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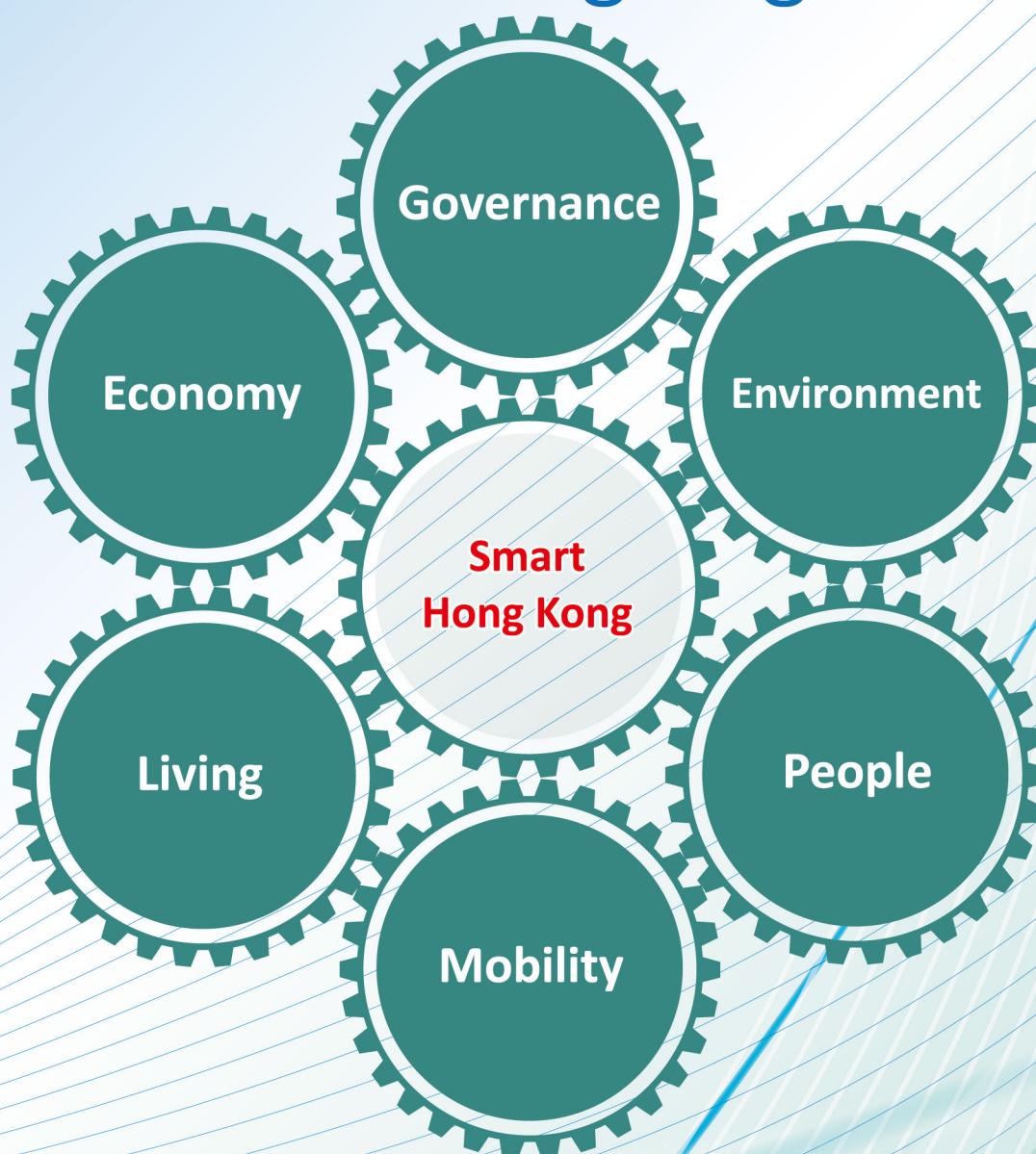


PROCEEDINGS

Technical Forum on

Energy Technology and Innovation for

Smart Hong Kong



6 March 2017 (Monday), 1:30 - 5:30 pm
Chiang Chen Studio Theatre,
The Hong Kong Polytechnic University,
Hung Hom, Kowloon



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Technical Forum on Energy Technology and Innovation for Smart Hong Kong

Programme

Time	Content
1:30-2:00 pm	Registration
2:00-2:05 pm	Opening Speech Ir Dr. Raymond KL Chan, President of HKAEE
2:05-2:30 pm	Keynote Speech Ir Alfred WH Sit, JP, Deputy Director/Regulatory Services, Electrical & Mechanical Services Department of the HKSAR Government
2:30-2:50 pm	Ir KW Kong, Senior Engineer, Electrical & Mechanical Services Department of the HKSAR Government "A smart Way for Building Energy Optimization - Retro-commissioning"
2:50-3:10 pm	Prof Christopher Chao, Head and Chair Professor, Department of Mechanical and Aerospace Engineering, Hong Kong University of Science and Technology "Development of a Photonic Radiative Cooler for Energy Saving"
3:10-3:30 pm	1st Q & A Session + Certificate Presentation, moderated by Ir S K Ho, Director of HKAEE
3:30-4:00 pm	Tea Break
4:00-4:20 pm	Ir Colin Chung, Managing Director, Sustainable Development & Environment Group, China Region, WSP Parsons Brinckerhoff "Distributed Energy – low Carbon smart Solution for Hong Kong"
4:20-4:40 pm	Mr. Nelson Ho, Director of Facility Management, Synergies Management Ltd. "Smart People vs Smart Technology for Energy Innovation"
4:40-5:00 pm	Ir Travis Kan, Director, Business Development, Schneider Electric Hong Kong "Cost Effective Energy Management and Building Control Solution"
5:00-5:20 pm	2nd Q & A Session + Certificate Presentation, moderated by Ir Eric Lau, Vice Chair of HKAEE
5:20-5:25 pm	Closing Ir Dr Shelley Zhou, Chair Lady of Organizing Committee

PROCEEDINGS

Technical Forum on Energy Technology and Innovation for Smart Hong Kong

Organizer:



Co-Organizer:



Hong Kong Association of Energy Engineers
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Organizing Committee

CHAIR LADY



Ir Dr. Shelley WW Zhou

MEMBERS



Ir Dr. Raymond KL Chan



Ir Colin CL Chung



Ir SK Ho



Ir Eric KW Lau



Ms Julie YC Wong



Ir Dr. Conson KH Yu



Mr HW Yu

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About HKAEE

Mission

Work towards reliable supply, innovative development and effective utilization of energy to achieve sustainability in our community.

Vision

Serve the professional needs and interests of its members and the community, identify and support good practices, new technologies and industrial standards; promote research, organise and deliver education and training aimed at maintaining excellence in professional competence and performance in energy engineering and related subjects.

Objectives

Accelerate institutional change such as:

- Development and provision of network services and focused fora to enhance participation and interaction of members to share information and improve understanding of energy policy and its sustainable practices.
- Development and dissemination of user-friendly tools for replicating or improving good policy, regulatory and financing practices to facilitate members and the community in contributing to the advancement of energy engineering.
- Support and promotion of new and innovative approaches to catalyze the development of financing funds and facilities for energy projects.
- Build up a strong constituency of sustainable energy financiers and investors and provide a forum for them to share information on the needs of energy market.

A Message from the President



On behalf of the Hong Kong Association of Energy Engineers (HKAEE), I would like to express my heartfelt thanks to all participants to the HKAEE Technical Forum 2017. It is a good timing to organize the Forum and share the latest energy technologies and innovations after the issuance of the Chief Executive's Policy Address and Hong Kong's Climate Action Plan 2030+ in January 2017.

In CE's Policy Address, the HKSAR Government emphasized the importance of promotion of development of innovation and technology to support sustainable economic growth and sharpen our competitive edge. While in Climate Action Plan 2030+, the Secretary for the Environment pushed ahead with a new carbon emissions reduction target for 2030 with action plans and urged the engagement and participation of the public to strengthen the climate-readiness of Hong Kong. Innovation and technology play an important role in dealing with climate change. Integration of smart technologies into various aspects of life in Hong Kong will also help to make the use of energy more efficient and effective. In addition, the 13th Five-Year Plan issued in late 2016 also identified a few key objectives that include advancing green development and putting "ecology first". This sets the scene in bringing further opportunities in environmental services, particularly on green technology and finance, where innovative energy technologies and management would play a significant role. The theme and content of this Technical Forum – "Energy Technology and Innovation for Smart Hong Kong" can meet these objectives. Local energy speakers from Government, Researcher, Designer, Operator and Supplier would surely bring you the latest innovative ideas and technologies for fostering the development of a Smart Hong Kong.

Our last two Technical Forums were held in May of 2011 and 2014, talking about the "Recent International Green Movement & Environmental Protection Strategy of China" and "Evolution Energy Solutions for Buildings and Technology Development" respectively. In these few years, the focus of energy saving was shifted from equipment solution prospect of energy efficiency of a building to system prospect of a smart building or Hong Kong. The Paris Agreement (COP21) came into force on 4 November 2016, succeeding the Kyoto Protocol. Hong Kong has set an ambitious carbon intensity reduction target of 65% to 70% by 2030 using 2005 as the base. While we will continue to improve energy saving for new buildings, our main focus is on existing buildings and public infrastructure. These changes involve different statutory requirements, stakeholders, applications and experiences. Today Technical Forum will definitely provide opportunities to broaden your knowledge in these areas to cope with and support the changes.

Last but not least, your participation has an important role in this Technical Forum by sharing your insights in the progress of Smart City development. I wish the Technical Forum every success and I do hope all participants enjoy and benefit from this meaningful event.

Ir Dr. Raymond K.L. Chan
President (2014-18)
HKAEE

A Message from the Organizing Committee Chairlady of Technical Forum



On behalf of the organizing committee, it is with great pleasure that I welcome you to the Hong Kong Association of Energy Engineer's Technical Forum on 6 March 2017 at Chiang Chen Studio Theatre, Hong Kong Polytechnic University!

Climate change is now regarded as an existential risk for the human race. While 195 countries have pledged to limit global warming to well below 2°C through the Paris Agreement in December 2015, it offers communities around the world a chance to embark on a low-carbon path.

Hong Kong's total greenhouse gas level is around 44 million tones, among which 68% from power generation, 18% from transportation and 5.8% from waste. The main potentials for Hong Kong to mitigate GHG emissions, rest mainly in using less coal in our local electricity generation, reducing electricity usage in buildings, making transport more energy efficient, and recovering (renewable) energy from waste. Innovative solutions and technology breakthrough are needed to reduce that 8 -14 million tonnes of carbon emission in the next 4 years to achieve our target, and in long-term to support Government's 2030+ plan.

The theme that we have chosen for this forum is "Energy Technology and Innovation for Smart Hong Kong", which aims to engage Government officials, academic professors, technology innovators, solution providers as well as industry professionals to share and discuss the potential solutions in energy field in driving a smarter Hong Kong.

The forum covers a broad spectrum of technical areas related to energy technology and innovation and its applications in Hong Kong. We are extremely grateful to Government departments' support – Environment Bureau, Architectural Services Department, Drainage Service Department, Housing Authority, and particularly Electrical & Mechanical Services Department. It is our honour to have Ir Alfred Sit, JP, Deputy Director of EMSD to give a keynote speech to share his views over energy related issues in near run, especially in response to Hong Kong's Climate Action Plan 2030+. Same gratitude to our five distinguish speakers to cover topics on retro-commissioning, photonic radiative cooler, distributed energy, smart people vs smart technology, and cost effective building control solutions.

We cannot thank enough the other over 20 supporting organizations and all the sponsor organizations. Without their continuous support, this forum could not be successful.

I would like to thank all the members of the organizing committee who have helped in crucial ways at various stages of organizing the technical forum – Ir Dr. Raymond KL Chan, Ir Colin Chung, Ir SK Ho, Ir Eric Lau, Ms Julie Wong, Ir Dr. Conson KH Yu, and Mr HW Yu. Their dedication and commitment, and willingness to work together even when there were tight time constraints, made the entire task proceed much more smoothly than we had hoped!

Last but not the least, we are grateful to Dr. Edward Lo, Department of Electrical Engineering of Hong Kong Polytechnic University to be our co-organization.

We hope that you enjoy the forum!

Ir Dr. Shelley Zhou, Organizing Committee Chairlady

**Technical Forum on
“Energy Technology and Innovation for Smart Hong Kong”
6 March 2017 (2:05 – 2:30pm)
Keynote Speech by Ir Alfred SIT, JP, Deputy Director, EMSD
Hong Kong - City of Tomorrow**



Biographies

Ir Alfred W H SIT is Deputy Director of the Electrical & Mechanical Services Department (EMSD) of the HKSAR Government. EMSD, being a government department, plays a dual role in Hong Kong. Firstly, it acts as a law enforcement department with regard to electricity, gas, railway, lift and escalator safety, and a number of related E&M safety areas. Its second role is to provide E&M engineering solutions and services to other government departments and public sector organizations in Hong Kong. EMSD is also charged with supporting government initiatives in promoting energy efficiency and conservation in Hong Kong.

Ir Sit has been working in the electrical and mechanical engineering field for more than 30 years. He is a Fellow Member of the Hong Kong Institution of Engineers and is active in the activities of the learned societies. He has served as the President of the Hong Kong Institute of Facility Management, the Chairman of the Biomedical Division and the Honorary Secretary of the Nuclear Division of the Hong Kong Institution of Engineers.

Synopsis

People say “Development and Energy Consumption are like “Light and Shadow” which are inseparable”. Is that the truth?

While the city develops rapidly, a plan on how we better utilize the resources and allow green development is essential. In 2015, the Environment Bureau unveiled an Energy Saving Plan for the Built Environment 2015~2025+, which set a new target on reducing Hong Kong’s energy intensity by 40 per cent by 2025. Furthermore, the Government announced “Hong Kong’s Climate Action Plan 2030+” in January 2017 which outlined the Government’s longer-term action in combating climate change and setting out the carbon emission reduction target for 2030.

As highlighted in the Action Plan, climate change is a cross-sector and cross-domain subject. All of us, including the Government, the trades and public are the key players. EMSD, as a department continuously focusing on energy efficiency, would like to share on what and how we can contribute to achieve those ambitious targets setting in the plans as well as build our “City of Tomorrow”.

A smart Way for Building Energy Optimization - Retro-commissioning



Ir KW Kong
Senior Engineer
Electrical & Mechanical
Services Department of the
HKSAR Government

Biographies

Ir KW Kong is a senior engineer of EMSD, HKSAR Government. He has over 18 years experience in building services design and project management of a wide variety of government premises. In recent years, Ir Kong has been actively involved in the promulgation of retro-commissioning and update of the technical standards and requirements of the Building Energy Code and the associated guidelines under the Building Energy Efficiency Ordinance and their promotion to the stakeholders.

Abstract

Hong Kong is a densely populated metropolitan city crowded with highrise buildings. It is imperative to reduce the use of electricity in buildings to combat climate change. As most of the existing buildings in Hong Kong were designed and built at a time when energy saving was not a foremost consideration, one of the key initiatives to achieve this target is to identify where the best potential energy savings for existing buildings are, and improve their energy performance through retro-commissioning. Retro-commissioning is a cost-effective process to periodically check an existing building's performance. The process identifies operational improvements that can optimize energy efficiency performance of the buildings and thus lower energy bills. The process can be performed alone or with a retrofit project.

The draft Technical Guidelines on retro-commissioning has already been completed by EMSD and stakeholder consultation is underway. A number of government buildings of varying size, usage, age and annual energy consumption have been selected as pilot projects for implementation of the draft Technical Guidelines on retro-commissioning. The feedback for stakeholders and experience gained from the pilot projects will be used to fine-tune the draft Technical Guidelines on retro-commissioning before its official launch in mid-2017.

The presentation materials of all five speakers of the Technical Forum 2017 are uploaded to the following QR Code or link.

<http://www.hkaee.org/forum2017/>



Development of a Photonic Radiative Cooler for Energy Saving



Prof Christopher Chao
Head and Chair Professor,
Department of Mechanical
and Aerospace Engineering
Hong Kong University of
Science and Technology

Biographies

Prof. Christopher Chao is a Chair Professor and Head of Mechanical and Aerospace Engineering at The Hong Kong University of Science and Technology (HKUST). He was Associate Dean of Engineering (Research and Graduate Studies) from 2011 to 2014. He has over 25 years of research and project coordination experience in numerous areas of energy and environmental engineering. He is Director of Building Energy Research Center and is leading research activities at HKUST in many energy efficient building initiatives and indoor contaminant transport. Prof. Chao is Fellow of Five professional societies including the American Society of Mechanical Engineers, the Institution of Mechanical Engineers, etc. and has published more than 100+ journal articles and book chapters, patents, etc. He is a HKUST senate member and a council member. He received his BSc(Eng) degree (first class honors) from the University of Hong Kong, MS and PhD from the University of California at Berkeley, all in Mechanical Engineering.

Abstract

In Hong Kong, building sector contributes to about 60% of the total energy consumption and is ranked number one among all followed by transportation. Cooling is a major portion of energy user in buildings in Hong Kong. There are various techniques for space conditioning. Among the various innovative options, radiative cooling is a very attractive one, since it requires no electricity and is environmentally friendly. By using a photonic structure to selectively reflect and emit photons in different wavelength regimes, net cooling can be achieved if the emission of infrared energy to outer space (where the radiation background temperature is 2.7 K) exceeds the absorption of sunlight and other environmental thermal radiation. An integrated photonic solar reflector and thermal emitter, also named a passive radiative cooler, has been developed and tested under the Hong Kong hot and humid climate. The experimental results show that the cooler provides a satisfactory cooling effect at night (i.e. the ambient air temperature is reduced by about 6°C), achieving the cooling capacity of about 38 W/m². The cooling performance during daytime still has room for improvement and we have received an Innovation Technology Fund to further research into this direction by incorporating other features. The team has recently also received a multi-million-dollar collaborative research fund from the Research Grant Council to explore another advanced option for radiative cooler development and other related energy efficient building technology.

The presentation materials of all five speakers of the Technical Forum 2017 are uploaded to the following QR Code or link.

<http://www.hkaee.org/forum2017/>



Distributed Energy – Low Carbon Smart Solution for Hong Kong



Ir Colin Chung
Managing Director,
Sustainable Development &
Environment Group,
China Region
WSP | Parsons Brinckerhoff

Biographies

Ir Chung has many years of experience in green building and sustainable design. Colin is the Immediate Past President of HKAEE and Managing Director of the Sustainable Development & Environment Group, China Region of WSP | Parsons Brinckerhoff. Colin is the fellow member of HKAEE, HKIE and many other professional institutions. Ir Chung was the Past Chairman of Energy Institute – HK Branch and Gas and Energy division of HKIE. Currently, he is also the director of HK Green Building Council, BEAM Society and Zero Carbon Building at Kowloon Bay.

Abstract

It is well known that our earth is getting warmer and warmer and resulted with change of the climate, severe and extreme weather which is a global challenge for all species and human being. Our Government also committed to cut the carbon emissions and reduce the carbon intensity by 50 to 60 per cent by 2020 when compared with the 2005 level. One of initiatives promoted by the HKSAR Government is to adopt distributed energy installations by using renewable fuel sources. The installation of small scale distributed power generation plants can be found in Hong Kong which are operated for years. The overall efficiencies and environmental issues of distributed energy system when compared with traditional grid power have to be studied in order to maximize the overall reduction of carbon emissions from the systems and minimize the impact to the nearby residents. The presentation will discuss the principle, design and considerations as well as the constraints of adoption of distributed energy system in Hong Kong.

The presentation materials of all five speakers of the Technical Forum 2017 are uploaded to the following QR Code or link.

<http://www.hkaee.org/forum2017/>



Smart People vs Smart Technology for energy Innovation



Mr. Nelson S.L. Ho
*MBA, F.PFM, FRICS, FHKIoD,
MHKIS, MbSHK, RPS(BS),
Beam Pro,
Green Building Faculty*

*Director, Facilities
Management,
Synergis Management
Services Limited*

Biographies

Mr Nelson Ho is an experienced Project and Facility Manager with over 28 years' experience in Projects and Facilities Management. He served in various renowned developers, major consulting firms and public organisations in Hong Kong.

Being a frequent award winner, Mr Ho had led his teams in various organisations to win various prestigious Awards in town and overseas. These included the United Nations' Cultural Award in Heritage in 2008, the HKIFM EFMA award in 2010 and the Grand Award in 2012, the HKIS QPFMA Grand Award in 2011, the Winner of Sustainability Initiative of the RICS Hong Kong Property Award 2012. Moreover, Mr Ho had led his team to certify for Hong Kong's first ISO 50001 Energy Management System in 2011. Mr Ho is also a frequent speaker in various conferences local and overseas for topics in FM, heritage conservation, energy management and sustainability.

Abstract

In the era of energy crisis and grave concern on sustainability, energy solutions from all directions are greatly in need. We had come across various intelligent solutions, including new equipment that consumes less energy, new technologies to save energy, new systems to manage energy use, as well as new alternative energy source such as solar or wind energy. However, with all these new innovations, energy still seems to be a issue yet to be resolved for our sustainable future. Yet, people spent not much emphasis on the human effect for energy innovation. The presentation is trying to explore the energy innovation issue taking into a more holistic view of technological innovation, together with management process and human factor which typically reflects the major concerns in the facilities Management field.

The presentation materials of all five speakers of the Technical Forum 2017 are uploaded to the following QR Code or link.

<http://www.hkaee.org/forum2017/>



Cost Effective Energy Management and Building Control Solution



Travis KAN
Director,
Business Development
Schneider Electric Hong Kong

Tel: 98652575
travis.kan@schneider-electric.com

Biographies

Travis joined Schneider Electric in 2013, is currently the Director of Business Development, drives business growth via marketing & strategy, commercial transformation, specifier program and digital customer experience program.

Travis Kan started his engineer career in CLP Power HK, he then joined General Electric (GE) as Sales Manager with last position Account Director, managing Energy Services Hong Kong business, with solid experience in Power Generation, Transmission & Distribution, and Control Solutions.

Travis received his Master Degree of Philosophy and Bachelor's Degree in Engineering from The University of Hong Kong. He is also a part-time lecturer for VTC HK and RMIT University (Australia).

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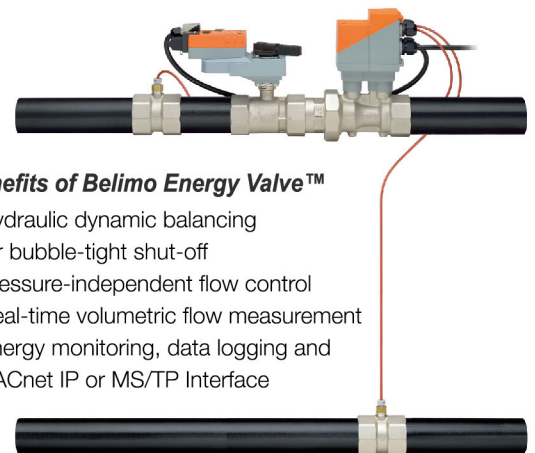


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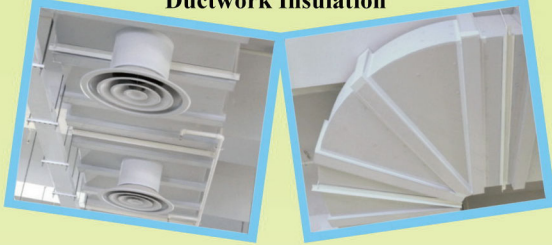
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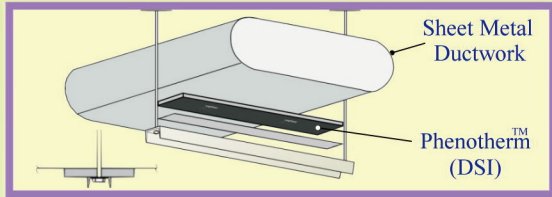


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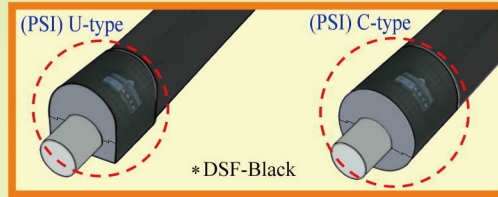


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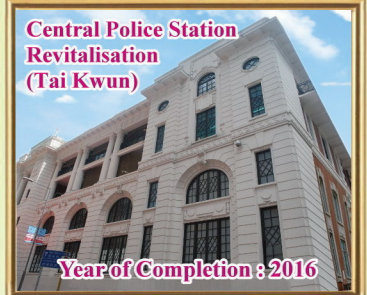


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Year of Completion : 1998



Nina Tower
Tsuen Wan, N.T.
Year of Completion : 2007

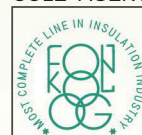


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Year of Completion : 2013



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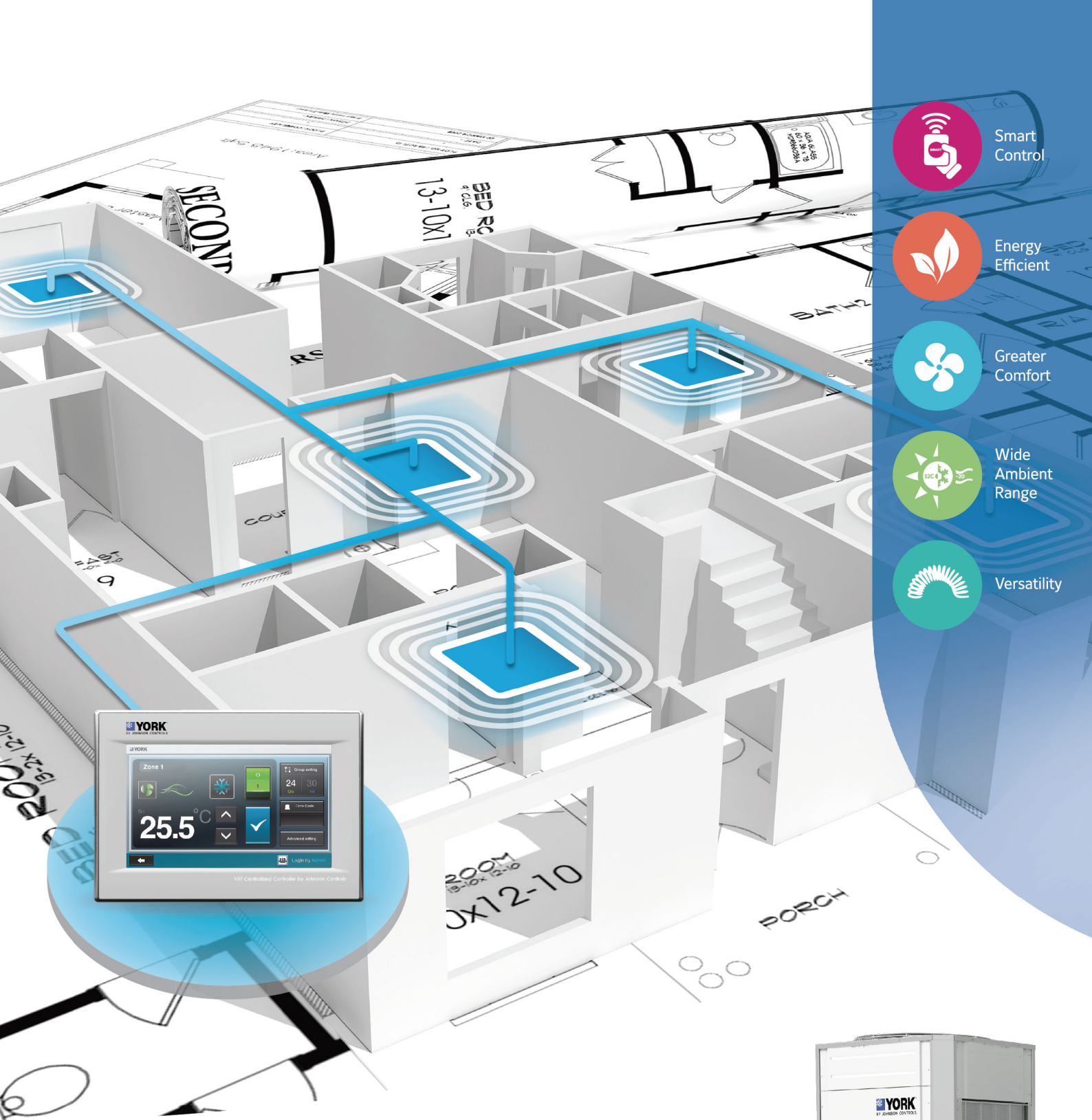
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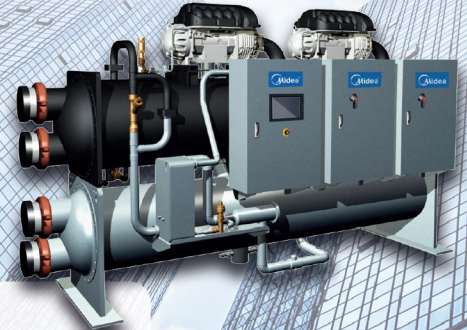


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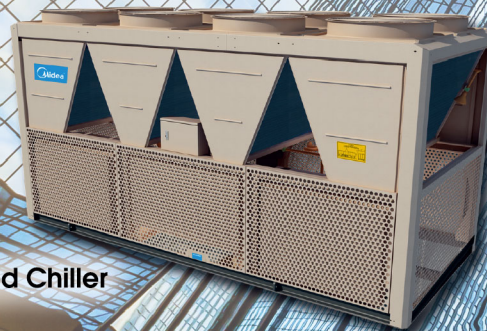


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Recent Job References:



Guangzhou Baiyun International Airport
Total Cooling Capacity: 35680RT



Shenzhen Metro: Line 9 & Line 11
Total Cooling Capacity: 18528RT



Shanghai Metro: Line 2 Replacement
Total Cooling Capacity: 1850RT

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In September 2016, Midea Electric (HK) Limited entered service agreement with Far East Engineering Services Limited, a member of FSE Engineering Holdings Ltd, to conduct testing and commissioning, provide warranty and maintenance services for Midea's centrifugal chillers, screw chillers and oil-free chillers in the Hong Kong Special Administrative Region and the Macao Special Administrative Region of the People's Republic of China.



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Major Projects References:

- Kennedy Town Public Swimming Pool
- Kwun Tong Public Swimming Pool
- Tuen Mun (NW) Public Swimming Pool
- Tung Chung Public Swimming Pool
- Hang Seng Management College Swimming Pool
- Diocesan Girl School Swimming Pool
- Holiday Inn Express, Wharney Gaungdong Hotel
- Disney's Hollywood Hotel, Cosmopolitan Hotel
- Sham Tseng & Stonecutter Island Sewage Plant
- Ocean Park, Cathay Pacific Airways
- HSBC Data Centre, Shek Mun
- Tsing Yi & Shatin Sport Centre,
- H.K. Sport Institution, Macpherson Stadium
- Hong Kong University
- Yuen Long Library, Ko Shan Theatre
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Air to water Heat Pump



Water to water Heat Pump



Swimming Pool Heat Pumps (Indoor & Outdoor)



Desiccant Dehumidification Unit (Low dew point)



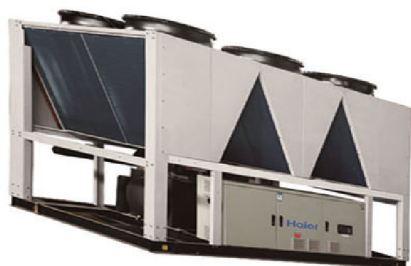
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