A BETTER TOMORROW ...

RECENT GREEN WORKS

AR DR TAN LOKE MUN

12TH OCTOBER 2017
KUALA LUMPUR
31st October 2011
Today – 7.23 Billion

7 Billion
How your world will change
HOW FAST ARE WE GROWING???

Currently . . .

at rate of approx. 225,000 people/day

Or

1 billion / 13 years

Plenty of work for EVERYONE!
OVERPOPULATION

= POVERTY + EXTINCTION
RAPID URBANISATION
HIGHER DENSITIES
<table>
<thead>
<tr>
<th>Rank</th>
<th>1990</th>
<th>2007</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tokyo</td>
<td>Tokyo</td>
<td>Tokyo</td>
</tr>
<tr>
<td>2</td>
<td>New York</td>
<td>New York</td>
<td>Mumbai</td>
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<tr>
<td>3</td>
<td>Mexico City</td>
<td>Mexico City</td>
<td>Delhi</td>
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<tr>
<td>4</td>
<td>Sao Paulo</td>
<td>Mumbai</td>
<td>Dhaka</td>
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<tr>
<td>5</td>
<td>Mumbai</td>
<td>Sao Paulo</td>
<td>Sao Paulo</td>
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<tr>
<td>6</td>
<td>Osaka-Kobe</td>
<td>Delhi</td>
<td>Mexico City</td>
</tr>
<tr>
<td>7</td>
<td>Kolkata</td>
<td>Shanghai</td>
<td>New York</td>
</tr>
</tbody>
</table>
In 1900 atmospheric CO2 levels were 287 parts per million.

13 May 2013

This week they hit 400ppm.

It is their highest level in 800,000 years.

Pollution
RISE OF AN ECOLOGICAL AGE
WATER FOOD SHELTER
INCREASE IN INEQUALITY
Young people with placards reading 'Without a house, without a job, without pension' during protests in April 2012
WATER

PLASTIC POLLUTION
PLASTIC POLLUTION
Plastic Pollution Is Growing

Total annual output of mismanaged plastic waste by coastal populations, top-ranked countries by billions of pounds

*Projection
Source: Jambeck et al, Science, 2015

CLIMATE DECK
HOW DOES THIS END?
CHANGE
WHAT’S AHEAD?

THE RISE OF THE NEW

ECOLOGICAL AGE
IS THERE ANOTHER WAY ?
THE GBI RATING TOOLS

NON-RESIDENTIAL

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.

<table>
<thead>
<tr>
<th>GBi Points Allocation Chart (Non-Residential)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1</td>
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<td>3</td>
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<td>4</td>
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<tr>
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</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

RESIDENTIAL

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.

<table>
<thead>
<tr>
<th>GBi Points Allocation Chart (Residential)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part</td>
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<tr>
<td>------</td>
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<tr>
<td>1</td>
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<tr>
<td>6</td>
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<tr>
<td>Total</td>
</tr>
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</table>

All forms and tools can be downloaded from www.greenbuildingindex.org

For more information please contact us at info@greenbuildingindex.org

LAUNCHED 21 MAY 2009
NEW LIFE FOR OLD
PLUGGING THE LEAKS IN EXISTING BUILDINGS

26 APRIL 2010
LAUNCH OF THE
GBI - EXISTING BUILDING RATING TOOL

MESSAGES

YAB DATO’ SRI MOHD NAJIB
BIN TUN HAJI ABDUL RAZAK
PRIME MINISTER OF MALAYSIA

I wish to congratulate Pertubuhan Akitek Malaysia (PAM) and the Association of Consulting Engineers Malaysia (ACEM) for the launch of the new Green Building Index (GBI) tool to help property owners to upgrade their existing buildings to become more “Green” and sustainable.

This is an important step as we press towards a High Income Economy. To achieve this vision we have to plug the leaks to reduce unaccounted losses and unplanned wastages. We cannot afford to have buildings that continue to use too much resources and energy whilst at the same time contribute wastes and harmful greenhouse gases that damages the environment. This GBI tool can also help to transform all aging and inefficient buildings to become higher value assets.

The Government’s commitment to a greener future is clear. Incentives in the form of tax exemption for building owners, and stamp duty exemptions for buyers of properties that achieve GBI certification have been provided in Budget 2010. These are to help the country to build more Green Buildings and also to develop more Green Technologies.

In addition, GBI Malaysia is a good example of how the private sector professionals and NGOs can work together to come up with an internationally accepted standard for Green Buildings in the tropics. We appreciate and encourage more of such innovation and creative input.

I support and wish you every success in its implementation.

“1 MALAYSIA” People First. Performance Now.

YAB DATO’ SRI MOHD NAJIB

YB DATO’ SRI PETER CHIN FAH KUI
MINISTER OF ENERGY, GREEN TECHNOLOGY AND WATER MALAYSIA

Congratulations to Pertubuhan Akitek Malaysia and Association of Consulting Engineers Malaysia for the launch of the new GBI Existing Building Rating Tool.

As the majority of existing buildings in Malaysia were built without green considerations, it is timely that GBI has developed a tool to help property owners to upgrade and retrofit their buildings. This will give new life to aging and out-dated buildings. They will become more energy, water and resource efficient, have better indoor working qualities and also contribute less waste and green house gases.

The Ministry of Energy, Green Technology and Water is fully supportive of all such contributions and inputs to help drive the development of Green Technology in Malaysia. I am pleased to note that GBI has received the full support of Malaysia’s building and property players. Incentives for GBI in the 2010 Budget will further propel the development of more green buildings in Malaysia.

In a short time, GBI has become recognised by the world community as Malaysia’s very own green rating tool. It gives building owners who are environment-conscious, as well as business-savvy, the opportunity to build or retrofit buildings that are not only environmentally more friendly but also make economic sense.

Well done, PAM, ACEM and GBI.

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 siting, 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.

THE GBI NREB RATING TOOL

NON-RESIDENTIAL EXISTING BUILDING (NREB)

The GBI Non-Residential Existing Building Rating Tool evaluates the sustainable aspects of existing non-residential buildings.

For the Existing Building Tool, the highest emphasis is on Energy Efficiency and Indoor Environmental Quality to address energy use and well-being and productivity of the users of the building. These two criteria together account for 59% of the total credit points. Credit points are also increased for Water Efficiency and Innovation to encourage such improvements and modifications. Facility Management is introduced for Sustainable Site Planning & Management and Materials & Resources to reflect the need for environmental protection in the use of chemicals, pesticides and procurement policy.

<table>
<thead>
<tr>
<th>CATEGORY</th>
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<td>Energy Efficiency</td>
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<tr>
<td>Indoor Environmental Quality</td>
</tr>
<tr>
<td>Sustainable Site Planning &amp; Management</td>
</tr>
<tr>
<td>Materials &amp; Resources</td>
</tr>
<tr>
<td>Water Efficiency</td>
</tr>
<tr>
<td>Innovation</td>
</tr>
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**TOTAL SCORE** 100

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<th>CREDIT POINTS ALLOCATION (NREB)</th>
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GBI POINTS ALLOCATION TABLE (NREB)

Sustainable Site Planning & Management and Materials & Resources are introduced to reflect the need for environmental protection in the use of chemicals, pesticides, and procurement policy.

PAM
Malaysian Architects leading the green revolution
SUSTAINABLE TOWNSHIPS
BUILDING BETTER GREEN COMMUNITIES

What is a Sustainable Township?

Sustainable Townships are livable places that meet the diverse needs of the community, both now and in the future. They are places that are well planned and designed, safe and secure, and enhances the surrounding environment, thus providing a high quality of life for the people who live, work and play there.

Drivers for Sustainable Development

Climate change and the impacts of global warming, have forced both governments and industry to make substantial changes to the way that they operate and function – the old business-as-usual adage is no longer acceptable in anyone’s language.

In recognition of this, the Malaysian Government has taken a significant step forward, especially as a developing nation, by committing to a minimum reduction of 40% of its carbon emissions by 2020 (based on 2005 carbon emission levels).

It must be noted, that the reduction of carbon emissions is only part of the solution, there is a clear need for a holistic approach to addressing sustainability issues, an approach that incorporates both mitigation and adaptation measures.

Countries throughout the globe have adopted various approaches and strategies for addressing climate change and driving sustainable development. The Malaysian Government has set a range of ambitious policies and targets – what is now needed is a vehicle for the implementation and delivery of projects that support the government’s goals.

What is the GBI Township Tool?

Green Rating tools are conceived to be able to assist architects, planners, designers, builders, property owners, government bodies, developers and end users to understand the impact of each design choice and solution towards being more environment-friendly.

The Malaysian Green Building Index was created to provide the building industry a common and verifiable mechanism to benchmark green property development.

The GBI Township Tool takes it to another level and sets out a vision for sustainability within the built environment and provides guidance to assist end users to deliver sustainable townships.
THE ECOLOGICAL FUTURE
iPhone 2007 - 2017
January 27, 2010: The iPad is announced

March 12, 2010: Apple begins taking pre-orders for iPad

April 3, 2010: The official release of the iPad; Apple begins shipping the Wi-Fi only model and 300,000 units sell in the first day
In 2009, Nissan unveiled the EV-11 prototype electric car. It was based on the Nissan Tiida (Versa in North America), but with the conventional gasoline engine replaced with an all-electric drivetrain, and included an 80 kW (110 hp)/280 N·m (210 lb·ft) electric motor, 24 kWh lithium-ion battery pack rated to have a range of 175 km (109 miles).
On October 2, 2017, for the 2018 model year, Nissan launched the new generation Leaf in Japan. The vehicle features a 40 kWh battery pack with an expected range of 240 km (150 miles) on a single charge with a new 60 kWh pack for over 320 km (200 miles) of range to be offered in 2018 for the 2019 model year.
iPhone ... but it is not a phone
Siri understands

A.I ... I AM
Elon Musk

Tesla Roadster first launch - 2008
50 GWh in annual battery production by 2020
Enough for 500,000 Tesla cars
Powered by renewable energy
Net zero energy factory

The Battery
The Future
KEPLER- 452b
Earth Similarity Index (ESI) 0.88
23rd July 2015
KEPLER-452b:
EXOPLANET MOST LIKE EARTH

- ESI 1.0
- ESI 0.88
- Orbits in habitable zone of G2-type star
- 365 days in a year
- Days in a year: 385
- 1.6 times the size of Earth

JULY 23, 2015

NASA: WE'RE OUT THERE
#NASABEYOND
ONE OLD EXISTING BUILDING
AT A TIME ...
273 kWhr/ms yr
Reduced to
100.40 kWhr/ms yr

MS1525, Energy Efficiency Code – 150 kWhr/ms/yr
SUEN GALLERIES • 2010 • BANGSAR
ONE HOUSE AT A TIME ...
GREEN BUILDING INDEX CERTIFICATE NO.
GBI-RNC-0002(P)

DATE OF ISSUANCE
26 APRIL 2010

S11 HOUSE
7 LORONG 11/5E, 46200 PETALING JAYA, SELANGOR, MALAYSIA

HAS BEEN AWARDED

PROVISIONAL GBI CERTIFICATION

OWNED/APPLICANT
DR TAN LOKE MUN & CHEW MAY-ANN

AR. BOON CHEWEE
CHAIRMAN
GREEN BUILDING INDEX GBI ACCREDITATION PANEL

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4 & 6 Jalan Tan Sri, 50480 Kuala Lumpur, Malaysia Tel: 603 2694 4182 Fax: 603 2697 4182
www.greenbuildingindex.org | info@greenbuildingindex.org
WIND TURBINES AND HEAT CONVECTION
WHY THE NEED FOR A MALAYSIAN GREEN RATING TOOL?

HARVESTING NATURE
THE AIR & LIGHT
- A built-in air vent that connects to a wind turbines
- Provides stack effect ventilation & light into the house

GREEN GREEN GRASS OF THE TERRACE
- A strip of lawn on the terrace for a little private al fresco haven
- Ideal for entertaining guests without compromising the privacy of the owners

SUSPENDED SPLIT STAIRCASE
- Sculptural focal point in the Living Room
- Dual access: one leads to the bedrooms, another leads to the terrace
- Space-saving solution to typical concrete staircases
OPERABLE RECYCLED CLAY ROOF TILE ‘BRISE-SOLEIL’
NOMAPS • 2016 • MELAKA
www.thenomaps.com
FLASHPACKERS
HOSTEL
nomaps
• Green Tower

• By Dr Tan Loke Mun / ArchiCentre
VENICE BIENNALE 2010

archicentre
THE GREEN TOWER

Green Tower is a high-rise multi-use building designed for the Malaysian tropics.

It bio-mimics a giant tree. The large sun-shading canopy roof is a self-supporting PTF structure filled with helium and lined with energy generation devices PVs and heat collectors. It gyrates with slight winds providing power generation through large solenoids lined dynamics in the vertical transport shafts. Rainwater is harvested from the canopy roof that is shaped like an ant-hill with facade channels to catch the winds. All living and working spaces attach onto this trunk and enjoys the shade, energy and resources of this bio-living tower.
Air-Craft

- By Dr Tan Loke Mun / ArchiCentre
T Colony

SUFFICIENCY

14th International Architecture Exhibition
Venice Biennale 2014
Malaysia Pavilion
EARLY DESIGN DEVELOPMENT
Auditorium pavilion
Elastic Deflection = 14mm

Long term Deflection = 14mm x 2.0 times (assumed) = 28 mm (span / 280)

= 450 kNm / m (ULS) 322 kNm / m (SLS)
ART AND CULTURE PAVILION • 2016 • JIMBARAN • BALI
ONE TOWN & CITY
AT A TIME ...
CREATING ECO-SYSTEMS
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THE DNA
CREATING ECO-SYSTEMS
PLACE-MAKING
MAJESTIC CITY
SEMENYIH
SMART GREEN FOREST CITY

PARK HOMES

COMMUNITY TOWN CENTRE

MULTI-LAYERED COMMUNITY

Concept DNA studies
Where this sheltering forest dwells

Nature’s craft & the Artist’s hand
shape both home and land.
SETIA CITY • 2009 - • SHAH ALAM
SETIA CITY
240 acres
Integrated Green Commercial City

D.N.A
FUTURE PROOFING

All Buildings are connected by elevated pedestrian Sky-Links
Ground level has wide paved walking boulevards linking to parks
GREEN FARM LAB • 38 ACRES • 2018 • PORT DICKSON
31st October 2011

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PLASTIC POLLUTION
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