

Seminar on Zero Energy Building Development Program
Zenith Hotel, Putrajaya, Malaysia.
 7 March 2024

ZERO ENERGY BUILDING (ZEB) DEVELOPMENT IN MALAYSIA



Ts. STEVE ANTHONY LOJUNTIN
 SUSTAINABLE ENERGY DEVELOPMENT AUTHORITY
 (SEDA MALAYSIA)
steve@seda.gov.my / asetio@damansara.net
 Tel : +6019-2829102



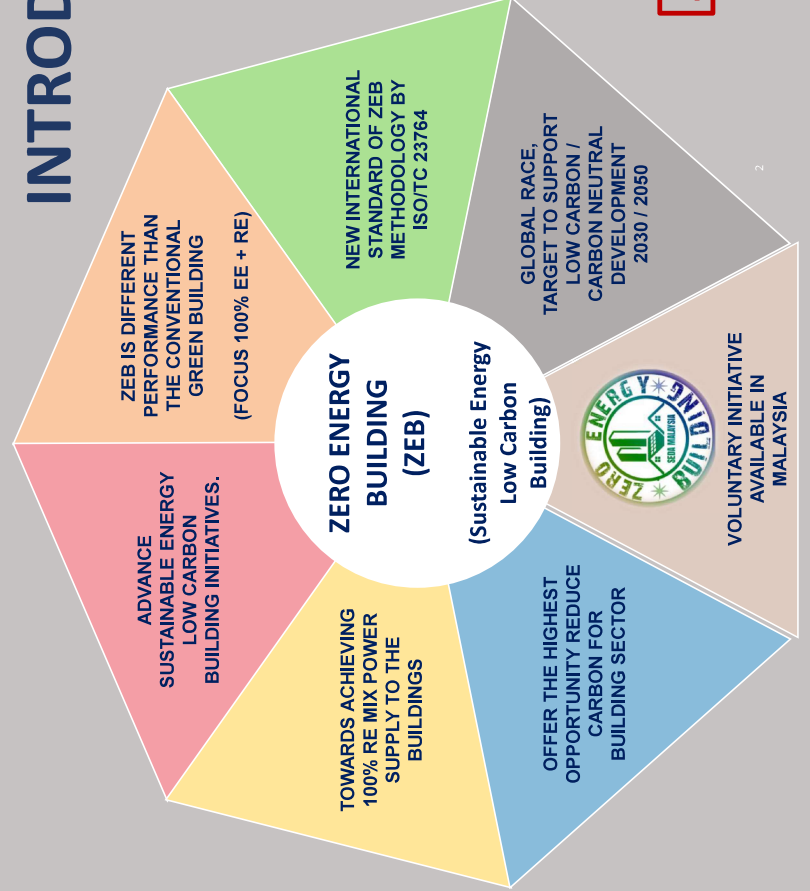
INTRODUCTION



- ZEB program able to provide direct support to the national 45% carbon reduction 2030 and later the Net Zero Carbon 2050.
- In Low / Neutral / Zero Carbon Cities Program, **building sector offer the highest chance** to reduce emission at affordable cost (quick wins).
- SEDA Malaysia has started the voluntary ZEB awareness, promotion & facilitation program in 2015;

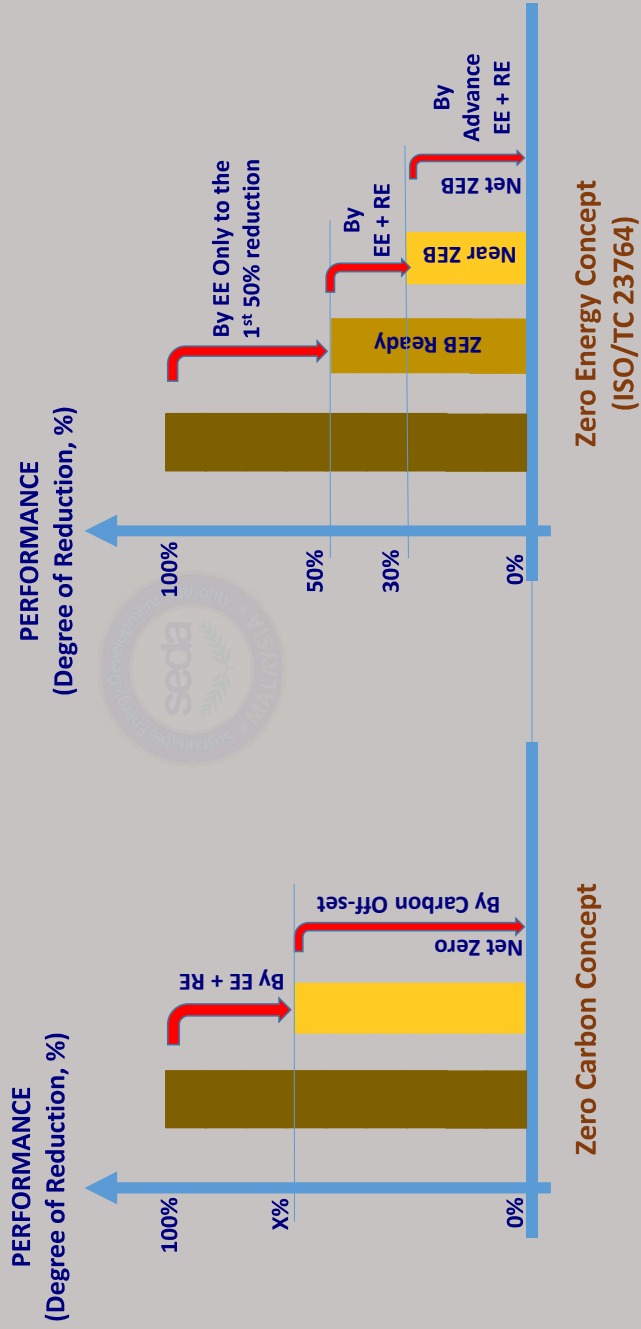
- a **compilation of experience and the continuity** of past NRECC's & agencies on EE in building design projects (The LEO, GEO & Diamond Building).

ZEB = (EE + RE) X Sustainable Practices

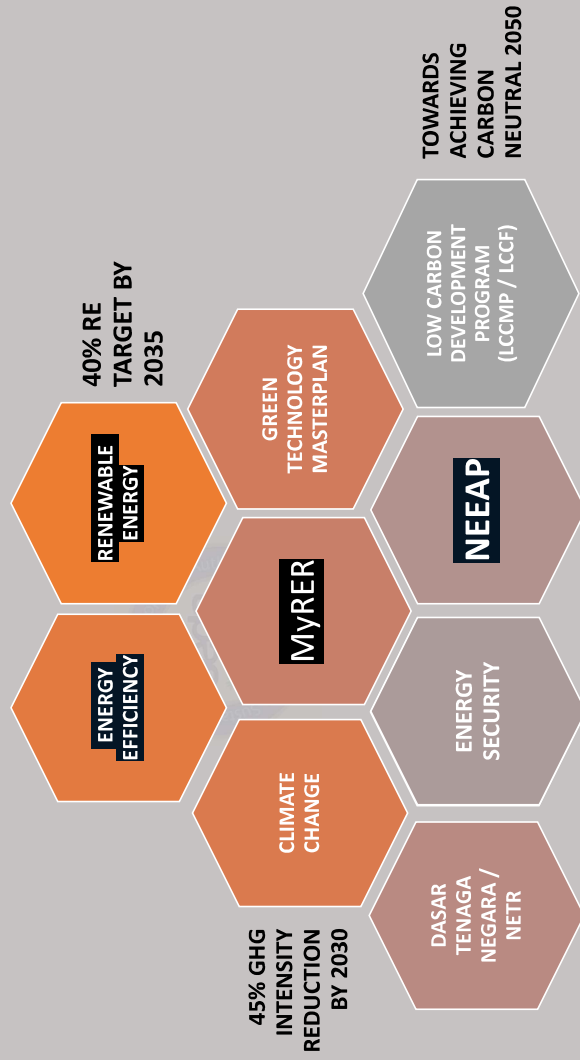


ZERO CARBON & ZERO ENERGY CONCEPT

Looks the same but it is different and will have different impact

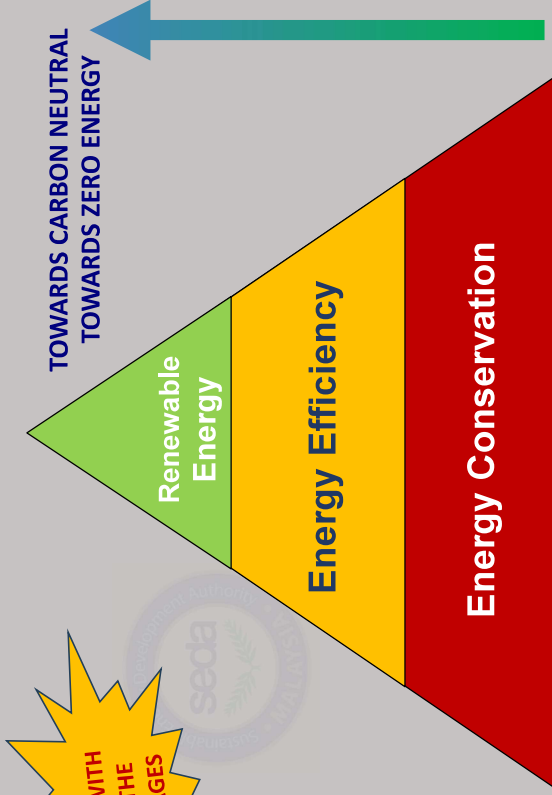
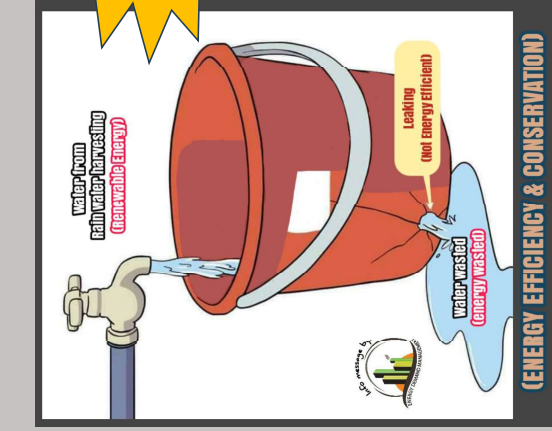


ZERO ENERGY BUILDING (ZEB) SUPPORT THE CURRENT POLICIES / PROGRAM



PRACTICAL APPROACH OF ZERO ENERGY:

Start with basic Sustainable Energy – **Energy Efficiency & Conservation**



SUSTAINABLE ENERGY PYRAMID !!

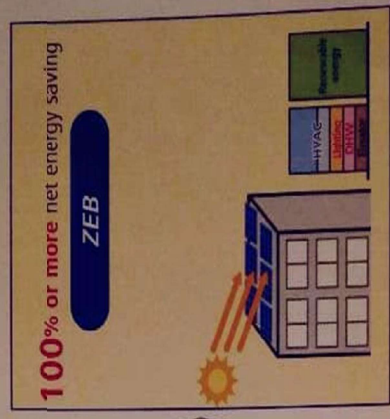
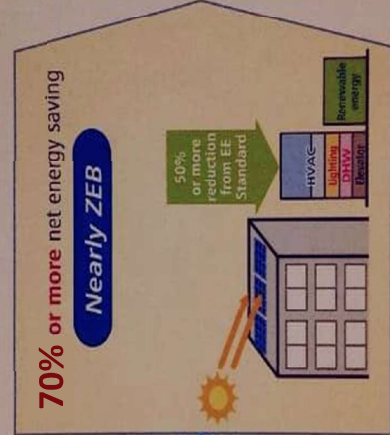
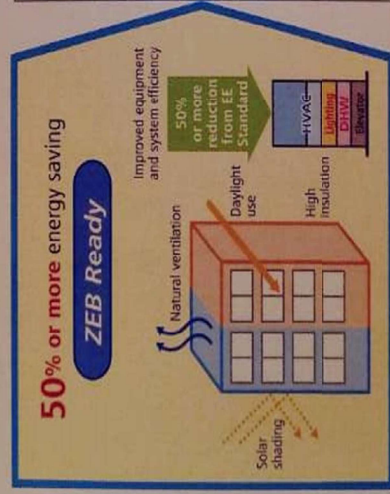
BASIC PRINCIPAL FOR SUSTAINABLE ENERGY & LOW CARBON PROGRAM



DEFINITION OF ZERO ENERGY BUILDING (ZEB) ZEB METHODOLOGY STANDARD BY THE ISO/TS 23764

Definition of ZEB

The concept of ZEB has been expanded to the “ZEB Series” which can be aimed for according to actual for conditions. The first step is to aim for super-low energy buildings which are defined as “ZEB Ready”, and then aim for “Nearly ZEB”, and above.



ZERO ENERGY BUILDINGS (ZEB) SERIES
(Malaysia adopted the definition ISO23764 on ZEB with minor changes to suit local scenario)
initiative by SEDA Malaysia, collaboration with JASE-W Japan

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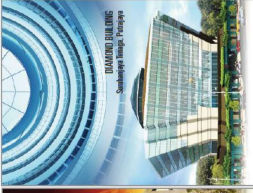
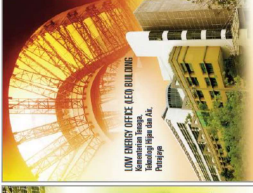


DEFINITION OF ZERO ENERGY BUILDING (ZEB) ZEB METHODOLOGY STANDARD BY THE ISO/TS 23764

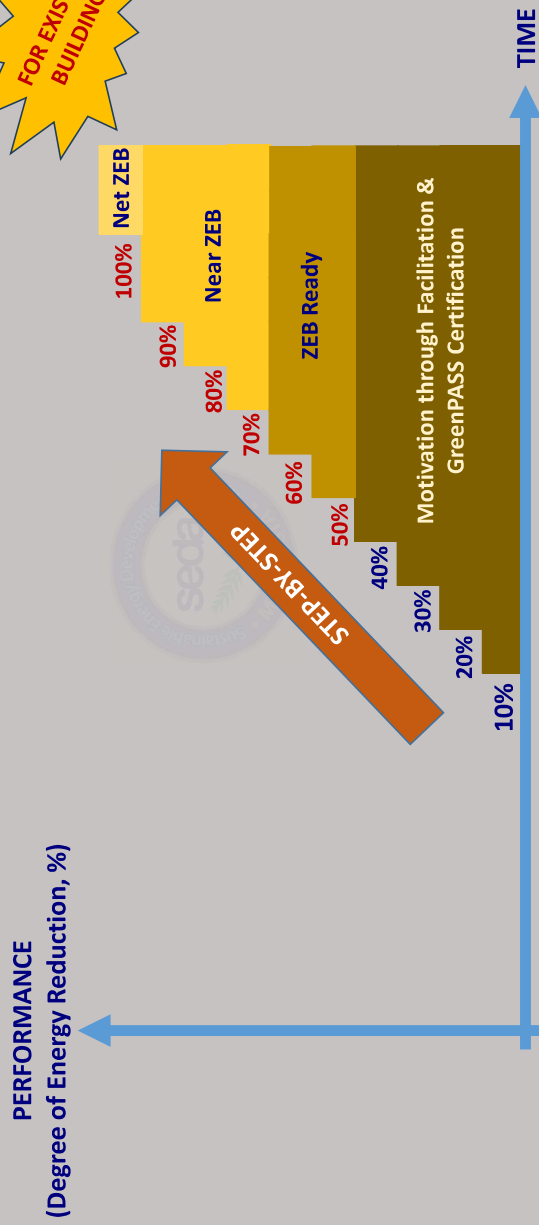
- 1) At Planning Stage:**
 - Have clear 'policy' or 'need statement' to achieve ZEB.
 - Step-by-step target (ZEB Ready, Nearly ZEB or Net ZEB).
- 2) At Design Stage:**
 - To select proper strategy to achieve ZEB.
 - Translate design to specifications : Design, materials, equipment certified by local / international standard.
- 3) At Construction stage:**
 - According to specification.
 - To install the right selected materials / equipment.
- 4) At Commissioning stage:**
 - Commissioning according to performance requirement.
- 5) At Monitoring & Verifications stage:**
 - To inspect the actual energy consumption.
 - To inspect the actual and compare to design energy consumption target.
- 6) At Reporting stage:**
 - To analyse the actual and design target energy system performance report, by simulation, etc.
 - To report the actual performance and ZEB achievement.

FOR NEW BUILDINGS

Six Core Elements for Standardisation (ISO)



Systematic and Affordable Way of Energy Efficiency Improvement to Achieve Zero Energy Building



FOR EXISTING BUILDINGS

STEP-BY-STEP APPROACH

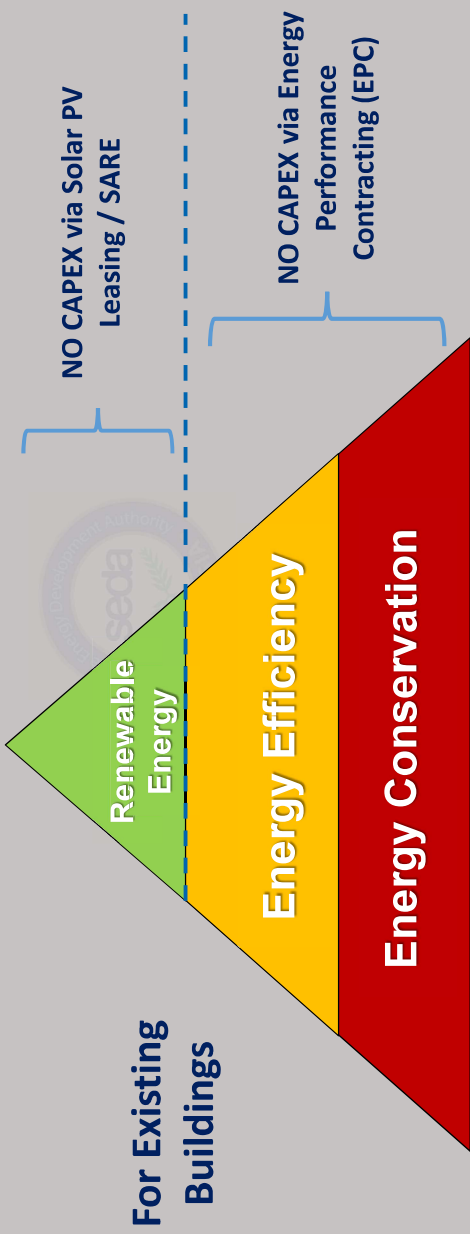


Affordable Way to Achieve Zero Energy Building (ZEB) For Existing Building



ZEB = (EE + RE) X Sustainable Practices

TOWARDS ZERO ENERGY



SUSTAINABLE ENERGY PYRAMID !!

BASIC PRINCIPAL FOR SUSTAINABLE ENERGY & LOW CARBON PROGRAM

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PAST INTEGRATED EE BUILDING DESIGN PROJECT (ZERO ENERGY BUILDING IN MALAYSIA)



2007

GREEN ENERGY OFFICE (GEO) BUILDING
Perak, Ipoh, Malaysia, Bangi

Malaysia 2009 30sen

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

2004

LOW ENERGY OFFICE (LEO) BUILDING
Kementerian Tenaga, Teknologi, Rangkaian dan Air, Putrajaya

Malaysia 2009 50sen

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

2010

DIAMOND BUILDING
Sunwayaya Innaya, Putrajaya

Malaysia 2009 RMI

BEI = 85
Net BEI = 63 (70% reduce)
637 TonCO₂/year
GBI & GreenMark : Platinum (2011)
ASEAN EA : 2012

2011

ESB - PANASONIC GREEN WAREHOUSE
SHAH ALAM

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

Surprisingly aligned to current ISO/TS 23764

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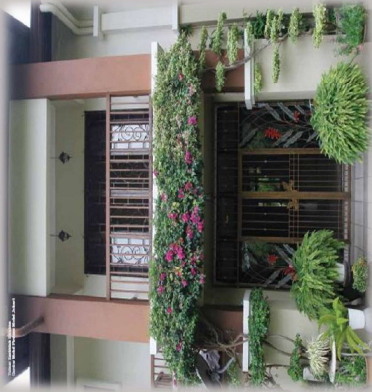


OTHER TYPE OF BUILDINGS – ISO/TS 23464 Format (ZERO ENERGY BUILDING IN MALAYSIA)



2007-2017

LOW CARBON HOUSE P14 @ PUTRAJAYA
(A Net Zero Energy Home)



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

2017 - 2022

Majlis Bandaraya
Petaling Jaya
Astaka Building



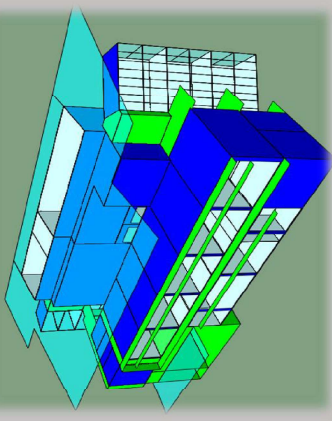
Winner of National &
ASEAN Energy Award 2022

EE (64.8%) reduction
RE (potential 23.5%)
Net Reduction (potential) = 88.4%

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2023 (NEW)

Unikl-BMI Living Lab
SEDA RE Training Partner



A Net Zero Energy Building

EE (51.3%) + RE (101.75%)
= 153% reduction
Net BEI = 0 kWh/m²/year

ZEB Assessment using Existing Tool – Aligning to ISO 23764 (No need to develop new assessment tool)

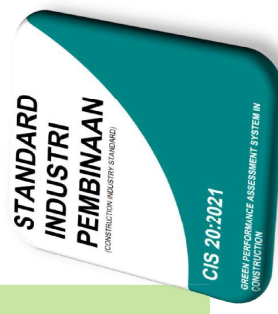
Sustainable Tools in Malaysia (by chronology)

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**
(Developed by CIDB, now adopted by SEDA)* - For Sustainable Energy
Low Carbon Building & Zero Energy Building
7. Penarafan Hijau (PH-JKR)*
8. MyCREST (CIDB-JKR)*
9. CASBEE Iskandar (IRDA-Japan)*
10. BEI Labelling (ST)*

Notes: •

• *** Government tools**
• **** The underlined are tools made in Malaysia.**
• GreenPASS is based on 100% CO₂ reduction assessment.
• MyCREST is based on partially CO₂ reduction assessment.

Compiled by SEDA Malaysia



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ASSESSMENT TOOL SUITABLE (ALIGNING TO ISO/TS 23764) FOR ZERO ENERGY BUILDING (ZEB) IN MALAYSIA

SUSTAINABLE LOW CARBON BUILDING ASSESSMENT

(Under the Low Carbon Building Facilitation Program)

A voluntary & industry driven initiative by:



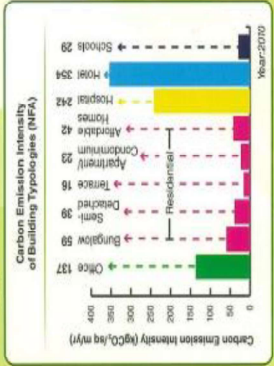
Using:
Sustainable Buildings
and Climate Initiative
UNEP
Common Carbon Metric

Carbon Reduction in Existing Building:

MEASURES	ANNUAL SAVING kWh/yr	RM/yr
No Cost Measures		
De-lamping office lighting	13,476	6,303.38
Low Cost Measures		
Use timer controller for temperature and operate air ventilation	637780	160,035.84
Use of daylight in warehouse	19,943	4,666.69
Replace normal EXIT signage to LED	2,208	516.67
Awareness campaigns	7933,931	164,719.85
High Cost Measures		
Replace the Metal Halide lamps to T5HO lamps	957012	228,040.81
Lighting zoning	486,564	116,058.06
TOTAL	2,882,914	684,401.87

Powerful GreenPASS (Operational Carbon Assessment)

Sample of Carbon Common Metric in Putrajaya:

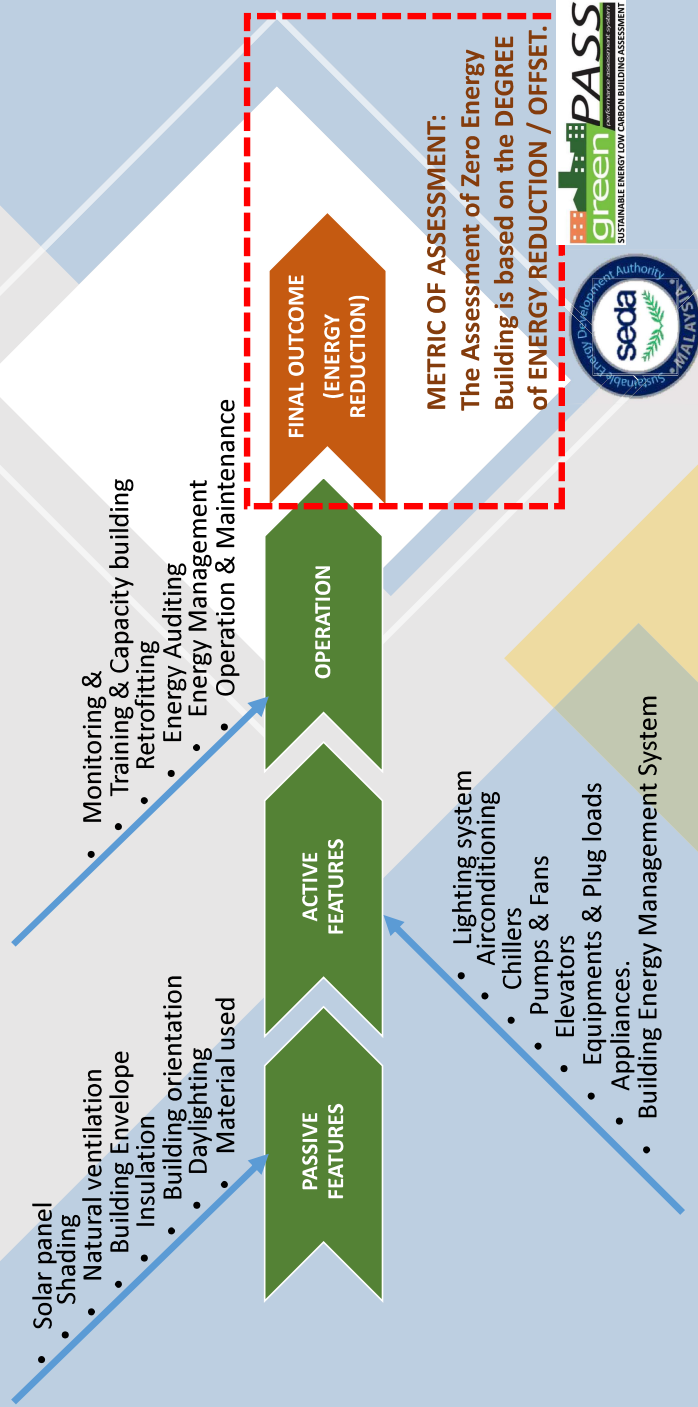


www.seda.gov.my/greenpass

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THE ASSESSMENT OF ZERO ENERGY BUILDING - An Outcome Based Assessment



greenPASS
SUSTAINABLE ENERGY LOW CARBON BUILDING ASSESSMENT

SUSTAINABLE ENERGY LOW CARBON BUILDING ASSESSMENT GREENPASS BY SEDA
 * Adopted the CIBD's Construction Industry Standard (CIS-20:2012) – GreenPASS Operation



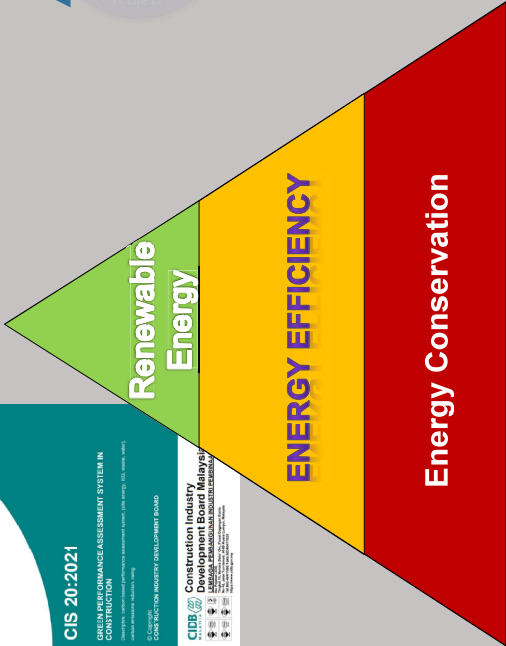
STANDARD INDUSTRI PEMBINAAN
 (CONSTRUCTION INDUSTRY STANDARD)



green PASS
 performance assessment system
 SUSTAINABLE ENERGY LOW CARBON BUILDING ASSESSMENT

CIS 20:2021
 GREEN PERFORMANCE ASSESSMENT SYSTEM IN CONSTRUCTION
 Construction Industry Standard (CIS) 20:2021
 Green Performance Assessment System in Construction
 Construction Industry Development Board

CIBD Construction Industry Development Board
 100, Jalan Sultan Abdul Aziz, 50450 Kuala Lumpur, Malaysia
 Tel: +603 2321 1000
 Fax: +603 2321 1001
 Email: info@cibd.gov.my



TOWARDS ZERO ENERGY

Level of Achievement % Energy reduction	Assessment Scheme for buildings (diamond)	ZEB Certification Scheme *
100% or more	100% (10 diamonds)	Net ZEB (NZEB)
≥ 70 to < 100	70% (7 diamonds)	Near ZEB (nZEB)
≥ 50 to < 70	50% (5 diamonds)	ZEB Ready
≥ 30 to < 50	30% (3 diamonds)	
≥ 10 to < 30	10% (1 diamond)	
≥ 1 to < 10	1% (0 diamonds)	

ZEB = (EE + RE) X Sustainable Practices

* Note : Aligning to ISO/TS 23764 & Japan ZEB Scheme Concept

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EXAMPLE: PILOT ASSESSMENT & CERTIFICATION (VOLUNTARY) USING GREENPASS



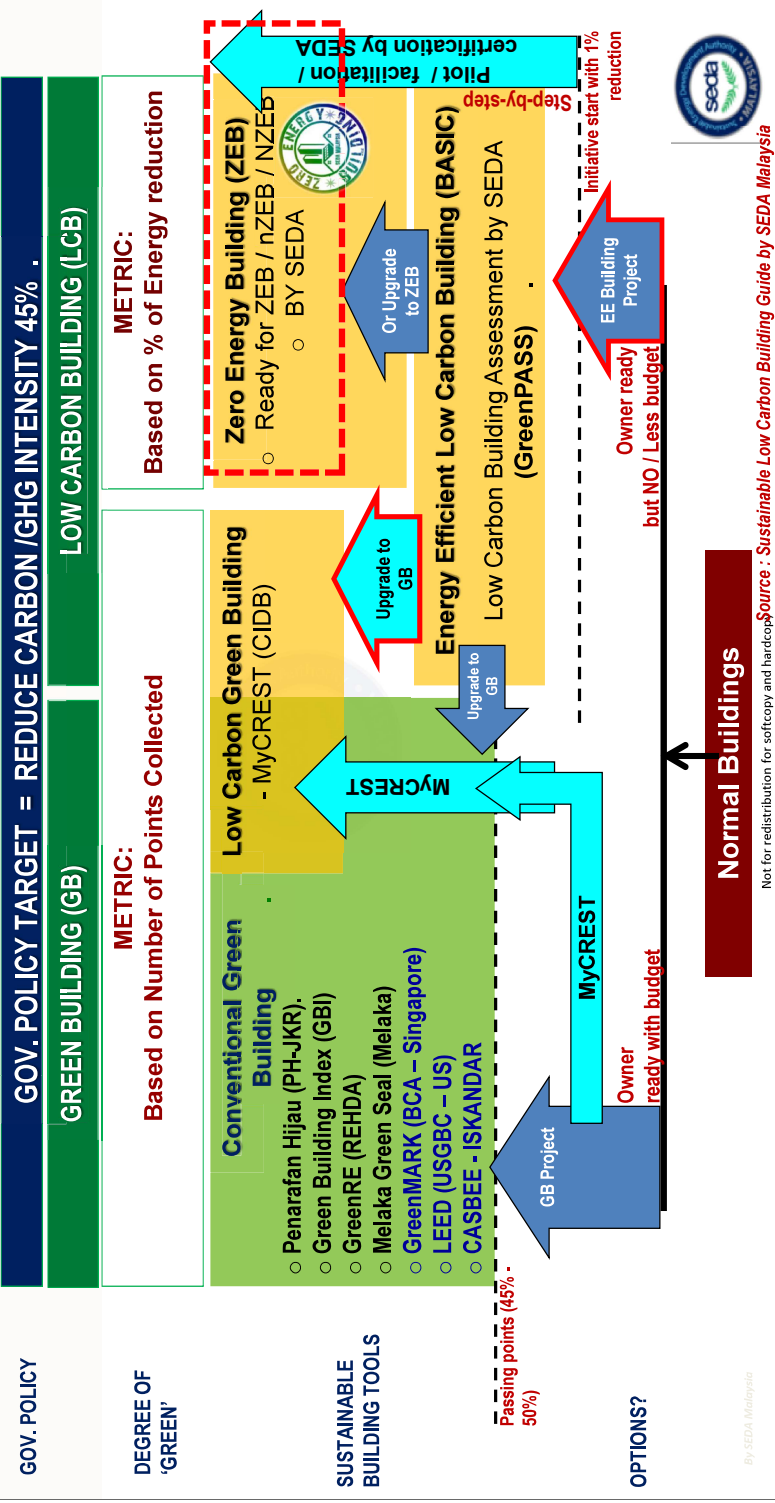
Existing building

New building

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SUMMARY / MAPPING OF VOLUNTARY GREEN BUILDING / LOW CARBON BUILDING / ZEB



CURRENT ECO SYSTEM TO SUPPORT ZERO ENERGY BUILDING (ZEB)



READY ASSESSMENT TOOL for ZEB / LCB by SEDA adopted CIDB's CIS20:2012 - *GreenPASS (Operation)*

Existing professional NGOs & experts in Malaysia (government & private)

INCENTIVES:
Current incentives on sustainable energy & financial facilities (EPC)

NET ENERGY METERING (NEM) Program by SEDA :
To off-set further balance of energy needed by RE.

Federal Government Program / PBTs:
: Energy Efficient. Renewable Energy. Low Carbon Building.

Supporting ZEB program in Malaysia



STANDARDS on Sustainable Energy:
MS1525, MS2680, MS1837, ISO15001 / AEMAS

SEDA's Low Carbon Building / ZEB Facilitation Program: PBTs, Gov Agencies & Private

Existing Sustainable Energy Service Provider (ESCOs & Solar RPVI / thermal Service Provider)

Guidelines & References Cases

Energy Efficient products ready in Malaysia (ST MEPS)

EE & RE Trainings & Capacity Building Program by agencies / private.

R & D Experts for local universities on Sustainable Energy

Affordable Online Energy Monitoring System (by SEDA, etc)



PROMOTION & DEVELOPMENT OF ZERO ENERGY BUILDING PROGRAM BY SEDA MALAYSIA

www.seda.gov.my/ZEB



PROMOTION & DEVELOPMENT OF ZERO ENERGY BUILDING PROGRAM WITH JASE-W.

- In 2018 – 2021: Annual ZEB Promotion, Awareness & Training Seminar supported by METI Japan & KeTSA.
- Soon in October 2022: Online ZEB Seminar in October 2022.



2018



2019

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2020



2021 : ONLINE

ZEB TRAINING IN JAPAN (with ASEAN countries)



**Workshop on The Dissemination and Promotion of ZEB (Zero Energy Building) and ZEB Family /series concept.
Organised & Coordinated
by METI Japan & AOTS**



3-7 September 2018 @Tokyo

FORMATION OF ZEB FOCUS GROUP



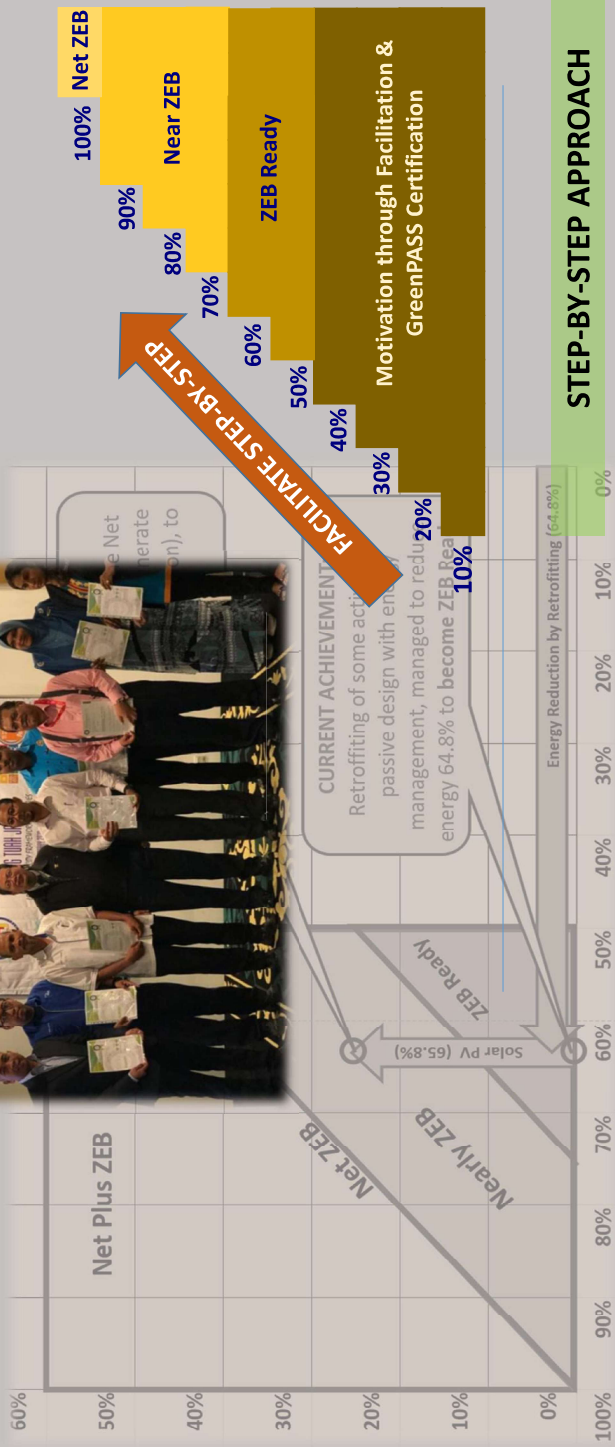
**ZERO ENERGY BUILDING (ZEB) CONCEPT:
Discussion, Promotion & Gap Analysis Study by Mitsubishi Research
Institute (MRI), UTM with Focus Group Stakeholders in Malaysia.**
KeTTHA, SEDA Malaysia, MBI, UTM, Energy Commission, GreenTech Malaysia, JKR CAST, Dept of Standard,
MGBCC, IEM, MBPJ, MPSebang, Perbadanan Putrajaya, IRDA



SEDA Malaysia Office, Putrajaya
12 March 2018



Zero Energy Building (ZEB) Facilitation to Building Owner.



Thank you for your attention



FACILITATION ON LOW CARBON BUILDING / ZEB PROGRAM?

Call / text +6019 2829102 / +603 88705800

www.seda.gov.my/ZEB



SEDA Malaysia,
Galeria PjH, Level 9
Jalan P4W, Persiaran Perdana,
Presint 4, 62100 Putrajaya, Malaysia.