

## **MEDIA RELEASE**

### **BCA'S REVISED GREEN MARK FOR RESIDENTIAL BUILDINGS AIMED AT ENABLING RESIDENTS TO ADOPT A MORE SUSTAINABLE LIFESTYLE**

- *BCA releases anonymised energy performance data of buildings in lead up to mandatory disclosure to spur innovative cost-effective solutions for reducing energy consumption*

**Singapore, 7 September 2016** – At the opening of the Singapore Green Building Week (SGBW) 2016, Guest-of-Honour Mr Lawrence Wong, Minister for National Development and Second Minister for Finance, announced new measures and initiatives that BCA is rolling out to further drive the greening of the built environment and enhance the green building experience for users.

#### **Revamped Green Mark criteria for residential buildings**

2 BCA has reviewed the Green Mark scheme for residential buildings and will be putting the new set of criteria on pilot for a year so that building designs will place greater emphasis on good passive design, façade performance, and effective natural ventilation to enhance the well-being of occupants. Besides ensuring energy and water efficiency, amongst other key green building features, the new Green Mark for Residential Buildings 2016 is aimed at encouraging building designers to proactively consider design features that promote adoption of a more sustainable lifestyle to reduce the building's impact on the environment. For example, having a home energy management system that allows building occupants to track their own energy consumption and make conscious efforts to change their practices and behaviour. In addition, the requirement to have the most energy efficient air-conditioning systems will help homeowners with greater savings on their electricity bills. The pilot Green Mark criteria will be fine-tuned after consultation with the industry before full implementation. *(More details on the revamped Green Mark criteria for residential building in Annex A)*

#### **Building Energy Benchmarking Report**

4 In the latest findings from BCA's third annual building energy benchmarking exercise, commercial buildings continue to perform well with a 7 per cent improvement in the Energy Use Intensity (EUI) over the past 8 years since 2008. The EUI is a measure of the annual total energy consumed per unit floor area when operating a building. For the first time, the building information and energy consumption data of healthcare facilities as well as tertiary and private education institutions were collated and analysed. The EUI of healthcare facilities was found to have increased by 4 per cent from 2008 while the increase for tertiary and private education institutions was around 7 per cent. This represents potential scope for building owners to improve the energy performance of these building types. Building owners could make use of these data to take a closer look into the energy performance of their buildings and develop strategies to improve them. BCA will be requiring owners of other building types, such as sports and recreation, civic and community institution, place of worship, to submit their building information and energy consumption data from next year. *(More details on the BEBR 2016 in Annex B)*

6 BCA Chief Executive Officer, Dr John Keung said, "To make energy consumption data more transparent for the benefit of building owners and occupants, BCA will release the energy performance data of commercial buildings in an anonymised manner through the Building Energy Submission System and data.gov.sg. We hope building owners, and even occupants, can make use of these data to assess where their building performance stands and develop cost-effective solutions to reduce energy consumption and carbon footprint if they find that their building is less energy efficient than similar building types. Moving forward, we hope to have all buildings, starting with commercial buildings, fully disclose their building energy performance in the next few years." Currently, major cities in the U.S., such as Boston, Washington D.C., and New York City have implemented mandatory disclosure of building energy performance. *(More details on this new implementation in Annex C)*

### **Expanding BCA's Green Mark's reach to Africa**

7 The green building movement in Singapore has gained much interest internationally. BCA will also be signing a Memorandum of Understanding with the

Rwanda Housing Authority (RHA) to collaborate on capacity building and the sharing of best practices in the design and development of green buildings and cities. Senior Minister of State for National Development, Mr Desmond Lee, will bear witness to this momentous occasion, as Guest-of-Honour at the IGBC welcome reception this evening. Through local green building consultant Green A, RHA will identify suitable projects to be assessed under BCA's Green Mark scheme as part of the programme to learn about Singapore's scheme. This collaboration was mooted following the successful experience that neighbouring country, Tanzania had in setting up a similar programme through an MOU signed with BCA in 2014. To date, the Green Mark scheme has reached out to 14 countries, including Australia, India, Vietnam, Indonesia, China and the Philippines. *(More details on the MOU in Annex D)*

### **Exciting line-up of events during SGBW: Highest students' participation**

8 On top of key announcements that were shared during the SGBW, the week also promises an exciting line-up of activities, including the anchor event, the IGBC which will play host to more than 1,000 participants, including international green building experts, policy-makers, academics, built environment practitioners, tenants and end-users, from over 30 countries. In addition, this year's SGBW will see the participation of more than 650 students, the highest number of students so far, in specially tailored events such as the BCA-SIA-SGBC International Tropical Architecture Design Competition 2016 for Institutes of Higher Learning, Build Green: Student Edition workshop as well as the Climate Innovation Challenge which took place earlier. *(More details on the students-related activities in Annex E)*

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**Issued by the Building and Construction Authority on 7 September 2016**

Enclosed:

Annex A – Factsheet on new Green Mark for Residential Buildings 2016 (GM RB: 2016)

Annex B – Factsheet on BCA Building Energy Benchmarking Report (BEBR) 2016

Annex C – Factsheet on Anonymised Disclosure of Building Energy Performance

Annex D – Factsheet on MOU with Rwanda Housing Authority

Annex E – Factsheet on SGBW students-related activities

**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](http://www.bca.gov.sg).

## **Annex A – Factsheet on new Green Mark for Residential Buildings 2016 (GM RB: 2016)**

### **Background**

Since the introduction of BCA Green Mark in 2005, BCA has reached many milestones and greened more than 2,800 buildings in Singapore. Today, there are 17 BCA Green Mark Schemes that covers buildings, beyond buildings and occupant centric schemes. With that, more than 31% of Singapore's built area is now Green Mark-certified. We are well on our way to achieving the goal of greening 80% of all buildings in Singapore by 2030.

To further stretch outcomes of sustainability, BCA reviewed the Green Mark for Non-residential Buildings GM NRB: 2015 criteria and launched it for piloting last year. With experience gained from GM NRB: 2015 and its pilot study, we have reviewed and will be introducing the new Green Mark for Residential Buildings GM RB: 2016 to ensure Green Mark-certified residential buildings have greater emphasis on good passive design, façade performance, and effective natural ventilation to enhance the well-being of end-users and occupants.

The GM RB: 2016 criteria will be structured into five sections namely,

- a. Climatic Responsive Design
- b. Building Energy Performance
- c. Resource Stewardship
- d. Smart & Healthy Building
- e. Advanced Green Efforts

### **Objective**

- a. To further stretch outcomes sustainability which include:-
  - i. Having buildings that are more climate responsive
  - ii. Using resources more efficiently throughout the lifecycle of the projects
  - iii. Having a more liveable and healthy environment for everyone
  - iv. Conserving existing biosphere through the integration of nature and protection of natural system
- b. To increase end-users' engagement in sustainable lifestyle
- c. To recognise projects teams, which include developers, architects consultants and contractors, in greening our built environment

### **Key Features of GM RB: 2016**

The GM RB: 2016 criteria will include the following new features:

- Biophilic design, which means having elements of nature in comfortable spaces to nurture the human-nature relationship, is important for the health and happiness of the building users
- Universal Design features that will ensure an inclusive environment for all residents

- Use of automation, data and behavioural science to enable residents to track their own energy use and allow development managers to optimise operation and maintenance procedures

Other features:

- Provision of relevant information and guidance to residents in order to raise awareness on the building's green features, and how residents can contribute positively to reduce the development's environmental impact further
- Integration of greenery and waterscape that is accessible for residents to enjoy
- Responsive façade that reduces heat gain into the building, providing comfort through reduced direct sunlight
- Design for effective natural ventilation for all dwelling units encourages thermal comfort and good indoor environmental quality for the residents
- Use of energy efficient air-conditioning systems and water efficient fittings help residents to save in electricity and water bills respectively
- Limiting the use of high-emitting building and furnishing materials improve indoor air quality for the health and well-being of residents
- Encouraging effective use of day light in residential units

## Key Enhancements of GM RB: 2016

Key Features	Current RB Scheme	Proposed GM RB: 2016
<b>1) In-line with national objective</b>		
City in a Garden	No pre-requisite requirement	Pre-requisite requirement for Gold <sup>PLUS</sup> & Platinum ratings
Reduce GHG emissions		
<b>2) In-line with other agencies' initiatives</b>		
NEA Singapore Energy Labelling Scheme (SELS)	Pre-requisite requirement for Gold <sup>PLUS</sup> & Platinum ratings	Pre-requisite requirement applies to all ratings
Use of sustainable construction & products		
<b>3) Passive design strategies</b>		
Address heat gain through western facades	No pre-requisite requirement on western facades	All façade orientation are imposed with a maximum allowable envelope thermal transmittance value
Achieve effective natural ventilation for GM Platinum	Only able to demonstrate through NV simulation	Options to demonstrate through NV and thermal comfort simulation
<b>4) Scoring system</b>		
Scoring criteria/ points	Part 1: Energy Efficiency (87) Part 2: Water Efficiency (14) Part 3: Environmental Protection (41) Part 4: Indoor Environmental Quality (6) Part 5: Other Green Features (7)	Part 1: Climatic Responsive Design (35) Part 2: Building Energy Performance (25) Part 3: Resource Stewardship (35) Part 4: Smart & Healthy Building (25) Part 5: Advanced Green Efforts (20)
<b>5) Credit system</b>		
Award rating tiers	Certified 50 to < 75 points Gold 75 to < 85 points Gold <sup>PLUS</sup> 85 to < 90 points Platinum ≥ 90 points	No Certified rating <sup>1</sup> Gold 50 to < 60 points <sup>2</sup> Gold <sup>PLUS</sup> 60 to < 70 points <sup>2</sup> Platinum ≥70 points <sup>2</sup>

Note:

<sup>1</sup> Almost all the certification projects using current GM schemes achieved at least Gold rating and above. As industry standard has improved considerably over the years, we have calibrated the award rating tiers by removing the Certified rating under GM RB: 2016.

<sup>2</sup> The overall point allocation for GM RB: 2016 is lower as compared to current RB scheme. The pre-requisites in GM RB: 2016 are no longer given any credits, unlike in current RB scheme. Thus, the required points to achieve the respective award rating tiers were adjusted accordingly.

*Embargoed till 7 September 2016, 10am*

## **Annex B – Factsheet on BCA Building Energy Benchmarking Report (BEBR) 2016**

### **Background**

Since 2014, with the support of building owners, BCA took a momentous first step towards greater transparency in building energy performance information. The release of the annual BCA Building Energy Benchmarking Report (BEBR) allows information on building energy performance to be readily available to stakeholders. The report provides an objective assessment of our green building efforts, based on robust evidence of the energy efficiency performance of buildings. This demonstrates Singapore's continuous efforts to pursue building performance enhancements.

### **Objective**

With the annual release of the BEBR, BCA hopes 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.

Other than bridging the information gap for the industry, the data are also used to review BCA's Green Mark scheme and green building policies. In this year's report, the analysis of building energy performance has been expanded to **include healthcare, tertiary and private education institutions.**

### **Target audience**

The national building energy benchmarks published in the report will provide building 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.

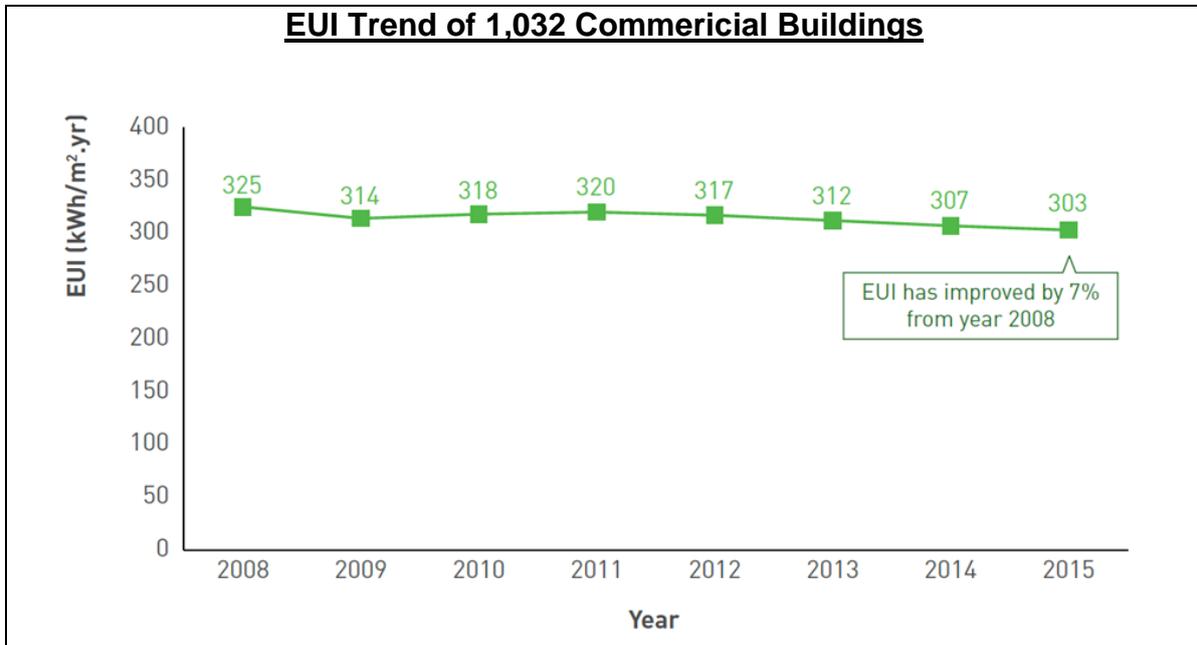
The national building energy benchmarks are set yearly and the report benefits stakeholders at all levels:

- **Building Owners, Facilities Managers, and Tenants** – raise awareness of energy performance of their buildings and spur positive action to improve performance standards
- **Consultants and Designers** – generate or refine new ideas, designs and best practices in designing/ retrofitting a green building
- **The Government** – means to monitor energy consumption and energy efficiency of buildings and provide insights to support formulation of appropriate measures

- **Research and Education Communities** – gain access to data to support research and studies to advance green building technologies and solutions for the future

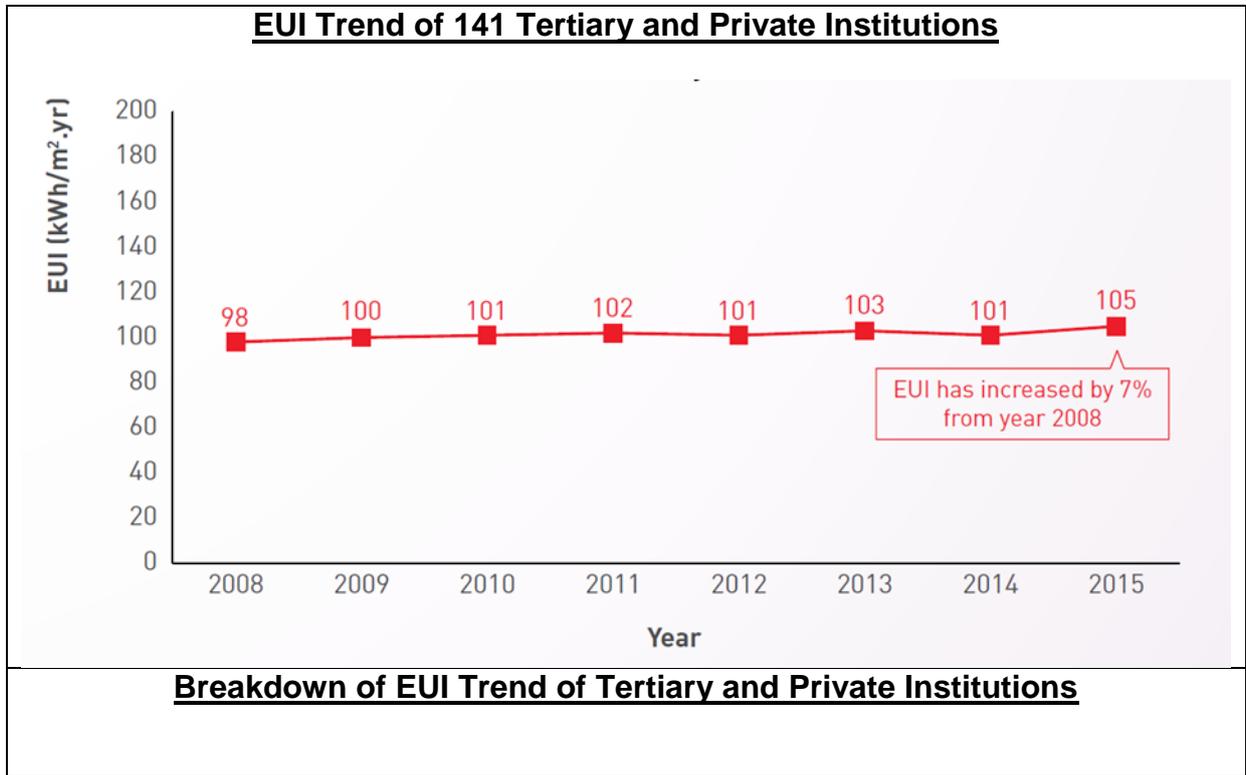
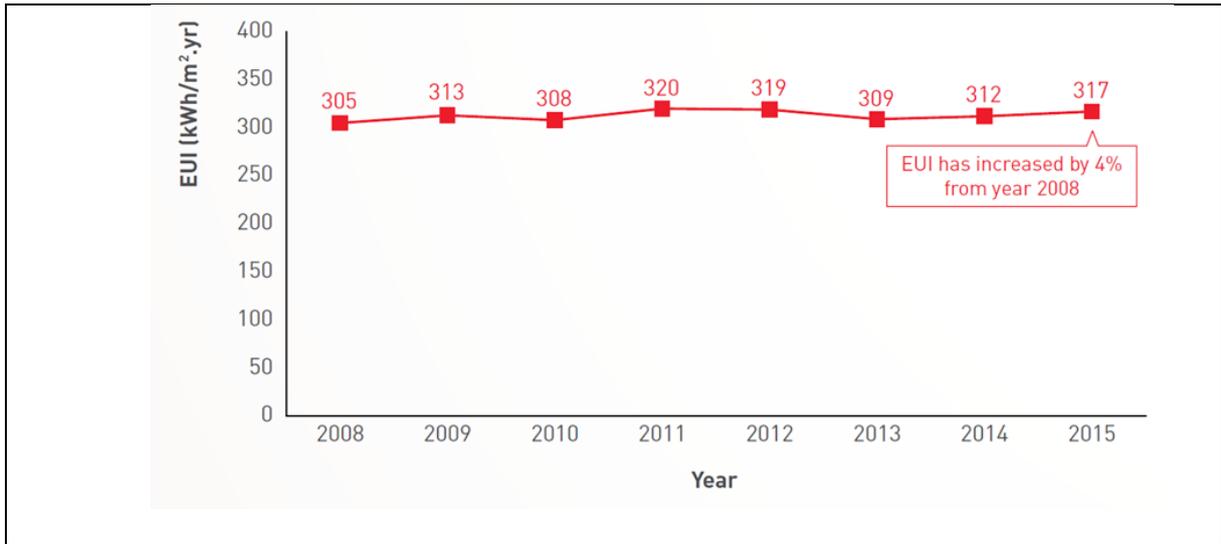
**Building Energy Performance Trends**

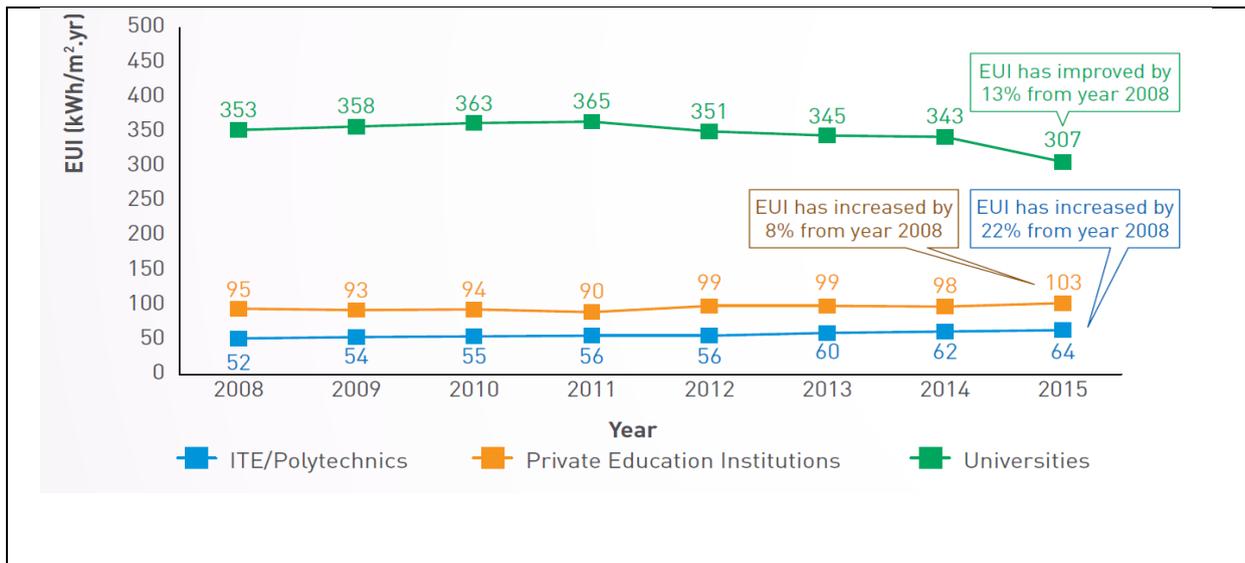
- Overall, the commercial building stock is performing well with a 7% improvement in the energy use intensity (EUI) from 2008 to 2015.



- The EUI of the two new building types – healthcare, tertiary and private education institutions, have shown an increasing trend. It was observed that the EUI has increased respectively by 4% and by 7% from 2008. This represents potential scope for building owners to improve the energy performance of these building types. Nonetheless, it is noted that within the tertiary and private education institutions category, the universities have showed an encouraging reduction in the EUI trend.

**EUI Trend of 59 Healthcare Facilities**





### Energy Performance of Green Mark vs Non-Green Mark Commercial Buildings

- One notable finding from the report is that **Green Mark commercial buildings have better performance, ranging from 9% to 13% lower EUI, as compared to non-Green Mark commercial buildings.** This shows that the BCA Green Mark scheme provides a useful and rigorous framework to achieve better efficiency.

### ***Building Owners and Tenants Energy Consumption Relationship***

Based on the third year's data, tenants' electricity consumption continue to be comparable to that of their building owners, signifying a greater need for building owners to step up their efforts in engaging their tenants so as to reduce their energy consumption and carbon footprint.

### ***Continuous Outreach to Building Owners***

With the release of the BEBR, BCA will continue to identify buildings with high potential for energy improvement and to organise **outreach workshops** to engage these building owners on areas of improvement, as well as the business cases for green buildings. BCA will walk the extra mile by having **one-to-one meetings** with some owners to better understand the challenges faced and suggest the way forward. BCA will also continue to focus on engaging tenants to inculcate behaviour change in energy use.

*Embargoed till 7 September 2016, 10am*

## **Annex C – Factsheet on Anonymised Disclosure of Building Energy Performance**

### **Background**

As a lead up to mandatory disclosure, BCA will release energy performance data of buildings in an anonymised manner starting this year. Such granular data at the building-level would enable building owners and tenants to better understand where their buildings stand in terms of energy efficiency.

### **Objective**

To improve transparency and raise awareness of our buildings' energy performance. The information will further spur creative yet cost-effective solutions to reduce the energy footprint in the built environment.

### **Target audience**

With the anonymised data, building owners and occupants, and even members of the public can perform a search on buildings using various parameters such as the building types, size and BCA Green Mark status. This information will facilitate an increased understanding and awareness of energy use in buildings.

### **Phases of the Anonymised Disclosure of Building Energy Performance**

The three phases for public building energy performance disclosure are:

- (i) Phase 1 - Voluntary building energy performance disclosure  
The top 10 buildings for each building type have been named, with consent from the building owners, in the annual release of the BCA BEBR since it was launched in 2014. At this phase, the corresponding EUI of these buildings were not released.
- (ii) Phase 2 - Disclosure of anonymised building energy performance data and voluntary disclosure of building energy performance data  
BCA will release anonymised building energy performance data of all commercial buildings through the Singapore's open data portal - data.gov.sg and BCA's Building Energy Submission System (BESS) for the first time on 7 Sep 2016. The anonymised data will provide insights to key stakeholders, for better monitoring of energy efficiency, and the optimisation of the overall building's performance.

While this round of data disclosure is done in an anonymised manner, BCA will still encourage building owners of commercial building to

participate in voluntary disclosure of their building's energy performance data. The first set of data for voluntary disclosure is slated to be released in Sep 2017.

(iii) Phase 3 Mandatory energy disclosure

Moving forward, BCA is working towards implementing mandatory energy disclosure in the coming years.

Interested parties may download the anonymised dataset at the Building Energy Submission System (BESS) website from 7 September 2016 onwards (<https://www.bca.gov.sg/BESS/BenchmarkingReport/BenchmarkingReport.aspx> or <http://www.data.gov.sg> ).

*Embargoed till 7 September 2016, 10am*

## **Annex D – Factsheet on MOU with Rwanda Housing Authority**

### **Background**

The Rwanda Housing Authority (RHA) is an agency under Ministry of Infrastructure and their mission includes provision of national housing, urbanisation, regulating and developing the construction industry, and government assets management. Under the Government of Rwanda's medium-term economic development strategy, green economy has been identified as one of the priorities for economy transformation.

Two specific areas promoted under the green economy initiative are green urbanisation and the promotion of green innovation in industrial and private sectors. This green economy is driven by the Ministry of Infrastructure with RHA as the implementation body. Through this MOU, BCA will be lending our expertise through the Green Mark scheme to help green both public and private developments.

A Rwanda Green Building Council was also recently set up to advise the government, engineers and property developers on how best the country can respond to risks of climate change, population growth and the ever-rising construction service prices, while managing the environment in a sustainable manner.

### **Objective**

In line with the vision set under 3rd Green Building Masterplan to be a global leader for green buildings, with special expertise in the tropics and sub-tropics – BCA will sign an MoU with Rwanda Housing Authority (RHA).

This is timely as the government of Rwanda is actively encouraging resource conservation, as well environmental protection to ensure sustainable growth. Government buildings and private sectors in Rwanda have started adopting environmental friendly practices in their projects. This provides business opportunities for our local green building players to participate in Rwanda development.

The scope of MoU collaboration includes:

- Capacity building and knowledge exchange, and sharing of best practices in green buildings
- Developing Rwanda's green building standards by taking reference from the BCA Green Mark scheme
- Promoting business collaboration in the area of green building

BCA had signed a similar MoU with National Housing Corporation, Tanzania, during IGBC 2014. The Green Mark projects certified in Tanzania to date includes apartment buildings, affordable housing (landed houses), and commercial office buildings. Two such examples are the NHC Place Building and Kigamboni Housing Estate.

*Embargoed till 7 September 2016, 8pm*

## **Annex E – Factsheet on SGBW students-related activities**

### **Background**

As part of the Singapore Green Building Week 2016, BCA has rolled out a series of student-related events and activities. More than 650 secondary and tertiary students participated or are participating in the BCA-SIA-SGBC International Tropical Architecture Design Competition, the Climate Innovation Challenge (CIC) and this week's BuildGreen: Student Edition workshop and Tree-planting at Zhenghua Nature Park. This is a record high in student participation for the Singapore Green Building Week, which is now into its eighth edition.

### **The BCA-SIA-SGBC International Tropical Architecture Design Competition 2016 for Institutes of Higher Learning**

#### **What**

The BCA-SIA-SGBC International Tropical Architecture Design Competition 2016 for Institutes of Higher Learning (IHL) is a design competition which focuses on tropical green architecture and sustainable building design solutions. It aims to raise awareness of the green building movement and initiatives amongst the younger generation and encourage them to become future architects and green experts in tropical green designs.

The competition was first launched in 2011 and is jointly organised by the Building and Construction Authority (BCA), Singapore Institute of Architects (SIA) and Singapore Green Building Council (SGBC). This is the sixth time the competition has been organised.

#### **Sponsors**

This year's competition is supported by CPG Consultants Pte Ltd.

#### **Eligibility**

Open to institutes of higher learning (IHLs) globally, either teams or individuals.

#### **Criteria for entries**

The theme for this year's competition is "**The Future of Green Tropical Living**". Design entries have to demonstrate the essentials and key constituents of a green residential building in a metropolitan city. Entries should be applicable for the tropical climate and showcase innovative and sustainable designs. They should also show how the proposed design will be able to integrate with the surrounding environment and landscape. In addition, it should also encourage a liveable environment, where human relationships, community integration and spirit can be fostered through shared spaces and the built environment.

Other requirements include:

- Incorporating both active and passive design strategies, renewable energy (if applicable) and other ecological features
- Demonstrating how the design encompasses energy efficient factors
- Ensuring that the design concept allows end-users to cultivate habits that will keep the home green in the tropical climate / incorporate design elements meant to guide users towards self-selecting energy-efficient behaviours
- Presenting a practical, feasible direction for future residential buildings, based on resources available in present day
- Incorporating the engineering feasibility of the design solutions proposed
- Using BCA Green Mark assessment tool to validate their sustainable design concepts

**Number of submissions received**

131 submissions from 15 countries were received. Five finalists are shortlisted for the final judging session. With more quality submissions this year, the Special Mention Award is newly introduced to recognise more students for their achievements.

**Finalists**

<b>Institution</b>	<b>Project Title</b>
Harvard University, United States of America	Urban Refrigerator
National University of Singapore, Singapore Singapore University of Technology & Design, Singapore Architectural Association, London	The Rainscape
Parahyangan Catholic University, Indonesia	The Nexus Project
Nueva Ecija University of Science and Technology, Philippines	Infininty – The Pacific Ring of Fire Habitat
University of Auckland, New Zealand	Kinetic Tower

**Special Mention Award**

<b>Institution</b>	<b>Project Title</b>
National Institute of Technology, Tiruchirappalli, India	The Panoramic Habitat

Parahyangan Catholic University, Indonesia	Green Metamorph Project
National Taipei University of Technology, Taiwan	Regenerative Architecture
Bandung Institute of Technology, Indonesia	Fundamental – Regain from the Past
Tamkang University, Taiwan	The Terrain of Water

### Judging criteria and scoring

1	Design Concept & Creativity	20%
2	Relevance to tropical context	20%
3	Relevance to theme	20%
4	Feasibility in current context	15%
5	Design for behavioural change and social capital	15%
6	Presentation	5%
7	Reference to BCA Green Mark rating	5%
<b>TOTAL</b>		100%

### Judging Panel

<b>Building and Construction Authority</b>	Mr Ang Kian Seng Group Director, Environmental Sustainability
<b>Singapore Institute of Architects</b>	Mr Tan Szue Hann Council Member and Sustainability Committee Chairperson
<b>Singapore Green Building Council</b>	Mr Ashvinkumar Kantilal Board Member
<b>CPG Consultants Pte Ltd</b>	Mr Cheong Yew Kee Senior Vice-President (Architecture)

## **The International Green Building Conference Build Green: Student Edition Workshop 2016**

### **Background**

The International Green Building Conference (IGBC) Build Green: Student Edition is an activity specially tailored to engage students on green building knowledge. In previous editions, the activity involves only students from the Institutes of Higher Learning (IHL), but for the first time this year, Secondary Schools (SS) will be participating too.

### **Programme for IHL students**

The first half of the day encompasses self-learning tasks and activities which will expose IHL students to green technologies, ideas, and careers in sustainable built environment.

In the afternoon, they will be tasked with a carnival-themed mission, whereby they have to set up carnival-themed booths and use what they have learnt to educate the SS students on how they can green their schools.

### **Programme for SS students**

To prepare the SS students with some knowledge of green buildings, a half day programme has been planned out. The students will have the opportunity to go on a private green tour, hosted by Marina Bay Sands (MBS), to better understand green building features. They will then visit the MBS Skypark (observation deck) and, through an interactive Augmented Reality Programme, learn about iconic Green Mark landmarks surrounding MBS, such as the Singapore Sports Hub.

### **Target audience**

1. Built Environment Sector
  - Stakeholders will get an opportunity to showcase to the IHL students their latest technologies and ideas, and excite them on the prospects of the industry.
2. IHL students
  - Deepen their knowledge of the Green Mark schemes, in particular the Green Mark for Schools
  - Broaden their mind-sets and allow them to learn about different professions in the Built Environment Sector
3. SS students
  - Learn and understand the various green building features
  - Educate them on how they can play their part in contributing to creating a sustainable environment
  - Encourage them to think out of the box for innovative green ideas they can implement in their schools to create a greener environment in their schools