

MEDIA RELEASE

BCA INTRODUCES REVAMPED GREEN MARK SCHEME TO PUSH THE ENVELOPE IN SUSTAINABILITY

- *New Green Mark 2015 to further drive sustainable outcomes for Singapore*
- *BCA SkyLab, world's first high-rise rotatable laboratory for the tropics, unveiled*
- *Positive trends on building energy performance observed in the BCA Building Energy Benchmarking Report (BEBR) 2015*

Singapore, 2 September 2015 – Guest-of-Honour Mr Choi Shing Kwok, Permanent Secretary, Ministry of the Environment and Water Resources, announced the new Green Mark 2015 and details of the BCA SkyLab, the world's first high-rise rotatable laboratory for the tropics, at the opening ceremony of the Singapore Green Building Week (SGBW) 2015 held at Marina Bay Sands. He also shared key findings from the second BCA Building Energy Benchmarking Report (BEBR) and latest green initiatives rolled out by the Building and Construction Authority (BCA).

Launch of the Green Mark 2015 (refer to Factsheet A)

2 In its commemorative 10th year for BCA Green Mark scheme this year, BCA has introduced a new version of the Green Mark scheme called the "Green Mark 2015" to further push the boundaries on environmental sustainability. The Green Mark 2015 was developed through a collaborative framework involving more than 100 industry specialists and experts, and 12 taskforces led by BCA. The collaboration was complemented by extensive consultation with industry bodies and academia. This version, which was developed for new non-residential buildings, will incorporate key changes, with an expanded focus to address sustainability in a more balanced and holistic manner.

3 Green Mark 2015 has been structured into four main sections:

- (i) Climatic Response,
- (ii) Building Energy Performance
- (iii) Resource Stewardship
- (iv) Smart & Healthy Building.

4 A bonus section on advanced green building efforts is included, to spur efforts beyond requirements.

5 Key benefits for building occupants and users include a stronger emphasis on indoor environmental quality in relation to enhanced health and well-being, and buildings that are equipped with smart controls and analytics to assist in the management and optimisation of building resources

6 The revamped scheme will enable projects to analyse its energy effectiveness in both the optimisation of energy efficiency as well as energy consumption. Greater

recognition for renewable energy will be considered; this will accelerate solar PV adoption by further encouraging the use of renewable energy through solar feasibility studies and solar ready roof design. The scheme is launched for piloting and will be fine-tuned before full implementation.

7 **Dr John Keung, Chief Executive Officer of BCA**, commented, “Green Mark 2015 will play a more prominent role in driving and communicating sustainability outcomes in Singapore, as buildings consume more than 30% of the total electricity. It will recognise the leadership of building owners who drive improvements to the overall environmental credentials of projects. Such leadership by the building owner will add a layer of accountability and integrity to the projects teams in business sustainability reporting.”

The World’s First High-Rise Rotatable Laboratory for the Tropics – The BCA SkyLab (refer to Factsheet B)

8 Guest-of-Honour Mr Choi Shing Kwok also unveiled the details of the BCA SkyLab. It will be the world’s first high-rise rotatable laboratory for the tropics with state-of-the-art facilities for testing and development of innovative energy-efficient building technologies.

9 Built on the rooftop of a new building at the BCA Academy, the BCA SkyLab is constructed on a rotatable platform to enable tests to be carried out at any orientation to the sun and wind. The BCA SkyLab is part of BCA’s plans to further accelerate the pace of research, development and application of energy-efficient building technologies. .

10 Developed in collaboration with Lawrence Berkeley National Laboratory (LBNL) in California, the BCA SkyLab complements BCA’s existing Zero Energy Building (ZEB) to develop green building research and development efforts in Singapore. BCA SkyLab is expected to be completed with a pipeline of technologies to start test-bedding by the first half of next year.

11 **Dr John Keung, CEO of BCA** said, “With the BCA SkyLab, we are moving another step closer to the ambitious goal of achieving **‘low-energy high-rise’ buildings and ‘zero-energy low-rise’ buildings in the tropics**. BCA will work closely with the industry and academia to drive innovation in green building design, construction and maintenance to make this possible.”

Release of the BCA Building Energy Benchmarking Report 2015 (refer to Factsheet C)

12 BCA also released the Building Energy Benchmarking Report (BEBR) 2015 for the second year. The report provides a comparative study which covers commercial buildings and consists of two years’ data.

The three key findings in the report are:

- (i) Commercial buildings achieved **better energy performance in 2014** compared to 2013, with retail buildings showing the most significant improvement.

- (ii) BCA Green Mark certified commercial buildings **continued to perform better** than non-certified buildings.
- (iii) Tenants' electricity consumption **continued to be comparable** to that of their building owners, reaffirming the potential for tenants to play more active roles in improving the energy performance of their premises.

13 In the next benchmarking report, BCA will be including more building types, namely tertiary institutions and health-care facilities. This will lead to a more comprehensive overview of the energy performance of buildings in Singapore. BCA will also continue to identify buildings with high potential for energy improvement and engage building owners on areas of improvement, as well as promote the business case for green buildings.

14 **Dr John Keung, CEO of BCA** said, "With our green building policies and energy performance monitoring strategy firmly in place, we hope to see steady and sustained improvement year on year. I am confident Singapore is well on track to achieve our national target to green 80% of our building stock, and contribute to the achievement of Singapore's Intended Nationally Determined Contribution."

Issued by the Building and Construction Authority on 2 September 2015

About Building and Construction Authority

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, 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.

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Green Mark 2015 will play a more prominent role in driving and communicating sustainability outcomes. To achieve the sustainable outcomes of Green Mark 2015, the criteria have been re-structured into four main sections namely, Climatic Response, Building Energy Performance, Resource Stewardship and Smart & Healthy Building. A bonus section on Advanced Green Building Efforts is included, to spur efforts beyond requirements.

Extensive stakeholder engagement

- Developed in conjunction with 12 specialist technical taskforces co-chaired by industry experts and consisting of more than 100 industry members
- Partnered various institutional bodies such as the National University of Singapore (NUS) and the Eindhoven University of Technology (EUT)
- Extensively consulted various industry associations and government bodies on the approach and framework of the criteria

Key Changes for Green Mark 2015

Enhancement of Content

- Promotion of leadership, integrated design and collaboration along the entire construction value chain
- Setting into place a BIM-ready framework
- Enhancement of climatic responsive passive design strategies in the building structure and fabric
- Energy effectiveness covering both optimization of energy efficiency and energy consumption
- Consideration of building embodied energy and life cycle
- Greater emphasis on indoor environmental quality in relation to the health and well-being of building end users
- Adoption of sustainable building systems and products by functional groupings
- Smart buildings with controls and analytics to assist in the management and optimisation of building resources
- Accelerating solar PV adoption by further encouraging the use of renewable energy through solar feasibility studies and solar ready roof design

Restructure of Criteria

- Reducing the time and cost invested in design and certification by making available analysis templates,
- rules of thumb matrices, online simplified calculators and simulation tools for industry use
- Introduction of more pre-requisites to all tiers of Green Mark ratings in line with Singapore Standards as well as those which have been found to be industry norms through statistical analysis
- Communication of intent of indicators within criteria in a more coherent fashion
- Restructured framework and weightages

Factsheet B on BCA SkyLab

The BCA SkyLab will be the world's first high-rise rotatable laboratory, with state-of-the-art facilities for the testing and development of innovative energy-efficient building technologies. In collaboration with US-based Lawrence Berkeley National Laboratory, the BCA SkyLab is modelled after the FLEXLAB (the Facility for Low Energy Experiment in Buildings) in California, and is adapted to Singapore's tropical environment and urban setting.

The key features of the BCA SkyLab are its rotatable, and comprehensive plug-and-play testing capabilities. Beyond technical purposes, the BCA SkyLab also serves as an education and engagement platform for the sharing of research findings and expertise.

The BCA SkyLab is slated to be opened in the first half of 2016.

Rotatable Outdoor Facility

- i) It is rotatable at **360-degrees**, and can be orientated at any angles relative to the sun for testing of technologies.
- ii) It is a **test facility** located on the roof top of a building, where technologies can be tested in a high-rise urban setting under tropical weather conditions.

Comprehensive Plug and Play Testing Capabilities

- i) It has two identical indoor compartments (a test cell and a reference cell) of 40 m² each to simulate an office environment and to compare **tests and benchmark analysis** with reference to codes and standards.
- ii) It is equipped with an **advanced instrumentation system** and a comprehensive sensor network, capable of measuring energy performance and environmental parameters.
- iii) It can be used to evaluate the energy efficiency of the latest green building technologies in the areas of **façade, cooling, lighting and smart controls**.
- iv) It **is flexible and easily configured with a "Plug and Play" concept**, allowing easy installation of various technologies and change of layouts for testing.

Platform for Knowledge Sharing and Expertise Demonstration

The BCA SkyLab has placed a special emphasis on stakeholder engagement, incorporating a dedicated lounge and demonstration space adjacent to the main testing facility, allowing active knowledge sharing and expertise demonstration.

Snapshot of Basic Details of the BCA SkyLab

Project Team	
Developer and Owner	Building and Construction Authority
Partner in Technical Collaboration	Lawrence Berkeley National Laboratory, USA
Design Team	Jurong Consultants Pte Ltd
Main Contractor	Sanyo Engineering and Construction Inc
Physical Dimensions	
Gross Floor Area of rotatable laboratory	131.64 m ²
Diameter of the rotating platform	16 m
Each test cell dimension	8.1 m x 5.3 m x 3.6 m (width x depth x height)

For More Information

Please refer to the infographic brochure for more details.

A media DVD containing simulation video, graphic images and infographic brochure is available on request.

Factsheet C on BCA BEBR 2015

Background

Last year, with the support of building owners, BCA took an important first step towards publicising building energy performance information. The release of the inaugural BCA Building Energy Benchmarking Report (BEBR) 2014 allowed information on building energy performance to be readily available to stakeholders. The report provided an objective assessment of our green building efforts, based on robust evidence of the energy performance of commercial buildings. This demonstrated Singapore's continuous efforts to pursue building performance enhancements.

The national building energy benchmarks are set yearly and the report benefits stakeholders at all levels:

- ✓ **The Government** - means to monitor energy consumption and energy efficiency of buildings, & provide insights to support formulation of appropriate measures
- ✓ **Building Owners and Occupants** – raise awareness of the energy performance of their buildings, & spur positive action to improve performance of buildings
- ✓ **Building Consultants and Designers** – generate or refine new ideas, designs and best practices in designing/ retrofitting a green building
- ✓ **Research and Education Communities** – gain access to data to support research and studies to further advance green building technologies and solutions for the future

Objective

- To raise awareness among stakeholders on the performance of our buildings, spur positive action at all levels to initiate and implement improvements in building energy efficiency, drive change to energy consumption behaviour and embrace sustainable best practices as we move forward. The national building energy benchmarks published in the report will provide buildings owners with insights to the performance of their buildings and across other buildings in similar categories, equipping them with more information towards achieving their sustainability goals.
- For buildings that have potential to improve on their performance. BCA will also actively engage stakeholders through workshops to disseminate best practises and incentive schemes to fund energy improvement upgrades.

Three Key Findings

- Three important findings emerged from the comparison studies made with the 2 years data collected between 2013 and 2014.
 - Commercial buildings have **achieved better energy performance in 2014**, with retail buildings showing the most significant improvement at 4.6%.
 - Secondly, commercial buildings rated to Singapore's green building rating standards, the **BCA Green Mark**, have **continued to perform better than non-certified buildings**, as much as 15% for offices and 10% for retail buildings in terms of electricity consumption.
 - Thirdly, the **split between building owners and tenants' electricity consumption continues to take up an almost equal share of the total building's electricity consumption**. Tenants can be more active in improving the energy performance of their premises so as to achieve greater overall improvement for the entire building.