

MEDIA RELEASE

BCA PARTNERS INDUSTRY TO PILOT FIRST-OF-ITS-KIND RESEARCH AND INNOVATION SOLUTIONS TO ENHANCE EFFICIENCY OF COOLING SYSTEMS IN BUILDINGS

Singapore, 6 June 2024 – The Building and Construction Authority (BCA) is supporting two novel Research and Innovation (R&I) solutions to enhance the efficiency of cooling in air-conditioned buildings. The solutions are aimed at reducing energy usage for cooling commercial office and hotel spaces, which can account for about half of the total energy usage in these building typologies. The two pilot solutions are supported by BCA’s Green Buildings Innovation Cluster (GBIC) 2.0 programme (more details in Annex A), one of the key initiatives under the Singapore Green Building Masterplan (SGBMP) in support of the Singapore Green Plan, to achieve 80% improvement in energy efficiency for best-in-class green buildings by 2030.

2 Group Director of BCA’s Environmental Sustainability Group, Mr. Ang Kian Seng, said, “Currently, our best-in-class buildings are achieving 71% improvement in energy efficiency compared to 2005 levels. The two pilot solutions are part of our ongoing efforts to push the envelope of environmental sustainability towards increasing energy efficiency improvement in buildings to 80% by 2030. We hope to see more industry stakeholders stepping forward in this journey to achieve our sustainability aspirations for the built environment. To accelerate this, BCA will be launching a challenge call in July to invite the industry to develop innovative energy efficient solutions.”

Solutions to be piloted under the Green Buildings Innovation Cluster (GBIC) 2.0 programme

3 The first innovative solution involves a superhydrophobic (water repellent) coating for cooling coils found in an air-conditioning system’s Air Handling Unit (AHU),

which enables the coils to remain constantly dry. In the AHU, the cooling coils perform the primary function of air dehumidification and cooling. The coils facilitate air-conditioning by cooling the air such that it condenses into water on the cooling coil surface. However, the existing cooling coil materials are hydrophilic in nature, where condensed water forms a thick continuous layer covering the cooling coil surface. This leads to reduced efficiency of the cooling coils, dust accumulation and micro-organism growth, which in turn affect the quality of the cooled air, increase maintenance cost and the overall efficiency.

4 The proposed solution with its superhydrophobic material would enhance cooling coil heat transfer efficiency and it can be easily implemented to existing and new AHU equipment to improve overall performance, saving operation and maintenance cost. With improved efficiency of the cooling coils, the air-conditioning system's chiller can also operate more efficiently. The successful completion of this project is expected to result in more than 30% reduction in energy consumption of the AHU and 12% reduction in energy consumption of the chiller.

5 This collaborative research is led by Nanyang Technological University, Singapore (NTU Singapore) in collaboration with air conditioning contractor Powen Engineering Pte Ltd, and building owners South Beach Consortium and OCBC Property Services Pte Ltd. South Beach Consortium and OCBC Property Services Pte Ltd will be piloting this innovation at their office premises.

6 Mr. Lester Chan, Head of Sustainability at OCBC Group Property Management, said, "While we have achieved carbon neutrality in banking operational emissions from 2022, we remain committed to advancing decarbonisation. We do this by consistently prioritising the deployment of sustainable technologies and optimising building system efficiency for our properties. Through partnerships with industry players like BCA and NTU, we can also deliver more innovative solutions with long-term impact. Specifically for the real estate sector, conventional energy optimisation methods such as equipment replacement may not be that effective in the long run. The GBIC programme supports the test-bedding of new technologies, which may accelerate decarbonisation outcomes both for OCBC and the built environment at large."

7 The second innovative solution is a cost-effective monitoring system to measure the air side system, which is the portion of the air-con system that deals with the movement and treatment of air within a building, to improve energy efficiency. Due to high cost of installing current systems for accurate measurement and verification (M&V) of air side systems, building owners faced challenges in optimising the AHU system within for energy savings.

8 The innovative M&V toolkit, developed by Building System & Diagnostics Pte Ltd, consists of sensors and meters to measure parameters such as air temperature and will be able to interface with building management systems to optimise the AHU system, potentially achieving energy savings of 25%. The solution is being test-bedded at the South Beach Tower owned by South Beach Consortium.

9 Ms. Samantha Tan, General Manager of South Beach Consortium said, “As green buildings is an important part of Singapore’s climate change migration strategy, we are in need of innovative solutions that would bring us to the next level of greener buildings. To achieve this, we need to put on a different pair of lens. We need to work with stakeholders on piloting innovative solutions for energy efficiency improvement and green building features that would transform to potentially greener built environment and reduction in carbon emission. As we push the boundaries of energy efficiency and environmental sustainability, building owners will recognize the lower utility bills, more environmentally friendly, better health, and well-being as the benefits of green buildings.”

Continued Push Towards the Singapore Green Building Masterplan (SGBMP) through the Green Buildings Innovation Cluster (GBIC) Programme

10 To date, the Government has committed \$117 million to GBIC and the programme has supported the research, development and demonstration of more than 80 innovative technologies from more than 70 firms. Over the years, GBIC has been instrumental in driving advancements in energy efficiency for best-in-class green buildings under the SGBMP. Since Super Low Energy buildings were first introduced as best-in-class green buildings in 2018, there has been remarkable progress. Initially

achieving 60% improvement in energy efficiency over 2005 levels, our best-in-class green buildings have now achieved 71% energy efficiency improvement as of 2023.

11 To push the boundaries of energy efficiency in buildings and further reduce carbon emissions in the built environment, BCA will continue to target key demand building owners and developers, and their value chains to co-create and accelerate solutions and commercialisation through industry partnerships. To spur the development of more innovative energy efficient solutions, BCA will be rolling out the Research & Innovation Challenge Call for Decarbonisation in July 2024, seeking innovations in the areas of Innovative Cooling Technologies, Data-Driven Smart Building Solutions, and Advanced Building Ventilation Technologies. More details will be provided by BCA in July.

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Factsheets:

Annex A – Factsheet on Green Buildings Innovation Cluster (GBIC) 2.0