



### **3. OTHER EMERGING PRACTICES / TECHNOLOGIES** *(OT May 24)*

Publication date: May 2024

# Introduction

- (1) These slides contain potential innovative / performance enhancement technologies that may be applied to green building projects / existing buildings.
- (2) Sources of these technologies include: past CPD events held by HKGBC, information on the Internet, suppliers or trade/industry organisations that proactively approached HKGBC, or case sharing by government departments.
- (3) Interested users may directly contact the concerned suppliers whose information or website addresses have been indicated on the slides.

# **Construction Method & Management**



# Electrified construction machinery

#建築界電動車 #綠色運輸 #綠色建築 #新地 #純電動建築設備

(圖 : am730)

22 Feb 2024



Benefits - Reduce air pollution on construction sites  
Ensure the health of construction workers



Gammon introduces the first battery-powered crawler crane to Hong Kong to reduce carbon emissions

Embedding sustainability | 17 January 2023



# Energy Use



# Passive radiative paint applied to PV panels, condenser water pipes & AC equipment

## Passive Cooling Materials on Building Envelopes of Commercial Buildings

Reported by Sr Danny Leung, PFMD Council Member

On 11 August, the PFMD convened a webinar titled, "Case-Sharing on the Latest Application of Passive Cooling Materials to the Building Envelopes of Commercial Buildings". It featured two speakers who shared their expertise on the latest green building technologies.

The first speaker, Dr Martin Y Zhu, co-founder of i2Cool Limited and a PhD graduate of CityU's School of Energy and Environment, discussed the next generation of green building technologies – specifically how to combine passive radiative cooling materials and thermochromic smart windows. He also highlighted the importance of energy-saving technologies for air conditioning systems, especially in Hong Kong. A passive radiative cooler would go on roofs and exterior walls to reflect almost all sunlight while emitting mid-infrared thermal radiation to the cold universe, thereby achieving an "electrical-free cooling" effect.

Dr Zhu also mentioned the thermochromic smart windows that can change their colours according

to the temperature and divert heat gains and losses through windows. He presented a near-infrared-activated thermochromic perovskite smart window that demonstrated reversible color change (Figure 1) and another technology – ceramic-based daytime passive radiative coolers (Figure 2).

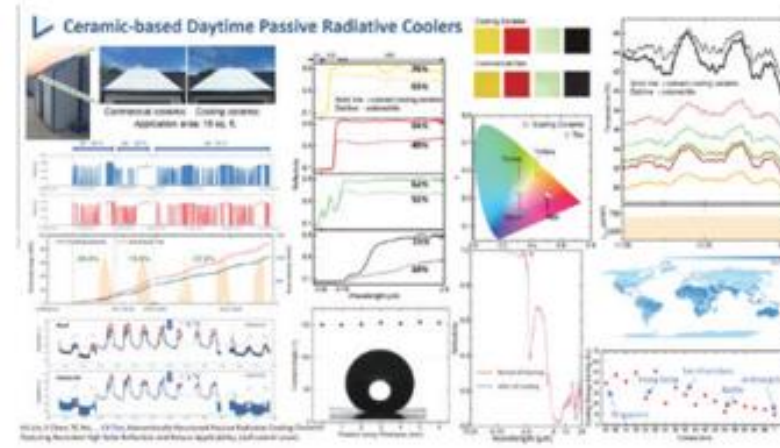


Figure 2: Ceramic-Based Daytime Passive Radiative Coolers

The second speaker, Ir Rocky Lau, Head of Building Solutions at EnerRight Intelligent Limited, shared several case studies on the latest applications of passive cooling materials on commercial building envelopes. He introduced the radiative cooling film (iFilm) on windows (Figure 3) and electricity-free passive radiative cooling paint (iPaint) on commercial and residential building rooftops, underneath solar photovoltaic panels, and condenser water pipes to reject solar heat gained from condenser water.



Cooling Tower (CT) surfaces can also be painted with radiative cooling paint

Source: HKIS CPD Event on 11 Aug 2023

# Carbon Reduction + Health & Wellbeing



# Algae for carbon capture & air purification



## Hong Kong Start-Up Unveils Liquid Microalgae Technology to Capture CO2

By: [Nidhi Goyal](#) | December 5th, 2023

AlGreen, a startup founded by biotechnology graduates from the Hong Kong University of Science and Technology, has devised an innovative approach to capture carbon, offering a potential solution to mitigate the effects of climate change.

Having observed the remarkable microalgae carbon capture storage properties in their entrepreneurship class at the Hong Kong University of Science and Technology, these graduates proceeded to establish AlGreen.

The start-up's miniature bio-capture system affectionately called the "liquid plant" can absorb 6.3 grams of carbon dioxide per week. The liquid plant product not only releases oxygen but also contributes to purifying the air.

Rehaan Lulla, co-founder, and Chief Technology Officer highlights the impressive ability of their 750-milliliter bio-capture system to absorb 6.3 grams of carbon dioxide (CO<sub>2</sub>) per week, surpassing traditional houseplants by a factor of 15.

[industrytap.com/hong-kong-start-up-unveils-liquid-microalgae-technology-to-capture-co2/70097](https://industrytap.com/hong-kong-start-up-unveils-liquid-microalgae-technology-to-capture-co2/70097)



This bank at Festival Walk features eco-friendly design elements, notably a 'CO<sub>2</sub> Reduction System' that utilises an aquatic microalgae reactor to reduce carbon dioxide levels. (Source: ESG Report of Hang Seng Bank, 2023)



↓ The Constructor

What is a SolarLeaf Bioreactive Façade?

Micro-algae bioreactor may also be applied at the external walls of a building.



# Water Use



# Artificial wetland / greywater garden



- 1st constructed wetland with all-year-round operation to recycle dirty water from handwashing for irrigation in Hong Kong
- Collect ~1,340L per day of greywater from AIRSIDE 6/F hand-washing basins and bio-filtrated

Source: [airside.com.hk/en/sustainability-highlights](https://airside.com.hk/en/sustainability-highlights)

# Materials and Waste



# Automatic refuse collection & weighing system in commercial building



- 1st commercial building to adopt ARCS with weighing system in HK
- Collect 4 fractions of waste/ recyclables (general waste, paper, plastic and metal)

Source: [airside.com.hk/en/sustainability-highlights](https://airside.com.hk/en/sustainability-highlights)

# Disclaimers

- (1) The indications of suppliers are not exhaustive. The inclusion of any particular brands in these slides is meant to be examples only and does NOT imply endorsement.
- (2) The use of the above technologies does not necessarily mean that IA points would be attained under BEAM Plus. Granting of points is on a case-by-case basis based on degree of innovativeness, amount of environmental benefit and other considerations.
- (3) Any suppliers who wish to share their innovative or performance enhancement technologies via these slides can contact HKGBC Secretariat via tel no. 3994 8868.