Promoting Green Buildings in Singapore

7th High Level Seminar on Environmentally Sustainable Cities
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Building and Construction Authority of Singapore
Resource Efficiency

- Population: >5.5mil
- Alternate Energy- Disadvantaged
- High Electricity Consumption Per Capita

Heavily Dependent for Energy Needs

- 719 km²
80% OF ALL BUILDINGS ‘GREEN’ by 2030
National Green Target
Global Leader in green buildings with special expertise in the tropics and sub-tropics

BCA Green Building Journey

2005

1st GREEN BUILDING MASTERPLAN

2006

New Buildings

2009

Existing Buildings

2014

Building Occupants & Tenants

>80% of buildings to be GM certified by 2030
The Green Mark – Building Rating System for Tropics

New Buildings

Supermarket

Existing Buildings

Data Centre

Retail

Restaurant

Office Interior

District

Park

Infrastructure

Landed House
<table>
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<th>Large Public Sector Buildings to meet higher GM rating</th>
<th>New Buildings – Platinum Existing Buildings - Goldplus</th>
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<tr>
<td>Green Small and Medium Public Sector Buildings</td>
<td>To meet min. GM Gold rating</td>
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<td>Government as Tenants</td>
<td>To lease from higher rating GM buildings upon lease renewal</td>
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<td>Green Procurement</td>
<td>Host at GM certified venues</td>
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<td>Government Land Sales (GLS) Projects</td>
<td>Key growth areas are stipulated with mandatory higher GM ratings</td>
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All new buildings are to meet a minimum standard equivalent to Green Mark certified level.

Building Control (Environmental Sustainability Measures for New Building) Regulations 2008
Existing buildings need to meet minimum standard when cooling systems are installed or replaced.

Maintain performance through three-yearly Energy Audit on Cooling System & Compliance of Design System Efficiency.

Track performance through annual submission of building information & energy consumption data.
Lowering the Barriers for the Private Sector

$20 MILLION GREEN MARK INCENTIVE SCHEME FOR NEW BUILDINGS

Encourage adoption of integrated design approach and accelerate adoption of green building design, practices and technologies

$100 MILLION GREEN MARK INCENTIVE SCHEME FOR EXISTING BUILDINGS

Push for greater adoption of energy efficient retrofitting design, practices and technologies to the large stock of existing buildings

$5 MILLION GREEN MARK INCENTIVE SCHEME FOR DESIGN PROTOTYPE

Promote best practices at the early design stage to facilitate high performance buildings
Lowering the Barriers for the Private Sector

$50 MILLION GREEN MARK INCENTIVE SCHEME FOR EXISTING BUILDINGS & PREMISES

Target SME owners & tenants to adopt energy efficiency improvements and measures

BUILDING RETROFIT ENERGY EFFICIENCY FINANCING (BREEF)

Provides credit facilities with a default risk sharing of 60%

GREEN MARK GROSS FLOOR AREA INCENTIVE SCHEME (GM GFA)

Grants bonus GFA for buildings that strive for higher GM ratings
Grooming Green Specialists

Building a Green Collar Workforce through a Comprehensive Suite of Green Building Courses in BCA Academy

**EXECUTIVE PROGRAMMES**

- **EXECUTIVE DEVELOPMENT PROGRAMME**
  - Leadership in Environmental Sustainability
    - Carnegie Mellon University
  - Innovations in Sustainable Design & Technology
    - Stuttgart University of Applied Science

- **SEMINARS**
  - Leadership in Green Building Lecture Series
  - BCA-REDS-SGBC Green Building Seminar
  - BCA-ASHRAE Green / HVAC Seminar Series

**ACADEMIC PROGRAMMES**

- **POSTGRADUATE DEGREE**
  - MSc in Sustainable Building Design
    - University of Nottingham
  - MSc in Facility & Environment Management
    - University College London

- **DEGREE**
  - BSc (Hons) in Facilities & Events Management
    - UniSIM, BCAA & Singapore Polytechnic

**SPECIALIST CERTIFICATION PROGRAMMES**

- **SPECIALIST DIPLOMA**
  - Facility & Energy Management
  - M & E Coordination

- **DIPLOMA**
  - Mechanical Engineering (Green Building Technology)
  - Strategic Facilities Management
  - Electrical Engineering & Clean Energy

**Target:**
20,000
Green Specialists
By Year 2020

**Currently:**
>13,000
PMETs trained
$52 MILLION GREEN BUILDINGS INNOVATION CLUSTER

Configurable test setup - Different orientations relative to the sun in tropical climatic conditions

In collaboration with the Lawrence Berkeley National Laboratory

Applied R&D
Technology Development
Capability Building
Performance Feedback
Industry Adoption
Technology Demonstration/Deployment
Engaging the End-Users

>200

Occupant-centric projects

BCA’S Dummies Guide for Restaurants & Retails

2nd BCA-SGBC Green Building Workshop for Building Owners

Green Partnership with Developers Promoting Green to Tenants

Supermarkets  |  Retails  |  Restaurants  |  Offices
Profile Singapore as a leading Sustainable Hub in the tropics

Enhance Professionalism and Knowledge in Sustainable Development

Dedicated Certification Body for Green Building Products and Services
IGBC - The Premier Green Building Event in Asia

International Green Building Conference 2016
Singapore

7 - 9 September 2016
Marina Bay Sands
Singapore

What to anticipate at IGBC 2016:
- Envisaging Our Next Decade
- A Bird’s Eye View of the Sustainable Built Environment
- Money Sense; Building Sense
- Data Revolution of Cities and Buildings
- Greening Inside-Out
- Updates of Green Mark Schemes
- Green Tours

Organised by
Strategic Partners
Co-located Events

SGBW Official Website: http://www.sgbw.com.sg
SGBW Facebook page: https://www.facebook.com/igbcsg
Monitoring Building Performance through Annual Mandatory Submission

**Stage 1**
(2013/2014)

- Existing and New Commercial Buildings
- Healthcare Facilities
- Tertiary Institutions

**Stage 2**
(2015/2016)

*Expanded coverage of building types in FY15*

**Average EUI of Green Mark & Non-Green Mark Commercial Buildings**

- Year 1: Non-Green Mark 252 kWh/m²·yr, Green Mark 214 kWh/m²·yr (15% improvement)
- Year 2: Non-Green Mark 292 kWh/m²·yr, Green Mark 271 kWh/m²·yr (7% improvement)
- Year 3: Non-Green Mark 529 kWh/m²·yr, Green Mark 478 kWh/m²·yr (10% improvement)

**EUI (kWh/m²·yr) over Years**

- Year 2008: 335 kWh/m²·yr
- Year 2009: 333 kWh/m²·yr
- Year 2010: 332 kWh/m²·yr
- Year 2011: 334 kWh/m²·yr
- Year 2012: 331 kWh/m²·yr
- Year 2013: 314 kWh/m²·yr
- Year 2014: 310 kWh/m²·yr

EUI has improved by 7% from year 2008
Marking 10 years of Green Mark

Over a decade, the Green Mark Scheme has helped Singapore to become a hub for green buildings in the tropics/subtropics, establishing a strong business case, through sustained high performance.

- > 80 million m² green GFA
- > 2700 Green Mark Projects
- 31% total existing building floor areas
Thank You