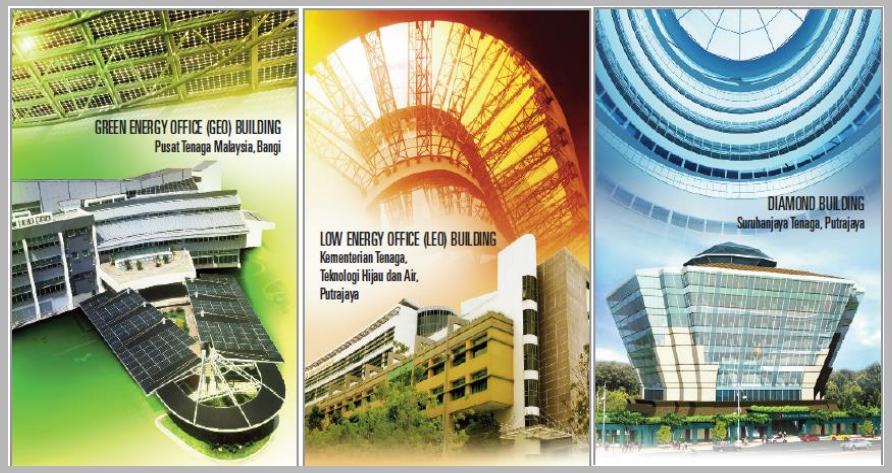
SEDA MALAYSIA OPEN DAY 2018

8 November 2018 | G Hotel, Penang

SEDA MALAYSIA OPEN DAY
Northern Region @ Pulau Pinang

08 NOVEMBER 2018



INTRODUCTION OF LOW CARBON BUILDINGS

Strategic & Affordable Way to Reduce CO2 emissions for Building Sector

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INTRODUCTION

Low Carbon Building

An alternative way to go green building.
A basic green building that focus on sustainable energy, starting with basic energy efficient features.

2010 : Green Technology Policy to support green and low carbon development

Definition of "Green Technology"

Green technology is the <u>development and application of products, equipment, and systems</u> used to conserve the natural environment and resources, which minimises and reduces the negative impact of human activities

- **Minimises the degradation of the environment.**
- **It has <u>zero or low green house (GHG) emission</u>.**
- **It safe for use and promotes healthy and improved environment for all forms of life**
- **It <u>conserves the uses of energy</u> and natural resources; and**
- **It promotes the use of renewable resources.**

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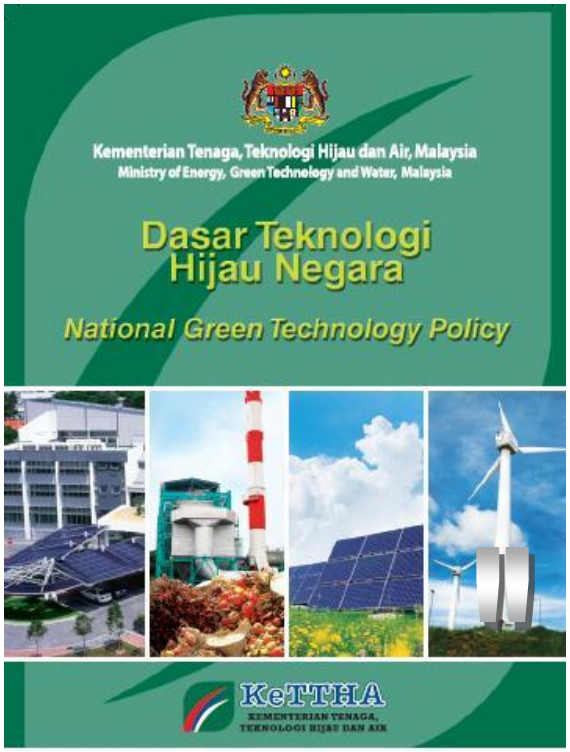
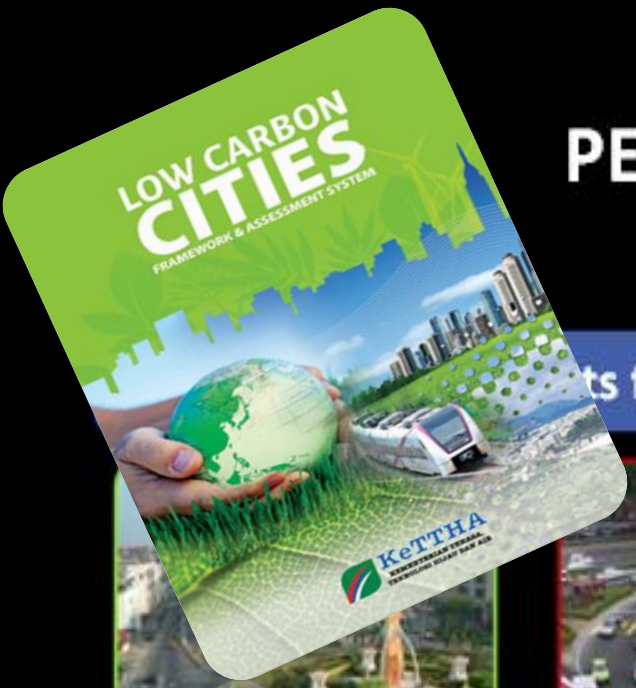


LCCF

PERFORMANCE CRITERIA

Base on Carbon Footprint



ts for GHG Reductions in Cities and Townships

Urban Environment

- Site Selection
- Urban Form
- Urban Greenery & Air Quality

Urban Transportation

- Shift of Transport Mode
- Green Transport Infrastructure
- Green Vehicles
- Traffic Management

Urban Infrastructure

- Infrastructure Provision
- Waste
- Energy
- Water

Buildings

- Low Carbon Building
- Community Service

** nZEB = High performance Low Carbon Building

Elements Contribute to GHG emission

13 Performance Criteria*

35 Sub Criteria

Brief about Green Building

Green Technology Involved

- **Energy**
- Indoor Environment
- Water Management
- Material used
- Site construction

Green Habits / Thinking

- Awareness / Responsibility
- Procurement
- Operation & Maintenance
- Recycling

Green / Sustainable / Low Carbon Buildings

Cekap Tenaga, Amalan Kita

CO_2

Reduced carbon footprint

Sustainable Building Tools in Malaysia

Sustainable Tools in Malaysia (by chronology)

1. GreenMARK (BCA – Singapore)
2. Green Building Index (GBI)
3. LEED (USGBC – US)
4. GreenRE (REHDA)
5. Melaka Green Seal (Melaka)*
6. CIS 20:2012 – GreenPASS (CIDB, now adopted by SEDA for LCB & ZEB program)*
7. Penarafan Hijau (PH-JKR)*.
8. MyCREST (CIDB-JKR)*.
9. CASBEE Iskandar (IRDA-Japan)

STANDARDS

- MS 1525
- ISO 50001
- ISO 14000

** Government tools*

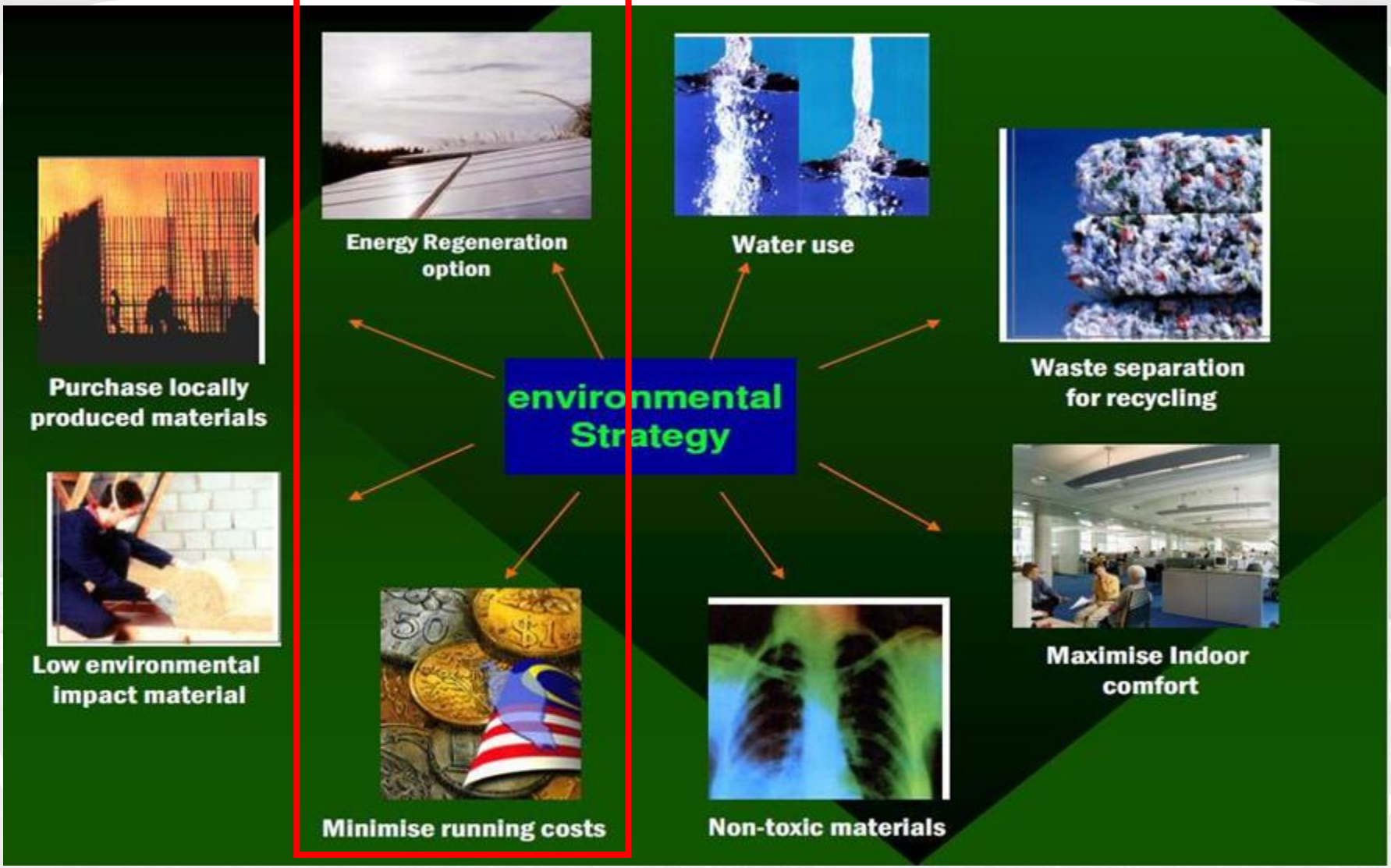
Notes:

- *GreenPASS is based on 100% CO2 reduction assessment.*
- *MyCREST is based on partially CO2 reduction assessment.*

** * No single tool be able to provide fair assessment to all type of buildings*

** * * The underlined are tolls made in Malaysia.*

Common Green / Sustainable Building Criteria



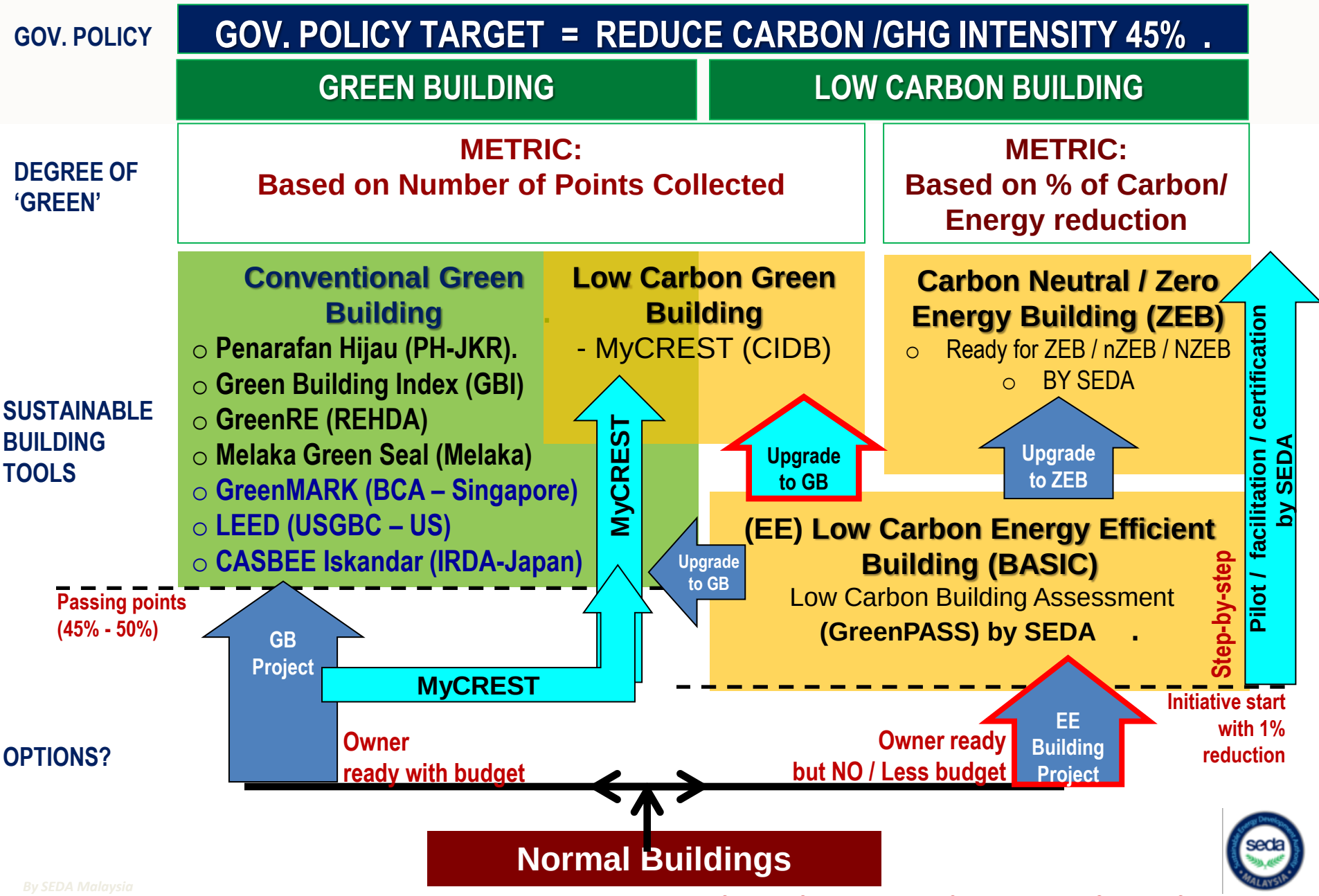
Cannot Afford to go Green Building? Difficult?

SOLUTION : DON'T STOP !!

Go for Low Carbon Building Option

An alternative and basic way to go green by appreciating SUSTAINABLE ENERGY (EE + RE) and carbon reduction achieved (Using quantitative & Step-by-step approach)

SUMMARY / MAPPING OF GREEN BUILDING / LOW CARBON



By SEDA Malaysia

Source : Sustainable Low Carbon Building Guide by SEDA Malaysia

What are the Low Carbon buildings

- **Low Carbon Building** is **similar to the conventional green building** system which promotes uses of green technology and green habits to reduce the degradation of the environment.

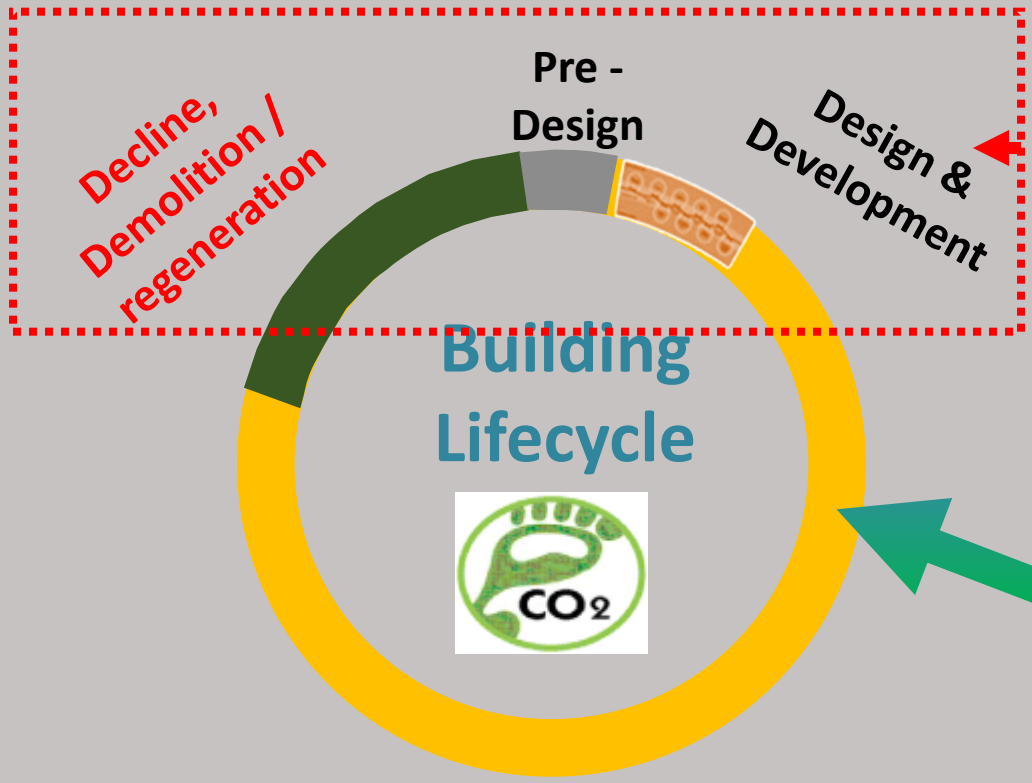
- The low carbon building **uses Carbon as metric** for **quantitative** references to assess the **actual environment impact** and **not based on points collected.**

- **A performance based:** Does not address and assess on how the building being designed. **Only** measure and assess the actual carbon reduction.

UNEP Sustainable Buildings and Climate Initiative
Common Carbon Metric

Low Carbon Building Focus on Operational Energy !

IMPORTANT FACT (by UNEP SCBI)
Carbon Emission in a life cycle of a building



During development phase
[Embodied CO2 footprint]
~ 20%

Operation Phase : Use, Management & Maintenance
[Higher Operational CO2 footprint]
From Energy Usage !!
80%

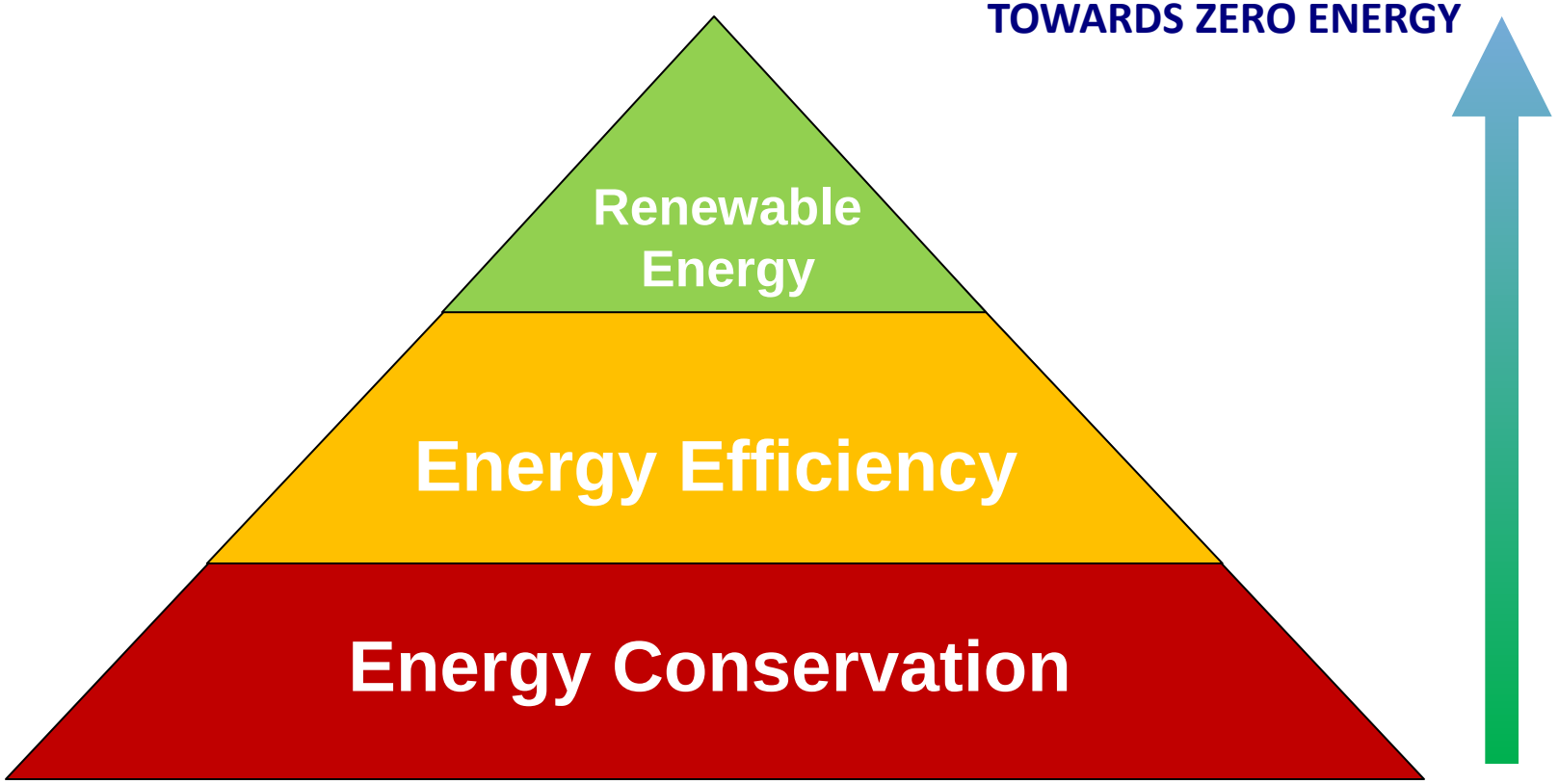
Next Step: After Energy Efficiency then Use Renewable Energy to off-set further the CO2 emission in building

FACT! Most of the CO2e emission is during the operation phase !!
ENERGY MANAGEMENT to tackle the source of the CO2 emission

Towards High Performance Low Carbon Building

Basic but Important Strategy !

TOWARDS CARBON NEUTRAL
TOWARDS ZERO ENERGY



SUSTAINABLE ENERGY PYRAMID !!

BASIC PRINCIPAL FOR SUSTAINABLE ENERGY & LOW CARBON PROGRAM

Low Carbon Building Assessment Tool - GreenPASS by CIDB (CIS 20 : 2012)

GreenPASS is a Performance Based **Assessment** System for Building

Green PASS assessment is **100% based on actual carbon emission** from building construction and / or operations

Applied for :

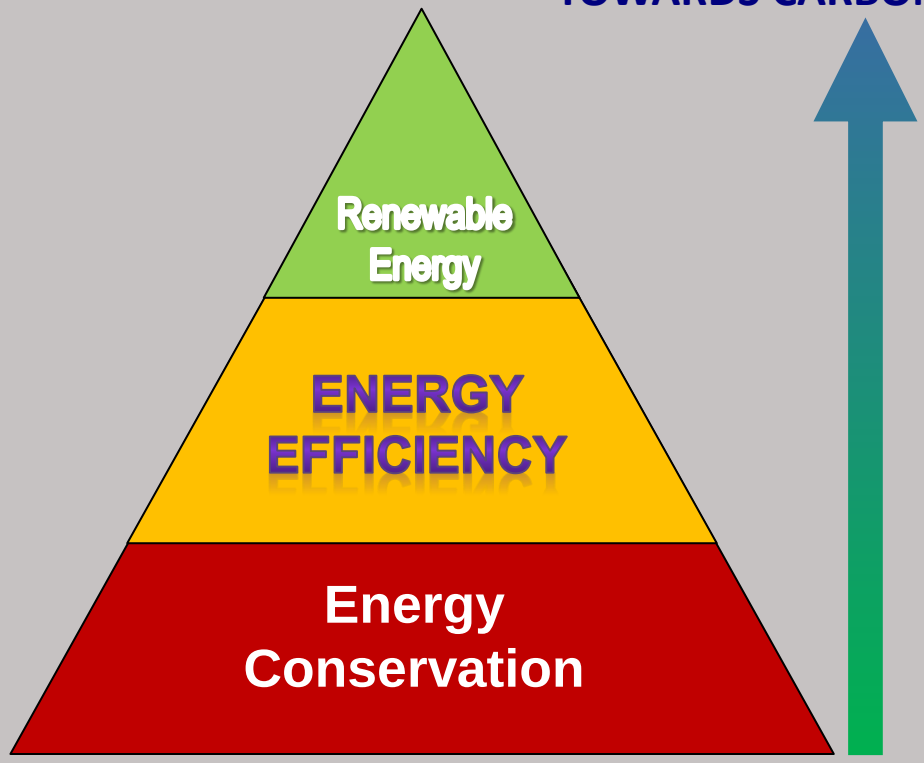
1) Building Construction;
2) Building Operations

Recognised as one of the sustainable building tools together with PH (JKR) and GBI under RMK11

Low Carbon Building / Zero Energy Building Assessment Tool by SEDA Malaysia.

* Adopted the CIDB's Construction Industry Standard (CIS-20:2012) – GreenPASS Operation

TOWARDS ZERO ENERGY
TOWARDS CARBON NEUTRAL



Level of Achievement (% of CO_2e Reduction)	Assessment Scheme for buildings (diamond)	Zero Energy Building (ZEB) Certification Scheme *
100% Carbon Neutral	💎💎💎💎💎💎	Net ZEB (NZEB)
≥ 70 to < 100	💎💎💎💎💎	Near ZEB (nZEB)
≥ 50 to < 70	💎💎💎💎	Ready Towards ZEB
≥ 30 to < 50	💎💎💎	
≥ 10 to < 30	💎💎	
≥ 1 to < 10	💎	

* Note : Possible aligning to Japan ZEB Scheme Concept

Energy Efficient Buildings Development Process for Low Carbon Building

OPERATIONAL CARBON ≡ OPERATIONAL ENERGY

USING ENERGY MANAGEMENT PROCESS

Credit to Zaini Wahab

EXAMPLES / PILOT CASES

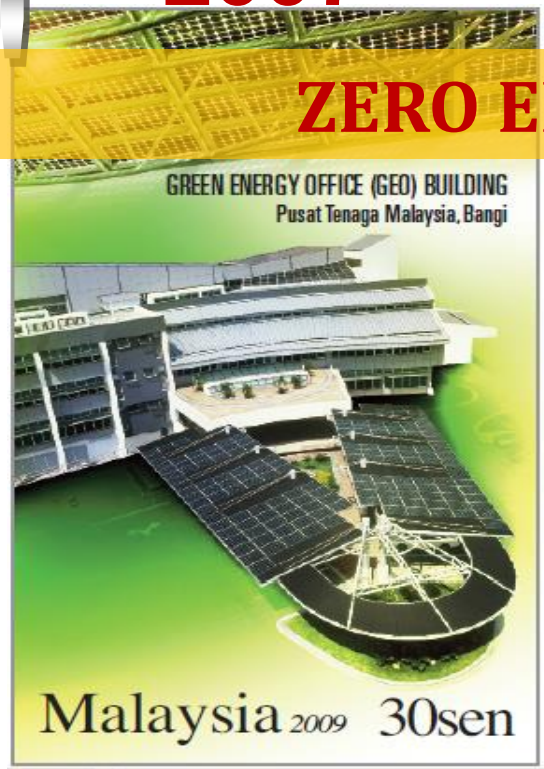
Energy Management Features & The Building Performance

NEW BUILDING DESIGN

Examples of Low Carbon (Energy Efficient) Building by the government.
CATALYS FOR GREEN BUILDING IN MALAYSIA

ZERO ENERGY BUILDINGS (ZEB)

2007

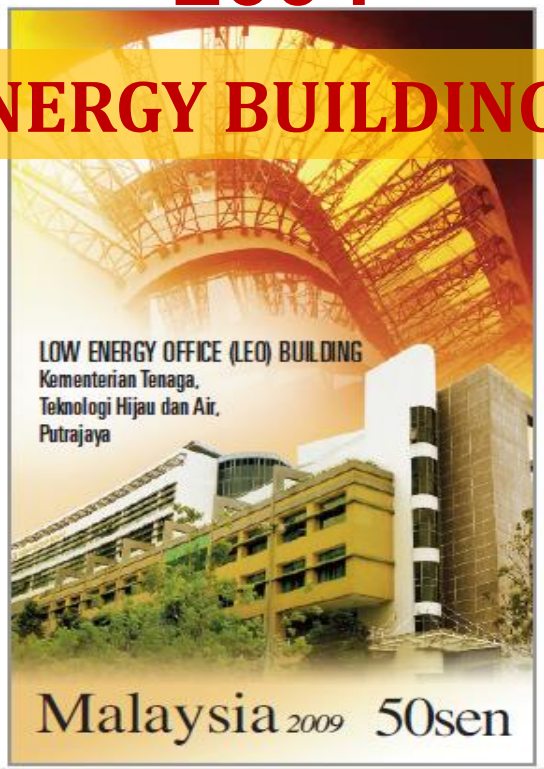


Nearly ZEB

Net BEI = 30 (86% reduce)
65 TonCO2/year
GBI : Certified (2009)
ASEAN EA : 2009/2010/2011

LCB GreenPASS Assessment (potential)

2004

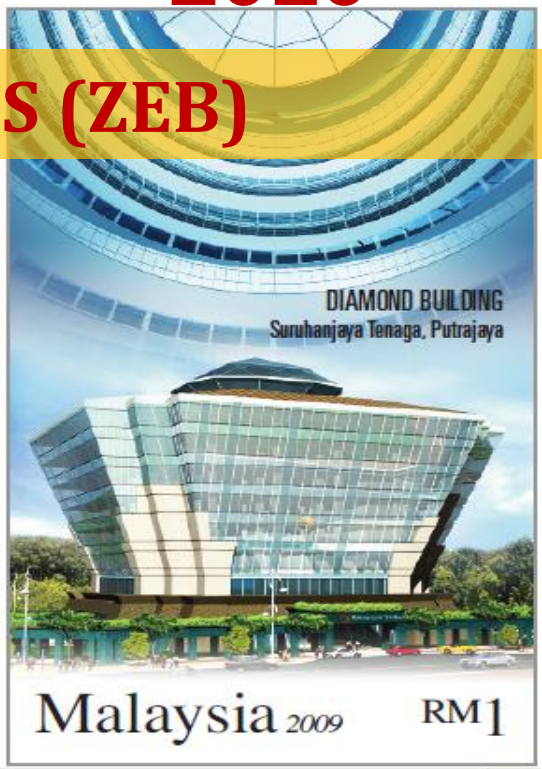


Ready to go ZEB

Net BEI = 114 (59% reduce)
1,490 TonCO2/year
GBI : Silver (2011)
ASEAN Energy Award : 2006

LCB GreenPASS Assessment (potential)

2010



Nearly ZEB

Net BEI = 63 (70% reduce)
637 TonCO2/year (**To verify)
GBI & GreenMark : Platinum (2011)
ASEAN EA : 2012

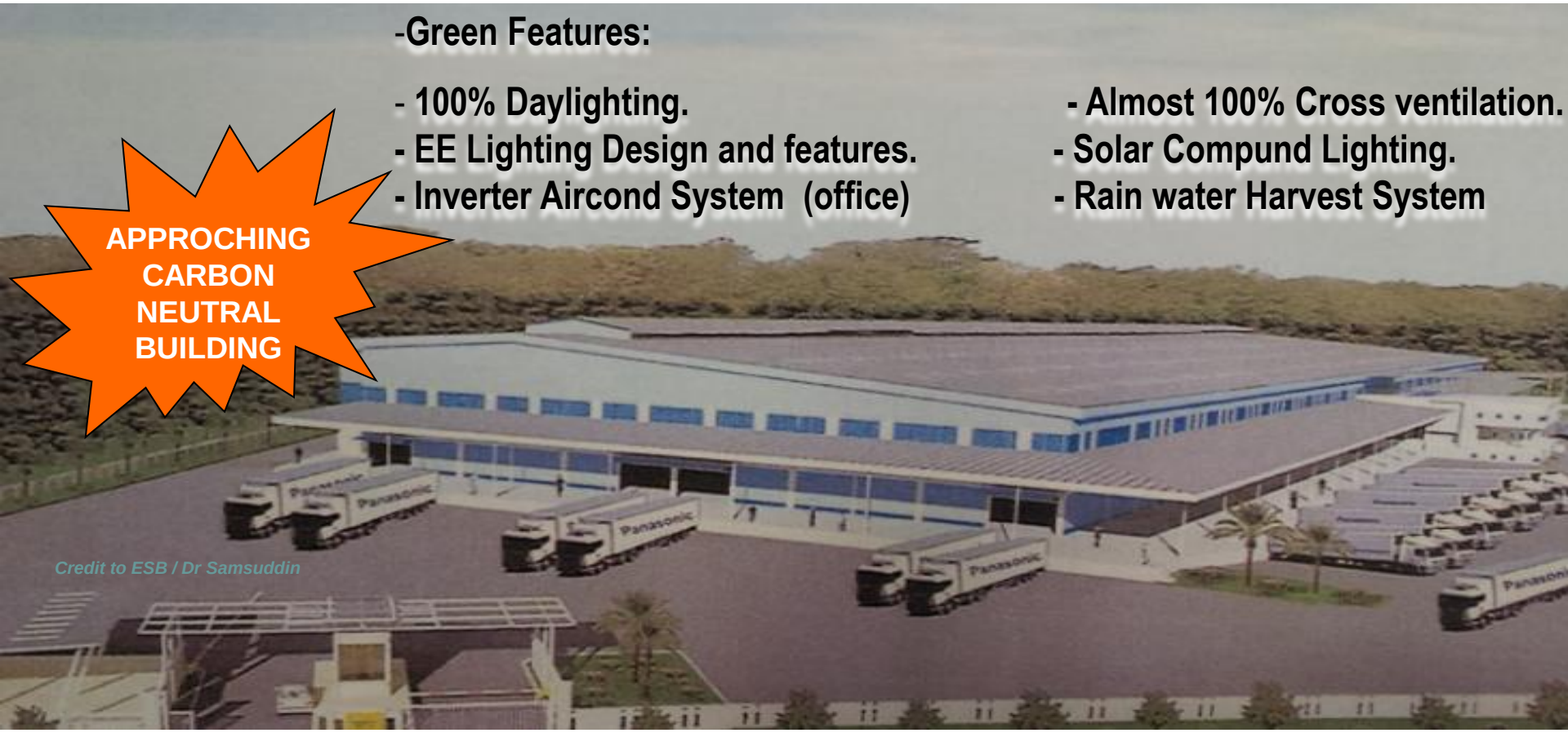
LCB GreenPASS Assessment (potential)

2011 ESB – PANASONIC GREEN WAREHOUSE in SHAH ALAM

-Green Features:

- 100% Daylighting.
- EE Lighting Design and features.
- Inverter Aircond System (office)
- Almost 100% Cross ventilation.
- Solar Compund Lighting.
- Rain water Harvest System

APPROCHING CARBON NEUTRAL BUILDING



- Net BEI = 15.6kWh/m2/year (more than 70% energy reduced)
- 384.2 TonCO2/year
- SME Green Award 2012
- ASEAN Energy Award : 2012 : 1st Runner-up Tropical Buildings

Potential LCB GreenPASS (Operational carbon) Assessment

Nearly ZEB

EXAMPLES / CASE

EXISTING BUILDINGS:
ENERGY AUDIT & RETROFIT BUILDING

ENERGY AUDITING

A systematic energy management process

To identify the potential energy saving measures in quantitative method and life cost cycle analysis

2007 : Retrofitted Warehouse / Workshop Building with Enhance Energy Management in Shah Alam

Measures	Annual Saving	
	Electrical	
	kWh/yr	RM/yr
No Cost Measures		
De-lamping office lighting	13,476	3,153.38
Low Cost Measures		
Use timer controller for temperature and operate silo ventilation	687,760	160,935.84
Use of daylight in warehouse	19,943	4,666.66
Replace normal EXIT signage to LED	2,208	516.67
Awareness campaigns	703,931	164,719.85
High Cost Measures		
Replace the Metal Halide lamps to T5HO lamps	957,012	223,940.81
Lighting zoning	498,584	116,668.66
TOTAL	**2,882,914**	**674,602**

Actual Cost Reduction 50%

Potential LCB GreenPASS (Operational carbon) Assessment

Ready to go ZEB

2010 – LOW CARBON HOUSE P14 @ PUTRAJAYA

(A Net Zero Energy Home)

Only need 2 – 3 kWp Solar PV to make zero energy house

Since 2010 – Nearly Zero Energy Home (nZEB)
In 2017 – Net Zero Energy Home (NZEB)

- The Green Features:
  - East-West building orientation.
  - Landscape to absorb heat (IR and UV
  - Natural cross ventilation & Daylighting.
  - Energy efficient light & appliances.
  - Energy efficient Interior Design.
  - Waste management.
  - Awareness and Green Practice.
  - EE (61.4%) + RE (38.6%) =

Cekap Tenaga, Amalan Kita

EE (61.4%) + RE (38.6%)
= 100% reduction
Net BEI = 0 kWh/m2/year

Potential LCB-GreenPASS on ZEB Assessment

SUB BUILDING / PARTIALLY

Sustainable Energy Development

SEDA Low Energy Office @ Kota Kinabalu 2014

APPROCHING CARBON NEUTRAL OFFICE

Only need 2.5kWp Solar PV to make zero energy office

BEI = 27 kWh/m2/year
CO2 = 16 KgCO2 / m2 / year
= 86.4% reduction

The Energy Efficient Features:

- Maximise use of Daylighting.
- Energy efficient light & appliances.
- Energy efficient Interior Design.
- Low Carbon ICT system
- Awareness and Practice.

Potential LCB GreenPASS (Operational carbon) Assessment

Nearly ZEB

Common Question by the Industry

Is the Low Carbon Building / Energy Efficient Building a green building?

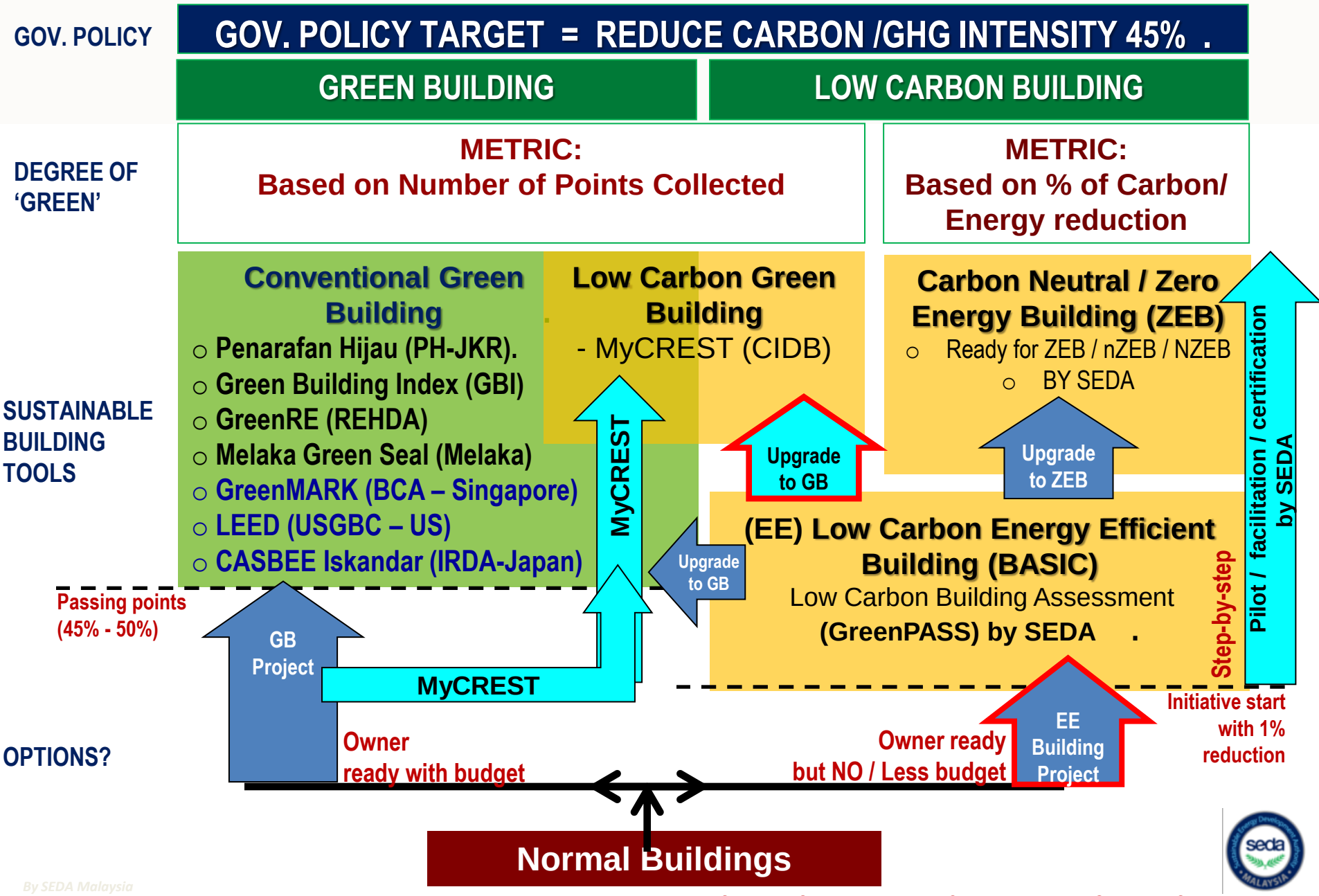
Answer = YES !

As a basic green building

Based on facts;

- ✓ **Green Technology Policy** Definition.
- ✓ **Sustainable energy** is part of basic green component.
- ✓ Most **global green buildings movement uses climate change** as key reason for going green (key contributor to climate change is carbon emission that mostly by product of energy consumption.
- ✓ **Proof in Malaysia** : The EE building (LEO & GEO Building) achieved Green Building Certification (GBI)

SUMMARY / MAPPING OF GREEN BUILDING / LOW CARBON



By SEDA Malaysia

Source : Sustainable Low Carbon Building Guide by SEDA Malaysia

Thank you for your attention

NEED HELP ON LOW CARBON GREEN BUILDING PROGRAM / ZERO ENERGY BUILDINGS?

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