

主辦單位：
Organizer



AEEMM
澳門機電工程師學會
Associação dos Engenheiros Eletrónicos e Mecânicos de Macau
The Macao Institution of Electrical and Mechanical Engineers

協辦單位：
Co-organizers



BSOMES
Building Services Operation and
Maintenance Executives Society
屋宇設備運行及維修行政人員學會



華南理工大學
South China University of Technology

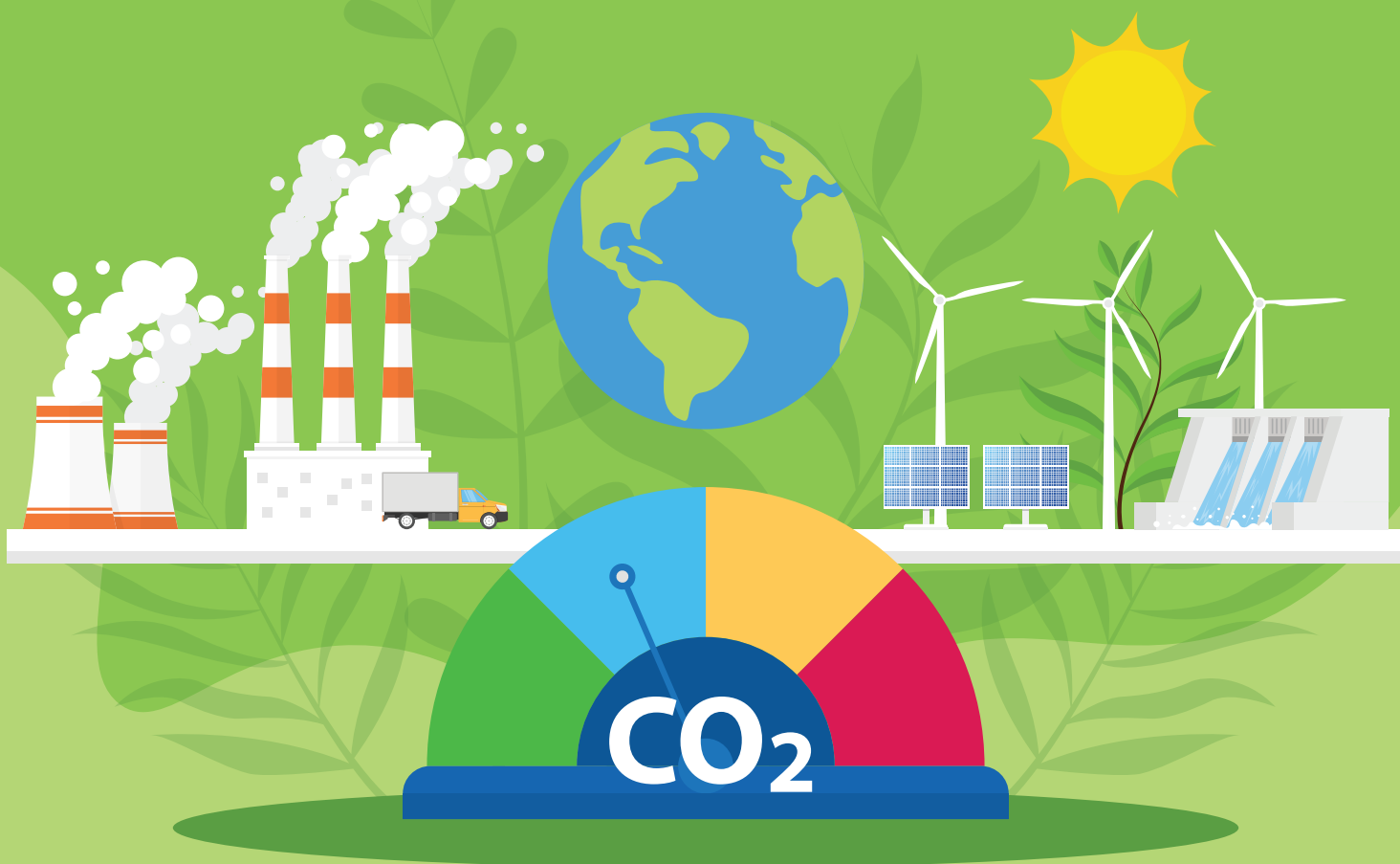


澳門科學館
CENTRO DE CIÊNCIA DE MACAU
MACAO SCIENCE CENTER

第十一屆粵港澳大灣區 屋宇運行及維護會議 大灣區屋宇設施邁向碳中和的 嶄新技術持續發展與智慧應用

The 11th Guangdong-Hong Kong-Macao Greater
Bay Area Conference on Building Operation and Maintenance
Sustainable Development and Smart Application of Innovative Technology
for GBA Building Facilities Towards Carbon Neutrality

15 • 09 • 2023



第十一屆粵港澳大灣區屋宇運行及維護會議

大灣區屋宇碳中和的嶄新技術持續發展與智慧應用

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一、Background 會議簡介：

"大灣區屋宇設施邁向碳中和的嶄新技術持續發展與智慧應用"會議是由澳門機電工程師學會主辦的一個專業技術交流平台。該會議旨在探討大灣區地區屋宇設施邁向碳中和的嶄新技術、持續發展以及智慧應用，以推動該區域的綠色發展和可持續發展。

近年來，全球氣候變化問題引起了越來越多的關注，各國紛紛制定了減少碳排放和實現碳中和的目標。澳門、香港和廣東省等大灣區地區也積極參與其中，並逐步推進建築行業的綠色發展。然而，在實現碳中和的過程中，屋宇設施起到了至關重要的作用。因此，探討如何利用嶄新技術和智慧應用來提高屋宇設施的能效以及減少碳排放，對於推動大灣區地區的綠色發展和可持續發展具有重要意義。

澳門機電工程師學會作為一個專業團體，除了貫徹地推廣電機及機械工程技術的相關專業知識外，也一直非常關注其他國際專業學會在工程技術方面的發展及本地地區在這方面的動向，期盼為本澳在工程技術領域方面能與國際接軌，並培養更多優秀的本地人才。

《第十一屆粵港澳大灣區屋宇運行及維護會議》將由澳門機電工程師學會為主辦單位並由屋宇設備運行及維修行政人員學會、華南理工大學、澳門科學館為協辦單位；會議將於二零二三年九月十五日在澳門科學館會議廳舉行，本屆會議的主題為《大灣區屋宇設施邁向碳中和的嶄新技術持續發展與智慧應用》。這次會議將圍繞法規與實務守則、推動新能源於屋宇設施上的應用與實踐、碳中和下的屋宇設施運行與維護以及老齡化大廈的屋宇設備系統改進和更新等範疇進行專題報告，學術研討、成功經驗和策略的分享。

這個會議將邀請到行業專家、學者和企業代表作為演講嘉賓，以分享他們在屋宇設施領域的經驗和最新研究成果。此外，會議還將提供一個交流平台，使與會者可以互相學習和討論，建立合作關係，促進行業的發展。

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二、Details of Conference 會議詳情：

Date 日期：	15 th Sep 2023 (Friday) 2023年09月15日 (星期五)
Time 時間：	08:30 - 17:30
Venue 地點：	Macau Science Center, Convention Hall 澳門科學館，會議廳
Quota 名額：	350 pax, limited places, first come first serve 350人，名額有限，先到先得
Language 語言：	Chinese and English 中文及英文
Audience 對象：	Electrical Engineers; Electrical and Mechanical Engineers; Mechanical Engineers; Design Consultant 電機工程師、機電工程師、機械工程師及設計顧問



物業管理業監管局
PROPERTY MANAGEMENT
SERVICES AUTHORITY

This is an “Official” and “Non-Core” activity related to “Others” under the CPD Scheme of the Property Management Services Authority. Holders of Property Management Practitioner Licence may receive a maximum of 5 CPD hours by participating in the activity.

此 [活動] 屬物業管理業監管局「持續專業發展計劃」下「非核心」內容範疇內有關「其他活動」的「非正式」學習 [活動]，物管人牌照持有人可藉參與 [活動] 而獲取最多 [5] 小時的認可持續專業發展時數。

三、Enrollment 報名：

(截止報名日期：2023年8月31日)



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四、Fee & Payment 費用及付款方法：

Membership price 會員：	MOP 770 *包括澳門機電工程師學會與協辦單位會員 *於8月10日或之前成功報名可享早鳥優惠 MOP 700
Others & Non-Member 其他及非會員：	MOP 840 *於8月10日或之前成功報名可享早鳥優惠 MOP 770
Remarks 備註：	1. 以上費用已包括：席間茶點及出席證書 2. 出席簽到者將於研討會後獲發出席證書一張 3. 技術研討會將向澳門建築、工程及城市規劃專業委員會申請持續進修活動 (CPD)

Payment 付款方法：	透過本會戶口進行轉帳： 1. 過數易 / EASY TRANSFER 系統識別碼 / FPS ID: 12657938 2. Mpay (*支援聚易用 Support Simple Pay) 3. 中銀智慧付 BOC Pay (*支援聚易用 Support Simple Pay) 4. 大西洋銀行戶口 (號碼：9008987130) 5. 中國銀行戶口 (號碼：18 5000 0088 2789 3)	 
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**請於完成付款後將轉帳收據或付款截圖發送至 pro.training@aeemm.org.mo

五、Conference Rundown 會議流程：

上午部分 / MORNING SESSION	
09:00-09:30	登記註冊 / Registration
09:30-09:35	歡迎詞 / Welcome Address 束承靖會長，澳門機電工程師學會 President of AEEMM, Mr. CHOK Seng Cheng, Stephen
09:35-09:40	開幕詞 / Opening Address 馮德祥理事長兼籌委會主席，澳門機電工程師學會 Council President of AEEMM, Mr. FUNG Tak Cheung, Philip
09:40-09:55	致送紀念品及大合照 / Souvenir Delivering and Photo Taking
09:55-10:05	主旨發言 / Keynote Speech 閻軍威教授 副院長，華南理工大學廣東省城市空調節能與 控制工程技術研究開發中心
Session Chair	
10:05-10:25	Presentation #1: Revisit to Operation and Maintenance Manuals for Green Buildings in Greater Bay Area Author: Hong Kong Building Commissioning Centre/Ir Leo CF Wong; Clydeman Engineering Ltd./Mr. CK Chan, Mr. Galaxy KH Tang; Oriental Engineering (HK) Ltd./Mr. Gabriel SS Ng; Mr. Danny TF Wong, Mr. Martin MK Wong
10:25-10:45	Presentation #2: 香港實施建築物重新校驗(再調適)的最新發展 Author: EMSD / Ir Lam Kin Wai, Ray
10:45-11:05	Presentation #3: Using the operation data to assess the Energy Performance of existing commercial buildings for facilitating the achievement of long-term energy / carbon reduction target Author: Hong Kong Green Building Council / Ir Dr. Paul Sat
11:05-11:30	休息 / Coffee Break
11:30-11:50	Presentation #4: 大湾区老旧数据中心的用能分析及能效提升研究：以佛山地区为例 Author: 华南理工大学智慧城市能源与空调节能团队/黄晓斐，闫军威，吴一心，胡诗晨
11:50-12:10	Presentation #5: Optimal Spatial-temporal Scheduling of Electric Buses for Flexibility Enhancement of Commercial Building Park Operation in Macau Author: State Key Laboratory of Internet of Things for Smart City and Department of Electrical and Computer Engineering, University of Macau / Mr. Lingming Kong, Ms. Ningyi Dai
12:10-12:30	Presentation #6: The Practical Use of Big Data Analytics and Artificial Intelligence Application to a Large Chiller Plant in one of Hong Kong's Tallest Buildings Author: ISPL Consulting Ltd / Dr. Leonard KH Chow, Ms. Killary Lui

五、Conference Rundown 會議流程：

12:30-12:45	答問時間 / Question & Answer
12:45-14:30	午膳 / Lunch Session
下午部分 / AFTERNOON SESSION	
14:30-14:50	<p>Presentation #7: A Comparative Analysis of the Lift Maintenance Performance of two Residential Buildings</p> <p>Author: Technological and Higher Education Institute of Hong Kong / Ir Dr. Roger TH Ng, The Hong Kong Polytechnic University / Ir Prof. Joseph H.K. Lai, Mr. Oscar C.H. Leung</p>
14:50-15:10	<p>Presentation #8: Application of Nanofiber filter to achieve indoor air quality and energy efficiency</p> <p>Author: Hospital Authority, HKSAR / Dr. Encon Hui; Nanofil Filtration Technology Limited / Mr. Eddie Fung</p>
15:10-15:30	<p>Presentation #9: Smart Operation and Maintenance Practices in Building Facilities towards Carbon Neutrality for Existing Commercial Buildings</p> <p>Author: Hong Kong Green Building Council Ltd. / Ir Dr. Paul Sat, Mr. TW Fung</p>
15:30-16:00	休息 / Coffee Break
15:55-16:15	<p>Presentation #10: Energy Management through Big Data Analytics for Existing Building</p> <p>Author: ARUP / Mr. Felix Chan, Ms. Jill Leung</p>
16:15-16:35	<p>Presentation #11: Digitalization of Monitoring-Based Commissioning through a Cloud-Based Smart Energy Management Platform</p> <p>Author: Swire Properties Limited / Mr. Timothy LT Lok, Ir Dr. Raymond MH Yau, Mr. Barry KP Lau</p>
16:35-16:55	<p>Presentation #12: Physical solution on Water-cooled Air Conditioning System - An innovative non-chemical and carbon neutrality approach</p> <p>Author: MAGEN TECHNOLOGY CO., LTD. / Mr. Alan WK Tong</p>
16:55-17:20	答問時間 / Question & Answer
17:20-17:30	<p>閉幕詞 / Closing Address</p> <p>鄭偉文監事長，澳門機電工程師學會 President of AEEMM Supervisory Board, Dr. KUONG Wai Man, Raymond</p>
17:30	會議結束 End of Conference

*注：以上日程，所提及之主講嘉賓和論文名只供參考，最終的方案將在稍後時候公布
Remark: The above speakers and papers are provided for reference only; the final information will be published in due course

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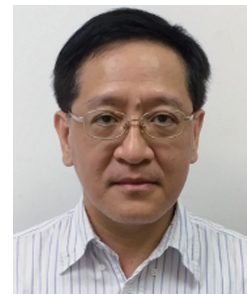
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Presentation #1:

Ir Leo CF Wong, Technical Director - Hong Kong Building Commissioning Centre

Ir Leo CF Wong - Leo obtained his BEng in Mechanical Engineering from Brighton Polytechnic UK then pursued four Master Degrees in China Studies, Sustainability, Law, and Language. He is a member of IMechE, CIBSE and HKIE for 30 years; and currently CEng, CEnv, RPE, CEM and CAP.

He specializes in building commissioning and is the first international member of Building Commissioning Association USA. He has authored over 30 conference papers covering building commissioning, operation and maintenance, green building assessment, and climate change issues and did the presentations in China, Hong Kong, Macao and Japan. He is a part time lecturer with City University of Hong Kong.



Mr. Galaxy KH Tang, Project Manager, Clydeman Engineering Limited

Mr. Kin-ho Tang - KH obtained his HD, BEng and MSc all in Building Services Engineering. He has about 17 years working experience in project and contracting; and serves as a project manager with Clydeman Engineering Ltd.

He has co-authored about 10 technical papers with Ir Leo Wong, and did two presentations in 2017 at Macao and 2019 at Wuhan.



Presentation #2:

Ir Lam Kin Wai, Ray - 香港特別行政區機電工程署

林健威工程師任職於香港特別行政區機電工程署，有超過8年屋宇裝備相關工作經驗。林工程師現時主要負責帶領團隊為超過200幢主要政府建築物進行重新校驗(再調適)的工作，以改善政府建築物的能源效益表現及推廣重新校驗(再調適)以減少碳排放，致力達至碳中和目標。他亦策劃各項宣傳工作，並將建築物能源效益及重新校驗(再調適)推廣至各持份者及公眾。



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Presentation #3:

Ir Dr. Paul Sat - Hong Kong Green Building Council

Ir Dr. Paul Sat graduated with a BEng (Hons) degree in Building Services Engineering and worked as engineer in an E&M Consultant Firm. He acquired his PhD degree in energy discipline at the Hong Kong Polytechnic University in 2003. He joined one of the largest building developers over 13 years and over 150 energy saving measures including both retrofitting, retro-commissioning and innovation works had already handled by him. In 2016, he joined the Hong Kong Green Building Council as the Head of Research and Public Education. He works together with the industry, various institutions and the Government on promoting energy efficiency, knowledge-based energy management and innovation projects, industry standards and practices. His current interest includes operating data analytic and diagnostic, building energy assessment & benchmarking, building performance evaluation and knowledge base energy management, retro- and re-commissioning process, use of big data, smart technologies, etc.



Presentation #4:

黄晓斐 博士研究生

华南理工大学智慧城市能源与空调节能团队

黄晓斐华南理工大学博士研究生，机械与汽车工程学院 - 智慧能源及碳排放管理决策与调控团队。2020年于广东工业大学环境科学与工程硕士，现为华南理工大学资源与环境博士生。主要研究方向为数据中心能效提升技术研究与应用；空调系统智能化节能调控；室内环境安全与健康数值模拟研究。主要成果：申请国家发明专利12项申请实用新型专利2项；发表SCI论文5篇中文核心论文1篇；参与国家自然科学基金1项参与广东省省科技计划项目1项；参与广东省自然科学基金1项；参与粤港澳大湾区18个数据中心节能减排工作累计节约用电量超2700万kWh。



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Presentation #5:

Mr. Kong Lingming, PhD student from State Key Laboratory of Internet of Things for Smart City and Department of Electrical and Computer Engineering, University of Macau



Kong Lingming received the B.S. degree in automation engineering from Shandong University, Shandong, China, in 2016 and the M.S. degree in electric engineering from National University of Singapore, Singapore, in 2018. He is currently pursuing the Ph.D. degree in electrical and computer engineering at the University of Macau, Macau, China. His current research interests include smart energy, power and transportation network integration.

Dr. Ningyi Dai, Associate Professor - Department of Electrical and Computer Engineering and State Key Laboratory of Internet of Things for Smart City, University of Macau



Ningyi Dai (Senior Member, IEEE) received the B.Sc. degree in Electrical Engineering from Southeast University, Nanjing, China, in 2001, and the M.Sc. and Ph.D. degrees in Electrical and Electronics engineering from the Faculty of Science and Technology, University of Macau, Macau, China, in 2004 and 2007, respectively. She is currently an Associate Professor with the Department of Electrical and Computer Engineering and State Key Laboratory of Internet of Things for Smart City, University of Macau. She is also assistant Dean of Faculty of Science and Technology, University of Macau. She has authored or coauthored more than 90 technical journals and conference papers in power systems and power electronics. Her research interests include the application of power electronics in power systems, renewable energy integration, and integrated energy system. Dr. Dai was the corecipient of the Macao Science and Technology Invention Award in 2012, 2018 and 2022.

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Presentation #6:

Dr. Leonard KH Chow, Vice President for Asia Pacific Rim

Development at the Association of Energy Engineers (AEE USA)

Dr. Leonard Chow is a highly accomplished and respected Regional Vice President for Asia Pacific Rim Development at the Association of Energy Engineers (AEE USA). With over 35 years of experience as a Consulting Mechanical and Building Services Engineer, Dr. Chow has been recognized by AEE USA for his outstanding contributions to the field of energy engineering. In 2011, he was awarded the prestigious Energy Engineer of the Year title, and in 2013 he was made a Fellow of AEE. Furthermore, he was elected to the AEE Hall of Fame in 2022 for his exceptional leadership and service to the industry.



Dr. Chow received his First-Class Honors degree from Imperial College London, U.K. and went on to earn a Master MSc and PhD degree. He is a registered Professional Engineer in the UK, Hong Kong, USA, and Australia, and has been practicing in the field for over 35 years. Dr. Chow is also the founder of his own company, ISPL Consulting Ltd, which he established 25 years ago. He has been a course manager for more than 13 years, bringing in over 50 AEE courses.

In addition to his many achievements, Dr. Chow has written over 30 technical papers, guidelines, and manuals, which have contributed significantly to the development of the energy engineering field. He has also conducted more than 30 technical seminars in recent years, sharing his knowledge and expertise with others in Hong Kong, Tokyo, Beijing, Xian, Shanghai, Jinan, Guangxi, Singapore, and Atlanta, USA. Overall, Dr. Chow's impressive contributions and accomplishments have made him an influential figure in the energy engineering industry, and a valuable asset to the AEE community.

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Presentation #7:

Ir Dr. Roger TH Ng, Associate Professor of THEi Hong Kong

Ir Dr. Roger Ng is currently an Associate Professor of THEi Hong Kong. He is a Chartered Engineer and a corporate member of BSOMES. He is now serving as the Programme Leader of the Bachelor of Engineering (Honours) in Building Services Engineering, and two Professional Diploma Meister programmes, respectively in Lift & Escalator Engineering and Power Electrical Engineering, at THEi.



Presentation #8:

Dr. Encon Hui, Ex-Hospital Manager of Hospital Authority, HKSAR

Dr. Encon Hui is a veteran of facility management with industrial experience in semiconductor manufacturing, food processing, turn key industrial projects, and hospital maintenance and improvement projects. He is a Corporate Member of HKIE qualified in engineering disciplines of Mechanical, Industrial and Building Services. He is also a founding member of BSOMES.



Encon's research and consultancy interests include maintenance strategy, energy efficiency, and asset quality management system.

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Presentation #8:

Mr. Eddie Fung, CEO - Nanofil Filtration Technology Ltd.

Eddie is a seasoned building services and facility management practitioner and was one of the founders of Building Services Operation and Maintenance Executive Society (BSOMES). He was trained up in mechanical engineering and an MBA graduate. He is knowledgeable and experienced in Indoor Air Quality (IAQ) management, energy saving and building services operation and maintenance. Eddie is now a Member of ASHRAE and Fellow Member of BSOMES.



Before starting his own business in air filtration, he was the head of facility management of Hang Seng Bank and was responsible for overall management of various building services systems of the bank's headquarters, branch network, offices, investment properties and data center. Starting from 2016, he led and completed a R&D project of nanofibrous air filter and is one of the inventors. He is devoted to continuously improve the indoor air quality through application of contemporary technologies.

Presentation #9:

Mr. TW Fung, Technical Manager of Hong Kong Green Building Council Ltd.

TW Fung has over 40 years' experience in engineering works / testing and commissioning of MEP installations for various famous property developers including Hong Kong Land Properties, Swire Properties, Kerry Properties and Hung Lung Properties. He set up and led the technical team for the operation and maintenance of MEP installations, coordinate the hand-over works for new building operation, and vetting the tenant's MEP design in both Hong Kong and Mainland China portfolios for various developers. He also provided technical support and training for technical teams and he is the key members in promoting energy efficiency, retrofitting and retro-commissioning of MEP installations for various developers. He is a member of ASHRAE, BSOMES, and CIPHE as well as a BEAM Pro of HKGBC. He is now the technical manager of HKGBC and contributing his knowledge and best practice to the industry.



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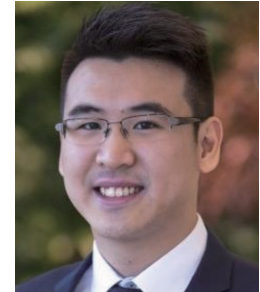
Presentation #10:

Mr. Felix Chan, Mechanical Engineer & Energy and Carbon Specialist - ARUP

Felix Chan is experienced in sustainable building design, building energy simulation and building energy management.

Mr. Felix Chan joined Arup in 2012 and is now a Senior Consultant in Arup Sustainability Group. He is specialized in sustainable design and energy efficient design and has participated in various Grade A commercial projects in Hong Kong. Felix is an energy and carbon expert. He has been involved in portfolio building energy analysis and opportunities for major property owners/ developers in Hong Kong. He also works on projects to help major developers (delete if anonymous, like Henderson Land, Nan Fung and MTRC) to develop corporate decarbonization roadmap. Felix has recently participated in zero carbon building feasibility study for historical properties in China.

Felix is interested in innovation. He offers smart green and innovative ideas and solutions integrating with green building design. His innovative technology “Neuron Health” has earned various local and global recognitions and awards. He also works on projects to healthy building and wellness design. His disinfection system design for residential units has obtained patent in Hong Kong. Recently, he and his team’s entry “The Living Lab” was the winner of the Existing Building” category in “Advancing Net Zero” Ideas Competition organized by HKGBC and Swire Properties. Felix is ambitious to make influence to the building sector to achieve carbon neutrality.



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The 11th Guangdong-Hong Kong-Macao Greater Bay Area Conference on Building Operation and Maintenance
Sustainable Development and Smart Application of Innovative Technology for GBA Building Facilities Towards Carbon Neutrality

Presentation #11:

Mr. Timothy LT Lok, Manager, Building Services - Technical Services & Sustainable Development, Swire Properties Limited

Timothy Lok is Manager, Building Services of Technical Services & Sustainable Development at Swire Properties. He is responsible for establishing the 1.5oC aligned Science-Based Targets and identifying energy reduction and decarbonization strategies to pave way for the company in advancing towards a net zero future. He led the digital transformation of technical services, including the implementation of Cloud-Based Smart Energy Management Platform across portfolios in both Hong Kong and Chinese Mainland. He leads the team in the identification and piloting of innovative technologies with the aim of decarbonization. He is also responsible for the energy analysis and retro-commissioning of buildings to continuously improve energy performance.



Ir Barry KP Lau, Deputy Head, Building Services - Technical Services & Sustainable Development, Swire Properties Limited

Ir Barry Lau is the Deputy Head, Building Services, Technical Services & Sustainable Development at Swire Properties Limited. He is responsible for formulating the corporate decarbonization and energy saving strategies within Swire Properties to pave way for the company in advancing towards a net zero future and technical support to the company's operation across Hong Kong and Chinese mainland. He is currently leading implementation strategies of energy reduction, Retro-commissioning, implementation of monitoring-based commissioning of all existing portfolios for deep energy savings and digital transformation of technical services and establishment of cloud-based energy management platform across global operations.



Barry is a fellow member of HKIE and IMechE. He is also registered as RCx Professional.

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Presentation #11:

**Dr. Raymond MH Yau, General Manager - Technical Services,
Technical Services & Sustainable Development, Swire
Properties Limited**



Sustainable Development at Swire Properties. He led the formulation of the company's SD2030 strategy and established 1.5oC-aligned Science-Based Targets. These strategies and ambition pave way for the company in advancing towards a net zero future. To achieve the targets, he spearheaded implementing energy reduction strategies through Retro-Commissioning, Digital Transformation, and tenant engagement programs. He partnered with HKUST and Tsinghua University in understanding embodied carbon emissions for new developments in Hong Kong and Chinese Mainland. He also commissioned climate risk assessment to understand both transition and physical risks of company assets. And to support the transition towards a net zero future he helped to establish the company's ESG Green Finance Framework. Dr Raymond Yau is the Co-chair of Tsinghua University (School of Architecture) – Swire Properties Ltd Joint Research Centre for Building Energy Efficiency and Sustainability.

Raymond is also a Member of the Advisory Council on the Environment, the Government of the Hong Kong Special Administrative Region; Executive Committee member and Board of Director in Business Environment Council; Director and Vice Chairman of Sustainable Development Committee, Hong Kong Green Building Council; Committee Member of China Green Building Council; and a Founding Member of International WELL Building Institute Governance Council.

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Presentation #12:

Mr. Alan WK Tong - MAGEN TECHNOLOGY CO., LTD.

Alan Tong, a hands-on mechanical engineer with over 40 years' experience in power plant and building services fields, started off his career as a student mechanical apprentice with CLP Power Hong Kong Limited in 1970 and upon the completion of his apprenticeship, he was retained by CLP to work as an assistant engineer in power plant maintenance area until his departure in late 70s.



In order to extend his career exposure, Alan Tong joined the Building Services Section at Housing Department of HKSAR Government as an inspector with involvement in Central Air-conditioning System, vertical transportation, water supply system & building services. He was a senior inspector before his retirement from the civil services in 2005.

With his knowledge gained over years in freshwater cooling tower water management system, Alan Tong has then devoted his time and effort in developing magnetic technology and sourcing "mineral salts extraction device" for application in physical treatment of industrial water involving calcium scale removal and disinfection aspects serving both Hong Kong and Macau markets. After 5 years of effort, he successfully applied the technique in leachate sewage plant and fresh water & sea water cooling system. He has been invited to present his findings at CIWEM 2010 Conference and been requested to submit a paper subsequently. His Paper on "Disinfection, BOD and COD Reduction via Magnetic Water Treatment" was published by CIWEM afterwards.

Alan Tong holds a Higher Certificate in Mechanical Engineering from the Hong Kong Polytechnic.