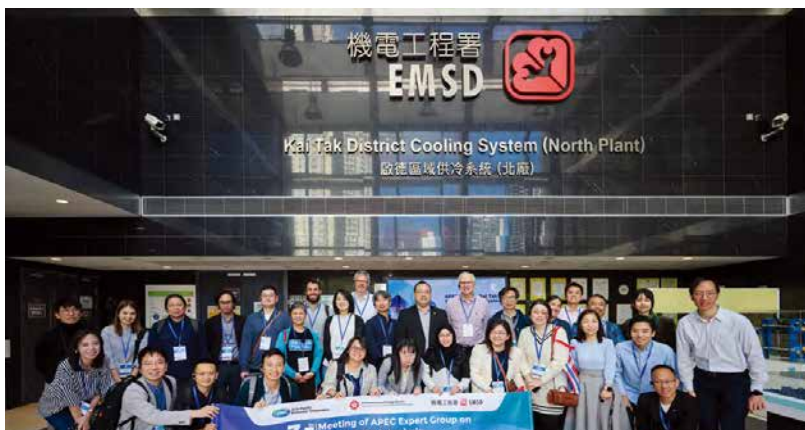
The 35th Meeting of the Expert Group on Energy Data and Analysis (EGEDA35) of the Asia-Pacific Economic Cooperation (APEC) was held in Hong Kong on 17 and 18 January 2024.

Over 40 experts and delegates from nine APEC member economies as well as two international organisations were gathered to share insights and exchange experiences on energy data and analysis with their counterparts. Discussion topics of EGEDA35 included updates on the work of the EGEDA on annual data collection, an overview of energy supply and demand in APEC, the progress of APEC goals, and data collection of new energy technologies, etc. A technical visit to Kai Tak District Cooling System (Northern Plant) and Shatin Communications and Technology Centre of Hong Kong Jockey Club was arranged on 19 January 2024 to share with the meeting delegates about energy efficiency and data development in Hong Kong, China.



■ 環境及生態局局長 謝展寰先生(前排左七)、機電工程署署長 彭耀雄先生(前排右四)與一眾代表拍照留念。

The Secretary for Environment and Ecology, Mr Tse Chin-wan (7th from left of the front row) and the Director of Electrical and Mechanical Services, Mr Eric Pang (4th from right of the front row) with the delegates at the 35th EGEDA meeting.



■ 與會代表參觀啟德區域供冷系統(北廠)。

Delegates visited the Kai Tak District Cooling System (Northern Plant).



修訂《建築物能源效益條例》(第610章)的建議

Proposed Legislative amendments to the Buildings Energy Efficiency Ordinance (Cap. 610)

香港九成的電力用於建築物，逾五成的碳排放來自建築物耗能相關的電力生產。為推廣建築物能源效益及節約能源，《建築物能源效益條例》(第610章)(簡稱《條例》)自2012年9月起已全面實施。而根據《條例》頒布的《屋宇裝備裝置能源效益實務守則》(簡稱《建築物能源效益守則》)和《建築物能源審核實務守則》(簡稱《能源審核守則》)每三年會作出檢討。

現時，《條例》主要要求13類新建建築物或於現有建築物進行主要裝修工程時必須符合《建築物能源效益守則》的最低能源效益設計標準；2類現有建築物須按照《能源審核守則》每隔不多於10年進行能源審核。完成能源審核後，《條例》要求建築物的擁有人在建築物主要入口的顯眼位置展示指明的能源審核表格。

為了於2050年前實現碳中和，我們將透過修訂《條例》，加強建築物節能減碳，包括擴大監管範圍至更多類別的建築物、縮短能源審核周期和強制公開能源審核報告資料等。

擴大監管範圍至更多類別的建築物

隨著智慧城市發展，根據機電工程署2023年版《香港能源最終用途數據》的資料顯示，數據中心在2021年已達全港建築物的整體用電量約4%。將此類建築物納入監管範圍將有助於提高香港整體建築物的能源效益。此外，我們亦建議將《條例》下的能源審核範圍擴大至更多類型的建築物，以進一步提升香港建築物的整體能源效益。

縮短能源審核周期

其它主要國家和城市的能源審核週期平均為5年，而社會上亦有意見認為現時的能源審核週期較長，未能完全發揮能源審核的好處。如縮短能源審核週期，業主或物業管理公司可以更及時獲悉並考慮採用最新的節能技術及管理措施。因此，我們建議將能源審核週期由現時的10年縮短至5年。

強制公開能源審核報告資料

提高建築物能源效益的數據透明度，可以讓公眾知悉該建築物的能源管理表現。我們建議修訂《條例》以公開能源審核報告內的技術性資料，從而鼓勵業界主動向建築物業主提供節能改造建議，加快推動業主實施能源管理機會以及綠色經濟發展。

Buildings account for about 90% of Hong Kong's total electricity consumption, and over 50% of our carbon emissions is attributable to generating electricity for our buildings. To promote energy efficiency and conservation in buildings, the Buildings Energy Efficiency Ordinance (Cap. 610) (BEEO) has come into full operation since September 2012. The Code of Practice for Energy Efficiency of Building Services Installation (Building Energy Code) and the Code of Practice for Building Energy Audit (Energy Audit Code) pursuant to the Ordinance are reviewed once every three years.

Currently, the BEEO mainly requires the compliance with the BEC for 13 types of newly constructed buildings and existing buildings when carrying out major retrofitting works; and conduct of energy audit in accordance with the EAC at intervals no longer than 10 years for 2 types of existing buildings.

In order to achieve carbon neutrality before 2050, we will enhance the decarbonisation of buildings by legislative amendments of BEEO which extending the scope of regulation to more types of buildings, shortening the interval of energy audit, and mandating the disclosure of information in energy audit reports.

Extending the scope of regulation to more types of buildings

With the development into a smart city, the data centre industry contributed to about 4% of the total Hong Kong's electricity consumption of buildings in 2021 based on Hong Kong Energy End-use Data 2023 issued by EMSD. Incorporating this type of building into regulatory scope would help driving energy efficiency to this type of building in Hong Kong. In addition, we also propose extending the scope of energy audits to more types of buildings under the Ordinance, so as to further enhance the overall energy efficiency of buildings in Hong Kong.

Shortening the interval of energy audit

The average interval of energy audit of other major countries and cities is 5 years. There are also opinions in the society that the current energy audit interval is comparatively long so that the benefits of energy audit may not be fully utilized. If the energy audit interval is shorten, building owners or property management companies can learn about and consider the adoption of latest energy saving technologies and management practices in more timely manner. Therefore, we propose shortening the energy audit interval from current 10 years to 5 years.

就註冊能源效益評核人的註冊申請加入能源界別工程師資格為其中一個考慮接納申請的條件

考慮到能源界別的註冊專業工程師或香港工程師學會法定會員擁有建築物能源效益的相關專業知識，以及考慮到《條例》修訂後須要遵規的建築物數量有所增加，我們建議將能源界別工程師資格加入為其中一個考慮接納申請成為註冊能源效益評核人的條件，及於上訴委員團和紀律委員團的成員組成加入能源界別的香港工程師學會法定會員。

進程與展望

為期兩個月的業界諮詢已於2023年11月15日展開，並於2024年1月15日結束。諮詢文件亦於機電工程署網站公佈。業界諮詢會議已分別於2023年11月及12月舉行，出席者包括相關政府決策局及部門、商會、專業團體、物業管理界、發展商及商會的代表。業界以及收到的書面意見大都表示支持。我們的目標是於2024年向立法會提交條例修訂草案。

最新消息，請瀏覽下列網址：

www.emsd.gov.hk/beeo/tc/mibec_beeo_WhatsNews.html

For updates, please visit the the following website:

www.emsd.gov.hk/beeo/en/mibec_beeo_WhatsNews.html



Mandating the disclosure of information in energy audit reports

Enhance data transparency on building energy efficiency can let the public to inspect the energy management performance of the buildings. We propose amending the Ordinance to facilitate the disclosure of technical information in the energy audit reports which in turn would encourage the trade to proactively offer energy saving retrofit proposals to the building owners, and speed up the implementation of energy management opportunities and development of green economy.

To include professional engineer of energy discipline as one of the assessment criteria for the application for registration as Registered Energy Assessor

Considering that MHKIE or RPE in the energy discipline have the relevant professional knowledge in building energy efficiency and taking into account the increased number of buildings that need to comply with BEEO upon the legislative amendments, we propose to include a MHKIE or RPE as one of the assessment criteria for accepting the application for registration as Registered Energy Assessor, and to include MHKIE in the energy discipline as one of the appointing members of the Appeal Board Panel and Disciplinary Board Panel.

Progress and Way Forward

A two-month trade consultation was launched on 15 November 2023 and ended on 15 January 2024. A consultation paper was published on the EMSD's website. Trade consultation meetings were also held in November and December 2023 with participation by representatives from the relevant Government bureaux and departments, trade associations, professional bodies, property management sector, developers and the Chambers of Commerce. The trade and written comments received are generally supportive. Our target is to submit the Amendment Bill to LegCo within 2024.



■ 政府已展開修訂《建築物能源效益條例》的準備工作

The Government has commenced the preparation work of Legislative Amendments to the Buildings Energy Efficiency Ordinance

機電工程署總部榮獲雙重綠色認證

The Green EMSD Headquarters with dual recognition

機電工程署總部最近於2023年12月獲得綠建環評既有建築2.0版綜合評估計劃的鉑金級評級，以及零碳就緒建築認證（既有建築 — 能源消耗指標）的特低耗能評級。這兩項認證對機電工程署總部在可持續發展方面的實踐作出高度肯定。

綠建環評是由香港綠色建築議會（HKGBC）認可，為本港建築物可持續發展作評估的工具，旨在促進建築實踐可持續發展並改善香港建築的整體環境表現。最近，香港綠色建築議會推出了零碳就緒建築認證。認證聚焦建築物的碳排放，旨在鼓勵業界節能減排，共同應對氣候變化。認證分為三種類型，分別能源表現證書、目標設定證書和進程證書，並適用於新建建築物及既有建築物。

綠建環評和零碳就緒建築認證均旨在鼓勵香港建築在可持續發展方面有更多的實踐，減少對環境影響，降低本港建築的整體能源消耗，從而早日實現碳中和的最終目標。



The Electrical and Mechanical Services Department Headquarters (EMSD HQs) recently achieved the Final Platinum rating of BEAM Plus Existing Building V2.0 Comprehensive Scheme and Extra Low ratings under the Zero-Carbon-Ready-Building Certification Scheme (Existing Building – EUI Pathway) in December 2023, which is highly recognized the sustainable building practices of EMSD HQs.

BEAM Plus is a comprehensive environmental assessment scheme for buildings developed by the Hong Kong Green Building Council (HKGBC). It aims to promote sustainable building practices and improve the overall environmental performance of buildings in Hong Kong. Recently, HKGBC launched the Zero-Carbon-Ready Building Certification Scheme, which focuses specifically on the carbon emissions of buildings and aims to encourage the building sector to combat climate change. The Scheme has three types of certificate namely Energy Performance Certificate, Target Setting Certificate and Progress Certificate for both new buildings and existing buildings.

It's worth noting that both BEAM Plus and Zero-Carbon-Ready Building Certification Scheme aim to encourage sustainable building practices, reduce environmental impacts, and improve the overall sustainability performance of buildings in the region as well as an ultimate goal of carbon neutrality.



綠建環評既有建築 2.0版綜合評估計劃的鉑金級評級

Final Platinum rating of BEAM Plus Existing Building V2.0 Comprehension Scheme



零碳就緒建築認證（既有建築 — 能源消耗指標）的特低耗能評級

Extra Low ratings under the Zero-Carbon-Ready-Building Certification Scheme (Existing Building – EUI Pathway)

「綠色社福機構」計劃—為非政府社福機構處所進行能源審核和能源改善工程

“Green Welfare NGOs” Scheme - Implementation of energy audits and energy saving projects for Welfare NGO’s premises

為協助非政府社福機構提高能源效益，環境及生態局和機電工程署，在社會福利署的協作下，於2021年推出為期5年的「綠色社福機構」計劃，為非政府社福機構處所進行基準能源審計並更換現有冷氣機至高效能的變頻式冷氣機和以發光二極管燈代替現有照明。

為了讓更多非政府社福機構認識計劃及受惠，機電工程署在宣傳上不遺餘力，先後推出一系列短片，以生動手法介紹計劃，並走訪超過四十多間非政府社福機構宣傳推廣，讓社福界能更清楚計劃內容及能源效益的重要性。「綠色社福機構」計劃推出至今反應熱烈，已收到約300份符合條件的申請。申請處所包括安老院、兒童及青年中心、兒童院、社區中心、展能中心、長者地區中心、宿舍及綜合家庭服務中心等。我們亦已為約100間非政府社福機構處所進行能源審核和展開能源改善工程，協助機構建立節能減碳文化，邁向實現碳中和的目標。

「綠色社福機構」計劃新一輪的申請預計於2024年中推出。屆時希望有更多機構參與，共同邁向碳中和。

To help welfare Non-Government Organizations (NGOs) improve energy efficiency, the Environment and Ecology Bureau (EEB) and the Electrical and Mechanical Services Department (EMSD), with the collaboration of the Social Welfare Department (SWD), have launched a five-year "Green Welfare NGOs" scheme in 2021 to conduct baseline energy audits and replacement of existing air conditioners with high-efficiency variable frequency air conditioners and replacement of existing lighting with LED lights.

To let more welfare NGOs be acquainted with the scheme and benefit from it, EMSD spared no effort in publicity. A series of short videos were launched to introduce the scheme in a vivid way, and more than 40 welfare organizations were visited for publicity and promotion, to let the welfare sector have more details on the scheme and the importance of energy efficiency. Since the launch of the "Green Welfare NGOs" scheme, the response has been overwhelming and approximate 300 eligible applications have been received. Applied premises include residential care homes, children and youth centres, children's homes, community centres, day activity centres, district elderly community centre, hostels and integrated family service centres, etc. We have already conducted energy audits and commenced the energy saving projects for about 100 welfare NGO premises, assisting the organizations to establish a culture of energy conservation and carbon reduction toward carbon neutrality.

The new round of applications for the "Green Welfare NGOs" scheme was scheduled to launch in mid-2024. Hoping that more welfare NGOs will participate and work together towards carbon neutrality.



■ 綠色社福機構的內容

Details of “Green Welfare NGOs”



■ 綠色社福機構的一系列短片

A series of videos for “Green Welfare NGOs”



於基督教香港信義會社會服務部總部推廣「綠色社福機構」後合影

Group photos with representatives of Evangelical Lutheran Church Social Service – Hong Kong after outreach talk of “Green Welfare NGOs”



於浸信會愛羣社會服務處總部推廣「綠色社福機構」

Outreach talk of “Green Welfare NGOs” at Baptist Oi Kwan Social Service Headquarters



於社福機構處所更換發光二極管燈(LED)

Replacement of LED for welfare NGO premises



淡水冷卻塔實務守則2023年版簡介

Introduction on Code of Practice for the Fresh Water Cooling Towers 2023 Edition

為配合最新的冷卻塔設計、安裝、操作及維修和水處理的發展，機電工程署已完成檢討《淡水冷卻塔實務守則》第1至3部(「《守則》」)及相關刊物，並於2023年11月21日推出最新的《守則》(2023年版)新版《守則》將在6個月寬限期後，於2024年5月21日全面生效，新版的《守則》除了提升冷卻塔收水器的效能，規管其飄水排放量更新為不可超過最高設計水循環率的0.002%外，亦建議使用實時遙距監控冷卻塔水處理系統，此技術可確保水質狀況及優化化學劑的使用量，從而避免退伍軍人病的傳播；另外《守則》還建議採用智能系統控制冷卻塔的運作，從而達致最佳整體能源效益。

欲知詳細資訊，請瀏覽下列網址：https://www.emsd.gov.hk/tc/energy_efficiency/fwct_scheme/publications/index.html

To keep up with the latest development in the design, installation, operation and maintenance, and water treatment of cooling towers, the EMSD completed the review of the "Code of Practice for Fresh Water Cooling Towers, Parts 1 to 3" ("CoP"). The updated CoP (2023 Edition) was launched and uploaded to the EMSD website on 21 November 2023, and will be fully implemented on 21 May 2024 after a 6-month grace period. Apart from strengthening the effectiveness of the drift eliminator of cooling tower installation by regulating its drift emission not exceeding 0.002% of the maximum design water circulation rate through the cooling tower, the updated CoP also recommends adopting the real-time remote control and monitoring water treatment system of cooling towers which ensures cooling water quality as well as enhances the chemical dosing in order to prevent the spread of Legionnaires' disease. Furthermore, it recommends adopting the intelligent control system for the operation of cooling tower optimizing overall energy efficiency.

For details, please visit the following website: https://www.emsd.gov.hk/en/energy_efficiency/fwct_scheme/publications/index.html



「設計、興建及營運」東涌新市鎮擴展(東)區域供冷系統工程項目正式展開

Commencement of Design Build and Operate Contract (DBO) for the District Cooling System (DCS) at the Tung Chung New Town Extension (East)

機電工程署於2023年9月批出東涌新市鎮擴展(東)(下稱「東涌東」)區域供冷系統工程項目合約予保華-四大聯營，展開興建區域供冷站的工作。「東涌東」區域供冷系統工程項目採用新工程合約第四版「設計、興建及營運」合約模式，相關合約模式亦為機電工程署首次採用。在此模式下，工程合約雙方，包括政府部門和承建商，均需要依照新工程合約條款訂明的要求，採用夥伴模式管理工程。由於此合約模式要求合約雙方人員建立良好的互助互信夥伴關係，從而減少不必要的合約糾紛，令工程進度減少延誤。此外，此「設計、興建及營運」合約模式是由承建商負責詳細設計和建造工程，同時把運作需求納入區域供冷系統的設計中，不但有效管控工程進度並按時完成，而且有助日後設施順利啟用運作，管理和保養，以配合有關新發展區的落成時間表。

EMSD awarded the "Design Build and Operate" (DBO) contract to Paul Y. – Big Four Joint Venture and commenced the construction of district cooling plant in September 2023. DBO under New Engineering Contract 4 (NEC4) contract form is adopted for the captioned project, which is the first of its kind in EMSD. Under this contract form, all contracting parties including the government department and the contractor, need to follow the contract conditions under the NEC and manage the project in a partnering manner. Through the implementation of contractual partnering, project stakeholders build up a high level of mutual trust and collaboration of risk management to minimise contractual disputes and reduce chance of delay in progress. Under the DBO contract, tasking the contractor with both detailed design and construction works will help expedite the project to tie in with commissioning of the new development area. Incorporating the operating requirements into the design of DCS will also facilitate smooth commissioning and operation as well as subsequent management and maintenance of the facilities.

「啟德區域供冷系統」填色及繪畫比賽－讓公眾了解區域供冷，加深對節能減碳的認識，以實現2050年達至碳中和的目標

District Cooling System at Kai Tak Development - Coloring and Drawing Competition – Raising Public Awareness on District Cooling and Energy Efficiency to Achieve Carbon Neutrality in 2050



■ 機電工程署署長彭耀雄先生於頒獎典禮上致歡迎辭

The Director of the Electrical & Mechanical Services, Mr. PANG Yiu Hung, delivered a welcoming speech during the Award Presentation Ceremony

配合《香港氣候行動藍圖2050》，機電工程署積極推動節能減排措施，以支持減碳行動。為加深公眾了解區域供冷系統，機電工程署舉辦是次比賽活動，希望將區域供冷系統特點及其對社會節能減碳的貢獻推廣至小學生。並透過填色及繪畫比賽，鼓勵學生就節能及可再生能源技術方面展現他們的創意與想像力。

比賽反應非常熱烈，得到不少學校的積極支持，吸引超過1,000名小學生參加。評審團在眾多作品中選出接近30份優秀的作品，並於2024年1月16日舉行了比賽的頒獎典禮，以表揚得獎同學別具心思和創意的畫作。優勝作品亦將會在位於新建成的啟德區域供冷第三廠房的「區域供冷教育中心」內展示。頒獎典禮後，得獎同學及其家長隨即獲安排於1月20日參觀啟德區域供冷系統(北廠)，由本署工程師介紹啟德區域供冷系統的規劃，講解系統相關節能原理和知識，讓參與者親身體會區域供冷系統的規模與運作。

機電工程署署長彭耀雄先生於頒獎典禮致辭時，鼓勵同學們要身體力行，一起從生活中多方面入手，持續地減少碳排放，並且支持區域供冷系統的建設，長遠提升更多建築物的能源效益，低碳轉型，幫助香港於2050年前邁向碳中和，一起塑造更美好的城市。

In line with the "Hong Kong's Climate Action Plan 2050" ("CAP2050"), the Electrical and Mechanical Services Department (EMSD) promotes energy conservation and emission reduction measures actively to contribute in carbon reduction. In order to nurture the public's awareness of DCS, EMSD organized this competition, to promote the District Cooling System and its contribution to energy saving and decarbonization among the primary school students. Throughout the Coloring and Drawing Competition, students are encouraged to express their innovative and imaginative ideas on Energy Efficiency & Conservation (EE&C) and Renewable Energy (RE) technologies.

The competition received an overwhelming response and received active support from schools. More than 1,000 primary school students participated in the Competition. About 30 outstanding works were selected by the judging panels, and presented in the Award Presentation Ceremony held on 16 January 2024 in recognition of creative and unique ideas of the award winners. The winning works will be displayed in the "Education Center" of the coming 3rd plant of the Kai Tak DCS. After the Award Presentation Ceremony, the winning students and their parents were invited to visit the Kai Tak District Cooling System (North Plant) on 20 January. Engineers from the Department introduced the infrastructure planning of the Kai Tak DCS and explained the energy-saving principles and knowledges related to the system. This allows the participants to experience in the scale and operation of DCS.

During the Award Presentation Ceremony, Mr. PANG Yiu-hung, Director of Electrical and Mechanical Services, gave speech to the participants and encouraged the students to be involved in reducing carbon emissions in various aspects of their daily life, and supporting the development of District Cooling System to improve building energy efficiency, low-carbon transformation, and help Hong Kong striving towards carbon neutrality by 2050, thereby shape a better city together.



機電工程署一直透過舉辦活動，啟發年輕一代對工程學科的興趣，鼓勵他們積極探索未來，在工程領域發展，讓學生可以深入了解工程師在城市發展中的重要角色及貢獻，認識工程領域的多樣性和挑戰性。透過參觀區域供冷系統廠房活動，鼓勵同學們向環保節能技術方面開展自己的興趣，將來投身工程界，以配合《香港氣候行動藍圖2050》，為「節能和綠色建築」發展，培育更多未來工程新一代精英，以實現碳中和的目標。

EMSD has been organizing activities to inspire the youngsters' interest and encourage them to explore the future and develop in the engineering field, so that students can have an in-depth understanding of the important roles and contributions of Engineers to our society, and the diversity & challenges from engineering aspect. Throughout the visit to the DCS plant, we hope to stimulate students' eagerness and interests in serving energy-saving technologies and green buildings to help support of "Hong Kong Climate Action Plan 2050" and the target of carbon neutrality ultimately.



機電工程署署長彭耀雄先生(後排左四)、環境及生態局首席助理秘書長(能源)岑曉彤博士(後排右四)、機電工程署副署長/規管服務潘國英先生(後排右三)、機電工程署助理署長/電力及能源效益姚德泰先生(後排左三)、總工程師/能源效益C江茂誠先生(後排左一)、評審委員會眾成員與填色比賽得獎者合照

Director of the Electrical & Mechanical Services Department, Mr. PANG Yiu Hung (forth from the left of the 2nd row), Prin AS for Env & Ecology (Energy), Dr. SHAM Hiu Tung (forth from the right of the 2nd row), Deputy Director/Regulatory Services, Mr. POON Kwok Ying (third from right of the 2nd row), Assistant Director/Electricity and Energy Efficiency, Mr YIU Tak Tai (third from left of the 2nd row), Chief Engineer/Energy Efficiency C, Mr KONG Mau Shing (first from left of the 2nd row), pictured with judging panel members and winners of coloring competition.



部分獲獎作品展現了得獎同學對區域供冷系統的創意想像。

Part of the awarded Entries demonstrated their imagination and creativity in relation to DCS



得獎同學隨後獲安排參觀啟德區域供冷系統北廠房

The winning students visited the North Plant of Kai Tak District Cooling System

2023年香港聯合研討會「揭開香港區域供冷系統的神秘面紗」演講 Presentation "Demystifying District Cooling Systems in Hong Kong" at Hong Kong Joint Symposium 2023

機電工程署被邀請於去年11月22日香港聯合研討會2023中分享在香港實施DCS的心得。主題為“揭開香港區域供冷系統的神秘面紗”的論文是由機電工程署呈交及由溫少耀先生(高級工程師/能源效益C6)在研討會上發表。本文的目的在於推廣DCS在可靠性和可持續性方面的優勢，並嘗試釐清坊間對DCS應用和運作風險上的誤解。

DCS是重要的低碳和節能基礎設施之一，旨在推動節能及能源效益。行政長官在2022年《施政報告》中宣布，政府會加快在新發展區中(包括北部都會區)建設DCS，以減少能源消耗。DCS是一個區域性的空調系統，將中央水源的冷凍水輸送到區內多個用戶樓宇，以滿足其冷卻需求。

DCS能為節能和提升能效帶來不同的好處，例如利用各用戶建築物的負載多樣化(Load Diversification)降低DCS製冷機組需安裝的製冷量、釋放天台興建綠化屋頂和安裝太陽能發電板、緩解城市熱島效應、樓宇因無須為裝設獨立的製冷機組和相關機電設備而令其設計可更具彈性、節省在樓宇裝設製冷機組的前期建築費用、避免個別樓宇空調機組運作所引致的噪音及震動等等。

DCS服務對於用戶營運其建築物攸關重要，其服務可靠性要達到比正常更高要求，以確保減低服務中斷的可能性。就供冷系統的設施上，用來提升其可靠性和應變能力的方案已被考慮及實行。一般而言，DCS的服務可靠性可以超越個別樓宇的中央空調系統，其特點包括(1)雙電力供應源頭，(2)足夠電力備援能力，(3)熱備份模式控制系統，(4)二十四小時候命的專家操作團隊，(5)三管式環形冷凍水管道網絡，(6)N+1關鍵後備設備。



EMSD was invited to Hong Kong Joint Symposium 2023, held on 22 November 2023, to share insights for implementing district cooling system (DCS) in Hong Kong. The paper titled “Demystifying District Cooling Systems in Hong Kong” was submitted by EMSD and presented by Kennis WAN (SE/EEC6). The aims of paper are to promote the benefits of DCS in terms of reliability and sustainability as well as demystify its applications with in-depth elaboration on the misbelief on service risks.

DCS is one of important low carbon and energy efficient infrastructures designed to promote energy conservation and efficiency. The Chief Executive announced in his 2022 Policy Address that the Government would accelerate the incorporation of DCS in New Development Areas including the Northern Metropolis to reduce energy consumption. Generally speaking, DCS functions as a district-wide air-conditioning (A/C) system, distributing chilled water from a central source to multiple buildings within a designated area in a reasonable distance.

DCS has various benefits to enhance energy saving/efficiency, reduce the overall installed cooling capacity of chiller plant by taking the advantage of cooling load diversification, release roof areas for other uses such as provision of green roofs and/or photovoltaic panel installation, mitigate heat island effect arising from heat rejection equipment of individual air-conditioning systems, allow flexibility in building design, diminish upfront capital cost for the buildings where central chiller plant and the associated plant rooms are not required, alleviate noise/vibration pollution, etc.

DCS service is critical for the users to operate their buildings. Therefore, its service reliability should be exceptionally high to ensure that occurrence of service disruption should be kept as low as possible. In this respect, due considerations should be taken to enhance both reliability and resilience of DCS. In general, service reliability of DCS can outperform the centralized A/C systems of individual buildings by introducing various features such as (1) dual-fed electricity power supply, (2) sufficient power redundancy capacity, (3) hot-standby control system, (4) expert 24/7 operation team, (5) 3-pipe chilled water network being arranged in a ring, (6) N+1 redundant provision of critical equipment.

在演講結束時，溫少耀先生向參加者補充DCS的持續發展，其目標是提高能源效益、可靠性和環保效益，包括利用人工智能優化DCS系統運作，透過提供現場清潔(Clean-in-Place)裝置來加強板式熱交換器的保養維護，使用全球衛星導航系統(GNSS)監測地下喉管狀況，以及研究合適、具有較低全球變暖潛能(GWP)新一代雪種，供DCS 製冷機組使用。

Finally, Mr. WAN shed light on continuous development in terms of energy efficiency, reliability and environmental friendliness, including optimisation of DCS plant operation with Artificial Intelligence, smart maintenance of plate type heat exchangers by clean-in-place approach, settlement monitoring of underground buried distribution pipes with Global Navigation Satellite System as well as potential refrigerants with low global warming potential suitable for DCS chiller use.



機電工程署高級工程師/能源效益C6溫少耀工程師(左2)·與一眾講者接收大會所頒發的感謝狀。

Ir. Kennis Wan (second left, Senior Engineer/Energy Efficiency C) of EMSD receiving Certificate of Appreciation from the organizer of The Hong Kong Joint Symposium 2023