INTRODUCTION to Green Building

Ir. Kok Yen Kwan

MIEM | PEng | MIET | CEng | MCIBSE | GBIF
WHY THE NEED FOR A MALAYSIAN GREEN RATING TOOL?

WHAT is a Green Building?

A Green building focuses on increasing the efficiency of resource use – energy, water, and materials – while reducing building impact on human health and the environment during the building’s lifecycle, through better sitting, design, construction, operation, maintenance, and removal. Green Buildings should be designed and operated to reduce the overall impact of the built environment on its surroundings.
WHY Green Buildings?

1. Green buildings are designed to save energy and resources, recycle materials and minimise the emission of toxic substances throughout its life cycle.

2. Green buildings harmonise with the local climate, traditions, culture and the surrounding environment.

3. Green buildings are able to sustain and improve the quality of human life whilst maintaining the capacity of the ecosystem at local and global levels.

4. Green buildings make efficient use of resources, have significant operational savings and increases workplace productivity.

5. Building green sends the right message about a company or organisation – that it is well run, responsible, and committed to the future.
What is the Green Building Index?

The Green Building Index (GBI) is Malaysia’s industry recognised green rating tool for buildings to promote sustainability in the built environment and raise awareness among Developers, Architects, Engineers, Planners, Designers, Contractors and the Public about environmental issues and our responsibility to the future generations.

The GBI rating tool provides an opportunity for developers and building owners to design and construct green, sustainable buildings that can provide energy savings, water savings, a healthier indoor environment, better connectivity to public transport and the adoption of recycling and greenery for their projects and reduce our impact on the environment.

GBI is developed specifically for the Malaysian-tropical climate, environmental and developmental context, cultural and social needs and is created to:

- Define green buildings by establishing a common language and standard of measurement;
- Promote integrated, whole-building designs that provides a better environment for all;
- Recognise and reward environmental leadership;
- Transform the built environment to reduce its negative environmental impact; and
- Ensure new buildings remain relevant in the future and existing buildings are refurbished and upgraded to improve the overall quality of our building stock.
Tool: Green Building Index (GBI)
www.greenbuildingindex.org
www.mgbc.org.my

Tool: Green Mark Singapore
http://www.sgbc.sg/

Tool: Greenship
www.gbcindonesia.org

Tool: “Berde”
http://philgbc.org/

Tool: Lotus
www.vgbc.org.vn

Tool: None Yet

Thailand Green Building Council
WHY THE NEED FOR A MALAYSIAN GREEN RATING TOOL?

The 2010 Budget Speech

YAB Dato' Sri Mohd. Najib Tun Abdul Razak
Prime Minister and Minister of Finance

Introducing the Supply Bill (2010)
In the Dewan Rakyat

23 October 2009

NRNC - Non Residential New Construction
RNC - Residential New Construction

National Green Tech Masterplan
Green Tech Fund (RM1.5B)
Income Tax Exemption Order
(for GBI certified building)

NREB - Non Residential Existing Building

SEDA Act
R.E. Act - FIT

3 M² GFA certified
7,500 acres reg. for GBIT

May – October – April – March – April – June –
Sept.
1) GBI ACCREDITATION PANEL (GBIAP)
The GBI rating system will be regulated by the GBI Accreditation Panel (GBIAP), an independent committee consisting of senior building professionals that will be reviewing and awarding the GBI rating to qualified projects.

The GBIAP comprises leading industry professionals recognised for their contribution in sustainable developments in Malaysia. They have been actively involved in every step of the rating system’s development, ensuring that the rating system is fully tested and compliant to both local and international standards and best practices.

2) GBI CERTIFIERS
The roles and responsibility of GBI Certifiers are to perform the detailed assessment and accreditation of building projects submitted to the GBI Accreditation Panel for GBI Certification.

3) GBI FACILITATORS
The roles and responsibility of GBI Facilitators are to provide services to enable building projects to achieve GBI accreditation.
STAGE 1  APPLICATION & REGISTRATION

Is the Application complete?

COMPLETE

GSB processes application and notifies Applicant of the Registration Fee

APPLICATION REGISTRATION

INCOMPLETE

GSB to request for more information from Applicant

Complete and submit the Application & Registration Form to GSB with supporting documents

Applicant to make the necessary Registration Fee payment to GSB and submit any other additional required information

GSB registers the application and gives a GBI Registration Number to the Applicant

GBI Agreement to be signed between GSB and Applicant

GSB assigns GBI Certifier at appropriate time

THE GBI ASSESSMENT PROCESS

How do I register?
DOWNLOAD THE APPLICATION FORM NOW!
www.greenbuildingindex.org
STAGE 1  APPLICATION & REGISTRATION

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APPLICATION

THE GBI ASSESSMENT PROCESS
STAGE 1  APPLICATION & REGISTRATION

REGISTRATION

- Applicant to make the necessary Registration Fee payment to GSB and submit any other additional required information

- GSB registers the application and gives a GBI Registration Number to the Applicant.
  GBI Agreement to be signed between GSB and Applicant.

- GSB assigns GBI Certifier at appropriate time.

THE GBI ASSESSMENT PROCESS
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## Green Building Index Registration Fees

<table>
<thead>
<tr>
<th>Size of Project</th>
<th>Total Gross Floor Area (m²)</th>
<th>Registration Fees (RM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Residence</td>
<td>Below 2,000</td>
<td>5,000.00</td>
</tr>
<tr>
<td>Small</td>
<td>Up to 4,000</td>
<td>8,000.00</td>
</tr>
<tr>
<td>Intermediate</td>
<td>4,001 to 10,000</td>
<td>10,000.00</td>
</tr>
<tr>
<td>Medium</td>
<td>10,001 to 30,000</td>
<td>20,000.00</td>
</tr>
<tr>
<td>Large</td>
<td>30,001 to 50,000</td>
<td>32,000.00</td>
</tr>
<tr>
<td>Extra Large</td>
<td>50,001 to 100,000</td>
<td>45,000.00</td>
</tr>
<tr>
<td>Mega Project</td>
<td>Above 100,000</td>
<td>Assessment fee will be determined on a project-by-project basis</td>
</tr>
</tbody>
</table>

* Rates shown are as of the date of the application and registration and may be revised from time to time as appropriate.
* Rates shown are excluding Government Service Tax (GST)

### Project Assessment
Fee as per prescribed includes:
- 1 Design Assessment (DA)
- 1 Completion & Verification Assessment (CVA)

### Appeal
A flat rate of RM1,000.00 per credit point
WHY THE NEED FOR A MALAYSIAN GREEN RATING TOOL?

STAGE 2  DESIGN  ASSESSMENT (DA)

Applicant to appoint their Project Coordinator/GBI Facilitator and submit for Design Assessment (DA) to GSB

Is the DA Submission complete?

- INCOMPLETE
  - GSB to return and request for completed DA submission

- COMPLETE
  - GBI Certifier undertakes the DA

  - GSB notifies Applicant of DA result

  - APPEAL
    - Fail
    - Request Review for a Higher Rating
    - To Submit Appeal Form & Fees

  - Appeal by Applicant?

    - NO APPEAL
      - GSB issues provisional GBI Certificate to Applicant

    - GSB records & publishes in GBI Register

THE GBI ASSESSMENT PROCESS

How do I register?
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STAGE 2

DESIGN

ASSESSMENT (DA)

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WHY THE NEED FOR A MALAYSIAN GREEN RATING TOOL?

**STAGE 2 | DESIGN | ASSESSMENT (DA)**

1. GBI Certifier undertakes the DA
2. GSB notifies Applicant of DA result
3. Appeal by Applicant?
   - NO APPEAL: GSB issues provisional GBI Certificate to Applicant; GSB records & publishes in GBI Register
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**APPEAL**
- Fail
- Request Review for a Higher Rating
  
  To Submit Appeal Form & Fees

THE GBI ASSESSMENT PROCESS
WHY THE NEED FOR A MALAYSIAN GREEN RATING TOOL?
STAGE 3
COMPLETION & VERIFICATION ASSESSMENT (CVA)

Applicant to submit for Completion & Verification Assessment (CVA) upon completion of project

GBI Certifier undertakes CVA

GSB notifies Applicant of CVA result

APPEAL
- Fail
- Request Review for a Higher Rating
To Submit Appeal Form & Fees

Appeal by Applicant?

NO APPEAL

GSB issues GBI Certificate to Applicant
GSB records & publishes in GBI Register

How do I register?
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STAGE 3  COMPLETION & VERIFICATION ASSESSMENT (CVA)

Applicant to submit for Completion & Verification Assessment (CVA) upon completion of project

GBI Certifier undertakes CVA
STAGE 3: COMPLETION & VERIFICATION ASSESSMENT (CVA)

GSB notifies Applicant of CVA result

APPEAL

- Fail
- Request Review for a Higher Rating

To Submit Appeal Form & Fees

APPEAL

No Appeal

GSB issues GBI Certificate to Applicant
GSB records & publishes in GBI Register

THE GBI ASSESSMENT PROCESS
Stage 3: Completion & Verification Assessment (CVA)

Applicant to submit for Completion & Verification Assessment (CVA) upon completion of project.

GBI Certifier undertakes CVA.

GSB notifies Applicant of CVA result.

APPEAL

- Fail
- Request Review for a Higher Rating

To Submit Appeal Form & Fees

Appeal by Applicant?

NO APPEAL

GSB issues GBI Certificate to Applicant

GSB records & publishes in GBI Register

THE GBI ASSESSMENT PROCESS
ENERGY EFFICIENCY (EE)
Improve energy consumption by optimising building orientation, minimizing solar heat gain through the building envelope, harvesting natural lighting, adopting the best practices in building services including use of renewable energy, and ensuring proper testing, commissioning and regular maintenance.

INDOOR ENVIRONMENT QUALITY (EQ)
Achieve good quality performance in indoor air quality, acoustics, visual and thermal comfort. These will involve the use of low volatile organic compound materials, application of quality air filtration, proper control of air temperature, movement and humidity.

SUSTAINABLE SITE PLANNING (SM)
Selecting appropriate sites with planned access to public transportation, community services, open spaces and landscaping. Avoiding and conserving environmentally sensitive areas through the redevelopment of existing sites and brownfields. Implementing proper construction management, storm water management and reducing the strain on existing infrastructure capacity.

MATERIALS & RESOURCES (MR)
Promote the use of environment-friendly materials sourced from sustainable sources and recycling. Implement proper construction waste management with storage, collection and reuse of recyclables and construction formwork and waste.

WATER EFFICIENCY (WE)
Rainwater harvesting, water recycling and water-saving fittings.

INNOVATION (IN)
Innovative design and initiatives that meet the objectives of the GBI.
WHY THE NEED FOR A MALAYSIAN GREEN RATING TOOL?

The GBI Non-Residential Rating tool evaluates the sustainable aspects of buildings that are commercial, institutional and industrial in nature. This includes factories, offices, hospitals, universities, colleges, hotels and shopping complexes.

Of the six criteria that make up the GBI rating, emphasis is placed on energy efficiency and indoor environmental quality as these have the greatest impact in the areas of energy use and well-being of the occupants and users of the building.

By improving on the efficiency of active (mechanical and electrical) systems as well as incorporating good passive designs together with proper sustainable maintenance regimes, significant reductions in consumed energy can be realised. This can lead to a reduced carbon footprint and also offers long-term savings for the building owners.
The GBI Residential Rating tool evaluates the sustainable aspects of residential buildings. This includes linked houses, apartments, condominiums, townhouses, semi-detached and bungalows.

This tool places more emphasis on sustainable site planning & management, followed by energy efficiency. This serves to encourage developers and home owners to consider the environmental quality of homes and their inhabitants through better site selection, provisions of public transport access, increased community services and connectivity, as well as improved infrastructure.

Such achievement will help reduce the negative impact to the environment and create a better and safer place for residents and the community as a whole.
THE GBI RATING TOOLS

Launched in 2009:
1. GBI NRNC (Non-Residential New Construction)
2. GBI RNC (Residential New Construction)

Launched in 2010:
1. NREB (Non-Residential Existing Building)
2. RNC version 2.0

Launched in 2011:
1. GBI Township Development
2. IEB (Industrial Existing Building)
3. INC (Industrial New Construction)

Launched in 2012:
1. NRNC Data Center

NEW TOOLS BEING DEVELOPED:
GBI NRNC SHOPPING CENTRE
(TARGET LAUNCH IN YEAR 2013)
GBI NRNC RESORT & HOTEL
(TARGET LAUNCH IN YEAR 2013)

TEAM MEMBERS AND CONTRIBUTORS ARE WELCOMED
# Green Building Index Classification

<table>
<thead>
<tr>
<th>Points</th>
<th>GBI Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>86+ points</td>
<td>Platinum</td>
</tr>
<tr>
<td>76 to 85 points</td>
<td>Gold</td>
</tr>
<tr>
<td>66 to 75 points</td>
<td>Silver</td>
</tr>
<tr>
<td>50 to 65 points</td>
<td>Certified</td>
</tr>
</tbody>
</table>

![Building Diagram with Green Building Index Certifications](image-url)
### THINK & SAVE

#### SUSTAINABLE LIVING TIPS

<table>
<thead>
<tr>
<th>HOW CAN I HELP?</th>
<th>WHY DOES IT MATTER?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Energy</strong></td>
<td></td>
</tr>
<tr>
<td>• Turn off the lights, air-conditioning and television and reduce unnecessary</td>
<td>Our energy use is often wasteful and can impact the environment through green house</td>
</tr>
<tr>
<td>electrical use.</td>
<td>emissions that contribute to climate change. Sourcing for increasingly</td>
</tr>
<tr>
<td>• Try alternative renewable energy for some or all of your electricity.</td>
<td>depleting natural resources also leads to further damage to sensitive</td>
</tr>
<tr>
<td>• Use energy-efficient lighting appliances and hot water services.</td>
<td>environments.</td>
</tr>
<tr>
<td>• Use fans, operable windows for cross ventilation, insulation and sun-</td>
<td></td>
</tr>
<tr>
<td>shading devices to cool your homes.</td>
<td></td>
</tr>
<tr>
<td><strong>Transport</strong></td>
<td></td>
</tr>
<tr>
<td>• Walk, cycle or use public transport where possible.</td>
<td>Improving the way we go about our daily lives can reduce fuel use, which</td>
</tr>
<tr>
<td>• If you use a car, try to car pool with friends or co-workers.</td>
<td>increases pollution like smog and green house gas emissions, while reducing</td>
</tr>
<tr>
<td>• Optimize car use activities to reduce your car trips.</td>
<td>household costs and saving time.</td>
</tr>
<tr>
<td>• Consider the option to live, learn and work within the community or</td>
<td></td>
</tr>
<tr>
<td>locality of your home.</td>
<td>Avoiding waste where possible, encouraging reuse, recycling and proper waste</td>
</tr>
<tr>
<td>• Consider buying a fuel efficient car and service it regularly.</td>
<td>disposal are all ways to reduce the community’s impact on the environment.</td>
</tr>
<tr>
<td>• Consider living in an area that has public transport options.</td>
<td></td>
</tr>
<tr>
<td><strong>Waste</strong></td>
<td></td>
</tr>
<tr>
<td>• Avoid excess packaging and use a reusable bag when shopping.</td>
<td>Waste-free and wise water use helps maintain adequate fresh water resources for</td>
</tr>
<tr>
<td>• Recycle packaging and bags.</td>
<td>the community and the environment.</td>
</tr>
<tr>
<td>• Donate unwanted items to charities.</td>
<td></td>
</tr>
<tr>
<td>• Use compost systems or worm farms for food scraps and garden wastes.</td>
<td></td>
</tr>
<tr>
<td>• Correctly dispose of household hazardous wastes and batteries.</td>
<td></td>
</tr>
<tr>
<td>• Do not litter or discharge wastes into the waterways and surroundings.</td>
<td></td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td></td>
</tr>
<tr>
<td>• Reduce wasteful water use, i.e. have shorter showers, self-closing taps.</td>
<td>Waste-free and wise water use helps maintain adequate fresh water resources for</td>
</tr>
<tr>
<td>• Fix faulty plumbing and install water-wise showers and taps.</td>
<td>the community and the environment.</td>
</tr>
<tr>
<td>• Consider changing to low-water-use appliances such as washing machines</td>
<td></td>
</tr>
<tr>
<td>and toilets.</td>
<td></td>
</tr>
<tr>
<td>• Grow a water-wise garden.</td>
<td></td>
</tr>
<tr>
<td>• Consider installing a rainwater tank for watering the garden or external</td>
<td></td>
</tr>
<tr>
<td>cleaning purposes.</td>
<td></td>
</tr>
<tr>
<td>• Don’t throw rubbish into drains and waterways.</td>
<td></td>
</tr>
<tr>
<td>• Implement soil erosion and proper drainage to areas where earth has</td>
<td></td>
</tr>
<tr>
<td>been disturbed to prevent siltation of waterways.</td>
<td></td>
</tr>
<tr>
<td>• Preserve and maintain natural water courses and catchment areas.</td>
<td></td>
</tr>
<tr>
<td><strong>Lifestyle</strong></td>
<td></td>
</tr>
<tr>
<td>• Change to a healthier diet and lifestyle.</td>
<td>Good community health, more sustainable green rated buildings and homes, and a</td>
</tr>
<tr>
<td>• Exercise regularly or play a sport.</td>
<td>more supportive society can contribute to the community’s health and</td>
</tr>
<tr>
<td>• Get to know your neighbours and help keep your community safe.</td>
<td>sustainability.</td>
</tr>
<tr>
<td>• Visit your health practitioner for regular check-ups.</td>
<td></td>
</tr>
<tr>
<td>• Think about sustainability when purchasing or improving your home.</td>
<td></td>
</tr>
<tr>
<td>• When you can, buy locally and purchase locally made goods and produce.</td>
<td></td>
</tr>
<tr>
<td>• Further learning and developing new skills are great ways to challenge</td>
<td></td>
</tr>
<tr>
<td>yourself and meet other people.</td>
<td></td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
</tr>
<tr>
<td>• Join in litter cleanup activities.</td>
<td>A healthy sustainable environment creates and allows its communities to recreate in</td>
</tr>
<tr>
<td>• Report any illegal dumping or open burning.</td>
<td>it; it is an important heritage to be kept for future generations.</td>
</tr>
<tr>
<td>• Report any illegal logging, mining or destruction of the natural environment</td>
<td></td>
</tr>
<tr>
<td>• Enjoy the natural environment and recreational areas through healthy</td>
<td></td>
</tr>
<tr>
<td>activities such as walking, jogging, hiking, climbing, boating, swimming,</td>
<td></td>
</tr>
<tr>
<td>snorkeling and diving.</td>
<td></td>
</tr>
<tr>
<td>• Be responsible to preserve local flora and fauna.</td>
<td></td>
</tr>
</tbody>
</table>

**GreenBuildingIndex**

*IS SUPPORTED BY*
THE GREEN BUILDING GROWTH in MALAYSIA

GBI Registered and Certified Properties By Numbers

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THE GREEN BUILDING GROWTH in MALAYSIA

GBI Certified Properties by Gross Floor Area

Copyright (August 2012)

01-Apr11 01-May11 01-Jun11 01-Jul11 01-Aug11 01-Sep11 01-Oct11 01-Nov11 01-Dec11 01-Jan12 01-Feb12 01-Mar12 01-Apr12 01-May12 01-Jun12 01-Jul12 01-Aug12

- 732,273 m²
- 1,084,429 m²
- 1,717,144 m²
- 2,000,900 m²
- 2,467,967 m²
- 2,810,580 m²

CVA
DA
“There must be a better way to make the things we want, a way that doesn't spoil the sky, or the rain or the land”

Sir Paul McCartney

“There is a sufficiency in the world for man's need, but not for man's greed”

Mohandas K. Gandhi (1869 – 1948)

“We do not inherit the earth from our ancestors; we simply borrowed it from our children”

David Brower (1912 – 2000)