

GREEN BUILDINGS AS CATALYST FOR LOW CARBON CITIES

GREEN BUILDINGS MAKE GREEN CITIES (LOW CARBON CITIES)

1st SEPTEMBER 2020. MGTC WEBINAR. KUALA LUMPUR



Ar. Chan Seong Aun

Immediate Past President Malaysia GBC Green Building Council
Past President PAM – Malaysian Inst of Architects

SIX KEY GREEN BUILDING ACTIONS FOR LOW CARBON CITIES

1. Green Buildings for Green Cities
2. Planning for Green Cities
3. Cooler Buildings for Cooler Cities
4. Sustainable Landscaping & Heat Island Effect
5. Zero Waste Construction through BIM – IBS
6. Public Participation – MGBC & WGBC Roles



1

GREEN BUILDINGS FOR GREEN CITIES

GREEN CITIES ARE LOW CARBON CITIES

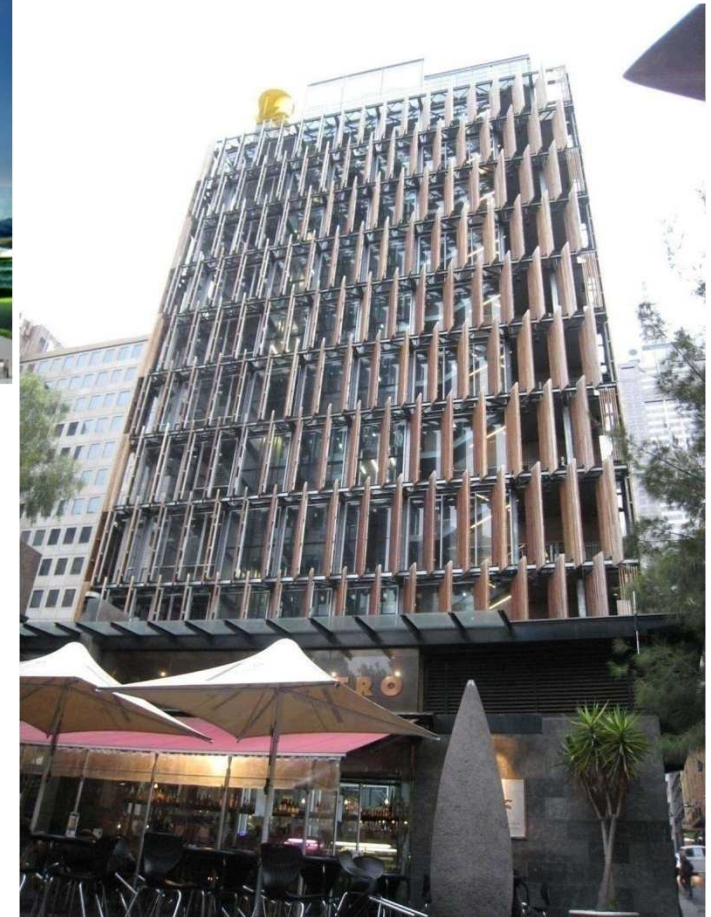


**WHAT IS A GREEN BUILDING?
GBI THE RIGHT TOOL**



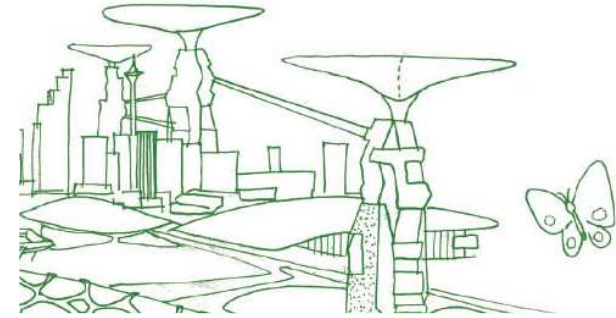
WHAT is a Green Building?

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 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.



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.



ECO_WALL



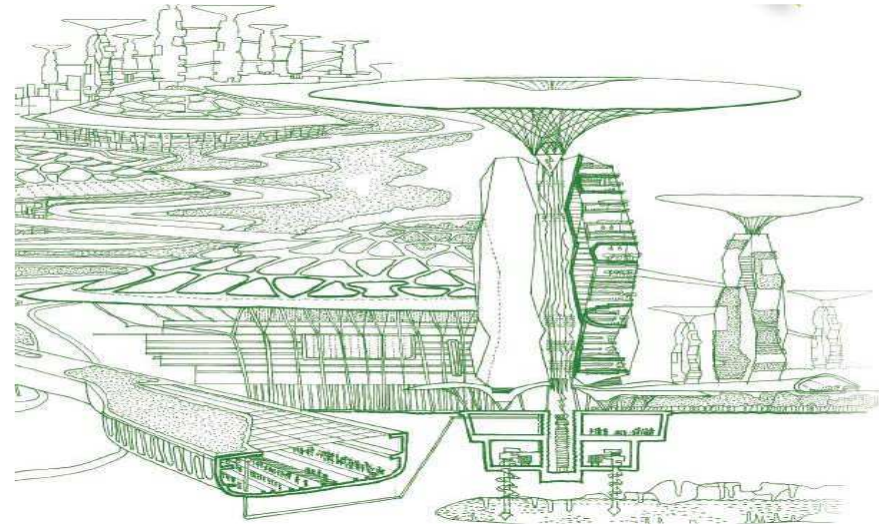
What is the green building index?

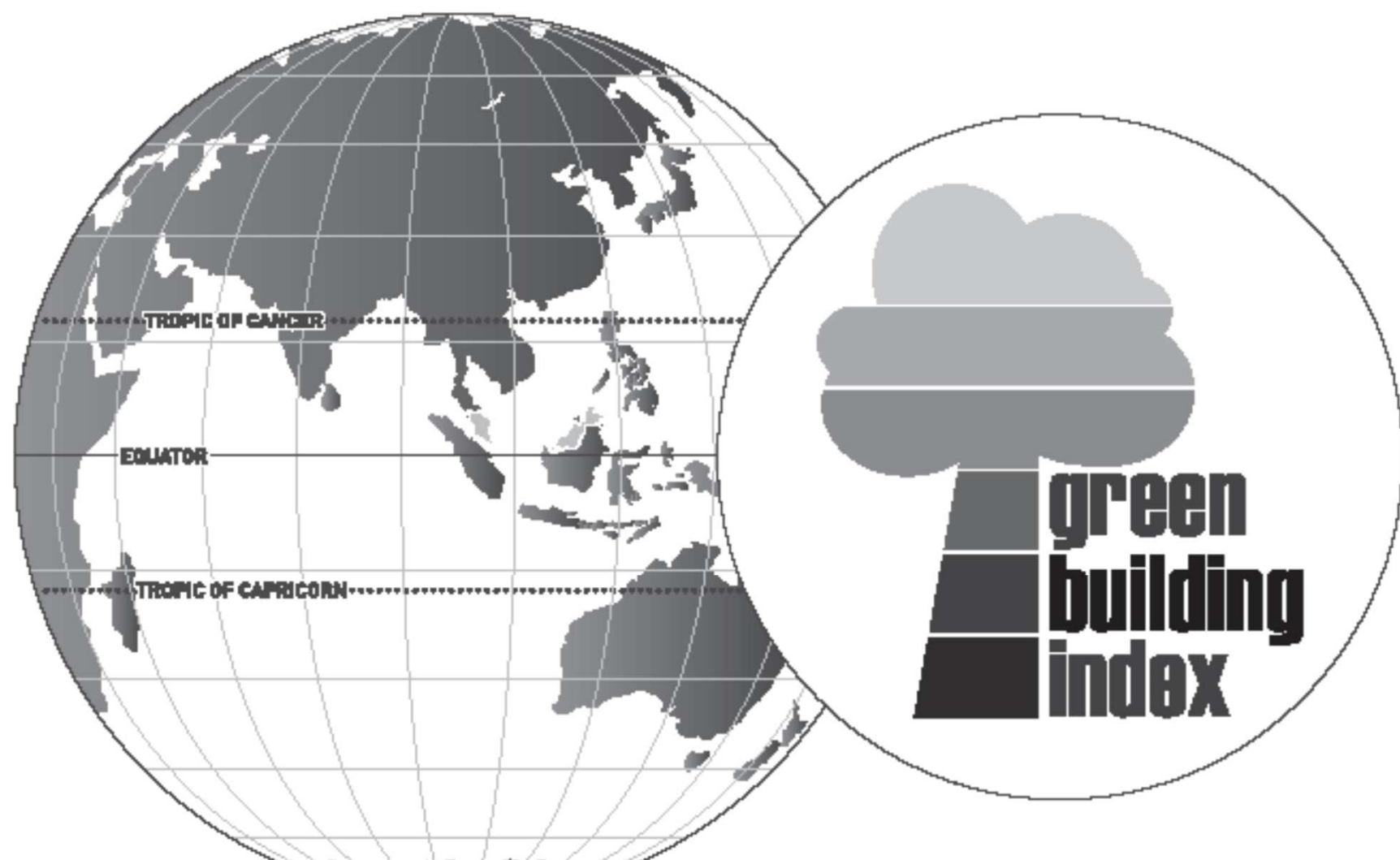
The Green Building Index (GBI) is Malaysia's industry recognised green rating tool for buildings to promote sustainability in the built environment and raise awareness among Developers, Architects, Engineers, Planners, Designers, Contractors and the Public about environmental issues and our responsibility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





-  • Australia: Nabers / Green Star
-  • Brazil: AQUA / LEED Brasil
-  • Canada: LEED Canada / Green Globes
-  • China: GBAS
-  • Finland: Promise
-  • France: HQE
-  • Germany: DGNB / CEPHEUS
-  • Hong Kong: HKBEAM
-  • India: GRIHA
-  • Italy: Protocollo Itaca / Green Building Council Italia
-  • Malaysia: GBI Malaysia
-  • Mexico: LEED Mexico
-  • Netherlands: BREEAM Netherlands
-  • New Zealand: Green Star NZ
-  • Philippines: BERDE / Philippine Green Building Council
-  • Portugal: Lider A
-  • Singapore: Green Mark
-  • South Africa: Green Star SA
-  • Spain: VERDE
-  • Switzerland: Minergie
-  • United States: LEED / Living Building Challenge / Green Globes / Build it Green / NAHB NGBS
-  • United Kingdom: BREEAM
-  • United Arab Emirates: Estidama



THE GBI RATING TOOLS

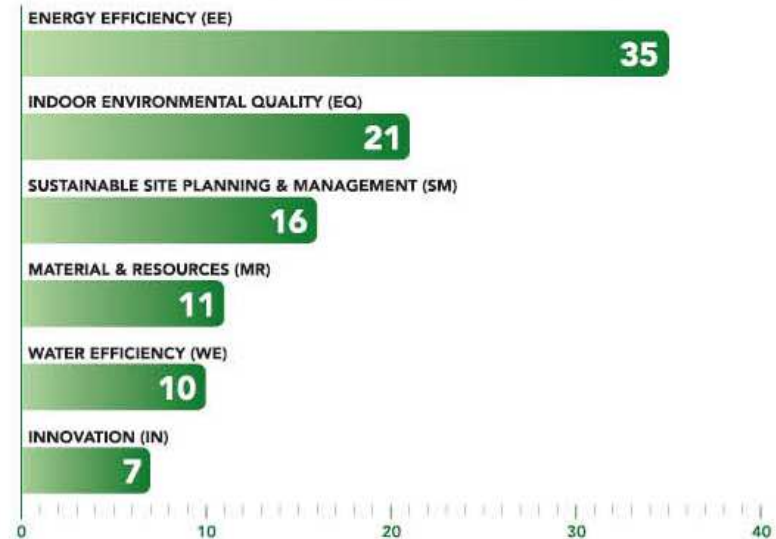
NON-RESIDENTIAL

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.

GBI POINTS ALLOCATION CHART (NON-RESIDENTIAL)



PART	ITEM	MAXIMUM POINTS
1	Energy Efficiency	35
2	Indoor Environmental Quality	21
3	Sustainable Site Planning & Management	16
4	Material & Resources	11
5	Water Efficiency	10
6	Innovation	7
TOTAL SCORE		100

THE GBI RATING TOOLS

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.

GBI POINTS ALLOCATION CHART (RESIDENTIAL)



PART	ITEM	MAXIMUM POINTS
1	Energy Efficiency	23
2	Indoor Environmental Quality	11
3	Sustainable Site Planning & Management	39
4	Material & Resources	9
5	Water Efficiency	12
6	Innovation	6
TOTAL SCORE		100



**BENCHMARKING THE FUTURE
FROM THE PAST 2009-2019**

21st MAY 2009



**GBI ASSESSMENT CRITERIA
FOR RESIDENTIAL**

FIRST EDITION | APRIL 2009 | VERSION 1.0

www.greenbuildingindex.org | info@greenbuildingindex.org
GREENBUILDINGINDEX SDN BHD (845666-V) 4 & 6 Jalan Tenggi, 50480 Kuala Lumpur, Malaysia Tel 603 2693 4192 Fax 603 2692 8782



**GBI ASSESSMENT CRITERIA
FOR NON-RESIDENTIAL (NC)**

FIRST EDITION | APRIL 2009 | VERSION 1.0

www.greenbuildingindex.org | info@greenbuildingindex.org
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MENARA WORLDWIDE |
NRNC | CERTIFIED



S11 HOUSE | RNC | PLATINUM

28th APRIL 2010

NEW LIFE FOR OLD

PLUGGING THE LEAKS IN EXISTING BUILDINGS

GBI - EXISTING BUILDING RATING TOOL



**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 unwanted 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 green house gasses 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 retro-fit 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 gasses.

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 retro-fit buildings that are not only environmentally more friendly but also make economic sense.

Well done PAM, ACEM and GBI.

YB DATO' SRI PETER CHIN FAH KUI

GBI CERTIFIED PROJECTS

NO.	PROJECT NAME	OWNER/APPLICANT	GBI RATING	CATEGORY
01	PTM GEO BUILDING	PUSAT TENAGA MALAYSIA	CERTIFIED	NRNC
02	KRC SALES GALLERY	KAJANG RESOURCES CORPORATION SDN BHD	CERTIFIED (DA)	NRNC
03	1 FIRST AVENUE	BANDAR UTAMA CITY SDN BHD	GOLD (DA)	NRNC
04	MENARA WORLDWIDE	CENTRAL HOLDINGS BERHAD	CERTIFIED (DA)	NRNC
05	3 HARMONI	SUNWAY SPK HOMES SDN BHD	CERTIFIED (DA)	RNC
06	S11 HOUSE	DR TAN LOKE MUN & CHEW MAY-ANN	PLATINUM (DA)	RNC
07	KEN BANGSAR	KEN PROPERTY SDN BHD	GOLD (DA)	RNC



www.greenbuildingindex.org | info@greenbuildingindex.org

GREENBUILDINGINDEX SDN BHD (845666-V) 4 & 6 Jalan Tangsi, 50480 Kuala Lumpur, Malaysia Tel 603 2694 4182 Fax 603 2697 4182



BANGUNAN PERDANA PUTRA | NREB | PLATINUM

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.

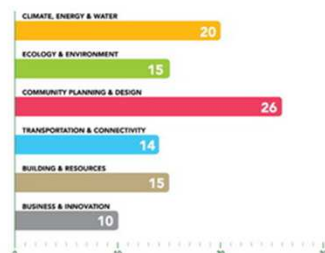
What is the GBI Township Tool?

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.

GBI Township Tool Points Allocation Chart



Core categories for the delivery of Sustainable Townships in Malaysia

1 Climate, Energy & Water



Sustainable Townships are balanced in their ongoing production and consumption of energy and water

They aim for zero net carbon emissions – by maximising passive design principles, minimising the impact of heat island effect, minimising energy consumption, adopting onsite energy generation, utilising renewable energy technologies such as co-generation and micro-generation.

They are water neutral – through the reduction of mains water consumption, rainwater harvesting and greywater recycling.

3 Community Planning & Design



Sustainable Townships are planned and designed for the benefit of the community

They are created using an integrated approach to master planning and best practice urban design principles emphasising people priority and greenspaces.

Such goals help create a strong sense of place for communities – resulting in more livable and diverse neighbourhoods.

5 Building & Resources



Sustainable Townships have a lower impact on resources – by applying the 'more from less' principle

They emphasise the need to minimise the use of highly resource intensive materials by using a life cycle approach.

They make effective use of local materials and resources for the construction of new communities.

2 Ecology & Environment



Sustainable Townships respect their surrounding environment and native ecological systems

They are sensitive to the needs of the local ecology & biodiversity and aims to preserve and enhance the ecological value of the natural environment.

They assist in stabilising land – subsidence by reducing the impact of flooding and erosion.

4 Transportation & Connectivity



Sustainable Townships are well-connected places that have a broad range of transportation options

They have excellent accessibility, connectivity and are well linked to surrounding districts.

They make good use of existing transport links and make priority and provision for future services – such as rail, bus and cycling networks.

6 Business & Innovation



Sustainable Townships are tailored to respond to local needs in creating business and employment whilst incorporating innovative solutions

They provide employment opportunities for its residents to work closer to their homes and schools. They provide avenues for businesses to form and flourish.

They demonstrate best practices through the implementation of innovative technologies and solutions at many different levels of the township.



HEREBY REGISTERS
TTDI ALAM IMPIAN
TTDI LAND SDN BHD

AS
PILOT PROJECT
FOR THE
GBI TOWNSHIP TOOL
29 MARCH 2011


Aik Keng Heng
Green Building Index Pilot Project Manager

GREEN BUILDING INDEX (GBI) is a non-profit organization that promotes sustainable building practices in Malaysia. It is a member of the Green Building Council of Malaysia (GBCM). For more information, please visit www.greenbuildingindex.org.



HEREBY REGISTERS
KEN RIMBA
KEN HOLDINGS BERHAD

AS
PILOT PROJECT
FOR THE
GBI TOWNSHIP TOOL
29 MARCH 2011


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Green Building Index Pilot Project Manager

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HEREBY REGISTERS
BOGA VALLEY
BOGA VALLEY CORPORATION SDN BHD

AS
PILOT PROJECT
FOR THE
GBI TOWNSHIP TOOL
29 MARCH 2011


Aik Keng Heng
Green Building Index Pilot Project Manager

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HEREBY REGISTERS
**KARAMBUNAI INTEGRATED
RESORT CITY (KIRC)**
KARAMBUNAI RESORTS SDN BHD

AS
PILOT PROJECT
FOR THE
GBI TOWNSHIP TOOL
29 MARCH 2011


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Green Building Index Pilot Project Manager

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HEREBY REGISTERS

ELMINA EAST
SIME DARBY PROPERTY BERHAD

AS
PILOT PROJECT
FOR THE
GBI TOWNSHIP TOOL

29 MARCH 2011

AR. BOON CHEE WEE
CHAIRMAN
GREEN BUILDING INDEX (GBI) ACCREDITATION PANEL

GREENBUILDINGINDEX SDN BHD (345664-V)
4 & 6, Jalan Tropic, 50480 Kuala Lumpur, Malaysia Tel: 603 2474 4182 Fax: 603 2477 4182
www.greenbuildingindex.org | info@greenbuildingindex.org



7th JUNE 2011

GREEN FACTORIES



**GBI INDUSTRIAL NEW CONSTRUCTION (INC)
&
GBI INDUSTRIAL EXISTING BUILDING (IEB)
RATING TOOLS**

7 June 2011



ELKEN DISTRIBUTION CENTRE | NRNC | SILVER



PIDSCMY GEO BUILDING | IEB | CERTIFIED

GBI Tool Development 2009 - 2019

1. Residential New Construction (RNC) Version 1	21st May 2009
2. Non-Residential New Construction (NRNC)	21st May 2009
3. Non-Residential Existing Building (NREB)	28th April 2010
4. Township	29th March 2011
5. Industrial New Construction (INC)	7th June 2011
6. Industrial Existing Building (IEB)	7th June 2011
7. NRNC: Retail	21st May 2011
8. NREB: Retail	21st May 2011
9. NRNC: Data Centre	11th January 2012
10. NREB: Data Centre	21st February 2013
11. Residential New Const (RNC) Version 3	11th July 2013
12. GBI Hotel & Resort Tool	27th February 2014
13. NRNC: Hospital Tool	23rd September 2015
14. NREB : Hospital Tool	23rd September 2015
15. Township 2 Tool BEIT2 & WE Cal	13 th July 2018
16. NREB Historic Tool	25 th August 2018



SETIA CITY MALL | NRNC | SILVER



DIGI TECHNOLOGY OPERATION CENTRE | NRNC | GOLD



CSF COMPUTER EXCHANGE 5 | NRNC | CERTIFIED



HOTEL PENAGA | NRNC | GOLD



**Registered & Certified GBI Green Buildings
2009 - 2019**

GBI PROJECTS LISTING

As of 28 February 2019





Source : GBI

	NRNC	RNC	NREB	INC	IEB	ID	T	Total
Applied	504	334	27	37	6	1	25	934
Registered	466	317	24	32	5	1	24	869
DA	184	128	6	6	2	0	12	338
CVA	51	60	7	4	2	1	0	125
RVA	11	0	2	3	0	0	0	16
Total Certified	246	188	15	13	4	1	12	479

GBI PROJECT REGISTER - BY CATEGORIES

Stage	Applied	Registered	Total Certified	Provisional Certification DA	Final Certification CVA	Renewal Certification RVA
NRNC	504	466	246 (51%)	184	51	11
RNC	334	317	188 (39%)	128	60	0
INC	37	32	13 (3%)	6	4	3
NREB	27	24	15 (3%)	6	7	2
IEB	6	5	4 (1%)	2	2	0
ID	1	1	1 (1%)	0	1	0
T	25	24	12 (2%)	12	0	0
Total as of 28 February 2019	934	869	479 (100%)	338	125	16

GBI PROJECT REGISTRY - BY RATING LEVEL

Rating Level	NRNC	RNC	INC	NREB	IEB	ID	T	Total as of 28 February 2019
 PLATINUM	11	6	-	1	-	-	1	19 (4%)
 GOLD	60	37	2	1	1	1	3	105 (22%)
 SILVER	29	17	1	2	-	-	4	53 (11%)
 CERTIFIED	146	128	10	11	3	-	4	302 (63%)
Total Certified	246	188	13	15	4	1	12	479

GBI CERTIFIED BUILDINGS & CO2 REDUCTION kTons

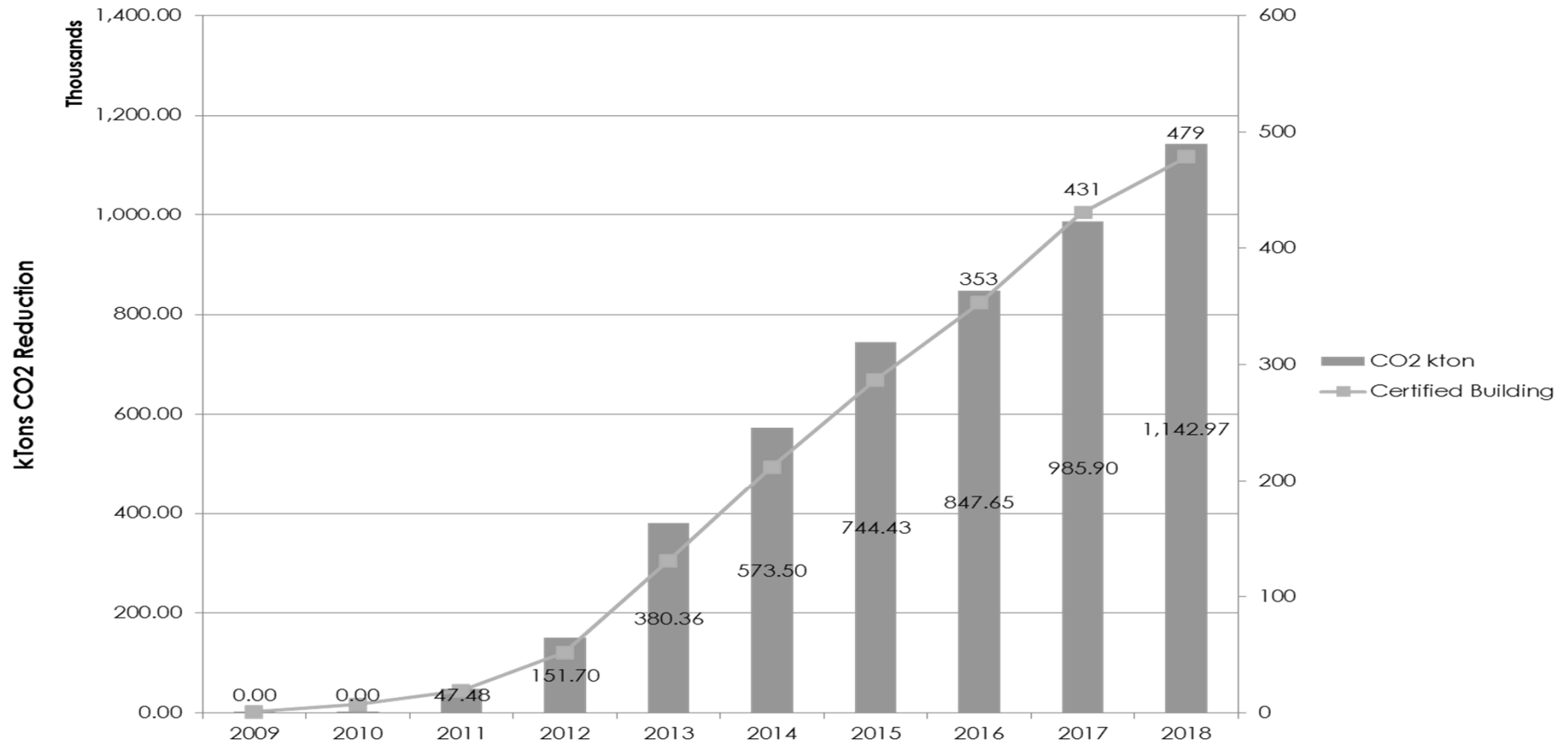
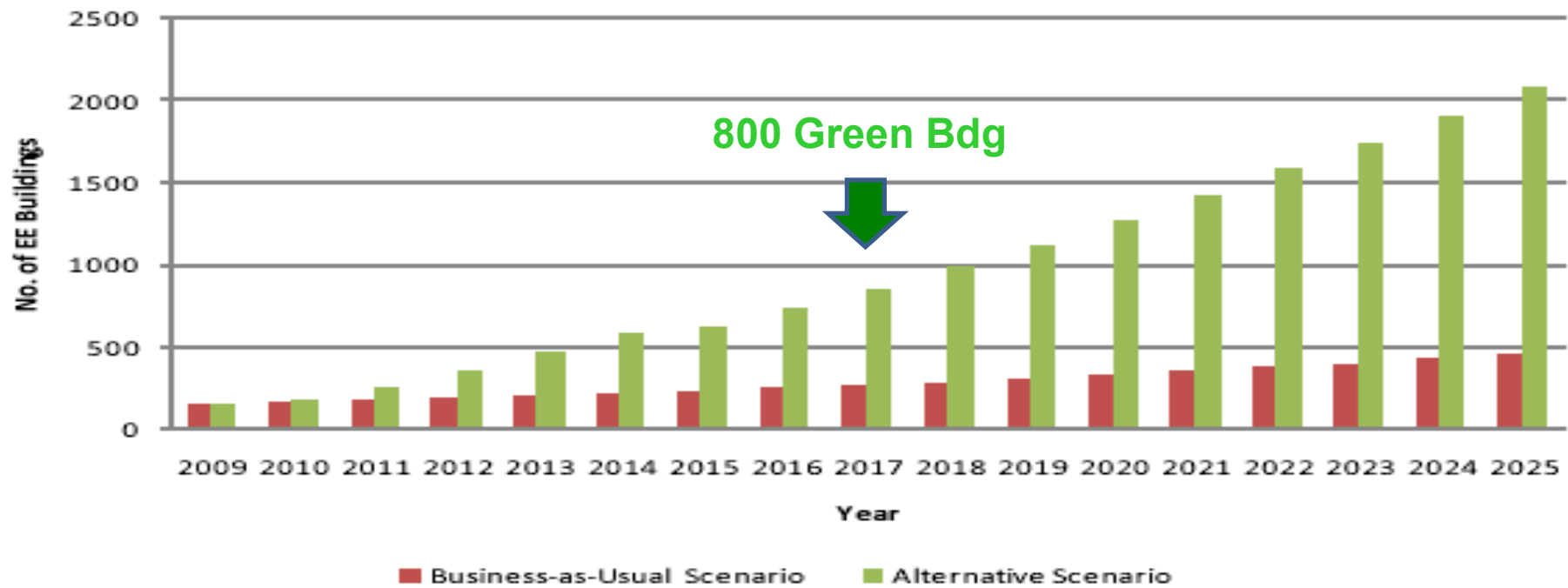
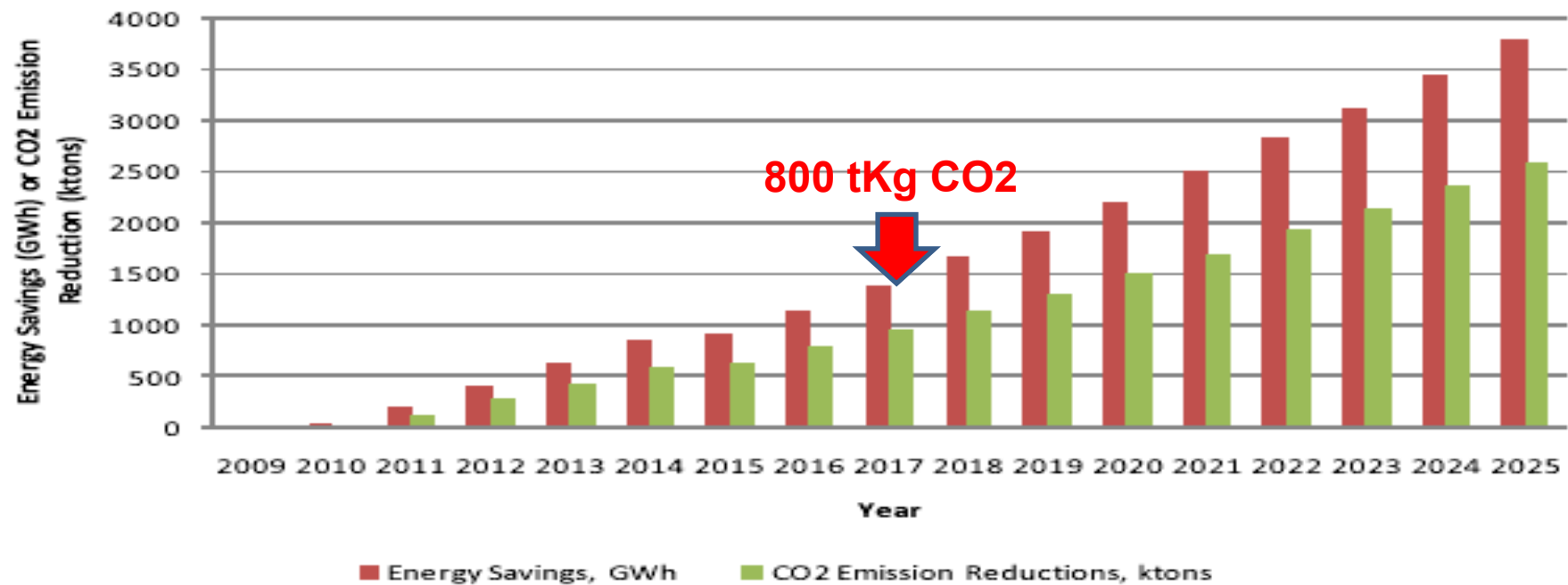


Fig 3: BSEEP - Forecast No. of EE Buildings
BEI ≤ 136 kWh/m²/yr



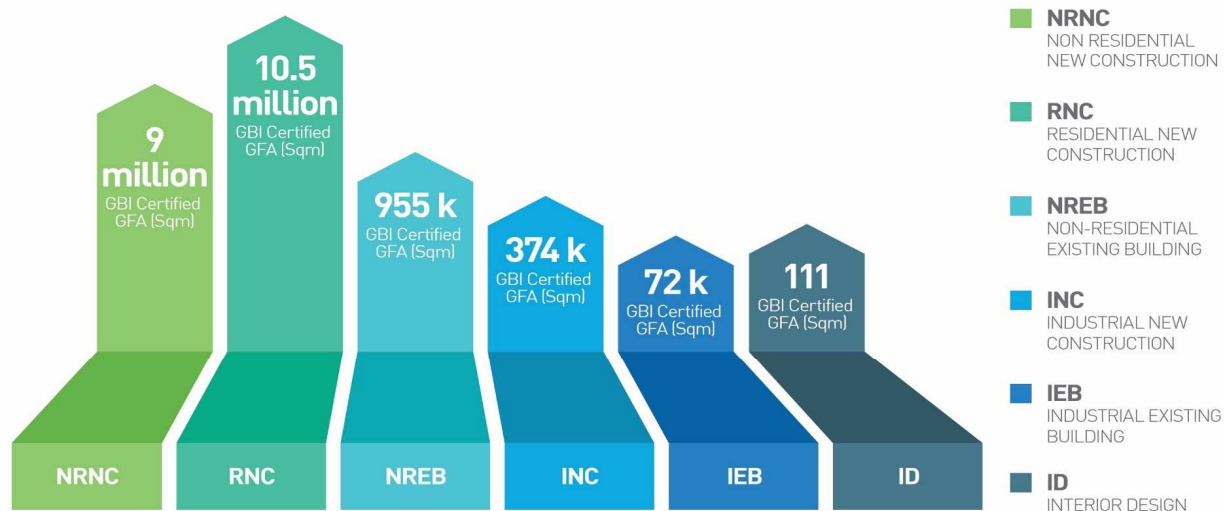
Source : BSEEP Malaysia Final Project Document

Fig. 4: BSEEP - Buildings Sector Forecast Energy Annual Savings & Annual CO₂ Emission Reductions



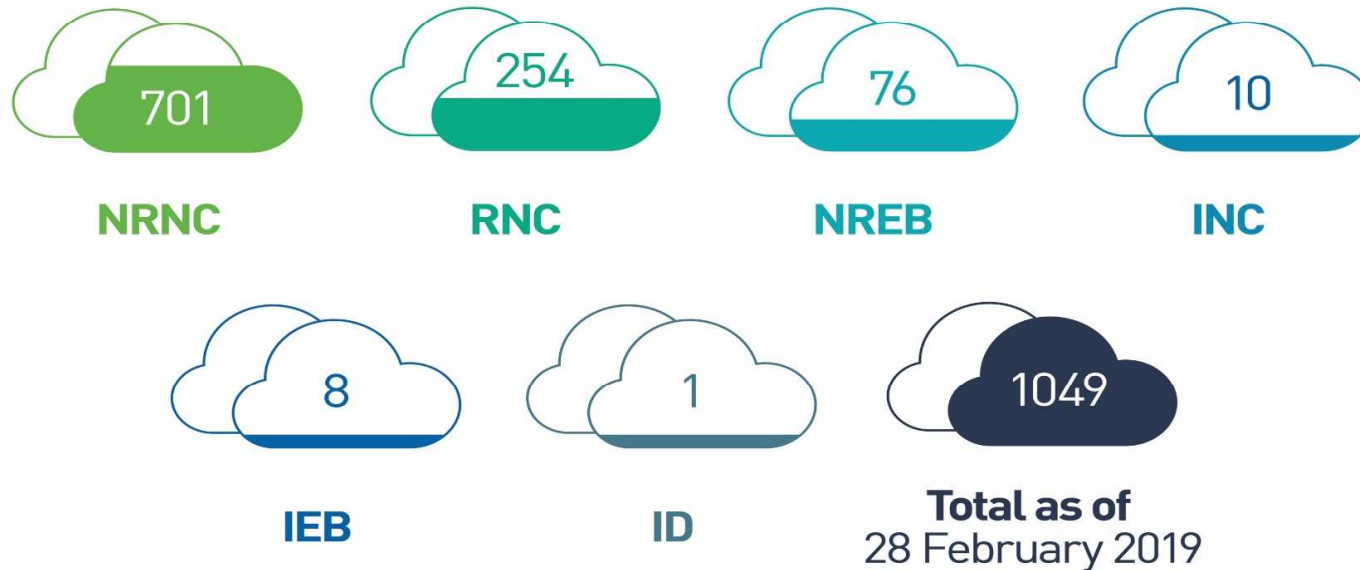
Source : BSEEP Malaysia Final Project Document

GROSS FLOOR AREA (GFA) OF GBI RATED BUILDINGS



Total as of 28 February 2019: **20.8 million (224.2 million sqft)**

CARBON DIOXIDE (CO₂) EMISSION REDUCTION OF GBI RATED BUILDINGS



CO₂ Emission Reduction : (ktCO₂e/annum, based on electricity energy reduction only @ 1kWh = 0.694 kg CO₂ - Peninsular / 0.699 kg CO₂- Sarawak / 0.536 kg CO₂ - Sabah)

GBI PROJECTS BY STATE/TERRITORIES

	Kuala Lumpur	Selangor	Penang	Putrajaya	Johor	Melaka	Sarawak	Sabah	Perak
Nos. Registered	265	310	92	38	80	18	16	12	8
Nos. Rated	179	157	45	27	37	8	7	3	4

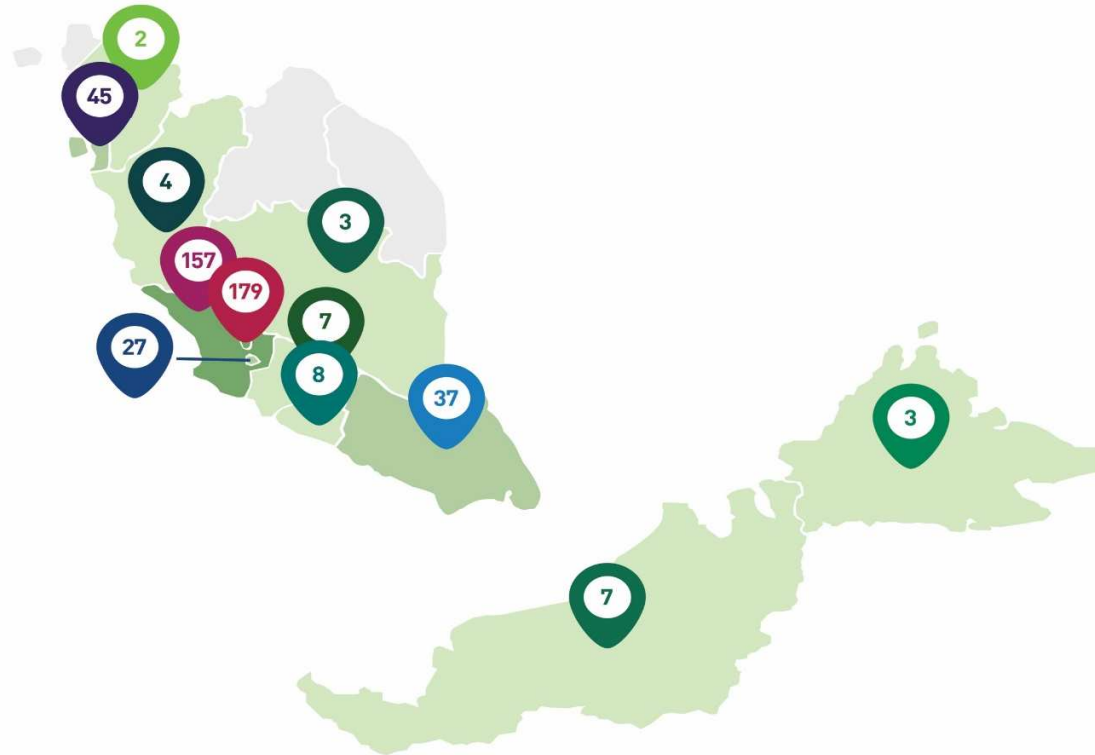
	Pahang	Negeri Sembilan	Kelantan	Kedah	Perlis	Terengganu	Labuan	Total
Nos. Registered	10	11	2	7	-	-	-	869
Nos. Rated	3	7	-	2	-	-	-	479

GBI PROJECT REGISTER - BY STATE / TERRITORIES



Total GBI Registered Projects by State / Territory: **869**

GBI PROJECT RATED - BY STATE / TERRITORIES



Total GBI Rated Projects by State / Territory: **479**

KEY INFORMATION SOURCE FOR GREEN BUILDINGS

www.greenbuildingindex.org

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.

WHAT WE DO?



What & Why

A Green building focuses on increasing the efficiency of resource use energy, water, and materials...

[Click for more](http://www.greenbuildingindex.org/whatandwhy)

<http://www.greenbuildingindex.org/whatandwhy>



How GBI Works

STAGE 1 Application & Registration
Complete and submit the GBI Application Form with...

[Click for more](http://www.greenbuildingindex.org/how)

<http://www.greenbuildingindex.org/how>



Organisation

PAM's architects have over the years been developing and working more and more towards a more sustainable...

[Click for more](http://www.greenbuildingindex.org/organisation)

<http://www.greenbuildingindex.org/organisation>



FAQ

Question Here

[Click for more](http://www.greenbuildingindex.org/faq)

<http://www.greenbuildingindex.org/faq>

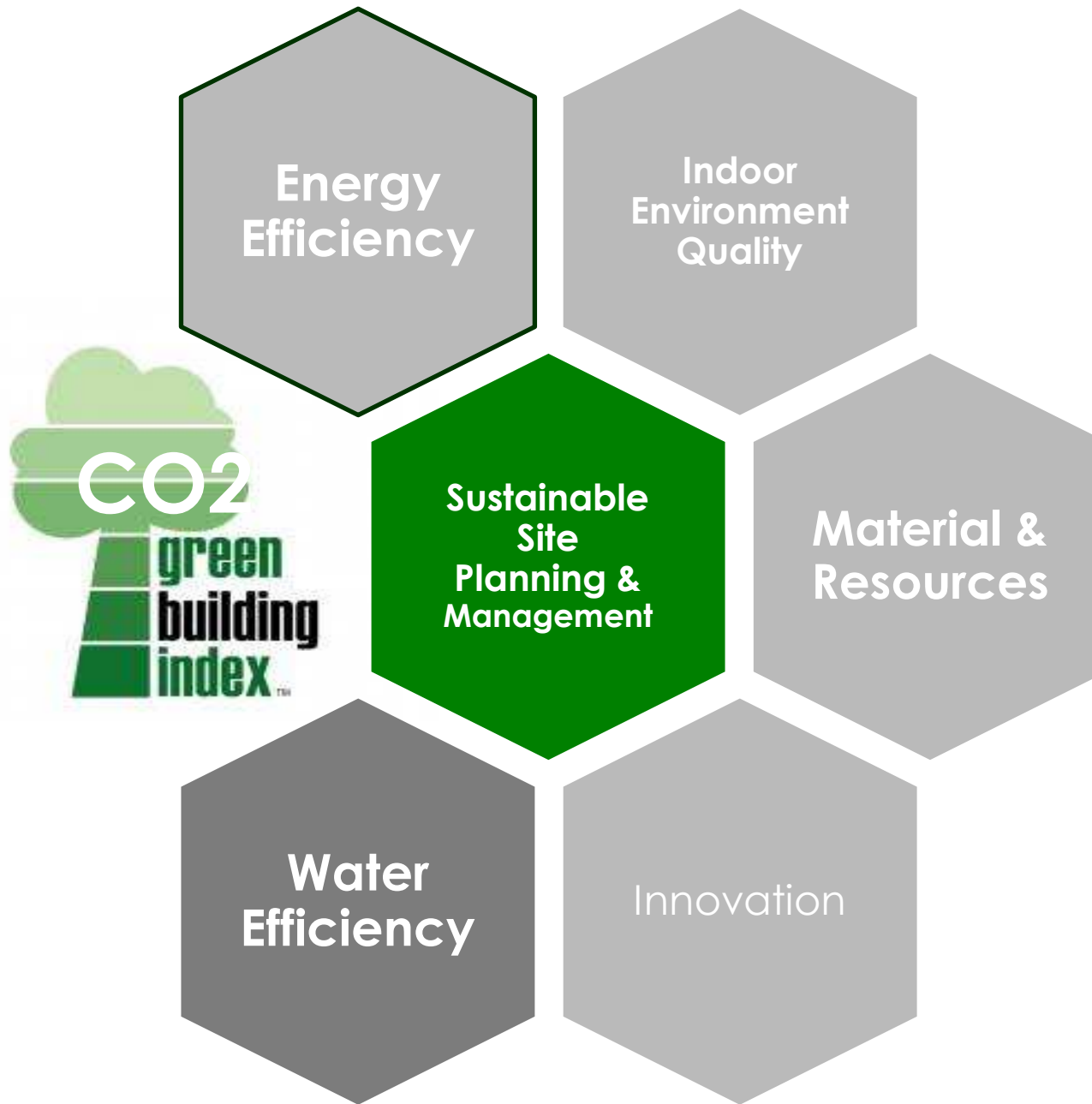
GBI TOOLS



2

PLANNING FOR GREEN CITIES

GREEN CITIES ARE LOW CARBON CITIES



NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

SUSTAINABLE SITE PLANNING & MANAGEMENT (SM)

SM	SUSTAINABLE SITE PLANNING & MANAGEMENT	
Site Planning		
SM1	Site Selection	1
SM2	Brownfield Redevelopment	1
SM3	Development Density & Community Connectivity	2
SM4	Environment Management	2
Construction Management		
SM5	Earthworks - Construction Activity Pollution Control	1
SM6	QLASSIC	1
SM7	Workers' Site Amenities	1
Transportation		
SM8	Public Transportation Access	1
SM9	Green Vehicle Priority	1
SM10	Parking Capacity	1
Design		
SM11	Stormwater Design – Quantity & Quality Control	1
SM12	Greenery & Roof	2
SM13	Building User Manual	1

"Countries will not meet emission reduction targets unless energy efficiency gains in the building sector are implemented. Due to the lifespan of buildings, failure to act now on energy efficiency and low carbon technologies will lock in detrimental energy and carbon impacts for decades"

**- United Nations' Statement at
Cancun Climate Summit, 2010**



80%

of GHGs in cities

>50%

of the worlds
population live in
cities

Cities occupy just

2% of the

world's landmass

MALAYSIAN ISSUES AND CHALLENGES



Rapid urbanization and affluent (high carbon) lifestyle



Relatively high carbon intensity dependence on fossil fuel



High Private car ownership



Low density development and urban sprawl



Low efficiency appliances

CURRENT GREEN POLICIES IN MALAYSIA

National Green Technology Policy 2009

- Energy, Building , Water and waste management and Transportation

Malaysia Budget 2010-2011

- Developing Putrajaya and Cyberjaya as pioneer township in green technology

National policy on Climate Change

- Roadmap for Malaysia to achieve 40% reduction of GHG emission by 2020

Green Neighborhood Guidelines – JPBD 2010

- Smart location, Neighbourhood pattern and design, Green Infrastructure.

Green Township Framework –Guide Towards LC Cities 2010- MIP

CURRENT SPATIAL PLANNING IN MALAYSIA AND GREEN CITIES CONSIDERATION

National Physical Planning(NPP2005)

National Urbanization Policy

Development plans

- State Structure Plans
- Local Plans

Development Control/ Planning approval

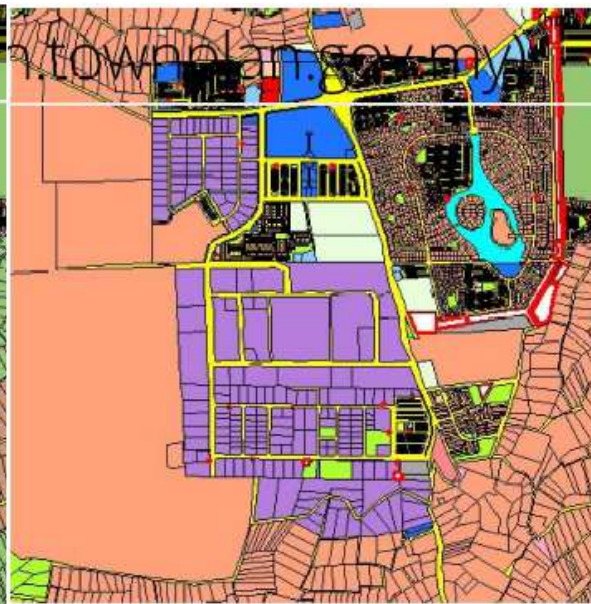
Green Neighborhood Guidelines – JPBD 2010

CURRENT SPATIAL PLANNING IN MALAYSIA AND GREEN CITIES CONSIDERATION

<http://iplan.townplan.gov.my/>



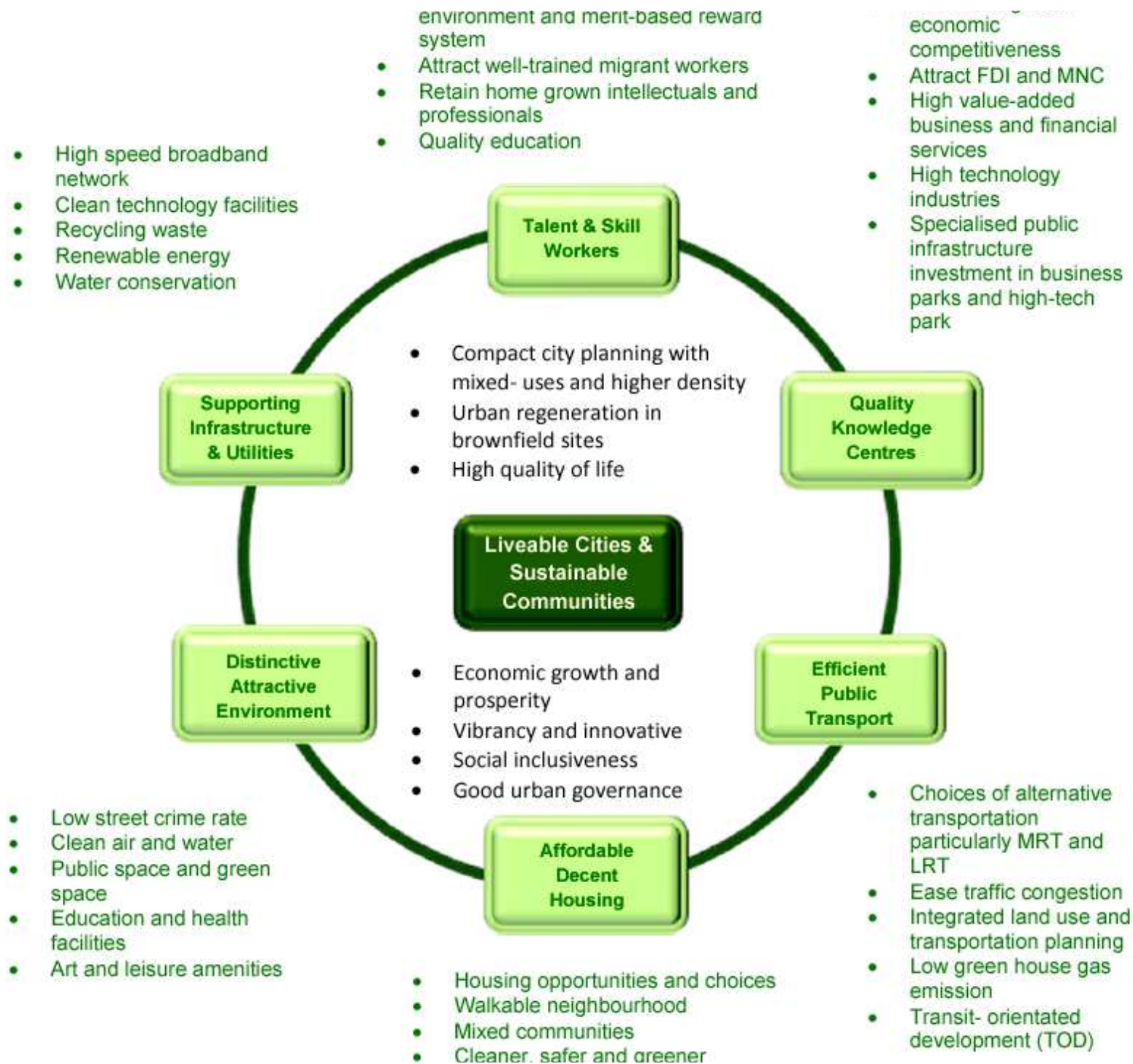
CURRENT



ZONING



COMMITTED



Kuala Lumpur Low Carbon Society Blueprint 2030

OVERVIEW

Consultancy and Research Team	Universiti Teknologi Malaysia (UTM), Kyoto University (KU), E-KONZAL Japan	
Client	Kuala Lumpur, Jurisdiction area falls under Kuala Lumpur City Hall	
Period	2016-2017	
	Base year 2010	Target year 2030



Kuala Lumpur Low Carbon Society Blueprint 2030

PROCESS OF PREPARATION



DRAFT REPORT

KUALA LUMPUR LOW CARBON SOCIETY 2030



Draft
KL LCSBP2030

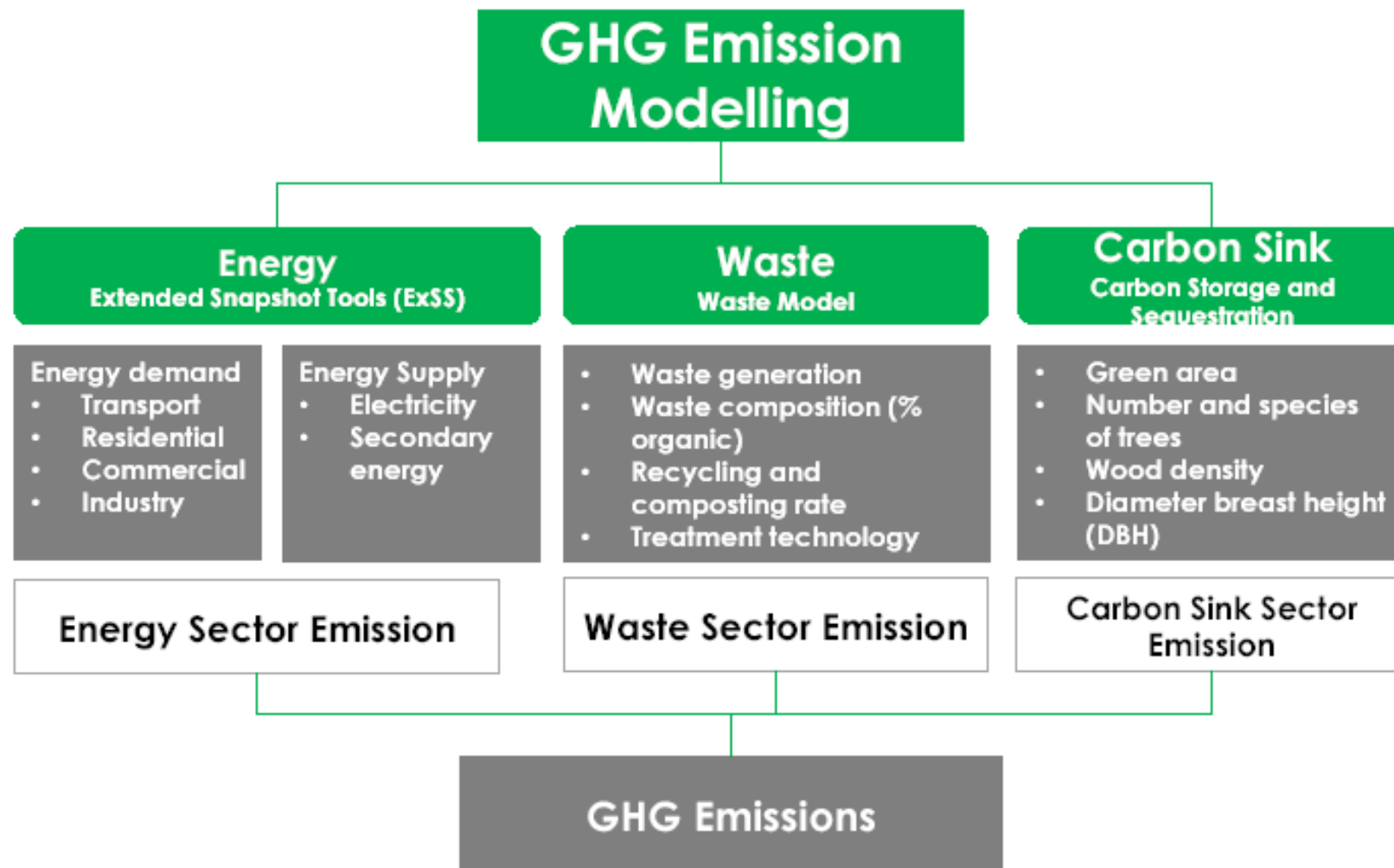
Date:
February
2017

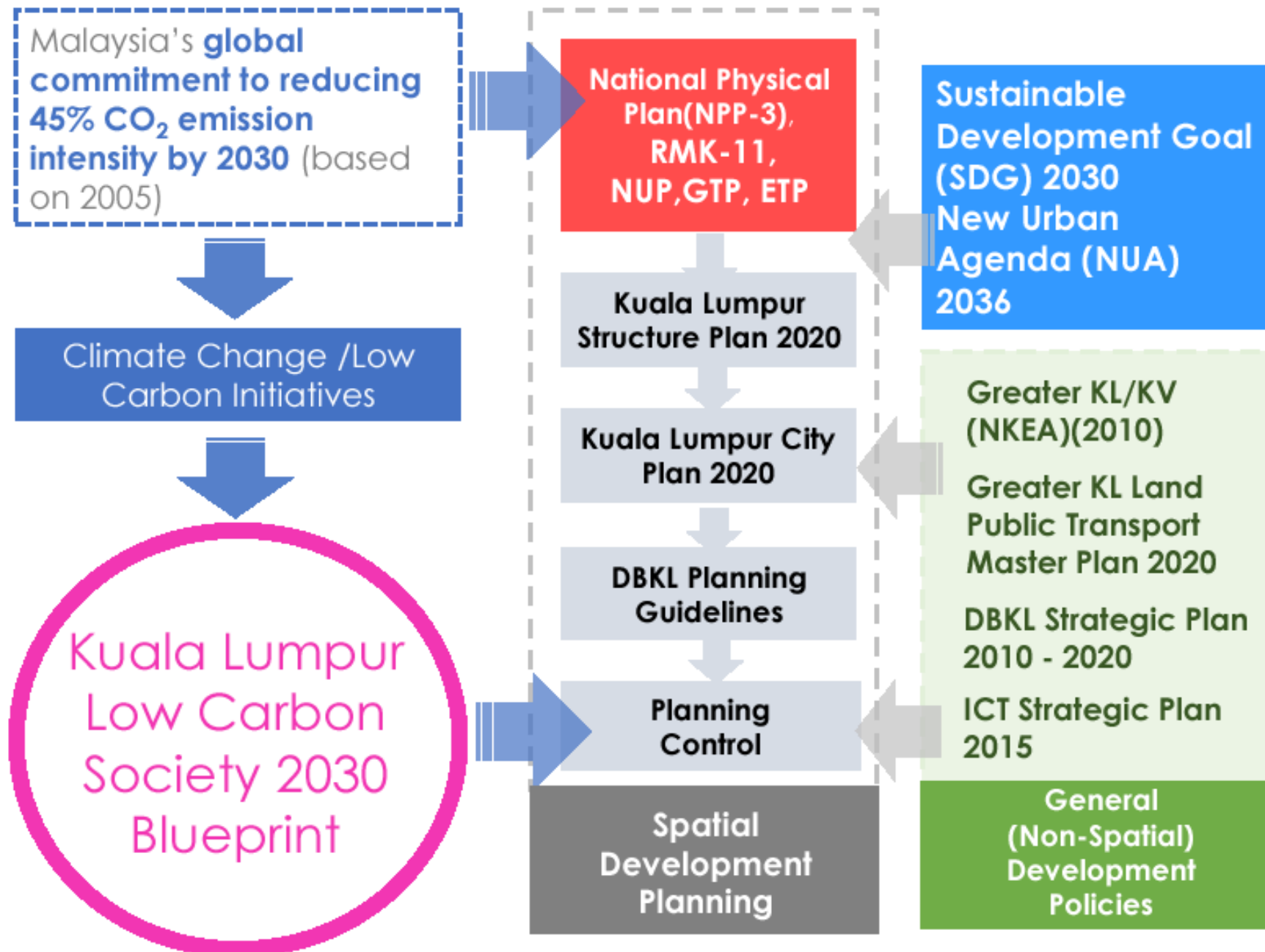
70 x 30

KL can reduce its carbon emission intensity
by as much as 70% by 2030

Kuala Lumpur Low Carbon Society Blueprint 2030

GHGs Emission Modelling



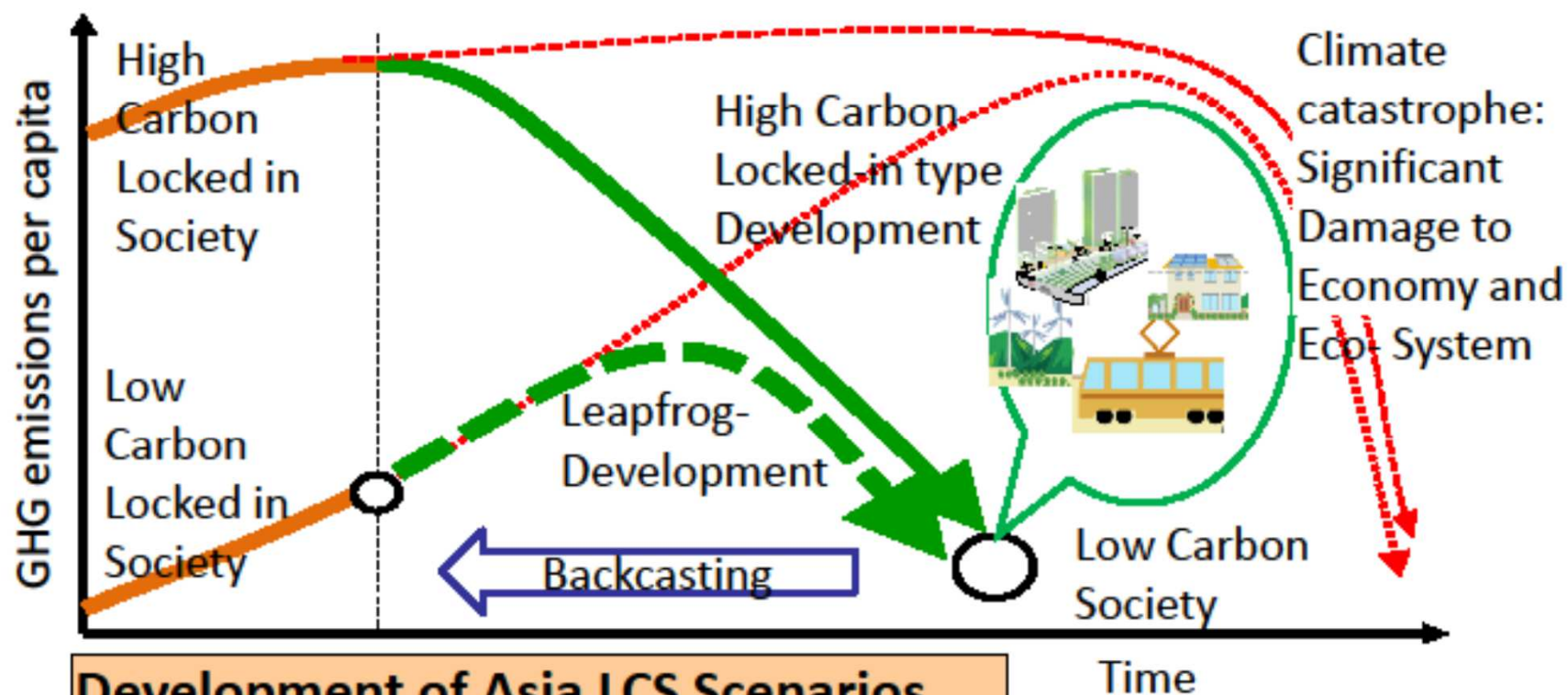


FOCUS GROUP DISCUSSION 3

ACTION, SUB-ACTION, MEASURES, PROGRAMS

	Action	No. of Sub-action	No. of Measures	No. of programs
1	Green Growth	4	7	23
2	Energy Efficient Spatial Structure	3	10	36
3	Green Mobility	5	8	30
4	Sustainable Energy System	4	6	14
5	Community Engagement and Green Lifestyle	4	6	29
6	Low Carbon Green Building	3	12	31
7	Blue and Green Network	5	11	27
8	Sustainable Waste Management	3	6	16
9	Sustainable Water & Wastewater Management	3	7	17
10	Green Urban Governance	4	10	30
TOTAL		38	83	253

How to reach to Low Carbon Society in Asia ?



- (1) Depicting narrative scenarios for LCS
- (2) Quantifying future LCS visions
- (3) Developing robust roadmaps by backcasting

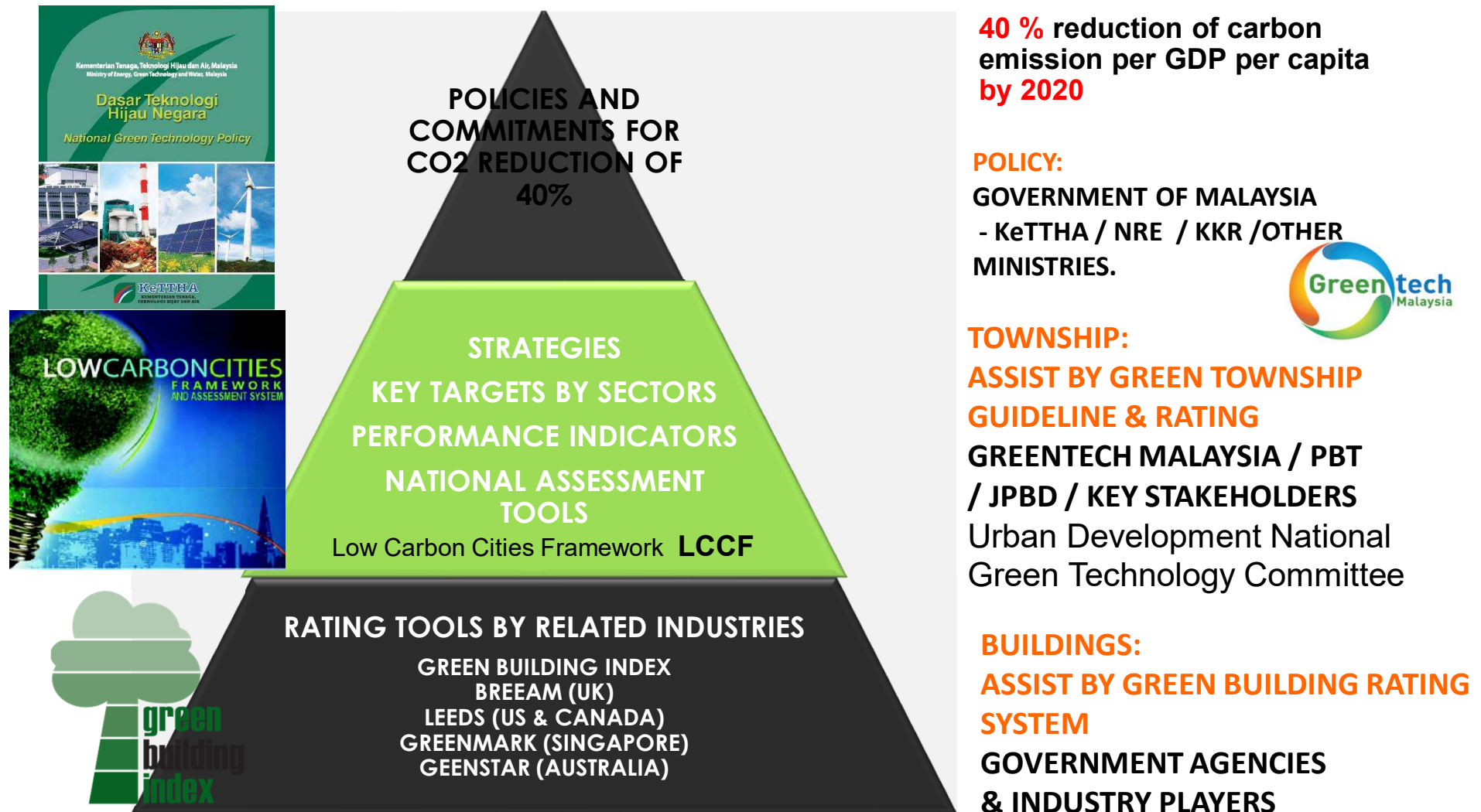
Policy Packages for Asia LCS

Funded by Ministry of Environment, Japan
and NIES

Overall Six Low-carbon actions, three “3R” Actions, two “Cooler” Action

Co2 reduction actions	CO ₂ emission reduction [tCO ₂]	Contribution in total reduction [%]
1.Integrated City Planning & management	305,546	17%
2.Low Carbon Transportation	570,319	32%
3.Cutting-Edge Sustainable Tropical Buildings	635,192	36%
4.Eco Concisions Home	65,555	4%
5.Comprehensive use of Renewable Energy	50,384	3%
6.The Green Lung of Putrajaya	64,394	4%
7/8 Thermal comfort and cooler urban envtm	63,058	4%
9. Minimum Consumption of Resources	26,182	1%
10/11 Repossession waste products and Maximum Recovery of Resources		
	1 780 630	100%

From Policy to Implementation



Smart Growth Principles

- Mix land uses
- Take advantage of compact building design
- Create a range of housing opportunities and choices
- Create walkable neighborhoods
- Foster distinctive, attractive communities with a strong sense of place
- Preserve open space, farmland, natural beauty, and critical environmental areas
- Strengthen and direct development towards existing communities
- Provide a variety of transportation choices
- Make development decisions predictable, fair, and cost effective
- Encourage community and stakeholder collaboration in development decisions

Smart Growth Network Partner Organizations

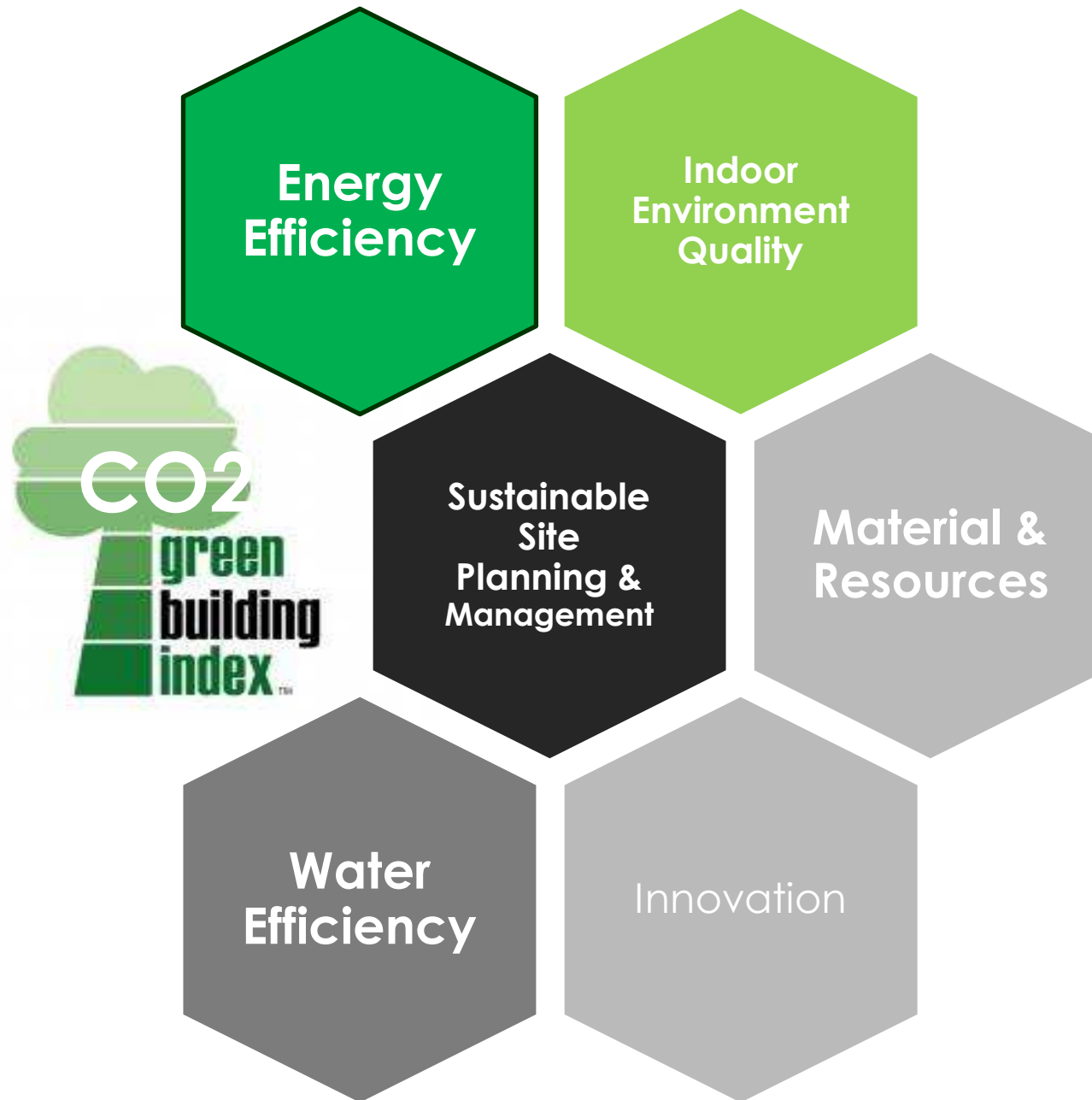


www.mgbc.org.my



3

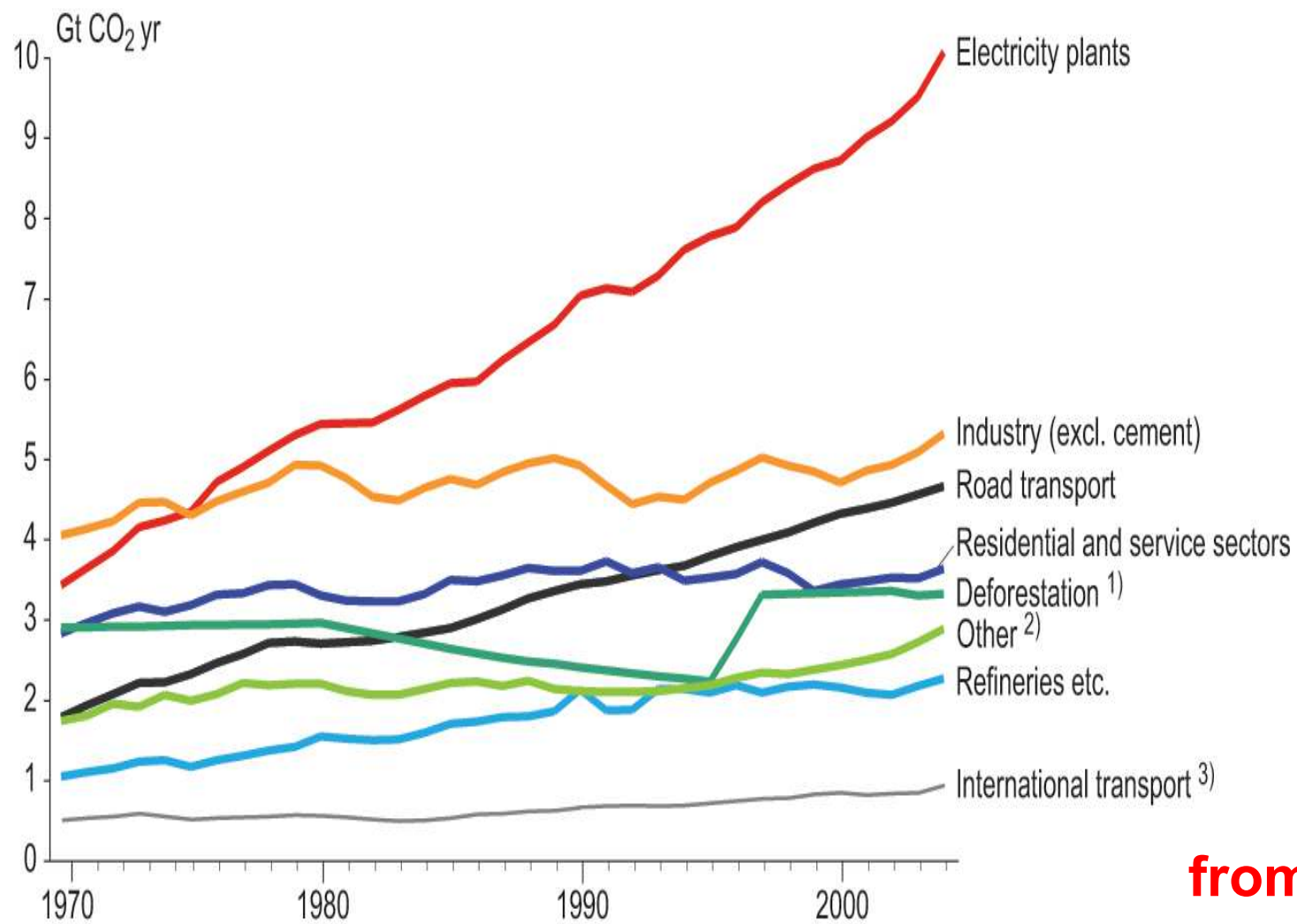
GREEN BUILDINGS ARE COOLER
LOW CARBON CITIES ARE COOLER CITIES



NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

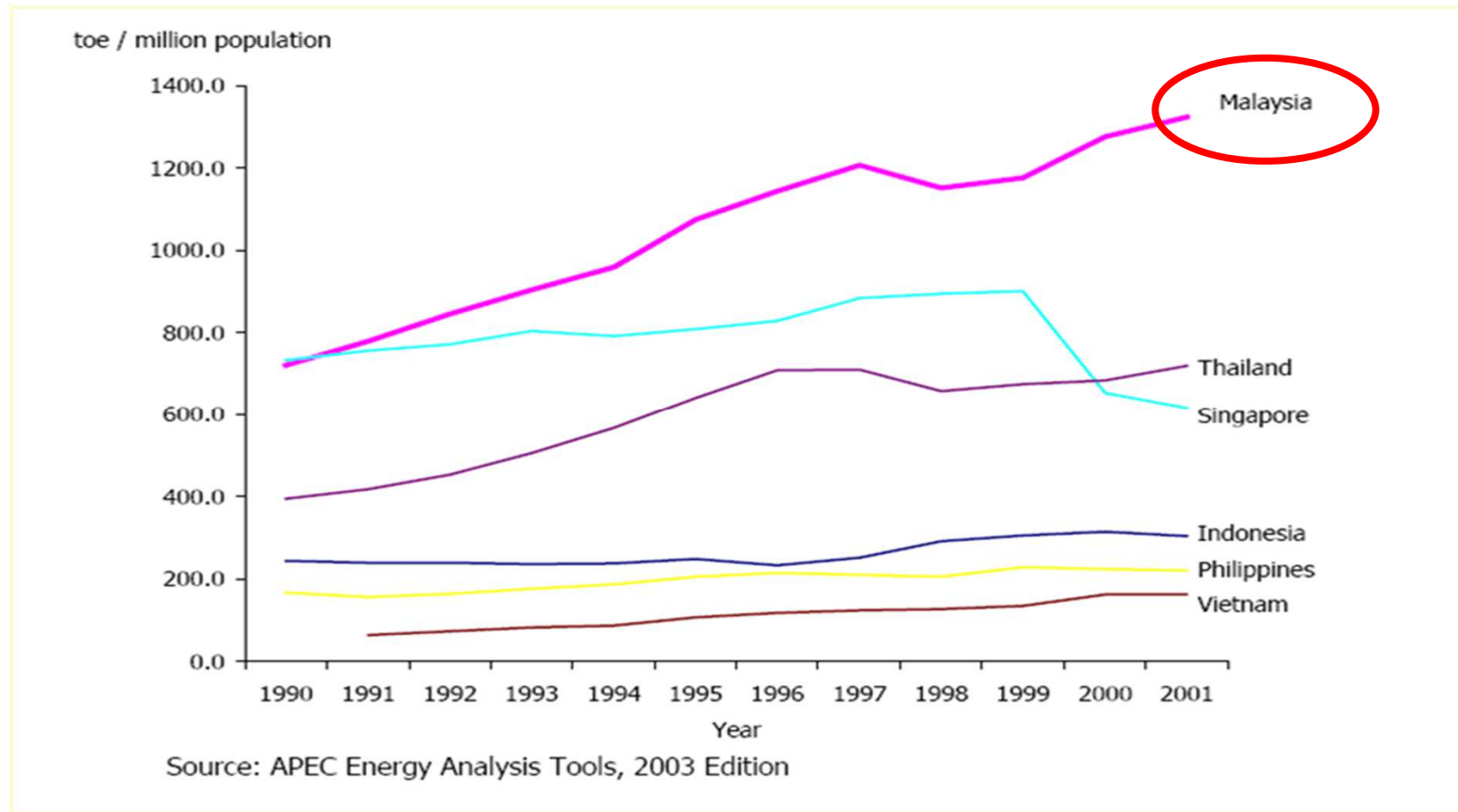
ENERGY EFFICIENCY (EE)

PART	CRITERIA	ITEM	POINTS	SUBMITTER	GBI
1	EE	ENERGY EFFICIENCY			
	Design				
	EE1	Minimum EE Performance	1		
	EE2	Lighting Zoning	3		
	EE3	Electrical Sub-metering	1		
	EE4	Renewable Energy	5		
	EE5	Advanced EE Performance - BEI	15		
	Commissioning				
	EE6	Enhanced Commissioning	3		
	EE7	Post Occupancy Commissioning	2		
	Verification & Maintenance				
	EE8	EE Verification	2		
	EE9	Sustainable Maintenance	3		



from IPCC

WHAT ARE OUR LOCAL ISSUES?

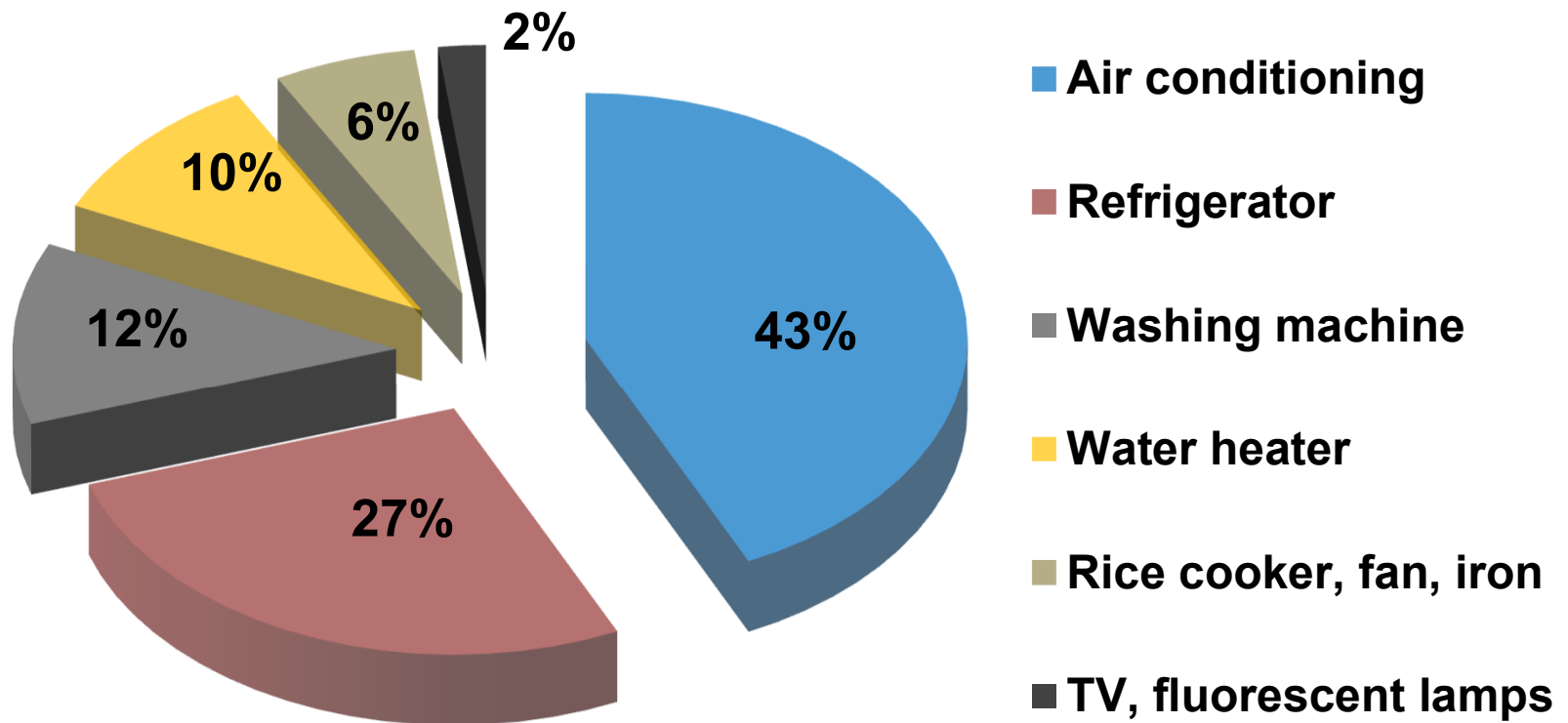


3. High Energy Consumption

Malaysia has the **HIGHEST** per capita Energy Consumption among ASEAN countries

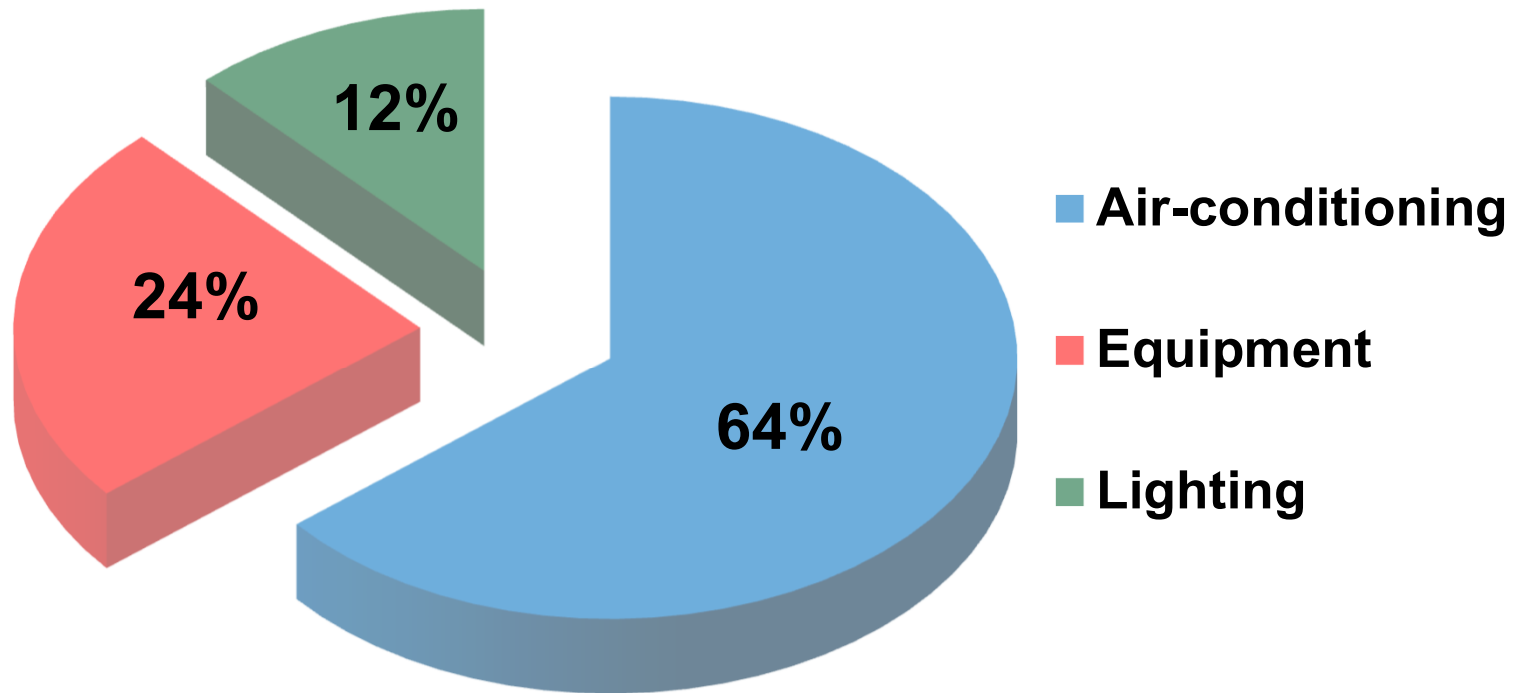
ENERGY USAGE

In typical Malaysian homes



ENERGY USAGE

In typical Malaysian office buildings



OTTV

RTTV

U-VALUES

NET ZERO

ROOF THERMAL RESISTANCE & HEAT GAIN



SSTH
75%



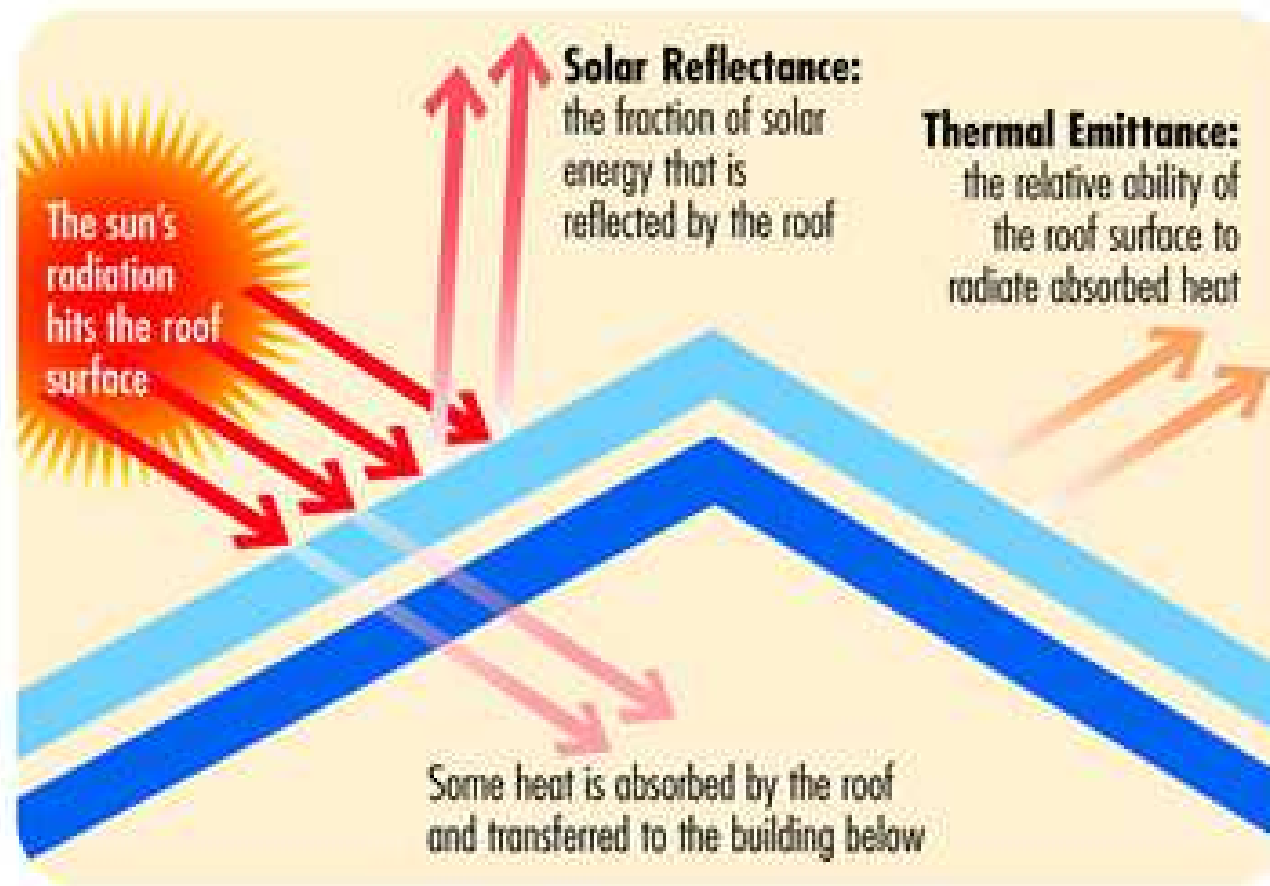
DSTH
50%



5S Flat
40%

THERMAL RESISTANCE

Roof Thermal Resistance and SRI

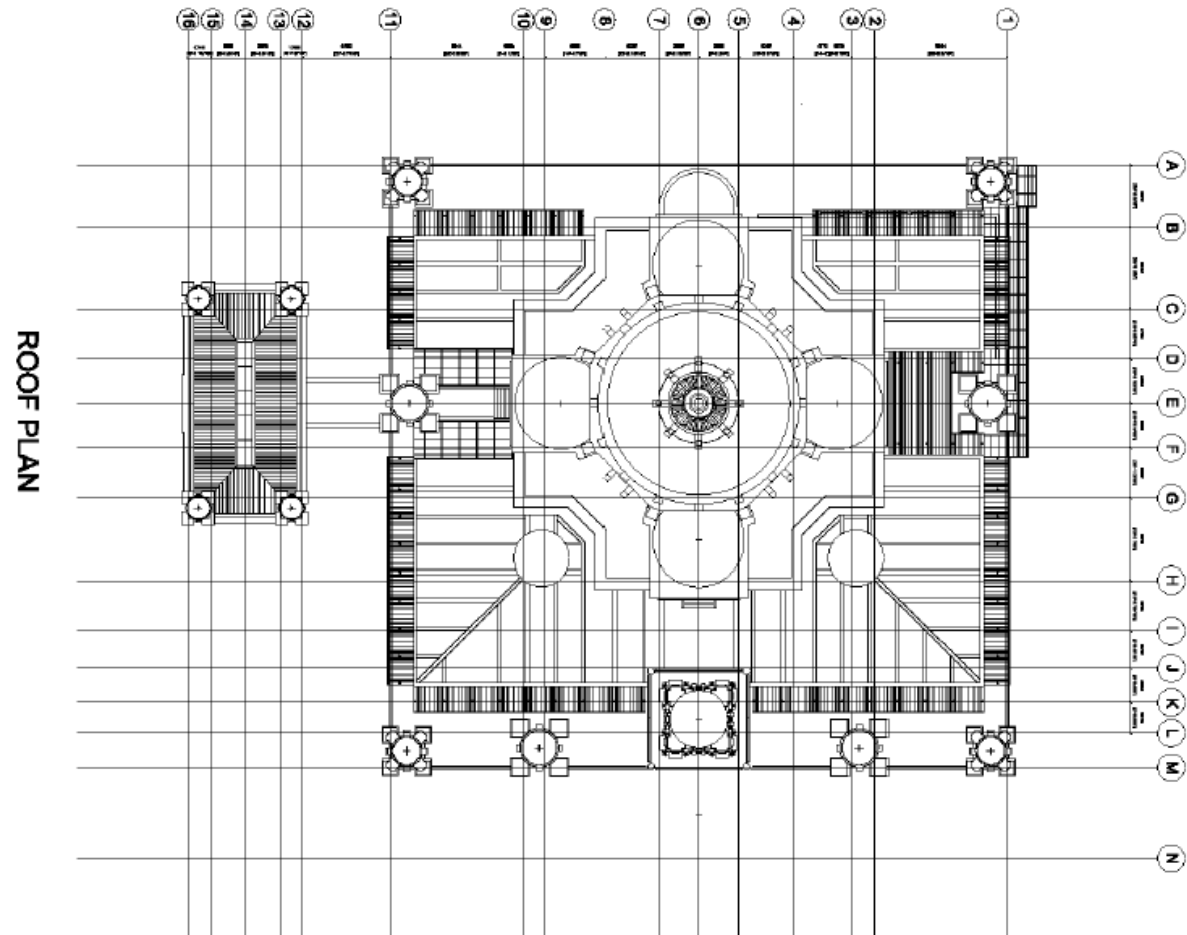


Masjid DiRaja Sultan Sulaiman Klang

1932-1934

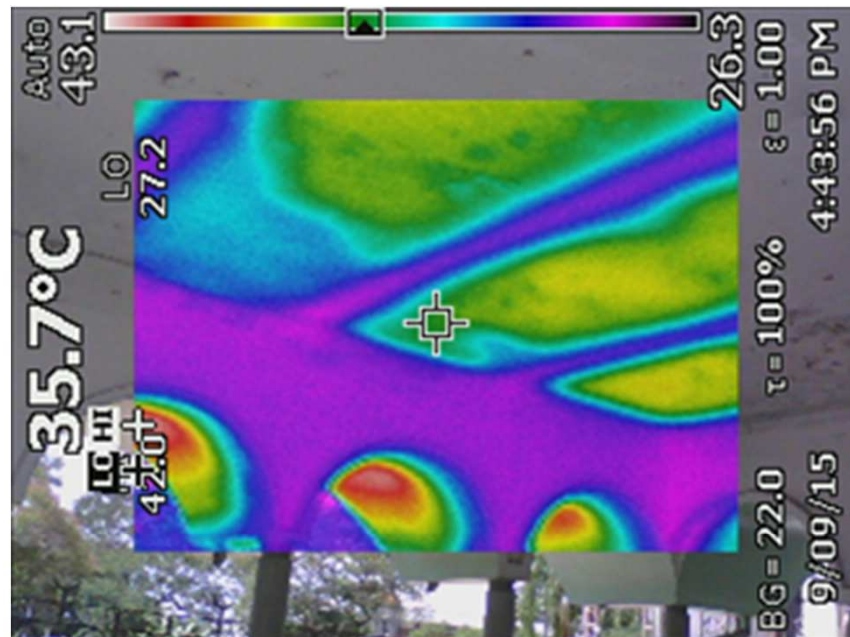


ROOF PLAN



Roof Insulation before & after

2015

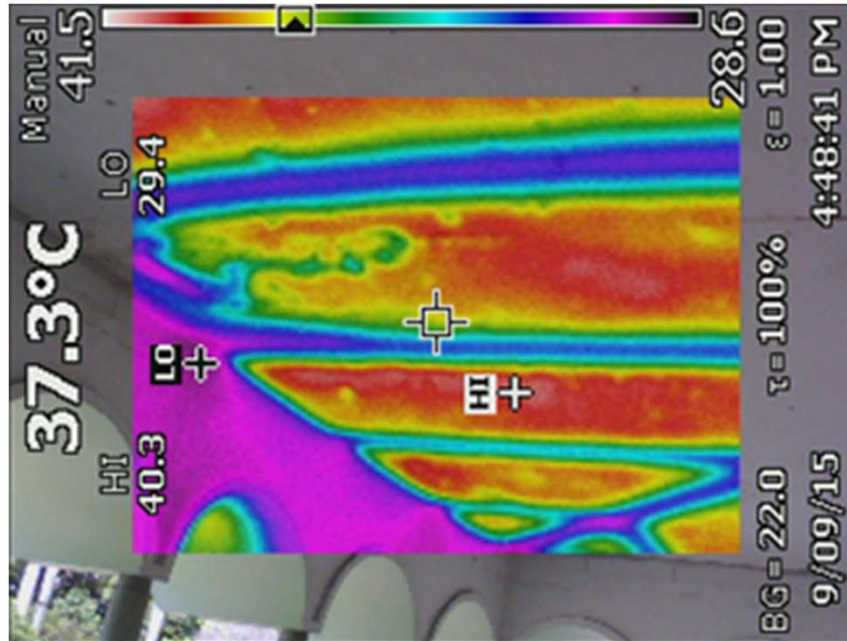


2017

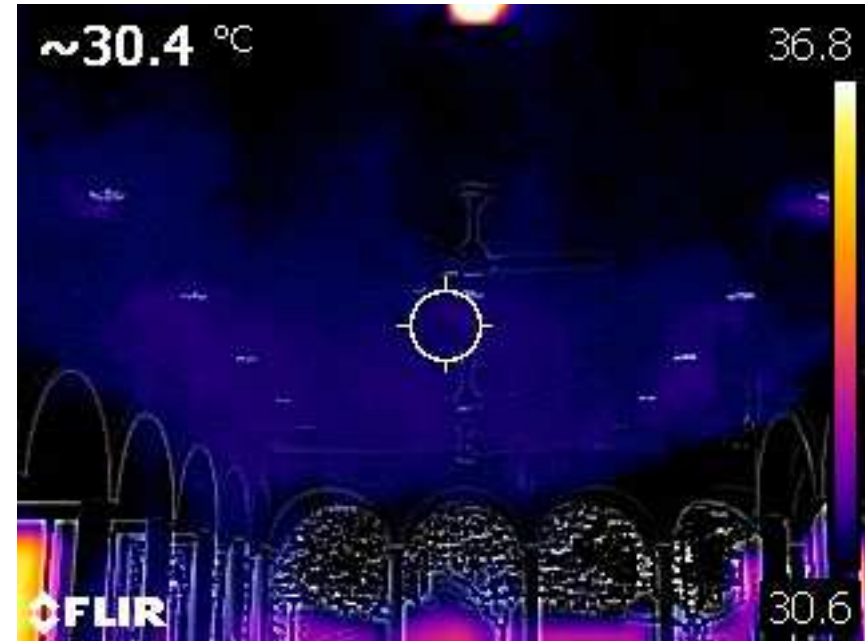


Roof Insulation before & after

2015

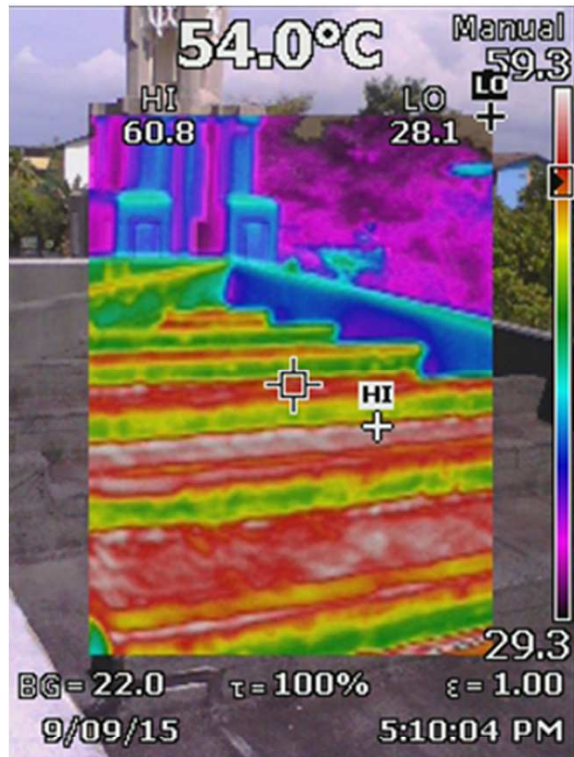


2017



External readings before & after

2015

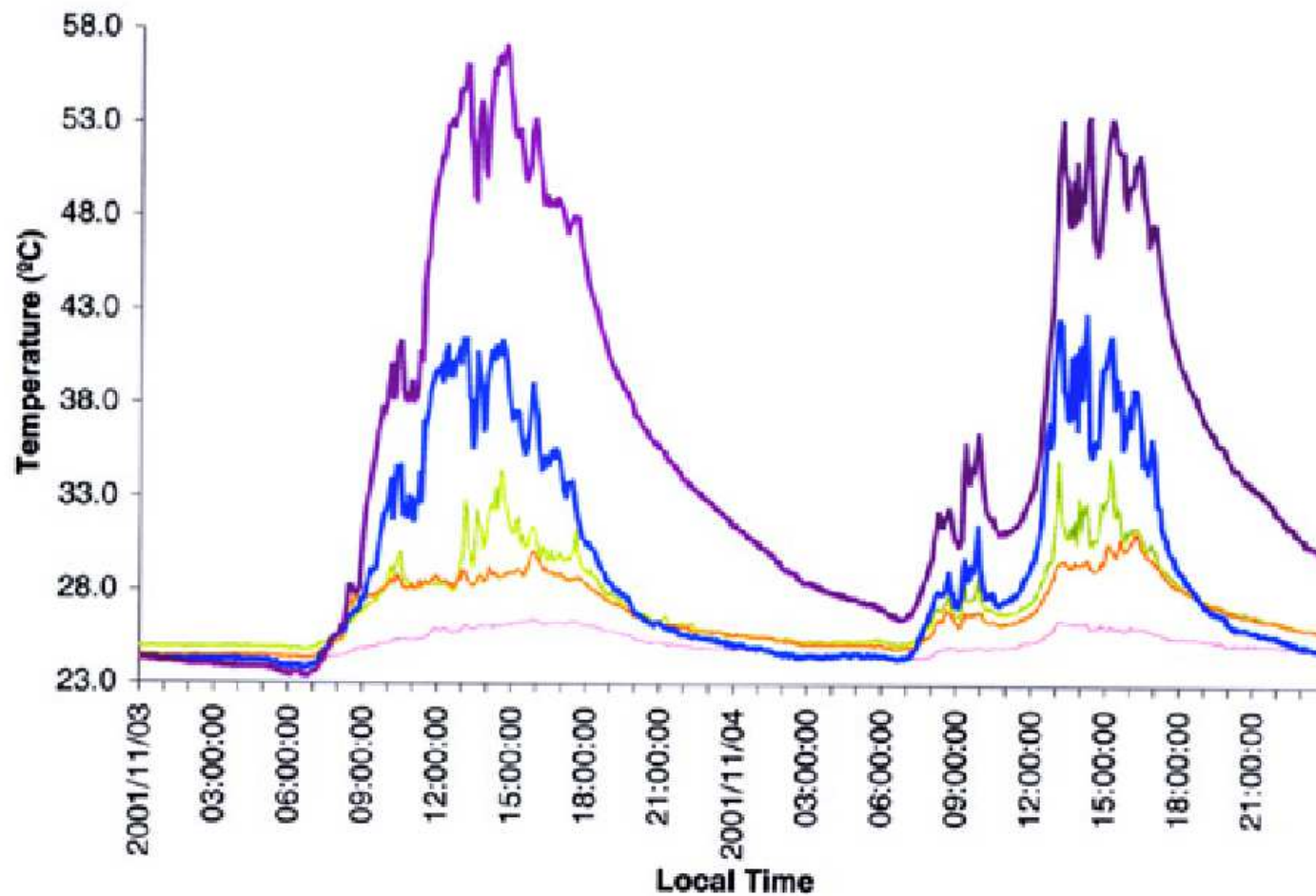


2017



URBAN ROOF LANDSCAPING

Comparison of surface temperatures measured with and without plants



ENVELOPE THERMAL RESISTANCE

Envelope thermal resistance NON-RES



FACTORIES

25%



LOW RISE

60%



HIGH RISE

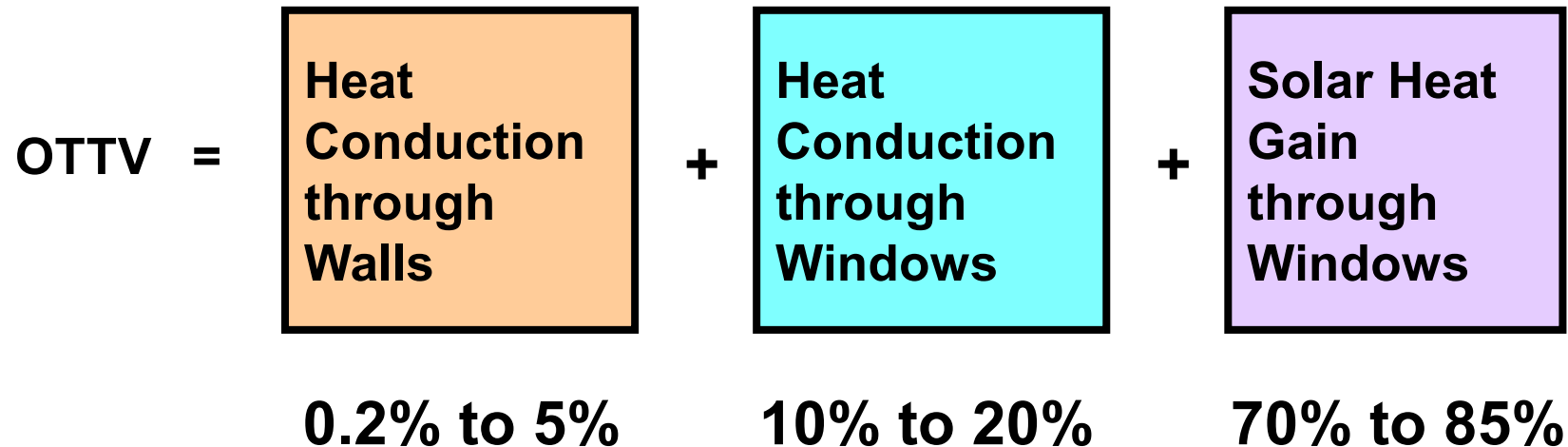
80%

BDG FABRIC HEAT GAIN & OTTV FORMULA

MS1525:2007 Clause 5.2.2 says

The formula for the OTTV of any given wall orientation is as follows:

$$OTTV_i = 15 \alpha (1 - WWR) U_w + 6 (WWR) U_f + (194 \times CF \times WWR \times SC)$$



COOLER BUILDINGS THROUGH BY-LAW 38A

UBBL by-Law 38A Amendment 2012

Energy efficiency in buildings

(1) New or renovated non-residential buildings with air-conditioned space exceeding 4,000 square metres shall be –

a) designed to meet the requirements of MS 1525 with regards to the Overall Thermal Transfer Value (OTTV) and the Roof Thermal Transfer Value (RTTV); and

b) provided with an Energy Management System.



4

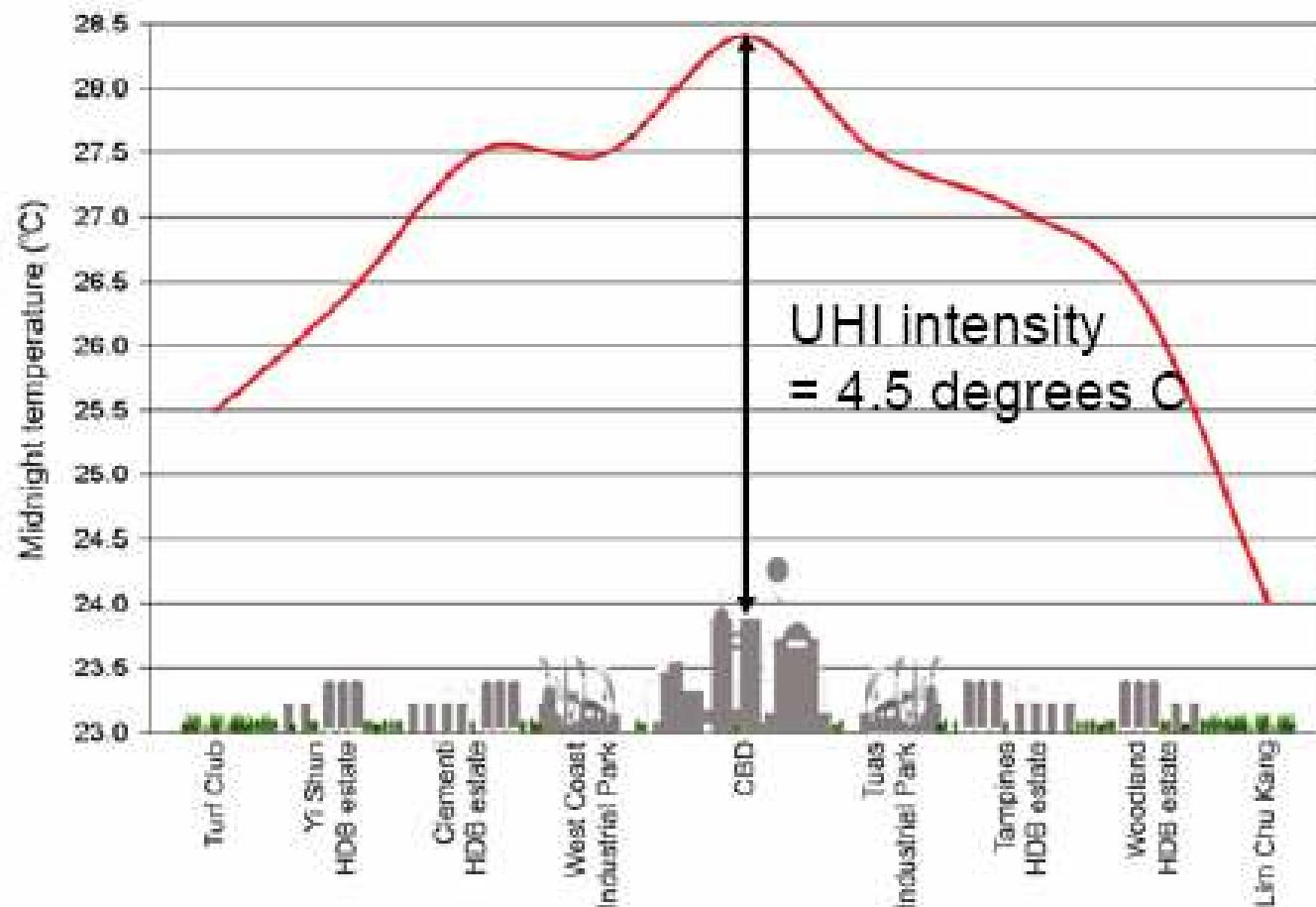
SUSTINABLE LANDSCAPING

HEAT ISLAND EFFECT



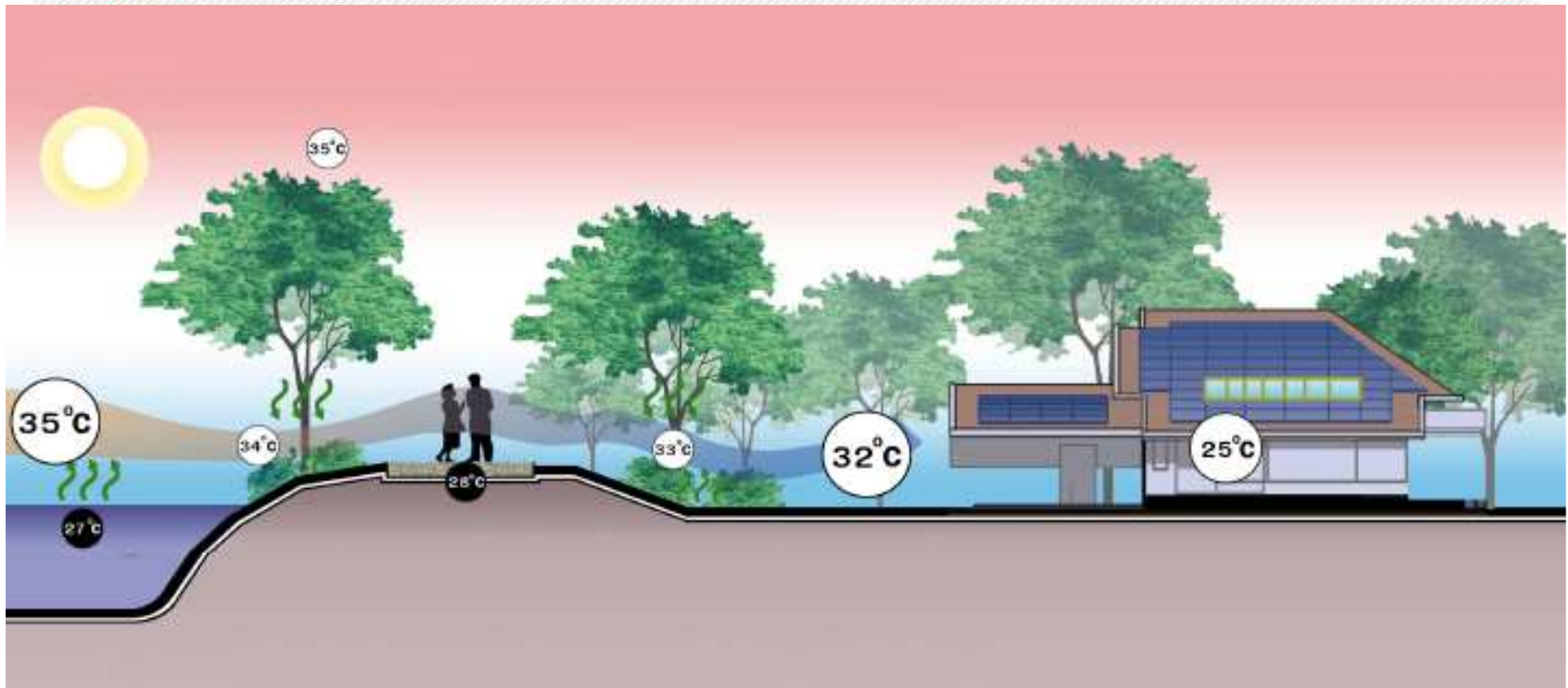
ITEM	AREA OF ASSESSMENT	DETAIL POINTS	MAX POINTS
SM4	OPEN SPACES, LANDSCAPING AND HEAT ISLAND EFFECT		
	Development should have smaller footprints and more landscaping, thereby reducing the well known effects of heat islands around hard scaped areas.		4
	Provision of landscaping with indigenous plants to 10% of total development area	1	
	Provision of additional similar landscaping of every extra 5%: 1 point up to a maximum of 3 points	3	

Sketch of Urban Heat Island profile in Singapore

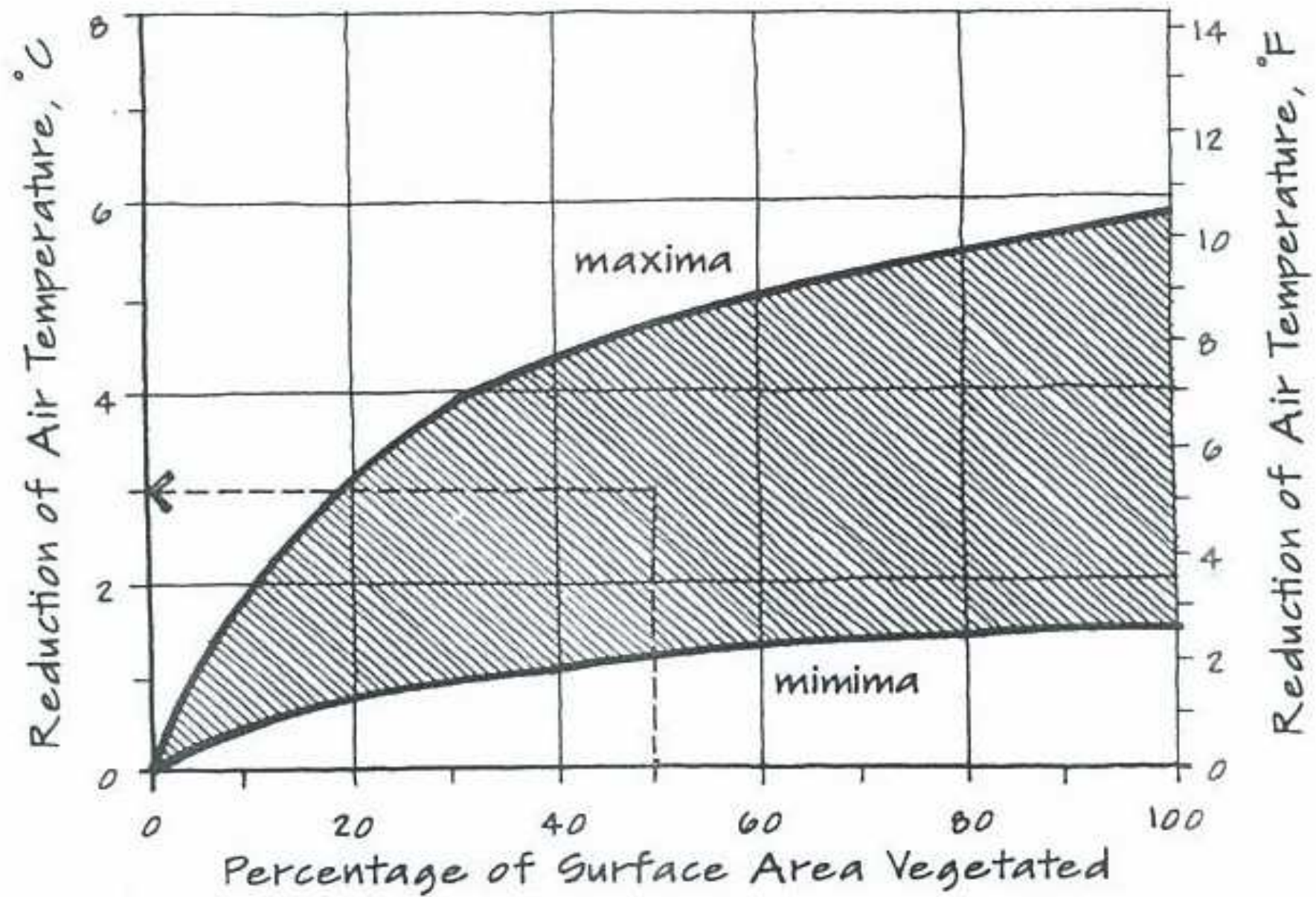




$$\Delta T = 39 - 25 = 14^{\circ}\text{C}$$

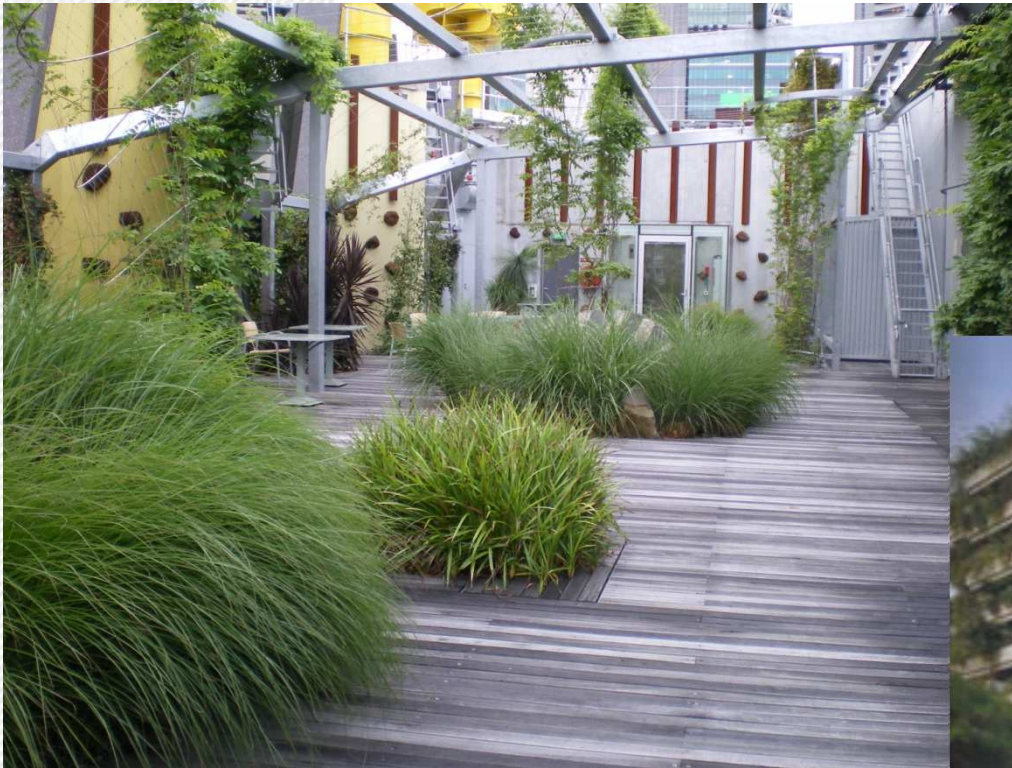


$$\Delta T = 32 - 25 = 7^{\circ}\text{C}$$



Cooling Rates Due to Vegetation Cover

URBAN BUILDING LANDSCAPING



CH2 Melbourne



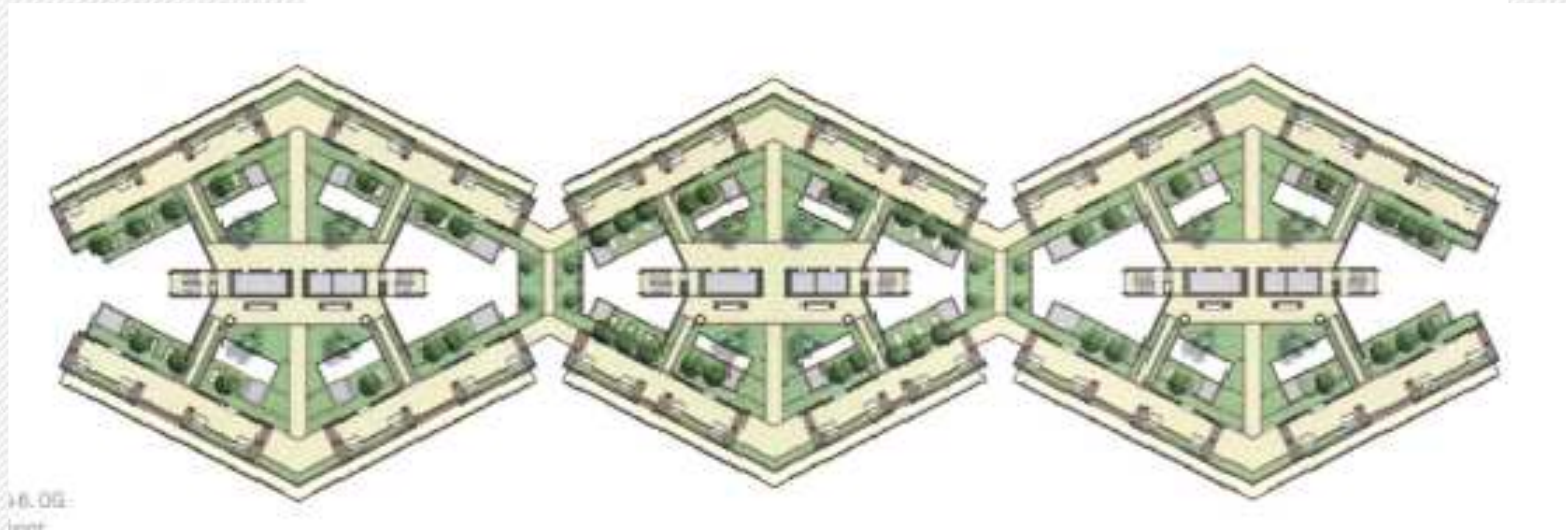
Condominium Singapore

URBAN BUILDING LANDSCAPING



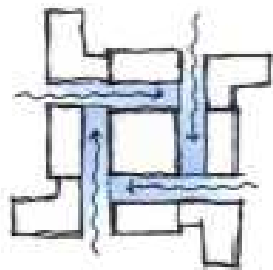
Condominium Singapore

URBAN BUILDING LANDSCAPING

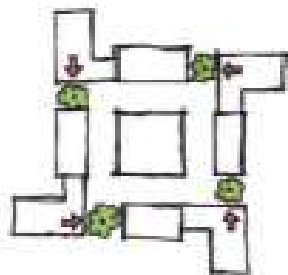


URBAN BUILDING LANDSCAPING

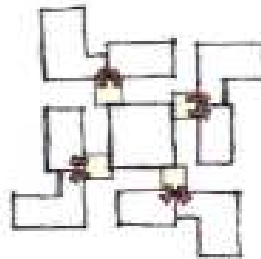
Wadala Mumbai India



Luftströmungen | Airflow



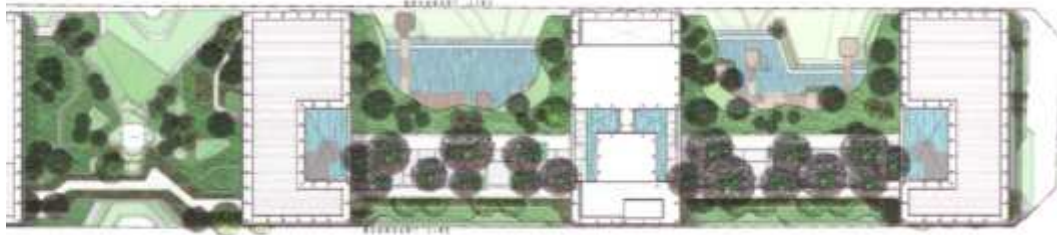
Begrünung | Greenery



Zugangsplattformen | Access platform



URBAN BUILDING LANDSCAPING



Pickering Singapore

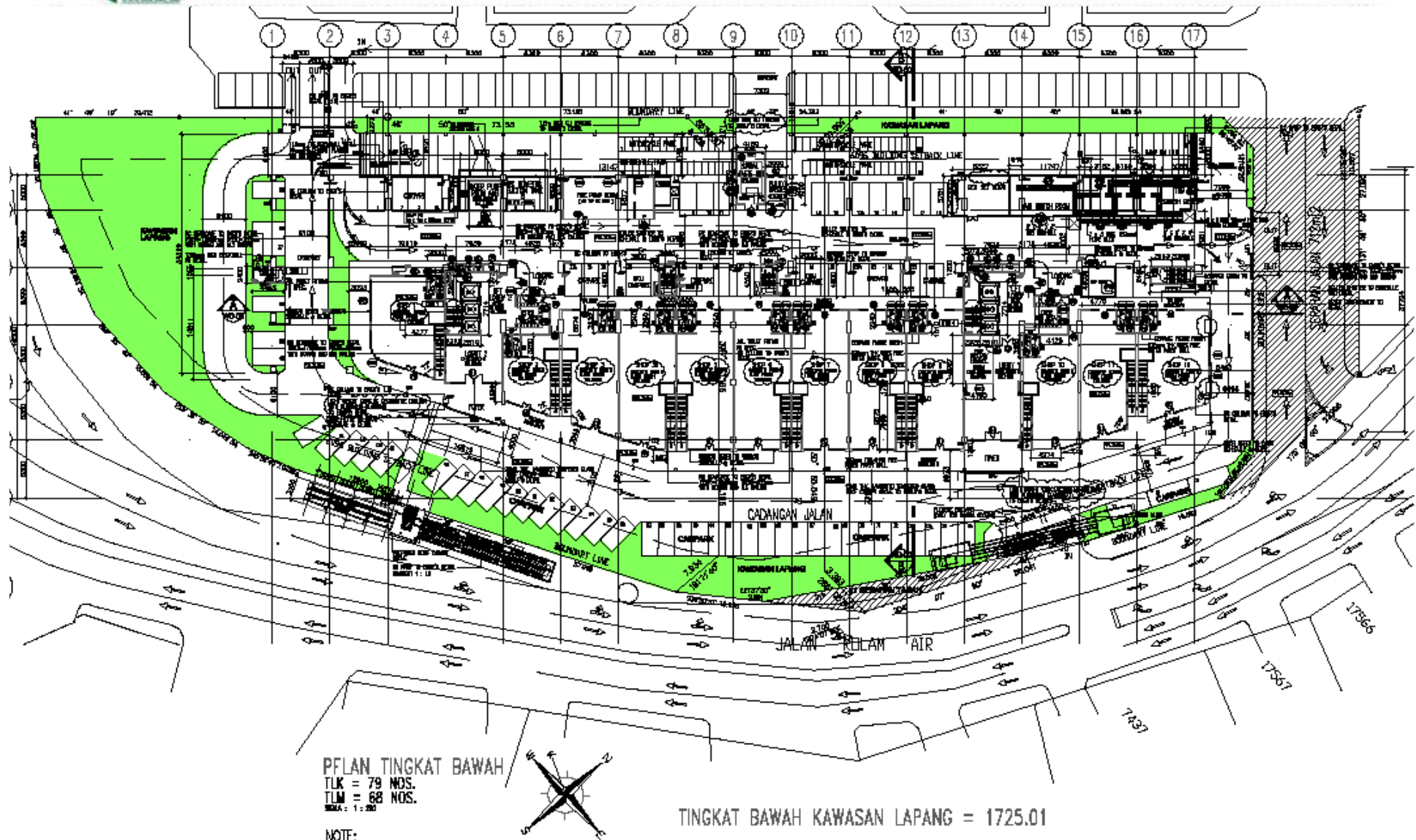


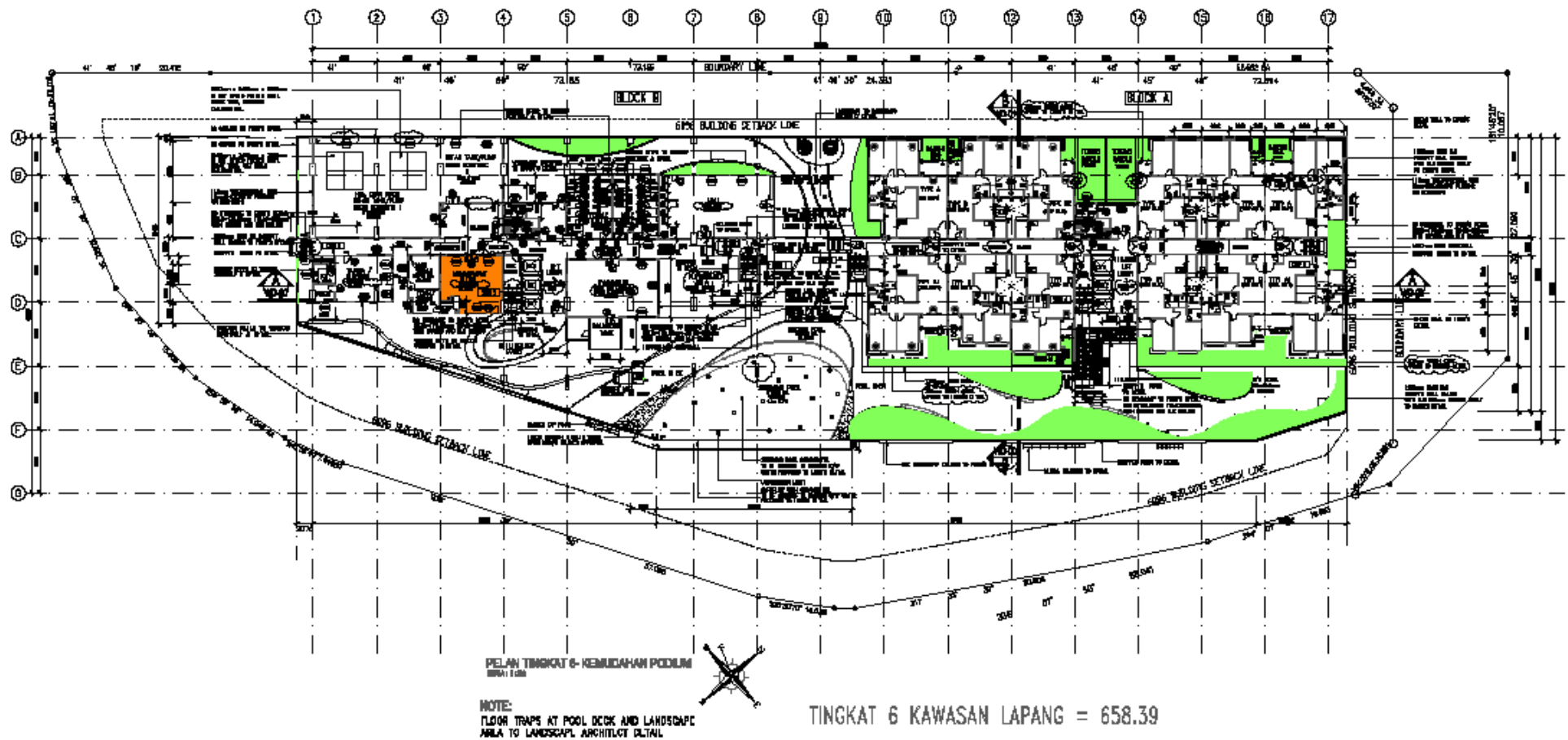
URBAN BUILDING LANDSCAPING



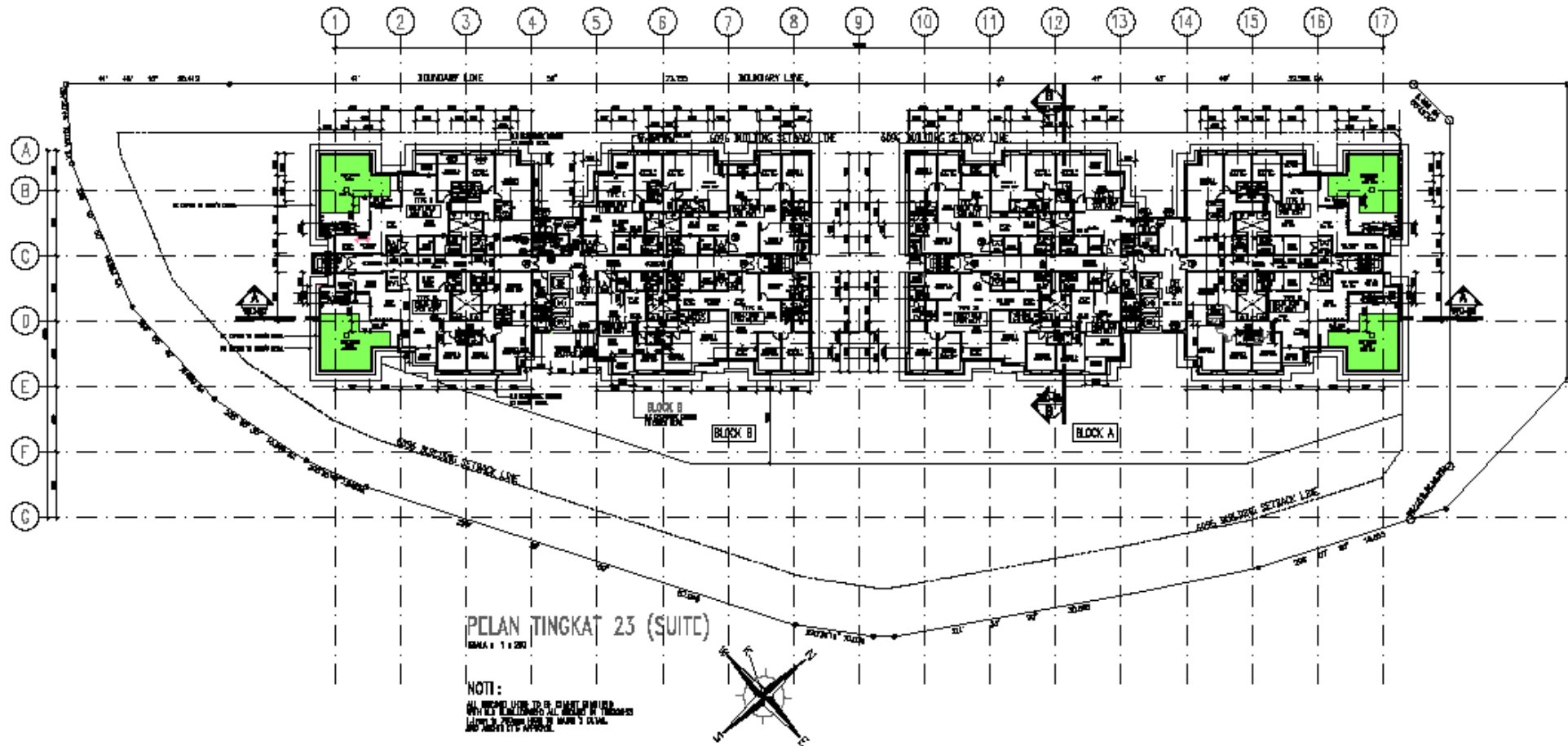
Rajadamri Bangkok



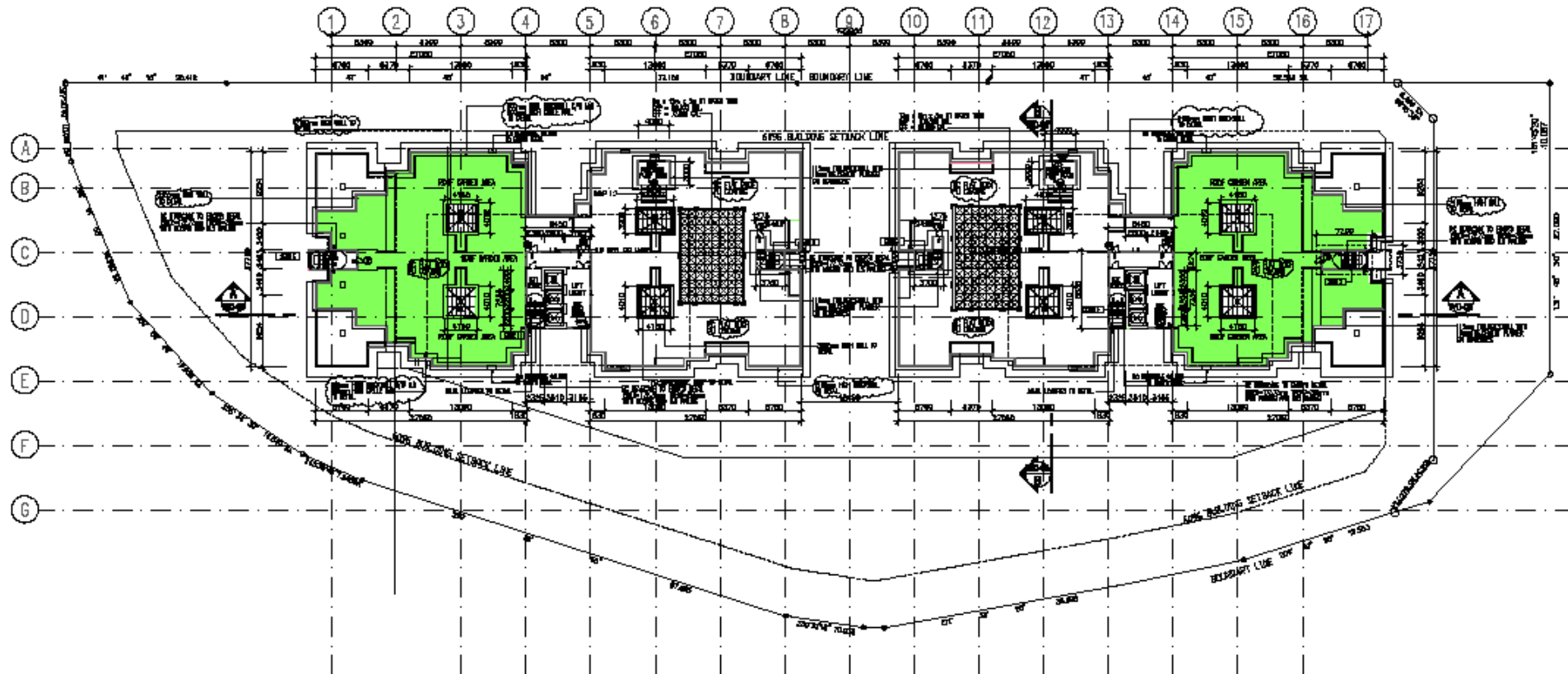








TINGKAT 23 KAWASAN LAPANG = 200.38 SQ.M



LANDSCAPE AREA

Ground Floor

P'LAN TINGKAT 23A- ROOF GARDEN
SKALA : 1 : 200

1725

Podium Roof L6

658

Penthouse L23

200

Roof

1067

TOTAL

3650

Land Area

10600



TINGKAT 23A KAWASAN LAPANG = 1067.22 SQ.M

Percent Landscape

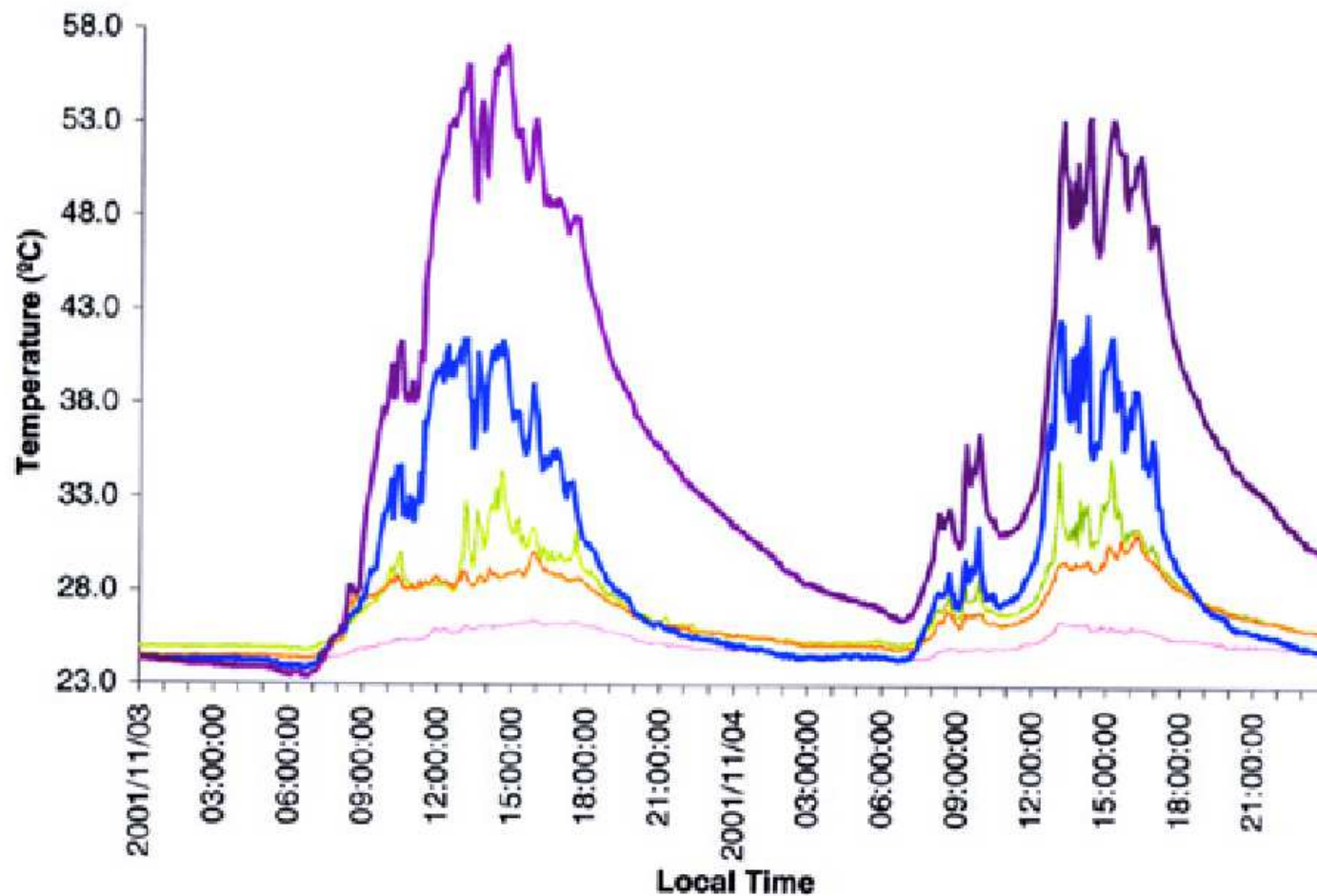
34.43%

www.mgbc.org.my



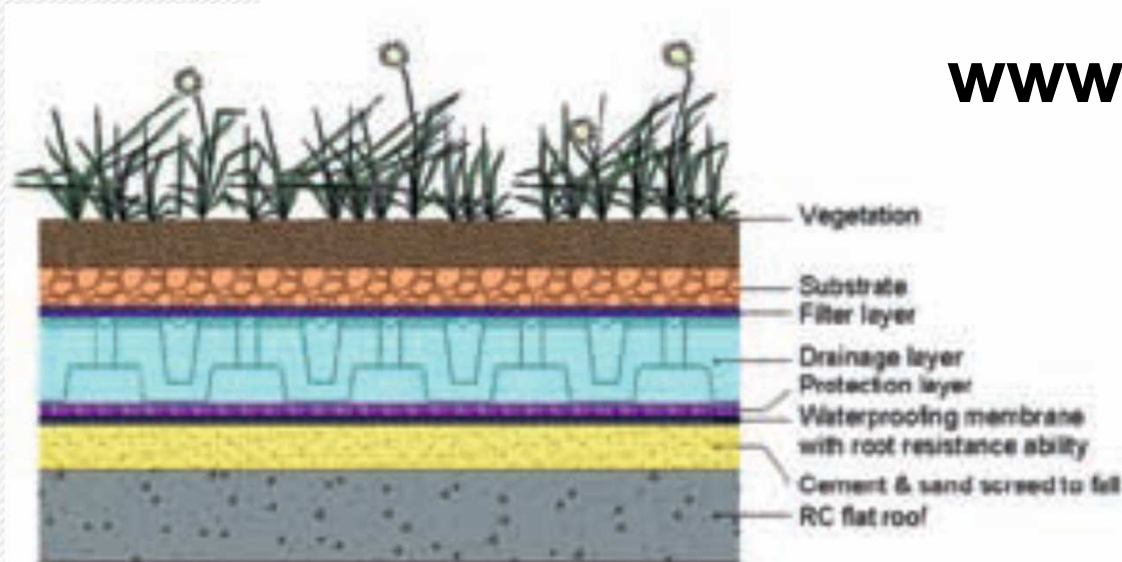
URBAN ROOF LANDSCAPING

Comparison of surface temperatures measured with and without plants



URBAN ROOF LANDSCAPING

www.nparks.gov.sg



- * RC flat roof
- * Cement and sand screed to fall
- * Waterproofing membrane with root resistance ability
- * Protection layer
- * Drainage layer
- * Filter layer
- * Vegetation support layer
- * Vegetation/ peripheral structures

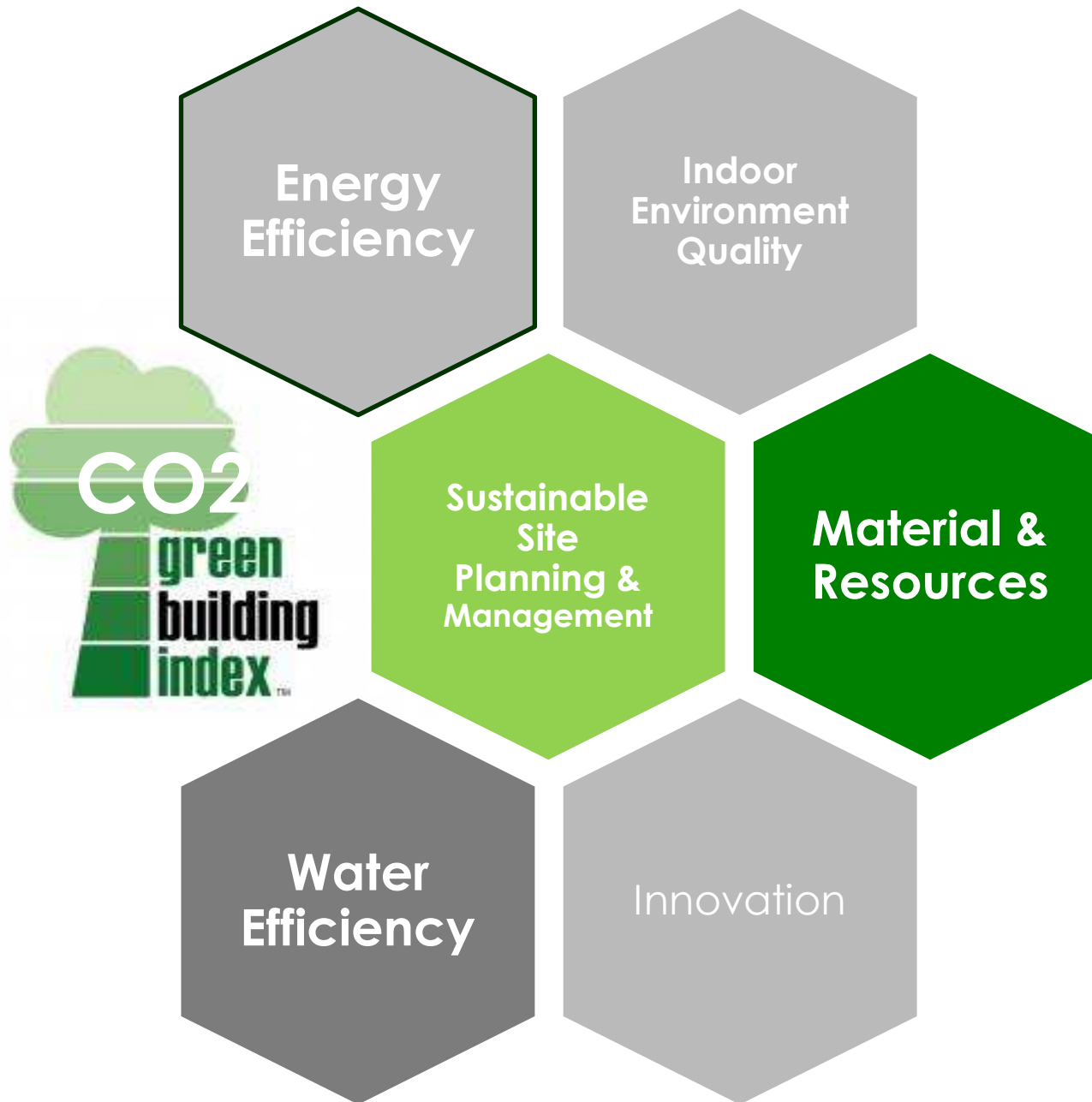
www.mgbc.org.my



5

ZERO WASTE CONSTRUCTION

BIM-IBS INTEGRATION



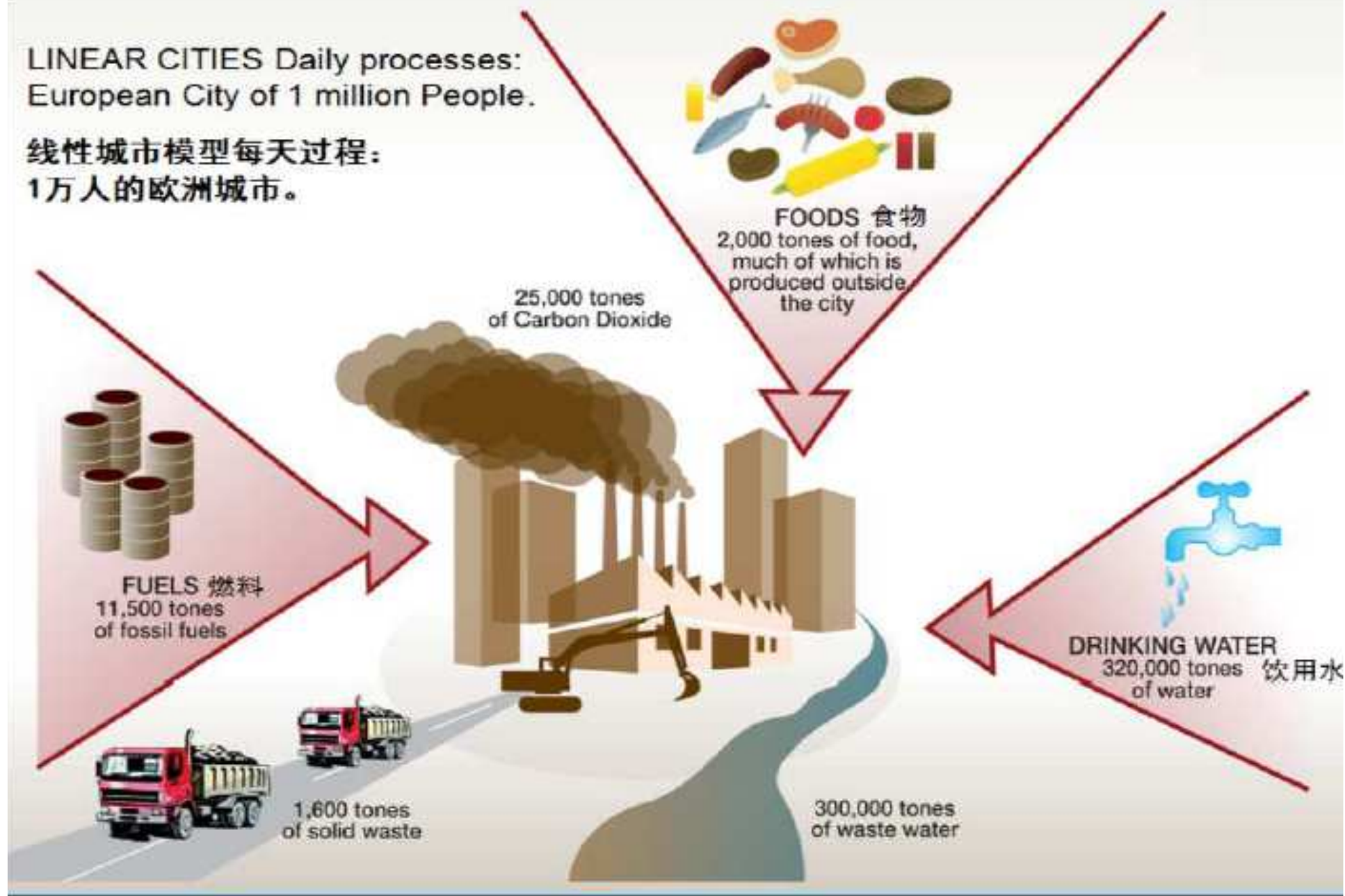
NON-RESIDENTIAL NEW CONSTRUCTION (NRNC)

MATERIALS AND RESOURCES (MR)

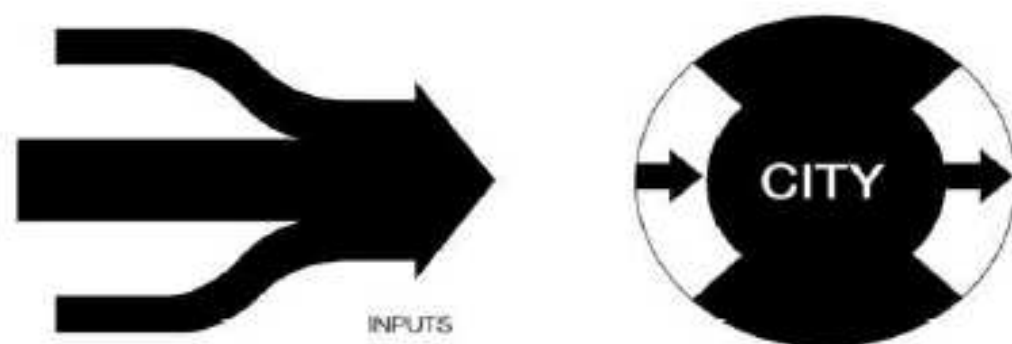
MR	MATERIALS & RESOURCES			
Reused & Recycled Materials				
MR1	Materials Reuse and Selection	2		
MR2	Recycled Content Materials	2		
Sustainable Resources				
MR3	Regional Materials	1		
MR4	Sustainable Timber	1		
Waste Management				
MR5	Storage & Collection of recyclables	1		
MR6	Construction Waste Management	2		
Green Products				
MR7	Refrigerants & Clean Agents	2		

LINEAR CITIES Daily processes:
European City of 1 million People.

线性城市模型每天过程：
1万人的欧洲城市。

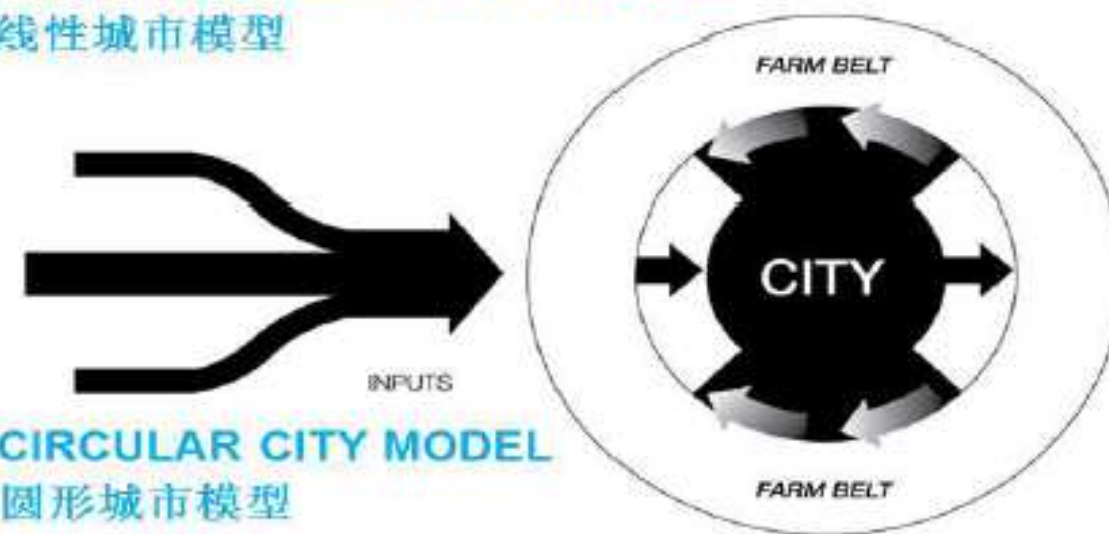
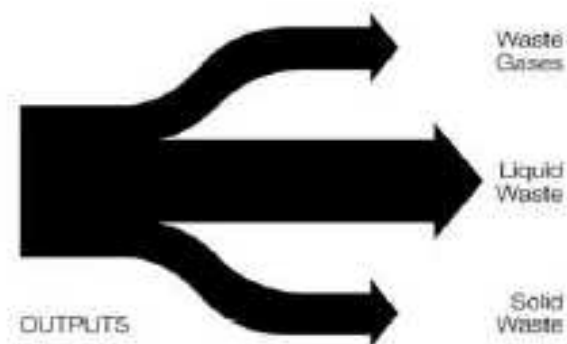


NEW CITY MODELS 新城市模型



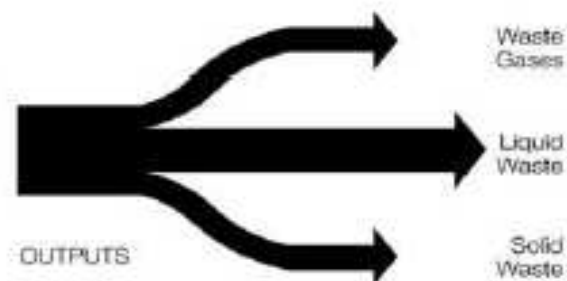
EXISTING LINEAR CITY MODEL

线性城市模型

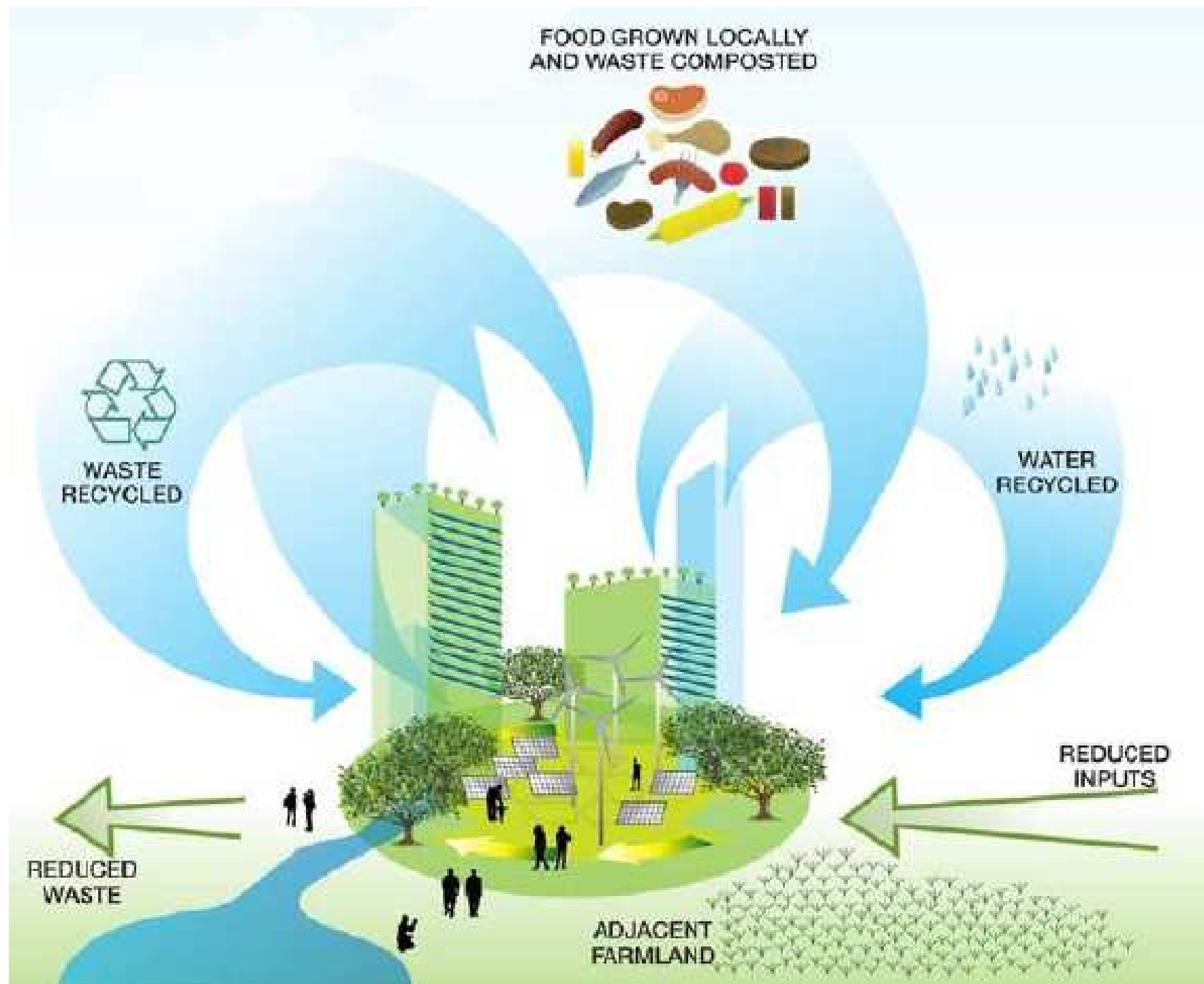


CIRCULAR CITY MODEL

圆形城市模型



Source: Richard Rogers



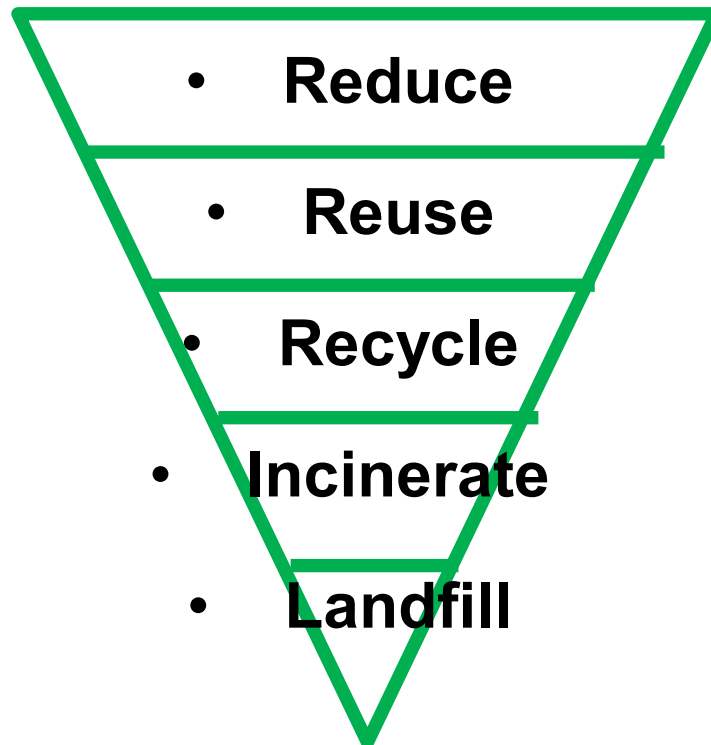
SWM STATUS IN KUALA LUMPUR

- **Average per capita waste generation is 0.5kg/day**
- **Average per capita for KL**
 - **is 1.5kg/day**
- **76% of waste is collected**
- **2% is recycled**
- **22% of waste is taken to dumpsites**
- **5% of waste from KL is recycled**



SWM TARGETS KUALA LUMPUR

SWM Hierarchy



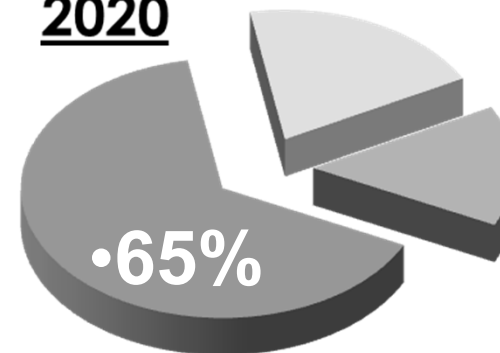
Current



Recovery

Landfill

2020

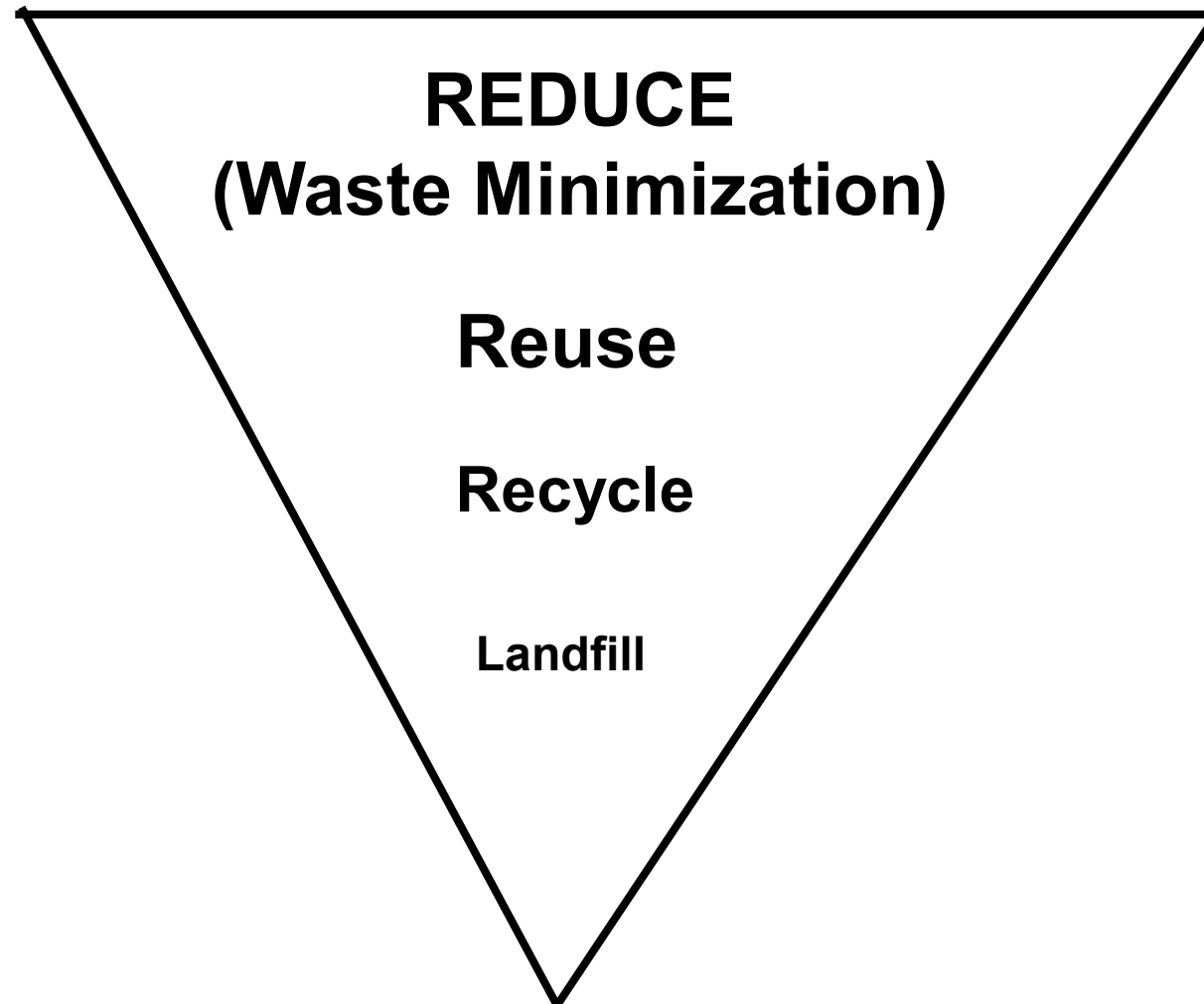


Recycled

Processed

Landfill

HIERARCHY OF WASTE MANAGEMENT



ZERO WASTE CONSTRUCTION

**Zero Waste Construction through BIM –
IBS Integration**

BIM – Building Information Modelling

IBS – Industrialized Building Systems

QUALITY ISSUES



PRODUCTIVITY ISSUES

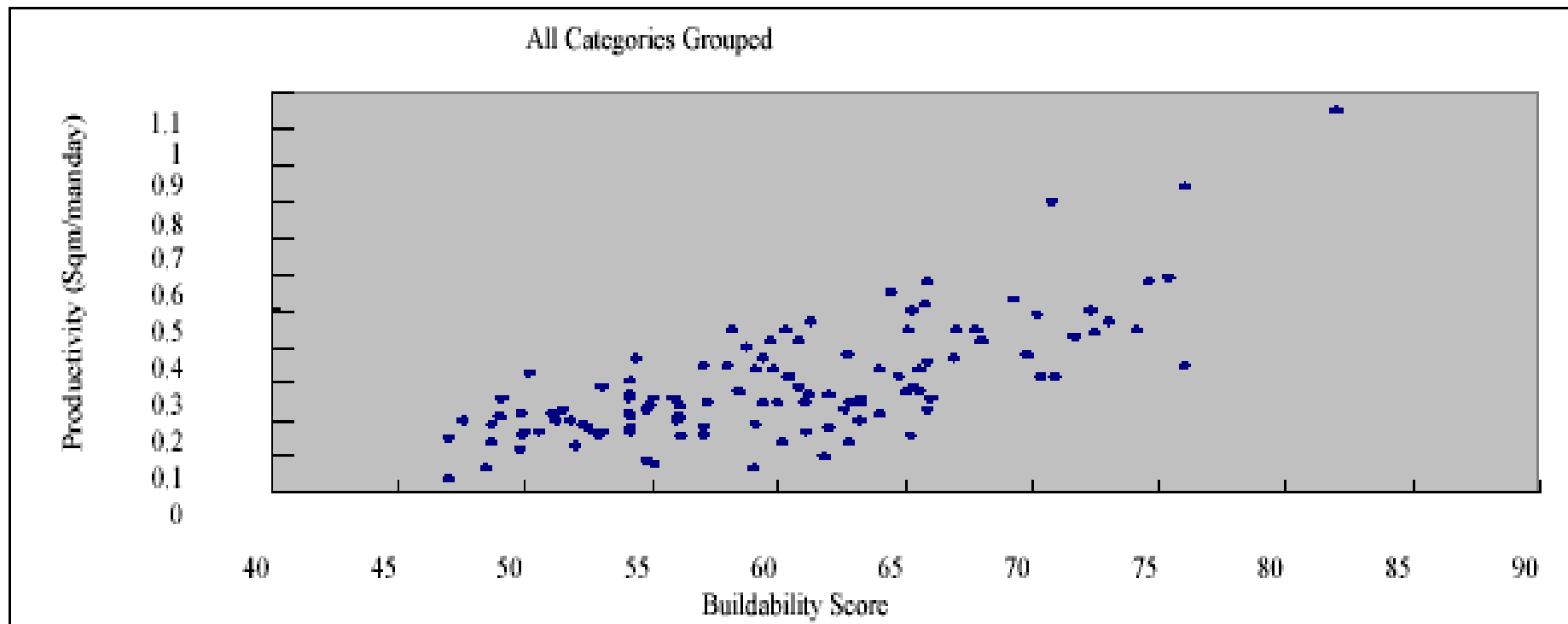
CHOA CHU KANG N6 C9 LABOUR PRODUCTIVITY

	FULLY PRECAST CONSTRUCTION (mandays)	CONVENTIONAL CONSTRUCTION (mandays)
PC ERECTOR	20	0
WATERPROOFING	15	0
STEEL BENDER	28	75
CARPENTER	20	125
CONCRETOR	17	15
TOTAL	100	215
LABOUR FORCE SAVING	115 (46.5%)	0
PRODUCTIVITY	0.17 mandays/m2	0.36 mandays/m2

NOTE.: THE ABOVE COMPARSION IS BASED ON THE AVERAGE
LABOUR FORCE FOR 4 NUMBERS OF 5 ROOM APARTMENT
AND 1 LIFT LOBBY PER STOREY.

THE AVERAGE CYCLE TIME PER STOREY BY USING BOTH
METHODS IS 14 DAYS.

PRODUCTIVITY & PROFITABILITY WITH IBS



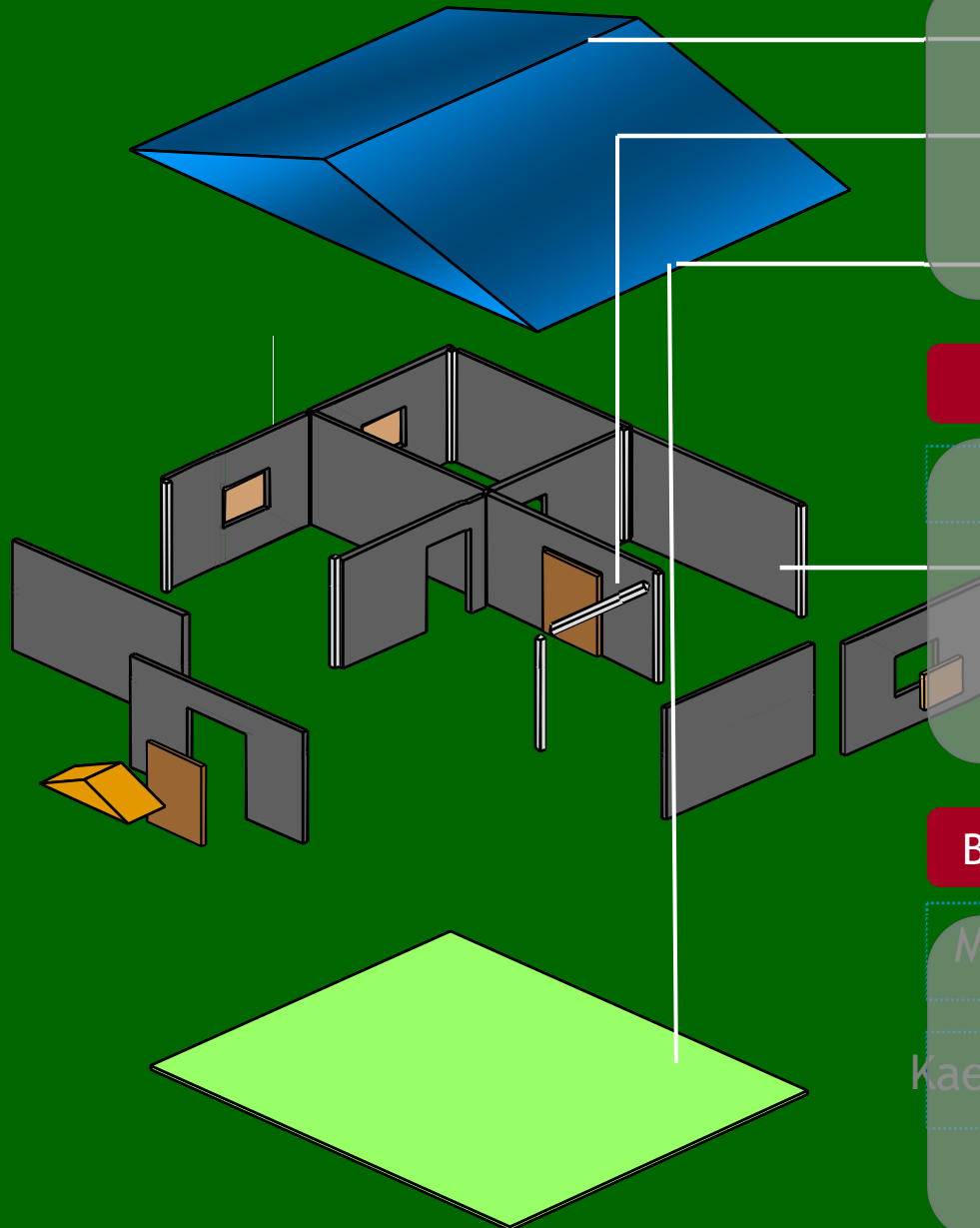
WHY IBS – REDUCED WASTE GENERATED

Waste Generation and Composition: Comparison Between an IBS (Parcel 7, Presint 9, Putrajaya) and a Conventional Project (Kamsis H, UKM). Based on 100 square m floor space

Construction Waste Materials	Amount of Waste Generated by Weight (Tonnes)	
	Fully Prefabricated	Conventional
Soil and sand	1.01	14.7
Brick and blocks	0.04	0.63
Concrete and aggregate	0.27	36.0
Tiles	0.02	2.72
Scrap metal	0.01	0.45
Wood	0.04	0.11
Plastic materials	0.01	0.03
Packaging products	0.07	0.002
Total	1.47	54.642

Source: LESTARI, 2009

IBS SCORE



BAHAGIAN 1 : SISTEM STRUKTUR

Struktur Bumbung

50%

Struktur Lantai

BAHAGIAN 2 : SISTEM DINDING

Dinding

20%

BAHAGIAN 3 : KAEDAH PEMBINAAN LAIN

Modular MS 1064

Repetitiveness

30%

Kaedah 3D / Volumetric (Prefab toilet)

GAMUDA



Changing the way we build

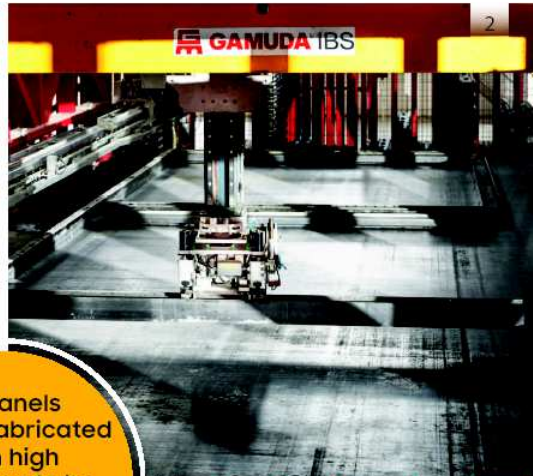
- Unlimited product variety
- Turnkey design and build services
- Shorter construction time
- Labour reduction
- Assured quality

Big savings with BIM - Time, Material, Money



With the Building Information Modelling (BIM) digital design system, all design information is incorporated and captured online.

Once all design clashes are resolved, the BIM data is fed into the robotics production system - the software drives the design to production. This design tool eliminates any error and guesswork that is normally associated with conventional construction methods.



All panels are prefabricated with high accuracy to be assembled on site in a 'Lego-like' manner

The Gamuda IBS system will also include fully finished, prefabricated bathroom pods

THE BEST DELIVERY FOR YOU

Fast

Much faster than
conventional construction
methods

Panels are delivered
to site and installed
like 'Lego', one floor
per week

Reduce construction
period by

12
months

Efficient

Uses 1/3 of labour
compared to
conventional method

Reduces foreign labour
dependency by

63%

Sustainable

Safe method
of construction

Low noise

Cleaner, greener
way of building

Minimal wastage

<1%





6

PUBLIC PARTICIPATION

MGBC & WGBC ROLES



Malaysia Green Building Confederation (MGBC) is a transparent, consensus based, and not-for-profit organization, aiming to promote Green Buildings and a sustainable built environment in Malaysia.



WORLD **GREEN** BUILDING COUNCIL

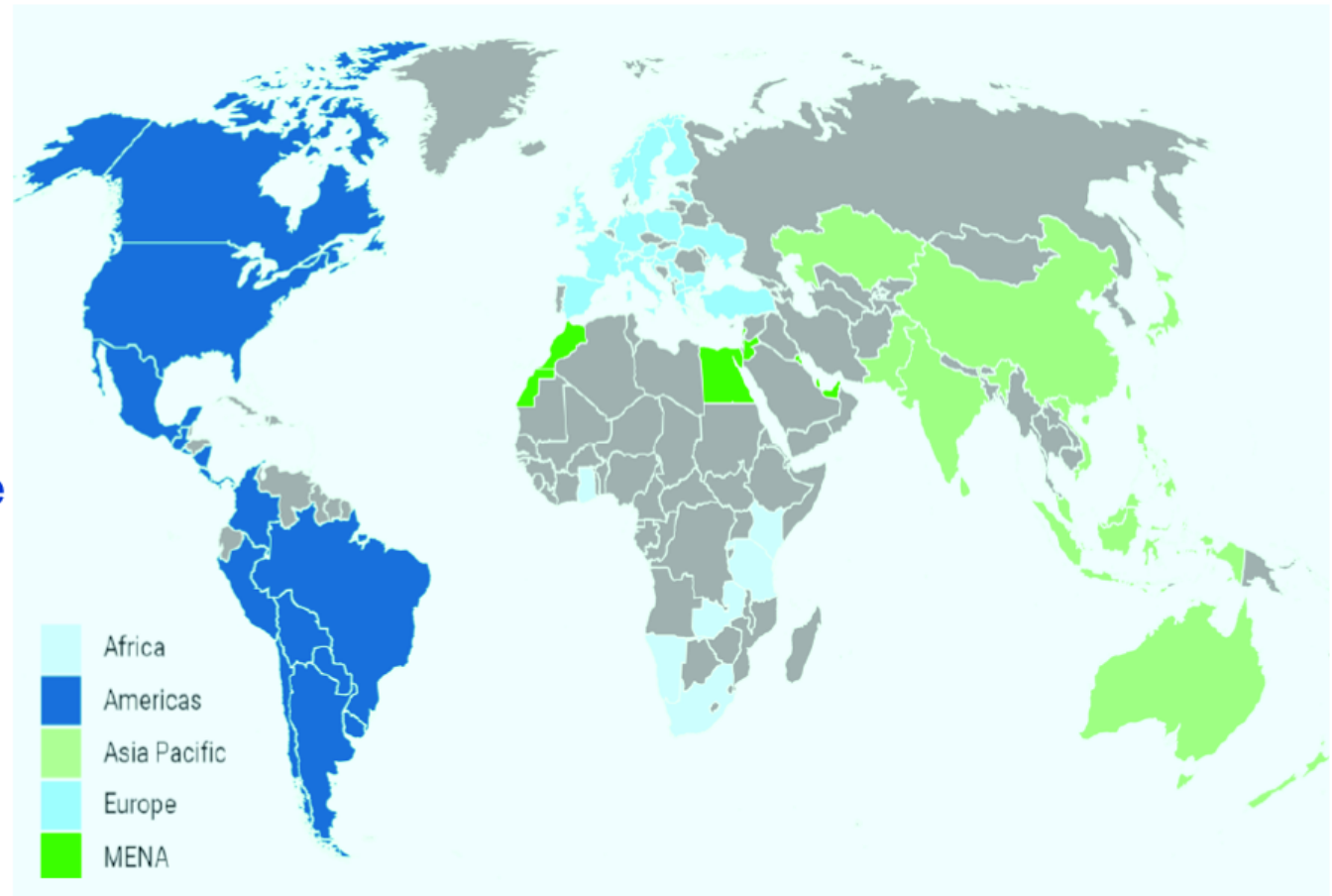


**Sustainable Buildings
and Climate Initiative**
National Member



WORLD GBC

- A global network of Green Building Councils in over 70 countries.
- The world's largest and most diverse network of sustainable built environment actors. 50k members
- Organised for local > regional > global impact.



WORLD GBC's ROLES



Rate



Educate



Advocate



Collaborate

WORLD GBC's WORK

National Policies



Green Cities



Existing Buildings



Healthy Buildings



High Performance Buildings

GBC'S AND THEIR IMPACT



Certifying more space

1.24
BILLION M²

of green building space around the world
has been certified by member GBCs.*



Influencing policy change

31
COUNTRIES

have made green building policy change
at either the city, regional or national level
with contributions from our GBCs.



5 NEW NET ZERO
BUILDING
CERTIFICATIONS

Launched through our Advancing Net
Zero project.



8 NATIONAL RENOVATION
STRATEGIES LAUNCHED

With support from the BUILD UPON project
in Europe.



WORLD
GREEN
BUILDING
COUNCIL



415B

m2 of building
stock in 2050

39%

of global GHG
emissions from
building sector

223B

m2 of building
stock in 2015

36%

of global energy
is consumed by
buildings



THANK YOU



malaysia**GBC**

chansa@malaysiagbc.org.my