

MEDIA RELEASE

BCA AWARDS \$8.3 MILLION GRANTS TO IMPROVE BUILDING ENERGY EFFICIENCY

Singapore, 30 July 2014 – Researchers from the National University of Singapore, Nanyang Technological University and Ngee Ann Polytechnic have been awarded S\$8.3million in grants by BCA as part of the Building Energy Efficiency Grant Call launched by the Energy Innovation Programme Office (EIPO)¹. First launched in September 2013, the aim of the scheme is to support the development of energy efficient and cost-effective technologies and solutions for buildings in the tropics. The research teams will be working with collaborators from the public and private sector including small and medium enterprises (SMEs). (*See Annex A for complete list of projects*).

2. The grant call was introduced to encourage public private collaborations to develop innovative technologies and solutions in the areas of Air-Conditioning & Mechanical Ventilation (ACMV) and Building Management & Information Systems (BMIS) for building retrofits in the tropics that can be adopted in five years' time.

3. BCA was allocated a sum of S\$15 million under the Energy Innovation Research Programme (EIRP) for Building Energy Efficiency to support the development of energy efficient and cost-effective technologies and solutions for buildings in the tropics.

4. Typically, ACMV systems account for a significant amount of energy utilised in buildings, ranging from 40% to 60% for a typical air-conditioned building. Given Singapore's climatic condition of high humidity, more energy is required to remove

¹The Energy Innovation Programme Office (EIPO) is co-led by the Economic Development Board (EDB) and Energy Market Authority (EMA), with funding support from the National Research Foundation (NRF), and it manages the Energy Innovation Research Programme (EIRP).

moisture from the air (dehumidification) to achieve a comfortable cooled environment. Technology that can effectively remove water from the air by using less energy will improve efficiency of air-conditioning system tremendously. To encourage a greater adoption amongst building owners and developers, solutions that are developed must be also cost effective.

5. One of the grant recipients Dr Lee Poh Seng, from the NUS will be developing a Novel Oblique Fin Air Conditioning (OFAC) System. Apart from Daikin Air-Conditioning (S) Pte Ltd, Dr Lee will also be collaborating with four other SMEs such as GCore Lab Pte Ltd, Green Koncepts Pte Ltd, NiCae Trading & Industrial Supplies Pte Ltd, Libra 2002 Pte Ltd. Together, these companies will be assisting in the development of prototypes, provide test bed sites for data collection and performance verifications and product commercialisation. He said, “The performance (energy efficiency) of conventional air conditioning system is limited to a large extent by the inefficient transfer of heat to and from the air. Our research project will integrate a novel oblique fin technology into a small capacity air-conditioning system which can significantly enhance the air side-heat transfer and thereby, raising the energy efficiency of the air conditioning system potentially by as much as 30%-40%”.

6. A Building and Information Management System (BMIS) controls, monitors and manages all the mechanical and electrical equipment installed in a building. However, current building management systems are not sufficiently integrated and synchronised. Hence, actual data and solutions of the operating environment are not accurately recorded, and this hinders opportunities for optimising energy efficiency in buildings and improving occupants’ satisfaction. The EIRP grant also sought solutions that allow different systems such as air-conditioning and mechanical ventilation systems, lighting, power systems, etc. to operate seamlessly towards ‘smart’ buildings.

7. “More efficient buildings mean better use of resources. By providing researchers with the right support and environment, ‘Low Energy High-rise Buildings in the Tropics’ is now a possibility in Singapore”, said Dr John Keung, CEO, BCA.

8. A second grant call is also in the pipeline and will be launched at the Singapore Green Building Week (SGBW) September this year. BCA will be seeking solutions that provide for better human thermal comfort, health and Indoor Environmental Quality. Some of the key evaluation criteria include innovation, relevance with respect to the current challenges faced in the built environment sector, potential to produce breakthrough results and the possibility to be commercialised to encourage adoption in buildings.

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Annex A: List of Awarded projects

| S/N | Title | Principal Investigator/ Institution Collaborators |
|-----|--|--|
| 1. | Replacement Of Cooling Tower By Compact Water And Energy Saving Super Hydrophobic Membrane Based Evaporative Cooler. | Mr. Antony Prince James Selvaraj / Ngee Ann Polytechnic - Truwater Singapore Pte Ltd |
| 2. | Measurement and Verification of Chilled-water Plant. | Prof. CAI Wenjian / NTU - Measurement & Verification Pte Ltd - Trane Singapore - National Environment Agency |
| 3. | Development of a Novel Oblique Fin Air Conditioning (OFAC) System. | Prof. LEE Poh Seng / NUS - GCore Lab - Green Koncepts Pte Ltd - NiCae Trading & Industrial Supplies - Libra 2002 Pte Ltd - Daikin Air-Conditioning (S) Pte Ltd - BCA |
| 4. | An innovative air treatment system for improved air quality, reduced humidity load and energy efficient ACMV. | Dr. CHUA Ernest Kian Jon / NUS - ST Kinetics Ltd |
| 5. | Adaptive Occupancy Based Localized Cooling Control of ACMV Systems. | Prof. XIE Lihua / NTU - Royal Institute of Technology, Stockholm, Sweden - CtrlWorks Pte Ltd - CNA Group Ltd - |
| 6. | Intelligent Information Management System for Smart Buildings using Multi-Agent-Enabled Wireless Sensor-Actuator Networks. | Prof. PANDA Sanjib Kumar/ NUS - NXP Semiconductors Singapore Pte Ltd - Jurong Town Corporation |
| 7. | Comfort-Driven Distributed ACMV Control Retrofit: Driving Energy Efficiency with Novel Sensing and Control Applications. | Dr Hu Guoqiang / NTU - Robert Bosch (SEA) Pte Ltd - University of California, Berkeley, USA - BCA |
| 8. | Optimised Energy Measurement & Verification (M&V) Protocol for Existing Buildings. | Prof. KONDEPUDI Sekhar / NUS - The Pennsylvania State University, USA - Siemens Pte Ltd |

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About Building and Construction Authority (BCA) Singapore

The Building and Construction Authority (BCA) of Singapore champions the development of an excellent built environment for Singapore. BCA's mission is to shape a safe, high quality, sustainable and friendly built environment, as these are four key elements where BCA has a significant influence. In doing so, it aims to differentiate Singapore's built environment from those of other cities and contribute to a better quality of life for everyone in Singapore. Hence, its vision is to have "a future-ready built environment for Singapore". Together with its education arm, the BCA Academy of the Built Environment, BCA works closely with its industry partners to develop skills and expertise that help shape a future-ready built environment for Singapore. For more information, visit www.bca.gov.sg.