GREENRE BUILD

Semi Annual Bulletin

Issue 6
July - December 2021

eISSN 2785-9401

Living With Light : Embracing Tropical Daylight for Energy Saving, Comfort & Health

Urban Heat Island : The Impact of Overheating Tropical Cities and Mitigations

Impact of Guidance Note on Ventilation and Indoor Air Quality (IAQ) for Residential and Non-Residential Settings Post COVID-19

Editorial.

EDITORIAL OFFICE
GreenRE Sdn Bhd
1st Floor, Wisma REHDA,
No. 2C, Jalan SS5D/6,
47301 Petaling Jaya,
Selangor.

Tel: +603-78032978
Fax: +603-78035285
Email: info@greenre.org

GreenRE Build is published by
GreenRE Sdn Bhd.

www.greenre.org

GREENRE BUILD
Semi Annual Bulletin

Follow us on social media for the latest news & announcements:

greenresdnbhd **greenresdnbhd** **greenremalaysia**

Content.

HIGHLIGHTS

FEATURED

Foreword.

Greetings Dear Readers,

Welcome to the year-end edition of the GreenRE Bulletin 2021.

Since September 2021, it has surely been a hectic few-months to most; particularly those actively resuming their business following the re-opening of more non-essential sectors after a long arduous pause following the full control movement order back in June 2021. With over 90% of Malaysians fully vaccinated to date, undoubtably a renewed sense of optimism for a return to normalcy follows.

As the nation continues with its recovery, the efforts to achieve a net zero carbon future is also taking shape. With the highly anticipated COP 26 recently concluded, there is real urgency globally to tackle global warming and the irreversible effects of crossing the 2○C threshold. The alarm bells have started ringing long before COP 26 and a concerted global effort to limit the rising temperatures to 1.5○C and achieving net zero carbon emissions by 2050 is thus critical before it is too late.

Over in GreenRE, despite the headwinds the industry is facing from the pandemic over the past 2 years, we are very much optimistic and encouraged by the growing number of registered projects for GreenRE certification. This a testament that the industry players are recognising the value of GreenRE certification and an increasing awareness of incorporating green elements to their products or assets to achieve long term sustainable and environmental goals.

In addition, over the months that followed during the National Recovery Period, we have also successfully achieved certain milestones most notably the endorsement from the Penang state government to incorporate GreenRE as a rating tool for green building certification by their local councils, registered 25 new GreenRE accredited professionals, the launch of our new website and recent awards of research grants with UTM and UTAR. We are also pleased to announced the completion of the GreenRE Platinum-rated WAO Child Care Centre in collaboration with REHDA Youth, the first of its kind in Malaysia. It has certainly been an eventful 2021 for us and wished to thank the management team of GreenRE for all their hardwork and efforts in their endeavours.

Lastly, our sincere appreciation to all our stakeholders for their continued support and let us move forward together towards a better 2022.

Stay safe always and a Happy New Year!

Ar Ethan Lai Wee Sheng

GREENRE MANAGEMENT COMMITTEE MEMBER

Events.

The Dubai Expo 2020 Climate Action and Property Market Webinar

The Cilimate Action and Property Market Roundtable Webinar was part of Malaysia's Net Zero Carbon Pavilion at the Malaysia Pavilion at Expo Dubai 2020 which is taking place from 1 October 2021-31 March 2022.

The roundtable was an initiative by Kementerian Alam Sekitar dan Air (KASA), under their Low Carbon Cities programme in the Expo Dubai 2022. It was jointly organised by UN Global Compact Network Malaysia and the Veritas Design Group.

The session, which included speakers and panelist from the construction and design planning sector in Malaysia, aimed to explore the synergy between the private and public sectors of the property market and built environment in advancing climate action.

REHDA President and GreenRE Director Datuk Ir Soam Heng Choon delivered the keynote address on the current and proposed state of property development in Malaysia.

The panelist for the session included Datuk Sulaiman Mohammad, Executive Director DBKL Planning, Datuk Azmir Merican, Group Managing Director of Sime Darby Property, Dato' Dr Dennis Ganendra, CEO of Min Consult, Mr Amarjit Singh, Chief Corporate Officer of Malaysia Resources Corporation, Mr David Hashim, Group President of Veritas Design Group and Mr Kenny Wong, Principle of Veritas Environment.

The recording of the roundtable session aired in Dubai Expo Malaysia Pavilion and uploaded to UNGCMYB's Youtube channel (link below) :

https://www.youtube.com/watch?v=1TS7Ej-ZcsE

Events.

GreenRE Sustainability Webinar Series,

Episode 6: Towards Net Zero Green Buildings, 21 October 2021

With climate change having an undeniable impact on the way we plan and manage cities, buildings and construction projects will need to take into account all available technologies and best practices to ensure a cleaner and greener environment. GreenRE is organising free webinars as part of our Sustainability Awareness Campaign, the sixth session in this series was held on 21 October 2021.

The two-hour free webinar, consisted of an impressive panel from University Malaya, Dr Nasrin Aghamohammadi (Assoc Professor in Environmental and Public Health, Department of Social and Preventive Medicine, Faculty of Medicine), The Institution Of Engineers, Malaysia (IEM), Ir. Ng Yong Kong (Council Member), and from Airestec Group, Mr Michael Folk (Projects and Business Development).

The welcome remarks was delivered by Datuk Seri Fateh Iskandar bin Mohamed Mansor, GreenRE Chairman and REHDA Immediate Past President. The webinar and Q&A session covered areas such as, the latest requirements for ensuring occupants well-being, WHO recommendations on IAQ and airborne viruses, HVAC recommendations, latest technology and much more.

There were around 220 registered participants for the online webinar. The next GreenRE sustainability webinar will be held in January 2021 (Green Building Innovations).

To download the presentation slides, visit: https://greenre.org/webinar_details?no=8.

Datuk Seri Fateh Iskandar bin Mohamed Mansor,
GreenRE Chairman & REHDA Immediate Past President

Hans Weemaes, Managing Director, Neapoli Sdn Bhd &
GreenRE Technical Panelist (Moderator)

Dr Nasrin Aghamohammadi, Assoc Professor in Environmental & Public Health,
Department of Social & Preventive Medicine, Faculty of Medicine, University Malaya

Ir. Ng Yong Kong , Council Member, The Institution Of Engineers, Malaysia (IEM)

Mr Michael Folk, Projects and Business Development, Airestec Group

Training.

GreenRE Accreditted Professional's Course (No.25 & No. 26) – Webinar

In the 2nd half of 2021, GreenRE conducted two intakes of the GreenRE Accredited Professional's Course (GreenREAPC), formerly known as GreenRE Manager's Course. GreenREAPC No. 25 (in June 2021) and No. 26 (25th - 28th October 2021) were both held online (via Zoom) due to the Covid-19 restrictions.

The GreenREAP course aims to provide a thorough understanding of green building principles and operations which enable candidates to gain knowledge on green building certification with a focus on GreenRE certification.

Both GreenREAP Courses were attended by over 20 participants respectively, from various backgrounds, ie. architecture, engineering (civil, mechanical and electrical), quantity surveying and project management. This course is a popular option for developers who are striving to produce sustainable real estate.

The MCQ examination and group project assessment was conducted one month after the lectures. Passing both the MCQ exam and group project are part of the requirements to be eligible to apply for the GreenRE Accredited Professional's certificate (formerly named as GreenRE Manager).

This course is also eligible for CPD points from various institutions, ie. Institution of Engineers Malaysia (IEM), Lembaga Arkitek Malaysia (LAM), Suruhanjaya Tenaga (ST) and Lembaga Penilai, Pentaksir, Ejen Harta Tanah dan Pengurus Harta (LPPEH), in addition to 15 CPD points from GreenRE.

This was the final session for 2021, for more information on GreenRE upcoming training courses for 2022 visit, https://www.greenre.org/training.

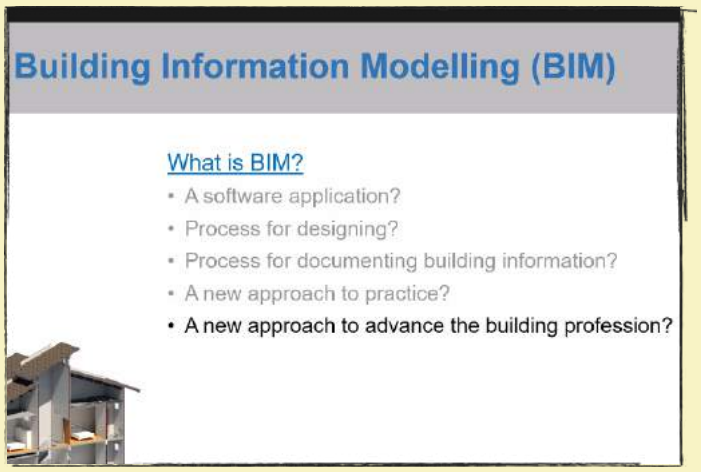
TOPIC	SPEAKERS	COMPANY
Efficient Air-Conditioning (ACMV)	Mr. Choong Chow Neng	G-Energy Pte Ltd
Artificial Lighting & Daylighting	Ar. Dr. Ratnakala Sithravel	Architectural Network
Energy Modelling & CFD	Mr Po Woei Ken	Building System & Diagnostics Pte Ltd
Water Efficiency, Rainwater Harvesting & Green Plot Ratio	Ar Clement Wong	Clement Wong Architecture
OTTV & RETV	Ar Dr Joseph Kong	DME Solutions Sdn Bhd
PV Technology	Mr Christophe Inglin	Energetix Pte Ltd
Sustainable Construction & Green Products	Mr S Ramesh	IJM Corporation Berhad
Passive Design	Ar Hoi Jung Wai	Axial Design Architect
Stormwater Management	Ir Razlan	Jabatan Pengairan dan Saliran
Green Innovation Features & Indoor Environmental Quality	Gregers Reimann	IEN Consultants Sdn Bhd

Training.

GreenRE Technical Seminar 02-2021 on Overview of GreenRE Building and Township Design Simulation, GreenRE Water Efficiency & Carbon Calculations (Webinar)

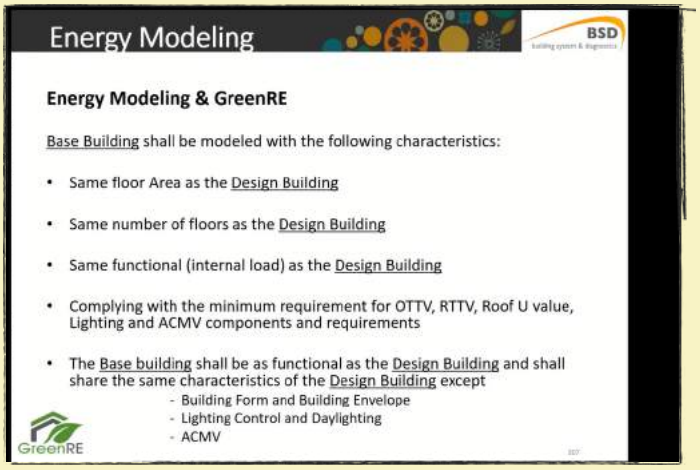
This was the first GreenRE Techical Seminar covering these topics - GreenRE Building and Township Design Simulations, GreenRE Water Efficiency and Water Calculations. It was successfully conducted by an experienced speakers from Building System and Diagnostics Pte. Ltd., Mr. Po Woei Ken and Mr. Saket Sarupria, Ar. Dr. Lim Yaik Wah (UTM) and also GreenRE Assessors, Ms. Nur Fateha and Ms. Intan Siti Zulaikha.

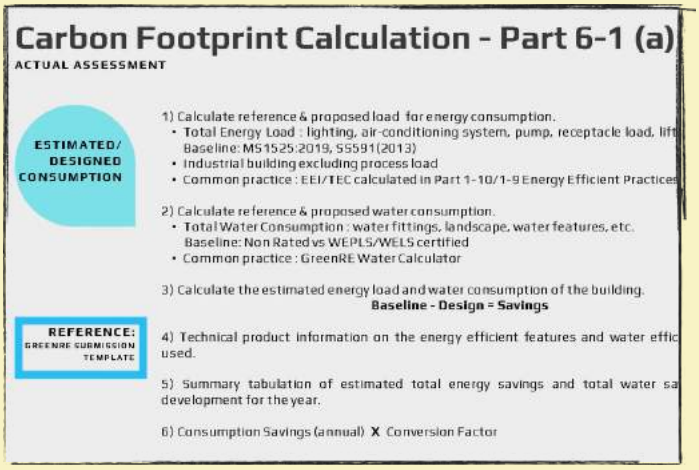
The course was carried out over two days. The first day focused on GreenRE requirements for building performance simulations, the parametric approaches for optimising building envelope thermal performance and also various case studies including computational fluid dynamics (CFD) simulation, daylighting etc. In addition, the speaker also presented on how we can leverage on parametric studies for optimising shading design in order to minimise façade solar heat gain and also other various sustainability strategies for optimising energy, water and waste.

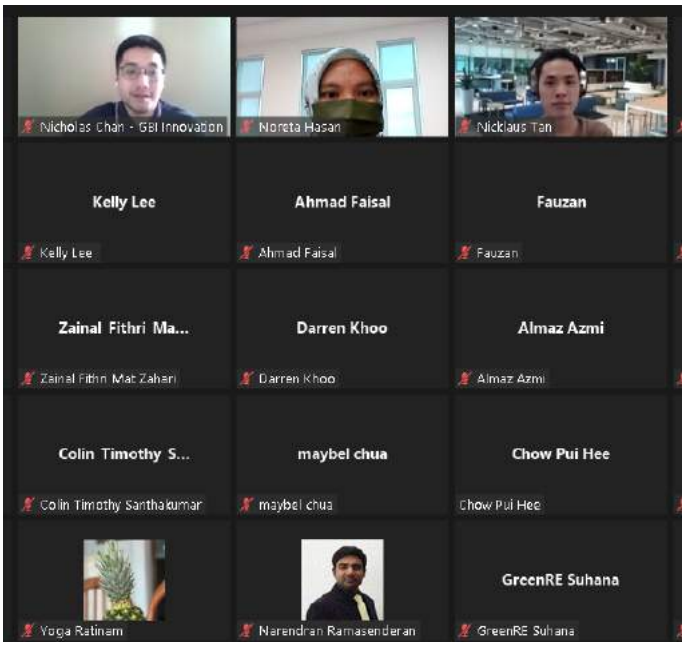


The second day of the course covered Building Information Modelling (BIM) for green building simulations by Ar. Dr. Lim Yaik Wah from UTM's Faculty of Built Environment and Surveying as well as GreenRE's Water Efficiency requirements and GreenRE Carbon Calculations for both operational and embodied carbon.

There were about 23 registered participants for this technical seminar and based on positive feedback received, GreenRE's future technical seminars will cover topics such as Overall Thermal Transfer Value (OTTV), Carbon Rating, Environmental Protection and Net Zero.







Training.

GreenRE Refresher Course 2021

GreenRE Refresher Course (GRERC) 2021 was held on 29th September 2021. The half-day course was organised to provide industry practitioners, specifically certified GreenRE Accredited Professionals (GreenREAP) up-to-date information on the latest developments in the green building industry and and GreenRE rating tools. It also included a discussion on the common mistakes made in GreenRE Project Submissions and case studies of green building projects.

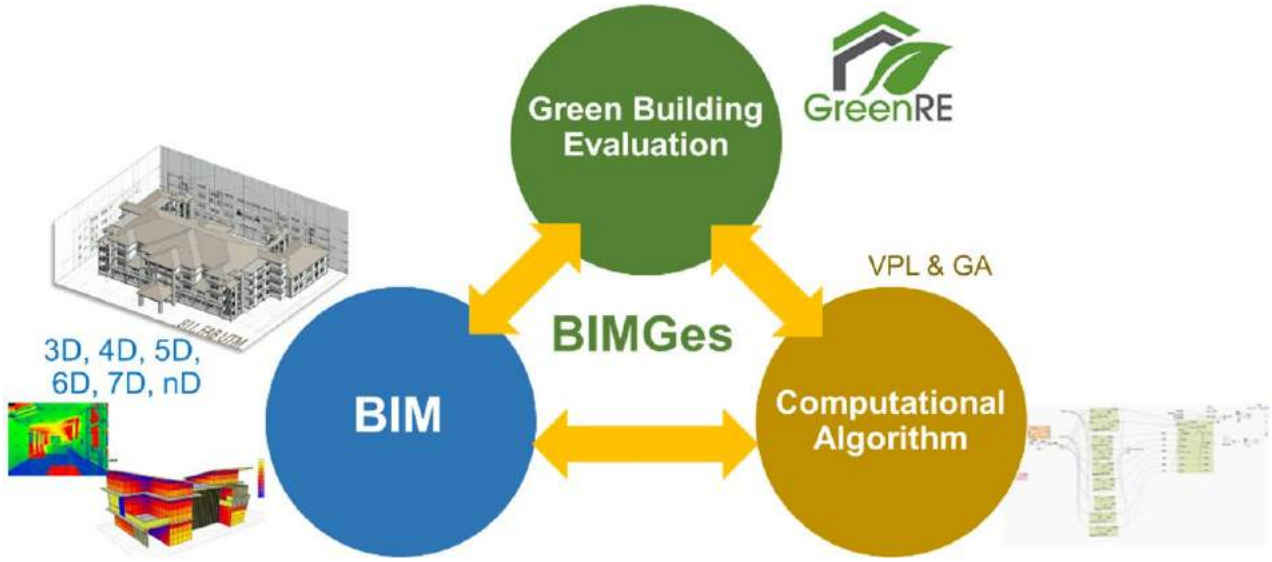
For this year, 37 GreenREAPs attended this course. GreenREAPs are required to either attend the Refresher Course or Day 1 of the GreenREAPC to be eligible for certification renewal every 2 years. In addition to this, GreenREAPs are also required to obtain a minimum of 10 CPD points per year as part of the renewal process.

The next GRERC is planned for June 2022. For more information on CPD guidelines and GreenREAP renewal application visit https://greenre.org/training.

Research on Computational Building Information Modelling (BIM)-based Automated Green Building Evaluation System

A GREENRE & UNIVERSITI TEKNOLOGI MALAYSIA (UTM) COLLABORATION

Researchers from Universiti Teknologi Malaysia (UTM) are collaborating with GreenRE on a research project titled "Computational Building Information Modelling (BIM)-based Automated Green Building Evaluation System". The project is funded by the Ministry of Higher Education, Malaysia (MOHE) with a grant amount of RM180,000. The UTM research team is led by Assoc. Prof. Ar. Dr. Lim Yaik Wah from the Faculty of Built Environment and Surveying, and the industry collaborator GreenRE team is led by Ir. Ashwin Thurairajah. The aim of this project is to develop a computational BIM-based automated green building evaluation system prototype known as 'BIMGes'. As BIM is an intelligent model, it can be integrated with computational algorithm to automate the data management, assessment, and documentation process for green building evaluation. Some of the Energy Efficiency criteria such as building envelope OTTV will be employed for the prototype development. The proposed prototype will be an innovative method of green building evaluation process using computational BIM. The research output will benefit the building designers, green building consultants, developers, facilities managers as well as researchers in the relevant fields. By providing a high level of automation, the research is expected to boost the development of green buildings for sustainable cities and communities.



By Ar. Dr. Lim Yaik Wah

Associate Professor (Architecture),
Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia (UTM).
Deputy Director, Centre for the Study of Built Environment in the Malay World (KALAM), UTM.
Principal of Lim Yaik Wah Architect.
Email: lywah@utm.my

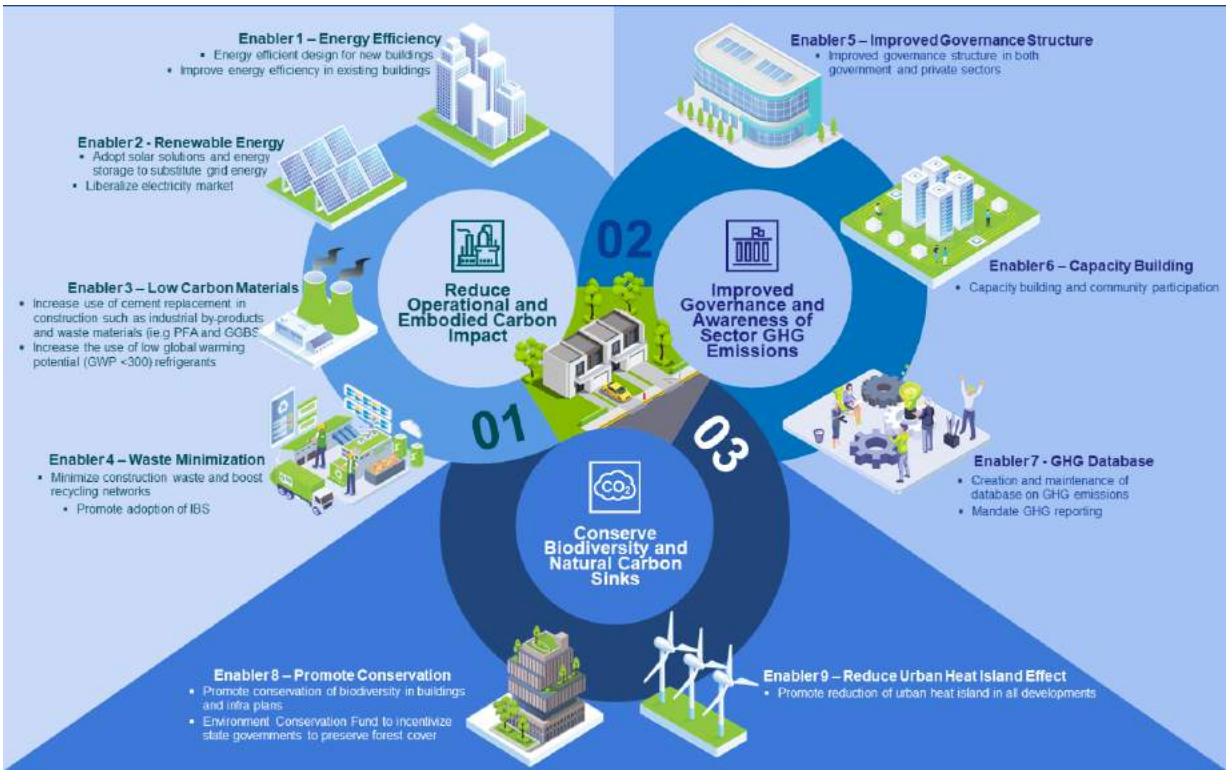
Climate Governance Malaysia (CGM)-CEO Action Network (CAN) Collaboration

As a signatory to the Paris Accord, Malaysia has committed to a national GHG emissions intensity reduction target of 45% by 2030 from 2005 levels. The 3rd National Physical Plan (NPP-3) targets a 50% reduction in national emissions intensity by 2040 and this is reflected in plans for sustainable infrastructure and the development of low carbon cities. 90% of Malaysia's population is estimated to be living in cities by 2050. The property and construction sector contributes approximately 40% of Malaysia's carbon footprint encompassing emissions throughout its lifecycle. Further, two-thirds of the building area that exists today will still exist in 2050 necessitating upgrades and retrofitting to lower their carbon impact.

To chart a course towards sustainable development in the real estate sector, GreenRE collaborated with Climate Governance Malaysia (CGM) and the CEO Action Network (CAN) to organize a series of roundtables with the aim of engaging various stakeholders to provide measurable and actionable policy recommendations for the Malaysian government. Four (4) topical roundtables were held as follows:

- **Roundtable #1** – Reducing Embodied Carbon in the Built Environment held on the 12th of July 2021. (moderated by Gregers Reiman, IEN and GreenRE)
- **Roundtable #2** – Reducing Operational Carbon in the Built Environment held on the 16th of July 2021. (moderated by Serina Hijjas, malaysiaGBC)
- **Roundtable #3** – Improving Resilience and Minimizing Ecological Damage held on the 19th of July 2021. (moderated by Dr. Dzaeman Dzulkifli, TRCRC)
- Conversation with the Ministry of Housing and Local Government (KPKT) held on the 27th of July 2021. (moderated by Dato Seri Johan Raslan, CAN)

These roundtables highlighted the need for a clear, long-term national roadmap towards lowering GHG emissions – 2050 and beyond. In tandem - enhanced regulations, improved governance and targeted incentives were the top three (3) recommendations to rapidly drive the private sector towards lowering their GHG emissions. The policy proposals are summarized as follows:



Moving forward, GreenRE will continue to engage with all levels of government to drive sustainable property development effectively. This is imperative to achieve the net zero carbon commitment by 2050 and support the carbon trading scheme proposed in the 12th Malaysia Plan.

ANNOUNCEMENT

Attention GreenREAPs!

Good News for GreenRE Accredited Professionals. There will be a **20% discount** on renewal fees until **28th February 2022**. These are the steps for the renewal application.

1. Sign up as member (GreenREAP only) in our website **www.greenre.org** via Login function.

2. Once approved, key in all courses or GreenRE projects you have been involved with. You may refer to the CPD Guidelines for CPD points approved by GreenRE.

3. Screenshot all the approved CPD courses or GreenRE projects and attach the image in the renewal form. Scan the QR code below for the renewal form.

4. GreenRE will email the invoice for renewal fee and the renewed e-certificate will be sent to you via email.

5. Renewal application is open until **28th February 2022**. Don't miss out on this discount and get your certificate updated.

Renewal Form QR Code

DATE: 14 - 17 FEB. 2022

ASSESSMENT DATE: 17 & 18 MAR. 2022

GREENRE ACCREDITED PROFESSIONAL'S COURSE NO.27 (WEBINAR)

COURSE FEE

Basic Course		
*also serves as a Refresher Course for GreenREAP	RM99	
*6 hours access to webinar contents (1st day) + Cert. of Attendance	*Member	
Complete Course and Assessment		
*19 hours access to webinar contents (4 days) + Cert. of Successful Completion + Cert. of GreenREAP (upon application and fulfilled requirements)	RM799 *Member	RM899 *Non-Member

*Member: GreenREAP/REHDA/IEM/BEM/LAM/ST/RISM/BQSM/ACEM/MIP/MBAM

CPD POINTS: GREENRE (15) | IEM, LAM, ST, LPPEH

HRDF CLAIMABLE

REGISTRATION: visit www.greenre.org / email training@greenre.org / call 03-78032978

greenresdnbhd | GreenRE Sdn Bhd Malaysia | greenremalaysia | GreenRE Sdn Bhd

Course Objectives

- To provide information and knowledge on the best practices of green building principles
- Understand and reduce life cycle cost of green buildings
- Legislative requirements on Environmental Sustainability for Buildings
- Provide an understanding on the interpretation of the GreenRE Tool Criteria, scores and certification process

Examination

The examination measures knowledge on green buildings, GreenRE rating system and the certification process. The examination is divided into 2 sections. Part 1 is multiple choice question (MCQ) test and Part 2 is group project. In keeping with our green and sustainable practices, course notes will be available in e-format.

GreenREAP Application

- Fully attended 19 hours of GreenREAP's Course
- Pass the examination (MCQ and group project)
- A recognized Degree or Diploma in related diciplines (engineering, architecture, QS, environmental science etc.) approved by GreenRE Review Panel, in addition to at least 3 years working experiences for Degree holder or 5 years working experiences for Diploma holder

*GreenREAP's certification is valid for 2 years from issuance

Renewal Requirements

- Compulsory attendance for GreenRE Refresher Course (at least once for each renewal application) or Basic Course of GreenREAP's Course (1st Day only)
- Accumulation of CPD points of 10 points per year (green building courses OR GreenRE project submission)

Schedule

14 Feb. 2022

0930 Introduction to GreenRE and Assessment Process (GreenRE)
1030 Introduction to GreenRE Rating Building & Township Tools (GreenRE)
1400 OTTV & RETV (Ar. Dr. Joseph Kong)
1630 Passive Design for Green Buildings & Township (Ar. Axxu Hoi Jung Wai)

15 Feb. 2022

1000 Artificial Lighting & Daylighting (Ar. Dr. Ratnakala Sithravel)
1430 Sustainable Construction & Green Products (Mr. S. Ramesh)
1600 Solar Photovoltaic for Buildings & Township (Mr. Christophe Inglin)

16 Feb. 2022

0930 Efficient Central Air-Conditioning (Mr. Choong Chow Neng)
1500 Indoor Environmental Quality & Green Innovation Features (Mr. Gregers Reimann & Mr. Suwan Bonma)

17 Feb. 2022

0930 Energy Modelling & Ventilation Simulation (Mr. Ken Po)
1400 Water Efficiency, Rainwater Harvesting and Green Plot Ratio (Ar. Clement Wong)
1530 Stormwater Management (Ir. Razlan Salleh)
1630 Briefing on Examination (GreenRE)

SCAN TO REGISTER

Notes:

- **The invoice will be sent once the registration has been submitted.**
- **Payment need to be done in order to get the Zoom links and also course slides.**
- **GreenRE has the right to alter the schedule of the course in the best interest and is not responsible for cancellations due to unforeseen circumstances.**

Calendar.

January - July 2022

JANUARY

19 GreenRE Free Sustainability Webinar Series
Episode 7: Future Proofing Buildings with Green Innovations.

20 CEO Series

FEBRUARY

14-17 GreenRE Accredited Professional's Course No. 27 (Webinar)

MARCH

16-19 ENGINEER Exhibition @ KLCC

17-18 GREENREAPC27 - Examination & Group Projects

22-24 GreenRE Technical Seminar 01-2022 (ACMV)

APRIL

27 GreenRE Free Sustainability Webinar Series
Episode 8: Solar

MAY

23-26 GreenRE Accredited Professional's Course No. 28 (Webinar)

JUNE

14-15 GreenRE Technical Seminar 02-2022 (Topic to be Confirmed)

23-24 GREENREAPC28 - Examination and Group Projects

29-30 ARCHIDEX - International Architecture, Interior Design and Building Exhibition

JULY

1-2 ARCHIDEX - International Architecture, Interior Design and Building Exhibition

14 Green Build Conference 2022 (GBC), TBC

20 GreenRE Refresher Course 2022

GreenRE Technical Panel Members

Tan Phay Ping
Managing Director,
Building System and Diagnostics Pte Ltd

Choong Chow Neng
Director, Business & Operation,
G-Energy Global Pte Ltd

Ar Clement Wong
Principle Architect,
Clement Wong Architecture

Ar Azril Amir Jaafar
Principal,
Veritas Architects Sdn Bhd

Ar Dr Joseph Kong
Principle,
DME Solutions Sdn Bhd

Nic Chin
Founder,
Green Quarter Sdn Bhd

Farizan D'avezac De Moran
Senior Partner,
GreenA Consultants

Sr Wan Ainon Zuraiha Wan Abdul Khalid
Chair of Building Management Board,
Royal Institute of Surveyors Malaysia (RISM)

Gregers Reimann
Managing Director,
IEN Consultants Sdn Bhd

Hans Weemaes
Managing Director,
Neapoli Sdn Bhd

Ahmad Thibri Mashri
Chief Operating Officer,
ESD Greentech Sdn Bhd

Ir Ashwin Thurairajah
Chief Operating Officer,
GreenRE Sdn Bhd

Ir Teah Oon Ling
Management Committee,
GreenRE Sdn Bhd

Teo Chui Ping
Bandar Utama Development
Sdn Bhd

GreenRE Training Panel Members

Ar Dr Joseph Kong
Principle,
DME Solutions Sdn Bhd

Ar Clement Wong
Principle Architect,
Clement Wong Architecture

Choong Chow Neng
Director, Business & Operation,
G-Energy Global Pte Ltd

S. Ramesh A/L V. Subramaniam
Senior Manager,
IJM Corporation Bhd

Ar Hoi Jung Wai
Managing Director,
Axial Design Architects Sdn Bhd

Christophe Inglin
Managing Director,
Energetix Pte Ltd

Po Woei Ken
Associate Director,
Building System and Diagnostics Pte Ltd

Gregers Reimann
Managing Director,
IEN Consultants Sdn Bhd

GreenRE Advisory Panel members

Ministry of Housing and Local Government
KPKT

Ministry of Energy and Natural Resources
KeTSA

Ministry of Environment and Water
KASA

Ministry of Transport
MOT

Department of Environment
DOE

Federal Department of Town and Country Planning
PLANMalaysia

Suruhanjaya Perkhidmatan Air Negara
SPAN

Energy Commission
ST

Sustainable Energy Development Authority
SEDA

Malaysia Investment Development Authority
MIDA

Jabatan Kerja Raya
JKR

Construction Industry Development Board
CIDB

Tenaga Nasional Berhad
TNB

Malaysian Green Technology And Climate Change Corporation
MGTC

Institut Sultan Iskandar
Universiti Teknologi Malaysia

Universiti Tunku Abdul Rahman
UTAR

National University Singapore
NUS

Malaysia University of Science and Technology
MUST

Jeffrey Sachs Centre on Sustainable Development
Sunway University

Malaysian Institute of Planners
MIP

The Institute of Engineers Malaysia
IEM

Malaysian Association of Facility Management
MAFM

Persatuan Pengurusan Kompleks Malaysia
PPKM

Master Builders Association Malaysia
MBAM

Institute of Landscape Architects Malaysia
ILAM

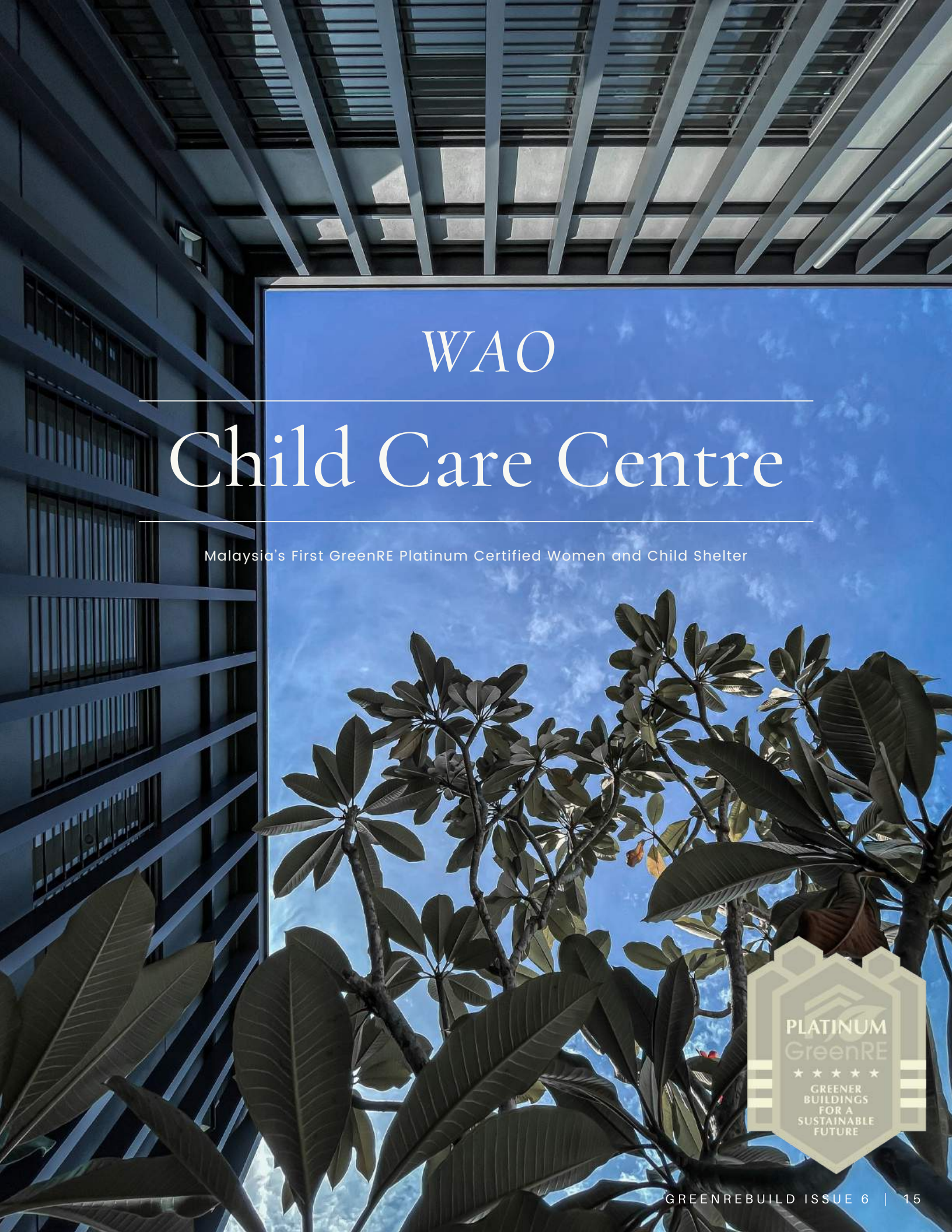
Association of Consulting Architects Malaysia
ACAM

International Green Training Centre Sdn Bhd
IGTC

Malaysian Photovoltaic Industry Association
MPIA

THANK YOU

Highest appreciation to our Technical Panel, Training Panel and Advisory Panel for your supports and contribution in 2021.
We look forward to our continued collaborations and mutual growth.



WAO

Child Care Centre

Malaysia's First GreenRE Platinum Certified Women and Child Shelter

Background

REHDA Youth (RY) signed an MOU with the Women's Aid Organisation (WAO) back in 2016 to rebuild their old bungalow which was destroyed by a fire. The home is a base for specialised childcare counselling for victims of domestic abuse.

As part of a meaningful corporate social responsibility (CSR) initiative, RY worked together with a number of industry partners (ie suppliers and consultants) to sponsor and contribute to this project, around 80% of the fixtures, electrical appliances and building materials were donated or sponsored.

With the new building, the facility meets their needs for security and privacy, for separation between children who stay there for the long term and for those who come in for daytime therapy, facilities that cater to the children's play and rest needs, for the caretakers, as well as other operational requirements.

The new WAO Child Care Centre rebuilt by REHDA Youth in collaboration with various industry partners, was designed with green building criteria in mind. The facility has fulfilled the design criteria for an environmentally sustainable building through improved energy efficiency, water efficiency, environmental protection, indoor environmental quality, and carbon offset. As a result, the WAO Child Care Centre is one of a few residential building projects to achieve the GreenRE Platinum award. With the sustainable enhancements implemented, the Child Care Center is estimated to reduce up to 40% of its total annual carbon emission.

Green Building Criteria

Energy

The energy efficient passive design of the building is demonstrated by no direct East-West facing windows, low window to wall (WWR) ratio of 0.10 and application of external shading devices to all facades which has resulted in a low envelope transfer value (RETV) of less than 20 W/m2. The building is also designed to capture prevailing wind and harness natural ventilation.

In terms of active design optimization, the building is equipped with 5-star rated electrical appliances including the use of inverter air-conditioning system and LED lighting to reduce building electricity consumption. With the energy saving measures taken, the Child Care Centre can save up to 60% of energy usage compared to a conventional landed home.

The building is also equipped with a 3kWp solar photovoltaic system, and Solar Hot Water system for renewable electricity generation which further reduces electrical consumption from the grid.

Water

All water fittings are low flow rate with “Excellent” rating under the Water Efficiency Labelling and Standards (WELS) from Singapore. A rainwater harvesting system with 750L tank size was installed to cater for landscape irrigation needs which further minimizes potable water consumption.

Green Products

The project has incorporated several eco-friendly building components. Cement and concrete are materials with the highest carbon footprint and this project replaced 30% of ordinary portland cement (OPC) with pulverized fly ash (PFA) which is a post-industrial waste from coal production. Concrete Usage Index (CUI) is an indicator of the amount of concrete required to construct a superstructure. The childcare center has a CUI of 0.133 m3/m2 which far lower than 0.35 m3/m2 baseline set by GreenRE.

Besides that, sustainable products implemented in the center such as exterior paint, gypsum board, water proofing membrane and wall panels are certified under the Singapore Green Label Scheme (SGLS). The Monier mineral roof system is certified by SIRM and malaysiaGBC. The materials are rated based on recycled content and minimizing harm to human and environment health.

To improve indoor air quality, low volatile organic compound (VOC) paint is applied to reduce harmful pollutants that can affect occupants' health.

Greenery

Extensive greenery has been incorporated into the landscape of the WAO Child Care Center including turfs, trees, and herbs. Lemon grass, Misai Kuching and King's Salad are among the herbs planted at the yard. The herbs have different functions such as as spice for food, refreshing tea and has medicinal value for treatment. Not only that, a set of recycling bins and a food waste bin is placed nearby the gate for collection of recyclables and food waste.

Transport

The WAO Child Care Center encourages the use of cycling as a low emission mode of transport, hence sheltered bicycle racks and shower facilities are provided to support the occupants who use this mode of transport.

BUILDING HIGHLIGHTS

01

FACADE

Exterior view of WAO Child Care Centre

02

COURTYARD

View towards internal courtyard

03

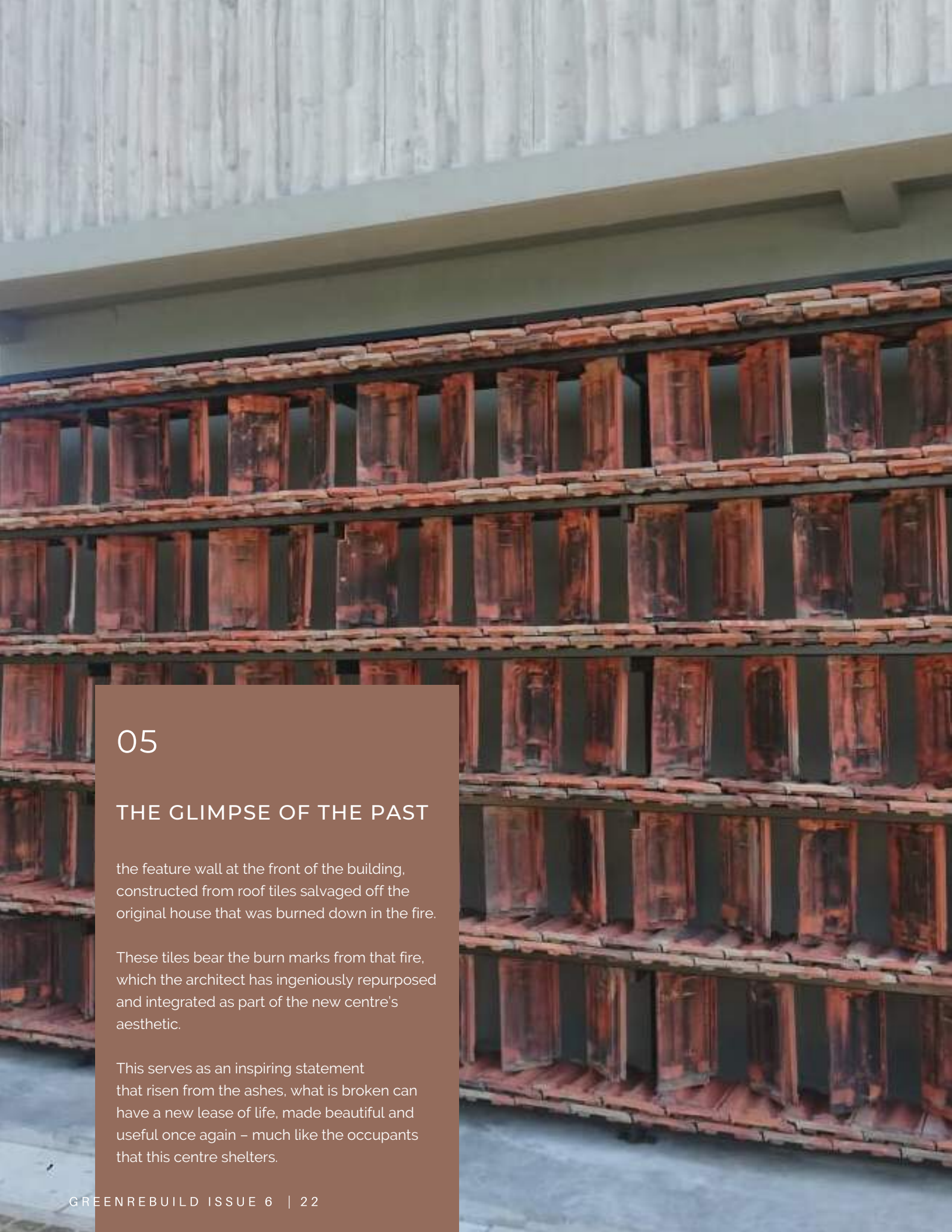
DAYLIGHT

Sufficient daylight from windows in building

04

GREEN COMMUTE

Sheltered bicycle rack provided



05

THE GLIMPSE OF THE PAST

the feature wall at the front of the building, constructed from roof tiles salvaged off the original house that was burned down in the fire.

These tiles bear the burn marks from that fire, which the architect has ingeniously repurposed and integrated as part of the new centre's aesthetic.

This serves as an inspiring statement that risen from the ashes, what is broken can have a new lease of life, made beautiful and useful once again – much like the occupants that this centre shelters.

06

ENCLOSURE

Ventilation panel provide shading for the office behind

07

LIGHT AND SHADOW

Vertical shading fins installed for reducing solar heat gain

08

RECYCLE

Recycling bins and food waste bins for shelter occupants

09

RAINWATER

Rainwater harvesting tank for landscape irrigation

10

SOLAR ENERGY

Solar panel system and solar water heater installed on the roof

09

HERBS

Misai Kuching, King's Salad,
& Lemon Grass

PROJECT TEAM

OWNER
Women's Aid Organisation (WAO)

ARCHITECT
Veritas Architect Sdn Bhd

C&S CONSULTANT
W. Lee & Associates Sdn Bhd

M&E CONSULTANT
EAB Consulting Engineers Sdn Bhd

QUANTITY SURVEYOR
Unitech QS Consultancy Sdn Bhd

LANDSCAPE ARCHITECT
Veritas Landscape Sdn Bhd

ESD CONSULTANT
BSD Consultancy Sdn Bhd

CONTRACTOR
IJM Land Berhad

Article contributed by:

BSD Consultancy Sdn Bhd
http://www.bsd.com.sg/
BSD provides consultancy towards achieving the environmentally sustainable design and construction of buildings and the built environment.

Daniel Lim (*daniel.lim@bsd.com.sg*)
Annabel Leong (*annabel.leong@bsd.com.sg*)

REHDA Youth
https://rehdayouth.com/

LIVING WITH LIGHT

Embracing Tropical Daylight for Energy Saving, Comfort & Health

By Ar. Dr. Lim Yaik Wah

Associate Professor (Architecture),
Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia (UTM).
Deputy Director, Centre for the Study of Built Environment in the Malay World (KALAM), UTM.
Principal of Lim Yaik Wah Architect.
Email: lywah@utm.my

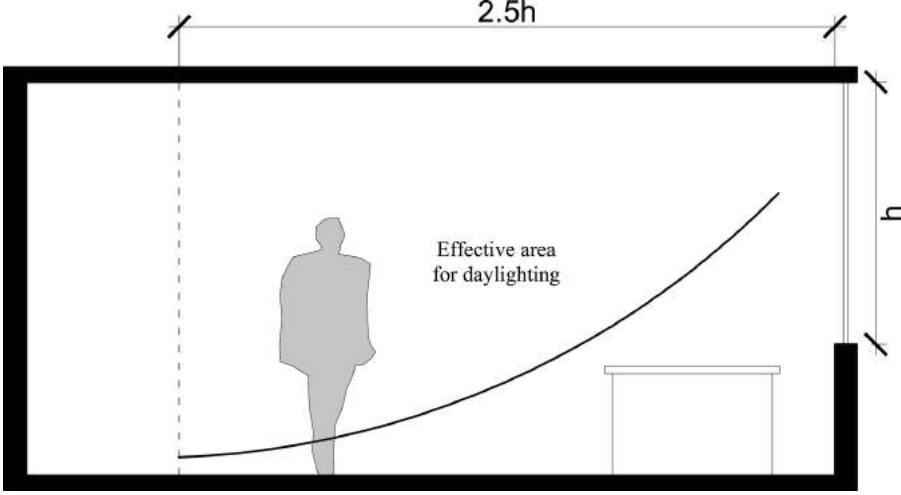
Light is the basis for all things to live and sustain; and daylight is the natural and sustainable source of light which is widely recognised to have beneficial impacts on human being physiologically and psychologically. Even the creation of human organs of visual perception is based on daylight; that is, daylight is constantly affecting human lifestyle, behaviour, emotion, comfort and health.

Light is the foundation for architecture as well. Le Corbusier, an esteemed Swiss architect, remarked that “Architecture is the masterly, correct and magnificent play of masses brought together in light.”

Daylight is a full spectrum of light which matches most closely to human visual response. In order to create a quality living environment, architecture must deal with daylight, which is the combination of natural sunlight and sky light (Fig.1). Daylighting shall be addressed as both an art and a science, as the benefits of daylight include: -

- *Energy saving for building lighting and cooling.*
- *Good quality of light for visual comfort.*
- *Psychological and physiological health.*
- *Increase of user productivity.*
- *Architectural design element.*
- *Minimum additional construction cost.*

ABOVE:
Fig.1 *Use of daylight in Energy Commission Diamond Building, Putrajaya (Lim, 2019)*



ABOVE:
Fig.2 *Rule of thumb of 2.5 times window height is effective for daylighting (Lim, 2019)*

Tropical Daylighting

In tropical regions, there is an abundance of daylight available because the external (global) illuminance can be as high as 100,000 lux, while the recommended indoor illuminance level for a common working space is only 300-400 lux according to MS1525:2019. Nevertheless, the abundance of daylight in the tropics has not been utilised to its maximum potential because it associates with solar heat gain which is high and consistent throughout the year.

Understanding the local climate and sky condition is the fundamental for good daylighting design. Tropical sky is predominantly intermediate (partially cloudy) with inconsistent presence of direct sunlight. It can change within a short period, from less cloudy sky with direct sunlight patches to cloudy sky with bright edges of clouds, hence the external illuminance may vary drastically.

Despite some buildings having large windows, many building occupants prefer to close the windows with blinds or curtains and use controllable electric lighting due to the inconsistent daylight illuminance level in tropical regions. Unshaded windows allow direct sunlight patches falling on the interior spaces which cause non-uniform daylight distribution, creating great contrast and visual discomfort.

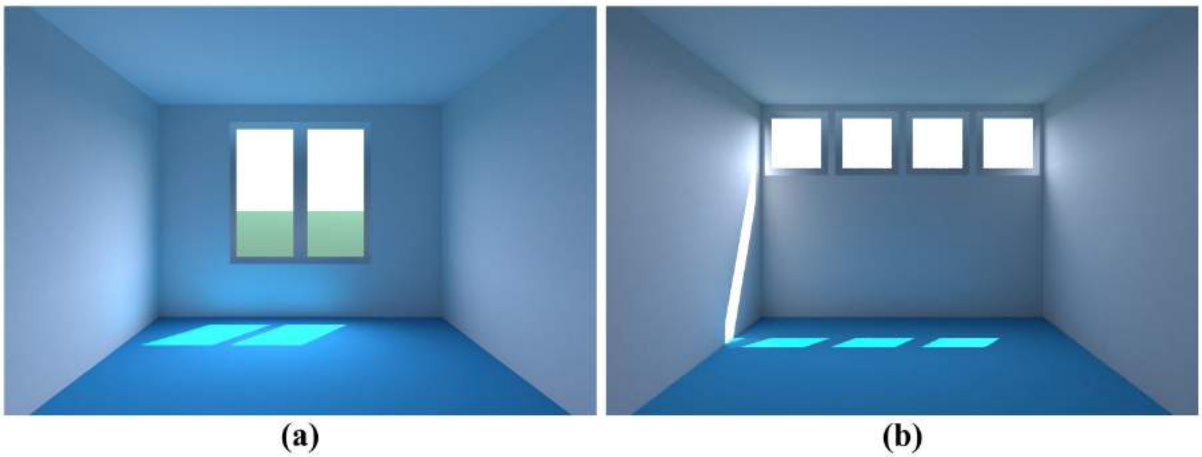
Although there are many studies on daylighting in temperate climate, the approaches to design and optimise daylight for buildings in tropical regions are expected to be different from other climatic regions, mainly due to the different sky conditions and the sun positions at locations near the equator. The challenge in tropical daylighting is not about achieving the quantity (amount) of daylight but is controlling the quality (distribution) of daylight. Various design strategies can be applied to improve tropical daylighting.

Building Form and Plan

Generally, in tropical climate windows facing north and south require lesser solar shading but receive better sky light. Besides, room depth has a great impact on daylight penetration and distribution. The rule of thumb of 2.5 times height of the window is commonly employed as the effective room depth for daylighting (Fig.2).

Window

Different window positions can give varied daylight penetration and distribution despite having similar window-to-wall ratio (WWR) (Fig.3). Besides, glazing is important to control heat gain and to allow daylight penetration. There are a few metrics for quantifying solar radiation and daylight passing through a window system such as shading coefficient (SC), Solar Heat Gain Coefficient (SHGC), and visible light transmittance (VLT).



LEFT:
Fig.3 *Different positions of window:*
(a) window at centre,
(b) window at top
(Lim, 2019)

ABOVE:
Fig.4 *External shading device (Lim, 2019)*

Shading Device

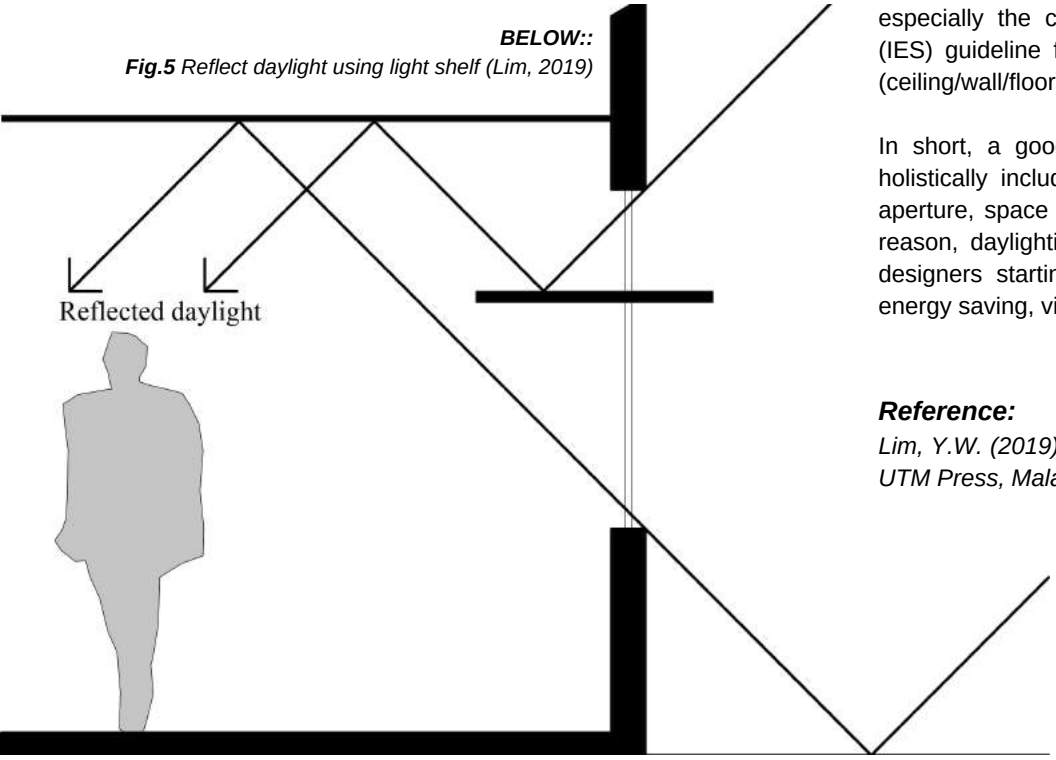
Shading device is useful to reduce direct sunlight and to control the distribution of daylight. The basic types of external shading devices include horizontal (overhang), vertical (fin) and egg-crate (Fig.4). Furthermore, light shelf is good for daylighting; it is potential to be installed internally or externally to reflect daylight into the deeper area of a building (Fig.5).

Interior

Interior design can also enhance daylighting. Changing the ceiling geometry helps to improve the daylight distribution. As the ceiling height increased, the distribution of daylight for both side-lighting and top-lighting would be better. The distribution of daylight also depends on the interior surface reflectance, especially the ceiling. The Illuminating Engineering Society (IES) guideline for minimum surface reflectance is 70/50/20 (ceiling/wall/floor).

In short, a good daylight design shall consider a building holistically including its building form, orientation, envelope, aperture, space layout, interior as well as materials. For that reason, daylighting strategies should be applied by building designers starting from the early design phase to achieve energy saving, visual comfort and occupant health.

BELOW::
Fig.5 *Reflect daylight using light shelf (Lim, 2019)*



Reference:

Lim, Y.W. (2019) Tropical daylighting for working environment, UTM Press, Malaysia. ISBN: 978-983-52-1620-6

Urban Heat Island

THE IMPACT OF OVERHEATING TROPICAL CITIES AND MITIGATIONS

by Dr Nasrin Aghamohammadi
Associate Professor of Environmental Health
Department of Social and Preventive Medicine
Faculty of Medicine, University of Malaya.
Email: nasrin@ummc.edu.my, nasrina@um.edu.my,

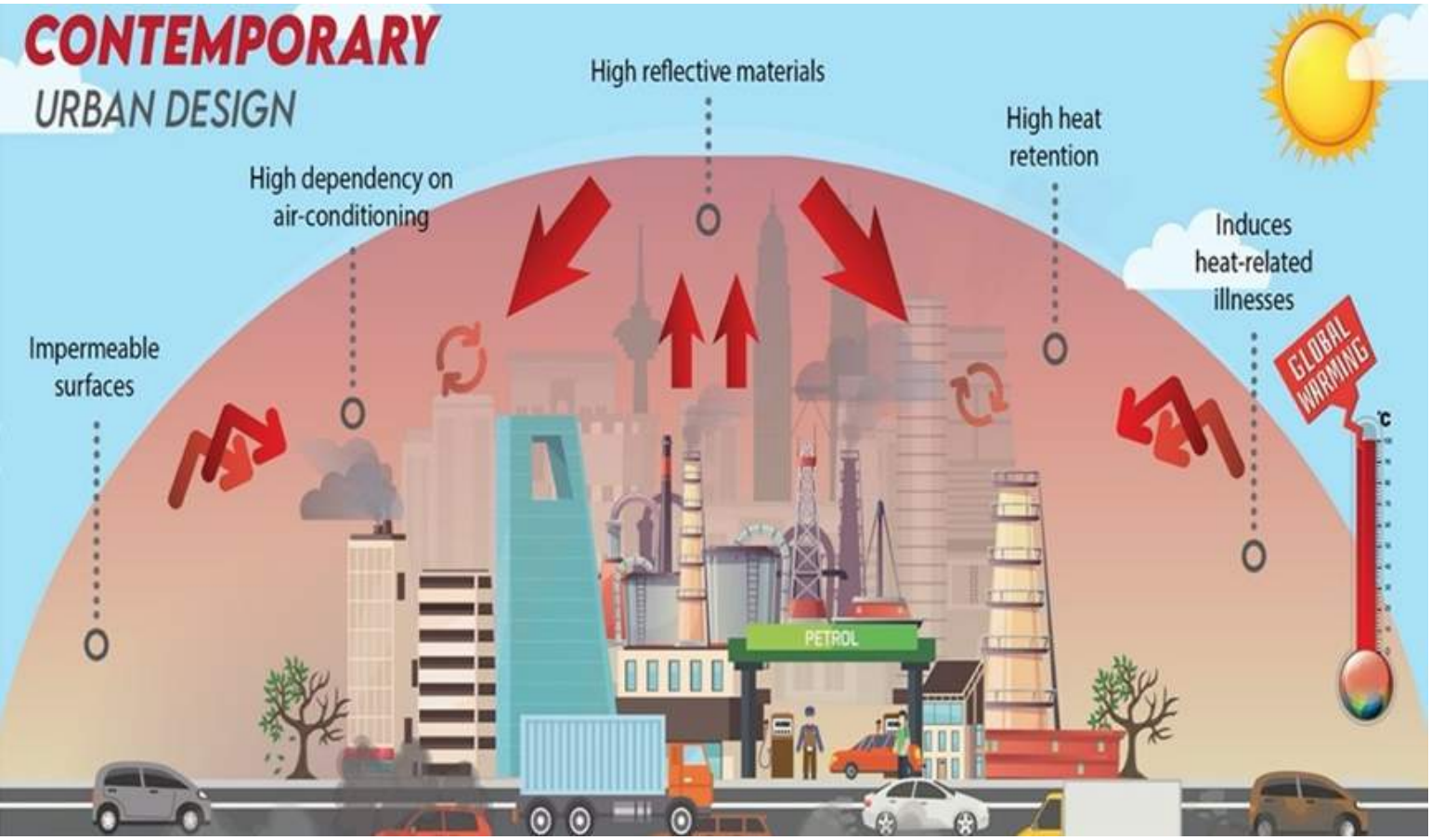
The rapid urbanisation, land-use changes and development has led to the significant rising of surface temperature in overly built urban areas compared to less dense areas mainly in Greater Kuala Lumpur and larger cities in Malaysia. This phenomenon is known as urban heat island(UHI).

Building surfaces absorb solar radiation during the day and reflects heat at night into the air which causes increased heat even at night time when we are expecting cooler time for the cities. Increasing unfavourable heat in the city centres tend to change the microclimate patterns dues to climate change such as wind direction, precipitation patterns and air pollution, water scarcity and climate disaster mainly flood in Malaysia as well as health and economic impact.

Urban Design

A review among 100 countries in 2015 shows UHI Intensity (UHII) was quite high and varied from 0.4-11°C during the late afternoons in most of the cities. Another study in Singapore investigated the temporal dynamics of UHI based on traverse observations and recorded intensities up to 7°C with the lowest temperatures in densely vegetated areas. Research in 1984 showed that the UHII of Kuala Lumpur (KL) reached up to 6.7°C in 1980. However, another researcher in 2012 recorded an increase of 1.5°C in UHII for KL city compared to a similar study done in 1985. Our recent Study in 2018 found intensity of 1.7°C in a selected urban station (Petaling Jaya) of Greater Kuala Lumpur (GKL) in 2016. Another study in 2020 determined that the night time UHII could reach up to 6°C with a significant influence from the wind speed and turbulence.

Overheated Tropical cities and extreme urban heat challenge the thermal sensations of the citizens. Many researchers documented that energy demand due to electricity consumption and cooling system of the buildings has a significant impact on increasing pollutions and adverse effects on outdoor and indoor thermal comfort. This has been indicated in the rising ecological footprint of cities that has an impact on economic losses and the levels of heat-related morbidity and mortality in metropolitan cities.



Solar radiation, heat and relative humidity are the main microclimate parameters in tropical cities that influenced the thermal comfort of city dwellers. It is found that the most important factor to identify the comfort level in humid and hot areas is shading and exposure to the heat. Therefore, it is necessary to factor in solar radiation and wind orientation in the design and planning stage to ensure public thermal comfort inside and outside the buildings in tropical cities.

Developers, urban planners and architects play an integral role in integrating the microclimate considerations to create the most favourable conditions for sustainable liveable cities at the early design stage and mitigate the increasing heat surface as well as decreasing the fever of the cities.

Urban Greening

Various research has indicated that increasing the green lung in the cities and application of vegetation and greenery in urban areas would improve the microclimate parameters such as rainfall, air temperature, relative humidity, wind pattern and solar reflections. Thus, urban greening and infrastructures have always been essential adaption strategy to mitigate the heat island phenomenon by increasing the resilience of the urban ecosystem towards heat-related consequences.

Field-based measurements explained that green lungs of the cities are cooler than the surrounding congested areas with buildings, leading to a temperature difference of up to 1°C to 7°C. The fever of the cities will cool down by increasing the vegetations (green lungs) due to shading impacts, alteration of wind patterns as well as evapotranspiration that prevents the surface/ air temperature to rise.

The shading depends on various factors such as canopy height, placement, the structure of the tree and the size of the leaf. In the process of evapotranspiration, the plant loses water into the atmosphere through evaporation. The absorbed solar energy causes an increase in the latent heat, and thus cooling the leaf as well as the temperature around the leaf. This condition is not the case for impervious urban surfaces, which immediately retain and absorb solar radiation. The ability of the vegetation to alter the air movement and advection largely depends on the vegetation type. For instance, a deciduous tree can reduce wind speed by 30–40%. Increasing the street trees, urban farming, neighbourhood park, and promoting green roofs (GR) and parks will be the mitigation approach to improve the urban greenery.

There are multiple benefits that GRs bring to the built environment:

- Air pollution reduction,
- Urban heat island effect reduction,
- Carbon sequestration,
- Reduction in urban runoff peak and quantity,
- Improving stormwater management consequently flood and disaster reductions,
- Cooling effects on microclimate,
- Acoustic insulation and noise reduction.

Urban Heat and Its Impact

Residents of Malaysia face various challenges related to environmental factors such as seasonal haze, air pollution, water crises and flash floods. UHI is another threat that is increasing thermal discomfort among urban communities. Elevating urban temperatures threaten the quality of life, increasing energy consumption and electricity bills, rising the ground-level ozone, deteriorating climate change and consequently increasing morbidity and mortality rates.

Despite a limited number of studies, previous findings revealed that increased use of air conditioning during summer increases electricity demands up to 2-4% for each 1°C rise in daily maximum temperature above the ambient air temperatures in warm climate regions. Apart from this, the urban heating phenomenon also enhances urban smog by acting as a precursor for the photochemical reactions in the atmosphere.

Consequently, health risks are increased by triggering a wide range of medical complications such as respiratory ailments, heat prostration and even cardiovascular failures. In addition, exacerbation of heat stress is often observed in temperate countries during the summer period when coupled with UHI effects. Further health implications may arise as urban warmth provides a conducive environment for many vector-borne diseases. UHI Impacts recognised directly is based on adverse impact on public health and urban migration, economic lost due to reduction of workers productivity exposed to heat , poor economic performances of households and the impact on the environment, ie. deterioration of environmental quality and natural resources.

Perspective from Stakeholder Dialogue Sessions

The impacts of Urban Heat Island (UHI) and stakeholders' perceptions are equally critical for concrete mitigation approaches and influencing their response to interventions that are aimed at encouraging behaviour change. A proper understanding of the UHI impacts on the society, economy and environment is deemed an essential motivating factor for the stakeholders to work towards UHI mitigations in the local context.

We adopted an inductive qualitative approach using Stakeholder Dialogue Sessions to assess the perceived impacts of UHI among various stakeholders, comprising policymakers, academicians, developers and Non-Governmental Organizations (NGOs), in a tropical city. The results showed five themes that were categorized into social, economic and environmental impacts;

- Deterioration of public health,
- Acceleration of urban migration patterns and spending time in cooler areas,
- Reduction of workers' productivity,
- Increased energy consumption by the households and
- Deterioration of environmental quality and natural resources

Although most of the stakeholders were quite unfamiliar with the term UHI, they still displayed a good understanding of the potential impacts of UHI due to their posterior knowledge and ability to rationalise the physical condition of the environment in which they live. The findings provide useful insights and valuable information to the local authorities to tailor necessary actions and educational campaigns to increase UHI awareness among the stakeholders. Being among the earlier studies to use a qualitative approach to attain the aforementioned objective, the findings are crucial to determine the level of understanding of the stakeholders on the impact of UHI. Through this study, the authors have highlighted the gaps and needs for knowledge improvements aimed at behaviour change among the stakeholders.

References :

*Nasrin Aghamohammadi *,Chng Saun Fonga, Muniratul Husna Mohd Idrus, Logaraj Ramakreshnana, Nik Meriam Sulaiman (2021) Environmental Heat-related Health Symptoms Among Community in a Tropical City, Science of the Total Environment (Q1,IF=7.9) (WoS)*

Nasrin Aghamohammadi, Logaraj Ramakreshnan, Chng Saun Fong, Rafidah Md Noor, Noor Rosli Hanif, Nik Meriam Sulaiman (2022) Perceived impacts of Urban Heat Island phenomenon in Greater Kuala Lumpur: perspectives from stakeholder dialogue sessions, Science of The Total Environments (WoS)*

Nasrin Aghamohammadi, Chng Saun Fong, Muniratul Husna Mohd Idrus, Logaraj Ramakreshnan, Ubydul Haque, (2021) Outdoor thermal comfort and somatic symptoms among the students in an educational campus of a tropical city. Sustainable City and Society (WoS)

Impact of Guidance Note on Ventilation and Indoor Air Quality (IAQ) for Residential and Non-Residential Settings Post COVID-19

BY IR. NG YONG KONG
B.Eng (Hons.) (Mech) UM, MBA (Hull) P.Eng.FIEM, GBIF.
Council Member of The Institution of Engineers, Malaysia (IEM)
Director of NYKK Engineering Group Sdn Bhd and Bezaire Sdn Bhd
Email: nyk@nyk.com.my

This article serves as a guide for the public on improving ventilation and Indoor Air Quality (IAQ) for residential and non-residential setting to reduce air borne transmission and its impact to the public. It should be accompanied with the latest standard operating procedures (SOP) established by Majlis Keselamatan Negara (MKN) and other key measures to reduce disease transmission such as requiring building occupants to practice physical distancing, wearing face masks, frequently washing hand and carrying out regular disinfection of high-touch points within the building.

On 8th July 2021, the Ministry of Health and Ministry of Human Resources came out with the Guidance Note on Ventilation and Indoor Air Quality (IAQ) for four different settings namely Residential, Non-Residential, Public area and Healthcare Facilities. These guidance notes were jointly developed by Ministry of Health (MOH), Ministry of Human Resources (MOHR), Department of Occupational Safety And Health (DOSH), Malaysian Public Works Department (Jabatan Kerja Raya Malaysia, JKR), SIRIM, ASHRAE Malaysia Chapter and others. It is developed based on the Industry Code of Practice (ICOP) on Indoor Air Quality 2010 published by DOSH and other established documents published by respective international organisation like Centers for Disease Control and Prevention (CDC), World Health Organisation (WHO) and ASHRAE on ventilation and indoor air quality during Covid-19 pandemic.

Residential Buildings

Some of the measures in the guidance note on ventilation are easy to adopt in residential settings, ie. by opening windows and doors in the morning and evening or where weather permits and switching on the ventilation or ceiling fans including the toilet exhaust as long as possible. As most residential settings use the split type of air conditioning system whereby air is mainly recirculated and with no provision for fresh air intake, opening of windows when air-conditioning is not in operation is the most cost effective way for air dilution.

Other measures to adopt is by using different spoon for different dishes and avoid transmission through saliva, installing mesh screens to prevent mosquitoes and insects from coming into the house, ensure water is in plumbing traps,

maintain pressurization and seal any openings between residential units. It may also be a good time to check any water log area for larvae to prevent dengue fever.

For apartments, extra care shall be taken to reduce the risk of infection in one unit from spreading to another. These include minimising opening windows in adjacent units and using balconies in close proximity at the same time.

In a nutshell, there are additional costs involved in these measures, increasing mechanical ventilation results in higher electricity consumption, usage of personal protective equipment (ie. masks, etc) and sanitisation of public spaces.

Non-Residential Buildings

For Non-Residential setting, the guidance note covers non-centralised air-conditioning system, centralised air conditioning system and natural ventilated spaces:

Condition: Centralised Air Conditioning System To reduce air borne exposures, changes to building operations have to be done and that include the following:	
Systems Evaluation of the air conditioning system and controls and to ensure that the components are functioning as per design.	
Increase the fresh air ventilation.	
Reduce occupant density.	
Check filter seals to avoid bypass.	
Check Water Systems.	
Filtration: Consider using filters of MERV 13 or higher MERV value filters provided the ACMV system can cater for it.	
Disable Demand Control Ventilation (DCV) where necessary.	
Consider using sterilization system available to sanitise or deactivate the viruses. *Eg. include ionizer, Ultra Violet Germicidal Irradiation (UVGI), Photo-Catalytic Oxidation (PCO), cold plasma Bi polar ionization, installing HEPA Filters, Low density engineered ozone system which can be installed in AHUs or ductwork*.	
Maintain temperature and RH as per recommended in the DOSH Industry Code of Practice for Indoor Air Quality (IAQ).	
Consider air flushing and others.	

Condition: Non Centralised Air Conditioning System	
Increase room ventilation rate.	
Operate existing exhaust fans in toilets or kitchen.	
Install additional ventilation system which comprises of fresh air supply and/or stale air exhaust is highly recommended.	
Use of potable air cleaners with particle filters of MERV 13 or higher to filter and clean indoor air or using air ionizers.	
Regular surface cleaning and check sanitary pipe water seals.	

Condition: Natural Ventilated Spaces	
Natural ventilation depends mainly on outdoor conditions where wind and temperature are the main factors for good ventilation.	
Do not close windows or doors when people are occupying the area.	
Consider using exhaust fans and purging the area.	
Carry out cross ventilation by opening windows or doors at opposite sides.	

Available Solutions

Air sanitiser ionisation technology such as photo catalytic oxidation or plasma clustering releases both positive and negative ions that can instantly inactive airborne pollutants, polarise air particles and make it heavy and fall. It works very differently compared to filtration/purifiacation system that traps airborne pollutants using higher MERV filters. Ionization process does produce a small amount of ozone and usually this amount is very minimal.

Another important point to note is the recommendation from World Health Organization (WHO) is a minimum of 10 l/s per person of fresh air.

How are we to achieve this as most engineers and designers in Malaysia follow the Uniform Building By-law or the Ventilation Rate Procedure in ASHRAE Standard 62.1 – 2019: Ventilation for acceptable indoor air quality for the calculation of fresh air per person by using our local occupant density of mainly 10m2/ person. This usually result in getting 5.5 l/s per person which fall short of the 10 l/s per person.

One way is to reduce the occupant density to achieve the ventilation rate to 10l/s per person. Another way is to look at the CO2 level.

It is long accepted that CO2 has been used as a surrogate for indoor pollutants emitted by humans and correlates with human metabolic activity. Indoor levels are an indicator of the adequacy of outdoor air ventilation relative to indoor occupant density and metabolic activity.

CO2 is co-exhaled with aerosol contains SARS-COV-2 by Covid-19 infected people and may be used as a proxy of SARS-COV-2 concentration indoors. But CO2 concentration alone cannot predict who has SARS-COV-2 infection.

What is the most economical way of checking the quality of air? Invest in a portable reliable **handheld CO2 sensor**. The portable handheld sensor can conveniently be carried around to monitor the level of CO2 in parts per million (ppm).

Alternatively install a wall mount CO2 monitor indicating temperature, relative humidity and CO2 level in an open office. What can be done if the CO2 PPM exceeds 800PPM as recommended by WHO? We will have to consider reducing the occupant density and increasing indoor ventilation (opening of doors and windows).

It can be concluded that in both settings regardless of the type of Air-Conditioning and Mechanical Ventilation (ACMV) systems used, it will be required to install additional equipment such as portable air cleaners, air ionizers and other sanitising systems in our ACMV systems.

However, it's heartening to note that there is a "tax incentive" or income tax (Costs of Renovation and Refurbishment of Business Premise) Rules 2020 of up to RM300,000. This amount that is extended to 31st December 2022 can be used to upgrade the ventilation system or renovate business premises to meet the guidance note to curb the spread of COVID-19.

References:

1. DOSH Guidance Note on Ventilation and Indoor Air Quality IAQ For Residential Setting and Non-Residential Setting During COVID-19 Pandemic.
2. ASHRAE Standard 62.1-2019 : Ventilation for Acceptable Indoor Air Quality
3. DOSH Industry Code of Practice for Indoor Air Quality 2010.
4. ASHRAE Journal 2020
5. ASHRAE Epidemic Task Force on Guidance Notes.

GreenRE will be organising a Technical Seminar on ACMV in the first half of 2022.

Follow us on Facebook & Instagram for latest training updates.

TECHNICAL UPDATES

1.0 Non-Residential Building (NRB v3.2) (September 2021)

- **Revision of the NRB 3-4 (h) – Provision of Green Fit Out Guideline**

  The requirement of Green Fit Out Guideline in the NRB 3-4 (h) will be removed and will be a part of the requirement in NRB 3-4(g) Provision of Building User Guide.

  Revised minimum requirement of the Building User Guide as follows:
  - Details of green building certification i.e rating tier, scorecard, certificate, validity etc.
  - Summary of green building features (ideally with photographs and diagrams)
  - Recommended practices for enhanced environmental performance of residence
  - Green fit out guidelines to detail recommended minimum environmental standards to assist building users' in making sustainable fit-out decisions.

- **Minimum floor area for Energy Modelling and Ventilation Simulation**

  For single or mixed mode ventilated buildings, requirements will be based on the following aggregate area:

Aggregate Non - Air conditioned Spaces (m2)	Aggregate Air conditioned Spaces (m2)	Ventilation Simulation requirement	Energy Modelling Requirement	Detailed manual calculation for Energy Savings
≥ 2000 m2	≥ 5000 m2	Yes	Yes	-
≤ 2000 m2	≥ 5000 m2	No	Yes	-
≥ 2000 m2	≤5000 m2	Yes	No	Yes
≥ 2000 m2	≤ 5000 m2	No	No	Yes

- **NRB 1-2: Point scoring for mixed AC system**

  Where there is a combination of centralized air-conditioned system with unitary air-conditioned system, the computation for the credits scored will be prorated according to the air conditioning capacity.

- **NRB 1-6: Artificial Lighting**

  Point scoring will be allowed if the following:
  - Provided by the developer
  - Not provided by the developer but included as part of the green lease AND inclusion in the building user guide
  - Not provided by the developer but included as obligation to a purchaser AND inclusion in building user guide

2.0 Residential Building (NRB v3.2) (September 2021)

- **Revision of the RES 3-4 (g) – Provision of Building User Guide**

  The requirement of Green Fit Out Guideline will be a part of the requirement in RES 3-4(g) Provision of Building User Guide.

  Revised minimum requirement of the Building User Guide as follows:
  - Details of green building certification i.e rating tier, scorecard, certificate, validity etc.
  - Summary of green building features (ideally with photographs and diagrams)
  - Recommended practices for enhanced environmental performance of residence
  - Green fit out guidelines to detail recommended minimum environmental standards to assist building users' in making sustainable fit-out decisions.

- **RES 1-1: RETV**

  In calculating the RETV, the habitable space façade should be considered in the calculation inclusive of facilities and amenities facade.

3.0 General

- **Energy Modelling Template**

  Every energy modelling submission must be submitted with the filled energy modelling template. Energy Modelling template is available for download from GreenRE's Website.

- **RES 1-1: RETV**

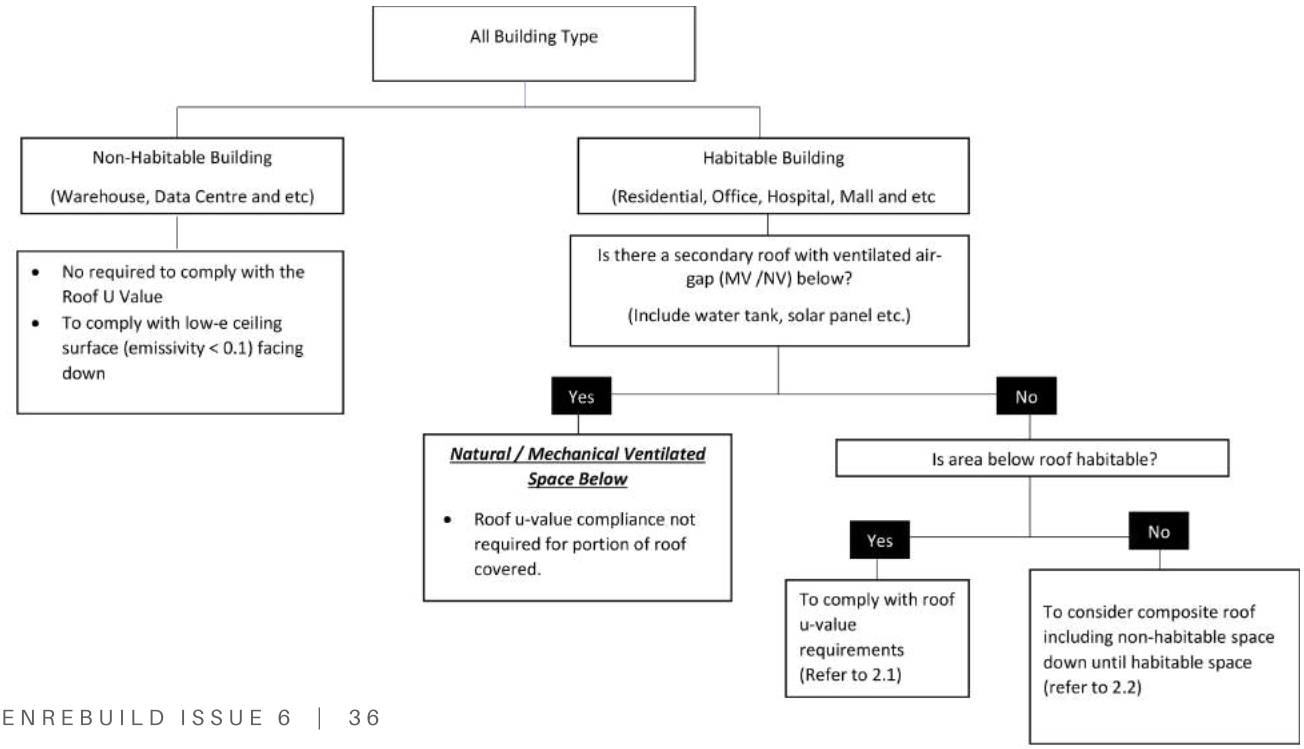
  In calculating the RETV, the habitable space façade should be considered in the calculation inclusive of facilities and amenities facade.

- **Revision of Wind Data**

  Tabulation of the prevailing wind direction and speed for specific zones in Malaysia has been revised and available on GreenRE's website. The data shall be used in conjunction with GreenRE's Ventilation Simulation Guideline – Appendix B for projects in Malaysia

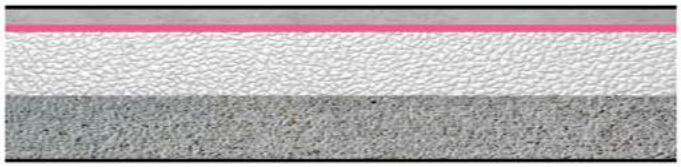
- **Roof U Value Compliance**

  For the compliance of the Roof U Value of the building please refer the flowchart.



Example of Roof U Value calculation

2.1. Type : Concrete Flat Roof with Insulation
Construction : With habitable space below



Office Area

Component (Material Description) Outside to inside	Thickness (mm)	Thermal conductivity (W/m.k), K-Value	Thermal resistance (m^2k/W), R
Outside surface resistance	-	-	0.055
Cement Screed	65	0.9	0.072
Water Proofing		0.23	0.004
Insulation (Polyurethane Foam)	50	0.027	1.852
Concrete Slab	150	1.13	0.133
Internal surface		-	0.148
		Total R	2.26

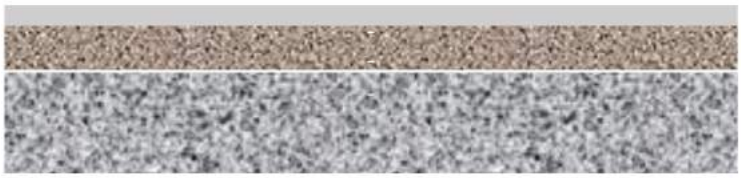
u-value = $\frac{1}{R}$

u-value = $\frac{1}{2.26}$

u-value = **0.442** W/m^2k

Example of Roof U Value calculation

2.2. Type : Concrete Flat Roof without insulation
Construction : With non-habitable space below



Pump Room

Office Area

Component (Material Description) Outside to inside	Thickness (mm)	Thermal conductivity (W/m.k), K-Value	Thermal resistance (m^2k/W), R
Outside surface resistance	-	-	0.055
Cement Screed	65	0.9	0.072
Water Proofing		0.23	0.004
Concrete Slab	150	1.13	0.133
Air Gap			1.423
Concrete Slab	150	1.13	0.133
Internal surface		1-	0.148
		Total R	1.97

u-value = $\frac{1}{R}$

u-value = $\frac{1}{1.97}$

u-value = **0.508** W/m^2k

4.0 GreenRE Renewal Fee Update (as of January 2022)

Renewal fees are applicable for GreenRE certified non-residential buildings (including industrial and healthcare projects) and residential buildings.

Size of Development	Total Gross Floor Area (m2)*	Renewal Fee (RM)	
		Non-Residential	Residential
Single Unit / Residence	Below 2,000	1,000	500
Small	Up to 4,000	2,000	1,000
Intermediate	4001 - 10,000	3,000	2,000
Medium	10,001 - 30,000	5,000	
Large	30,001 - 50,000	6,000	
Extra Large	50,001 - 100,00	8,000	5,000 (capped)
Mega Project	> 100,000	10,000 (capped)	

*Excluding Carpark

CONGRATULATIONS

Newly Certified GreenRE Accredited Professionals (GreenREAPs)

CERT NO	NAME	COMPANY
GREENREAP0290	AR. JACKY LIM CHUNG YER	JACKY ARCHITECT
GREENREAP0291	AR. TS. TAN KWON CHONG	TAN KWON CHONG ARCHITECT
GREENREAP0292	DR. NOOR INTAN SHAFINAS	UNIVERSITI MALAYSIA PAHANG
GREENREAP0293	LEE CHEE LEONG	2R CONTROL AUTOMATION SDN BHD
GREENREAP0294	MOHAMAD SALLEH SALIM	BON ESTATES SDN BHD
GREENREAP0295	HOW YONG CHANG	ISKANDAR CAPITAL SDN BHD
GREENREAP0296	DR. ANAND NAINAR	BSD CONSULTANCY SDN BHD
GREENREAP0297	MUHAMMAD HASEEF RAFIEI	VERITAS ARCHITECTS SDN BHD
GREENREAP0298	THIEN RU CHUN SHIRLEY	THENS ARCHITECT
GREENREAP0299	AHMAD FAUZAN HUDARI	TSG EXPERT (M) SDN BHD
GREENREAP0300	FOO YIHUNG	URBAN CATALYST ARCHITECTURE SDN BHD
GREENREAP0301	CHU JIA JUN	VERITAS ARCHITECTS SDN BHD
GREENREAP0302	CHEN CHI PIN	VERITAS ENVIRONMENT SDN BHD
GREENREAP0303	JOASH YAP EN CHEAN	SUNWAY INTEGRATED PROPERTIES SDN BHD
GREENREAP0304	NG BOON LAY	HAP SENG LAND SDN BHD
GREENREAP0305	TEE BOON TUAN	UNIVERSITI TEKNIKAL MALAYSIA MELAKA
GREENREAP0306	KUA CHIN TEE	JENTRIKON PERUNDING SDN BHD
GREENREAP0307	HUI KOK LEONG	HPA DESIGN STUDIO
GREENREAP0308	NADZIRAH MOHD MOKHTAR	UNIVERSITI MALAYSIA PAHANG
GREENREAP0309	LEONG SAI PINK	BANDAR SERAI DEVELOPMENT SDN BHD
GREENREAP0310	LEE YAN KANG	PERUNDING SISTEM ETM
GREENREAP0311	MARK TAN SZE TIEN	BSD CONSULTANCY SDN BHD
GREENREAP0312	MOHAMMAD FAUZI AMRIN	BGREEN CONSULTANCY SDN BHD
GREENREAP0313	TAN GEE	SUNWAY SOUTHERN MANAGEMENT SDN BHD
GREENREAP0314	NADHIRAH 'AFIAH BINTI AHMAD HISHAM	SUNWAY SOUTHERN MANAGEMENT SDN BHD
GREENREAP0315	WAN AI FEI	ECO WORLD DEVELOPMENT GROUP BERHAD
GREENREAP0316	HONG MEE SONG	G ENERGY INTEGRATED SERVICES SDN BHD
GREENREAP0317	JUSTO I. SANTOS JR.	CT ARCHITECT
GREENREAP0318	RAMLAN BIN ZAILANI	UITM SHAH ALAM

CONGRATULATIONS

Newly Certified GreenRE Projects

PROJECT NAME & LOCATION	COMPANY	ESD CONSULTANT	DESIGN REF	TYPE OF CERT	DATE OF CERT
ARUP KL Office Fitout, Kuala Lumpur	**Arup Jururunding Sdn Bhd**	**In-House Team**	**INT v1.0**	**Provisional**	**21/10/2021**
Sunway d'hill Residences (KD10)	**Sunway PKNS**	**Green Quarter Sdn Bhd**	**RES v3.1**	**Provisional**	**6/8/2021**
Sunway Grid Residence	**Sunway Iskandar Sdn Bhd**	**In-House Team**	**RES v3.1**	**Provisional**	**13/9/2021**
Empire Damansara Park 2 Plot 3	**Momentumace Sdn Bhd**	**Zeal Greentech Sdn Bhd**	**RES v3.1**	**Provisional**	**25/10/2021**
Sunway Mentari (YOLO)	**OCR Properties Sdn Bhd**	**ESD Greentech Sdn Bhd**	**NRB v3.0**	**Provisional**	**2/12/2021**
The Conlay Service Apartment	**Patsawan Properties Sdn Bhd**	**ESD Greentech Sdn Bhd**	**RES v3.0**	**Provisional**	**2/12/2021**
Camtronics Environmental Friendly Building	**Camtronic Sdn Bhd**	**Neapoli Sdn Bhd**	**EIND v1.0**	**Provisional**	**9/9/2021**
Baysuites	**Remajaya Sdn Bhd**	**BSD Consultancy Sdn Bhd**	**NRB v3.1**	**Provisional**	**5/10/2021**
JFTech New Building	**JF Microtechnology Sdn Bhd**	**Green Quarter Sdn Bhd**	**IND v1.0**	**Provisional**	**7/12/2021**
Menara B The Met	**Triterra Metropolis Sdn Bhd**	**DME Solutions Sdn Bhd**	**NRB v3.1**	**Provisional**	**24/12/2021**
Sri KDU International School	**Paramount Education (Klang) Sdn Bhd**	**LJ Energy Sdn Bhd**	**NRB v3.0**	**Actual**	**4/8/2021**
CJ2 and CJ3 Centre	**MyTelehaus Data Centres Sdn Bhd**	**Green Urban Matters Solution Sdn Bhd**	**NDC v1.0**	**Provisional**	**11/8/2021**
Edumetro	**HCK Properties Sdn Bhd**	**Green Urban Matters Solution Sdn Bhd**	**NRB v3.1**	**Provisional**	**21/10/2021**
Hap Seng Star Mercedes-Benz Autohaus @ Bukit Tinggi	**Hap Seng Realty (Auto) Sdn Bhd**	**DME Solutions Sdn Bhd**	**NRB v3.1**	**Provisional**	**2/12/2021**
Millerz Square, Old Klang Road Development Fasa 2, (Block E)	**Lim Legacy Development Sdn Bhd**	**Zeal Greentech Sdn Bhd**	**RES v3.0**	**Provisional**	**7/12/2021**
Solaris Parq - Residential	**Ibarat Duta Sdn Bhd**	**BSD Consultancy Sdn Bhd**	**RES v3.1**	**Provisional**	**9/12/2021**
Millerz Square, Old Kland Road Development, Fasa 3, Block D	**Lim Legacy Development Sdn Bhd**	**Zeal Greentech Sdn Bhd**	**NRB v3.0**	**Provisional**	**24/12/2021**
Phase 1, Phase 2, Phase 3 of Mutiara Hills	**Boustead Balau Sdn Bhd**	**DME Solutions Sdn Bhd**	**TS v1.0**	**Provisional**	**24/12/2021**
Phase 4 & Phase 5 of Mutiara Hills	**Boustead Balau Sdn Bhd**	**DME Solutions Sdn Bhd**	**TS v1.0**	**Provisional**	**24/12/2021**
REHDA Perak	**Real Estate & Housing Developers Association Malaysia (Perak Branch)**	**In-House Team**	**NRB v3.0**	**Actual**	**3/11/2021**
UMW HVM Park Precinct 1 Guardhouse	**UMW Development Sdn Bhd**	**DME Solutions Sdn Bhd**	**NRB v3.1**	**Actual**	**15/11/2021**

GREENRE CERTIFIED PROJECTS (2020/21)

Congratulations for achieving the prestigious GreenRE certification - we applaud your efforts towards sustainable real estate.

GreenRE®

As Seen on the Edge City & Country, 29 November 2021

PLATINUM GreenRE ★★★★★ GREENER BUILDINGS FOR A SUSTAINABLE FUTURE

MERDEKA 118
by PNB Merdeka Ventures Sdn Bhd **(Provisional)**

Sunway Velocity Two Office Tower
by Sunway Property **(Provisional)**

Sunway International School (SIS)
Sunway City KL by Sunway Property **(Provisional)**

Menara UOB 2
by UOB Properties (KL) Bhd **(Provisional)**

Caltex Ayer Keroh R&R Southbound
by Chevron Malaysia Limited

Caltex Ayer Keroh R&R Northbound
by Chevron Malaysia Limited

Encomas House
by Encomas Sdn Bhd

WAO's Child Care Center
by Women's Aid Organisation **(Provisional)**

GreenRE certified real estate projects are high performance green buildings and townships which are energy, water and resource efficient. Platinum and Gold certifications are the top two (2) award tiers for projects displaying exemplary design features to minimise environmental impact and greenhouse gas emissions.

GOLD GreenRE ★★★★★ GREENER BUILDINGS FOR A SUSTAINABLE FUTURE

Residensi Jendela
by Sime Darby Property (KLGCC Resort) Sdn Bhd **(Provisional)**

Sunway Belfield, KL
by Sunway Property **(Provisional)**

Sunway Velocity TWO (Tower C & D)
by Sunway Property **(Provisional)**

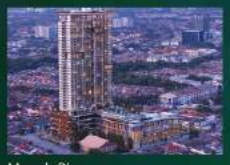
Sunway Onsen Suites
by Sunway Property **(Provisional)**

Sunway GEOLake Residences
by Sunway Property **(Provisional)**

Sunway Artessa
by Sunway Property **(Provisional)**

1 Powerhouse
by Bandar Utama City Assets Sdn Bhd **(Provisional)**

D'Vervain Residences
by EXSIM Group **(Provisional)**



Megah Rise
by PPB Hartabina Sdn Bhd **(Provisional)**

Parc3 @ KL South
by Eupe Corporation Berhad **(Provisional)**

Menara BAC
by Brickfields Asia College Sdn Bhd **(Provisional)**

Residensi Allevia Mont' Kiara
by Allevia Sdn Bhd **(Provisional)**

Stonor 3
by Cipta Klasik (M) Sdn Bhd (Tan & Tan Developments Bhd)

McDonald's Drive Thru@Setia Alam
by Gerbang Alaf Restaurants Sdn Bhd

Hap Seng Business Park
by Hap Seng Logistics Sdn Bhd

GTower
by MTrustee Bhd as Trustee for IGB Commercial REIT

Green Consultants involved in these projects:

BSD building system & diagnostics · DME solutions · ESD · ZEAL GREENTECH SDN. BHD.

A Sustainability Initiative by:

REHDA

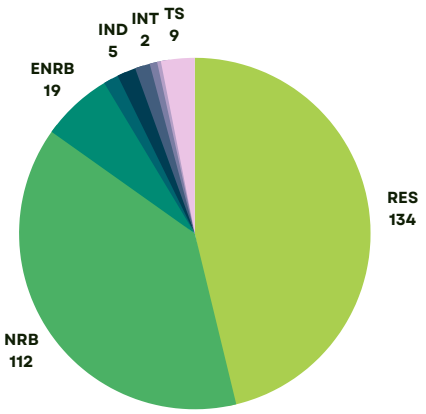
bsi. ISO 9001 Quality Management

GreenRE Sdn Bhd (1040485)
www.greenre.org

Project Statistics.

Project Registered

As of December 2021



Legend

- Residential (RES)
- Non Residential (NRB)
- Existing Non Residential (ENRB)
- Healthcare Facilities (HC)
- Industrial Facilities (IND)
- Existing Industrial Facilities (EIND)
- Office Interior (INT)
- Data Centre (NDC)
- Township (TS)

Project Certified

174 out of 290 projects registered are certified as of December 2021

Certified Buildings

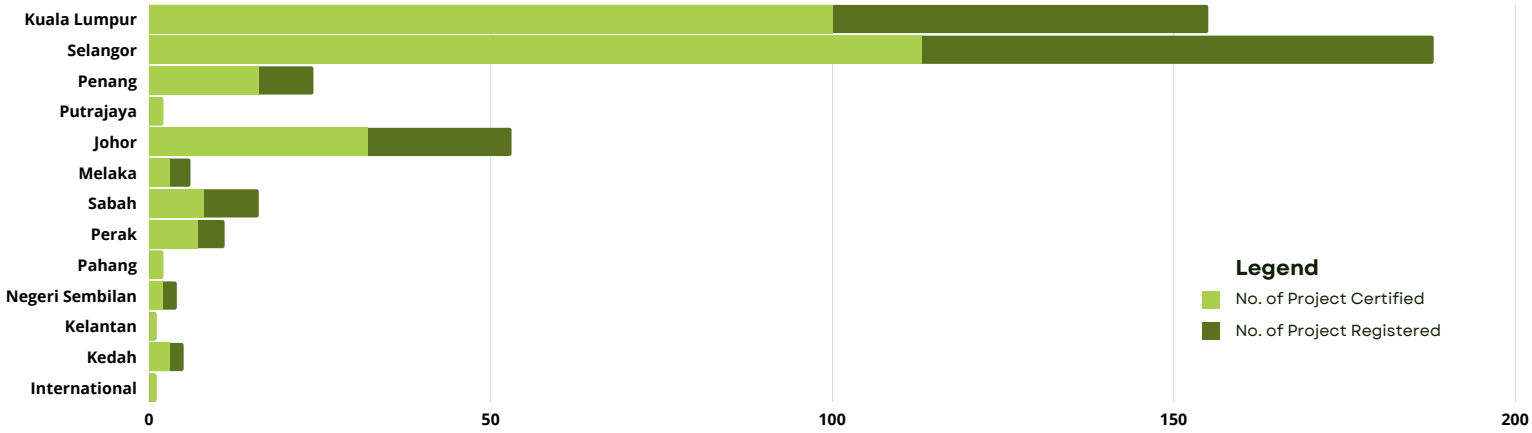
8,833,447.15 sqm out of 17,321,370.36 sqm of buildings are certified as of December 2021

Certified Township

2,335.48 acres out of 7,729.42 acres of townships are certified as of December 2021

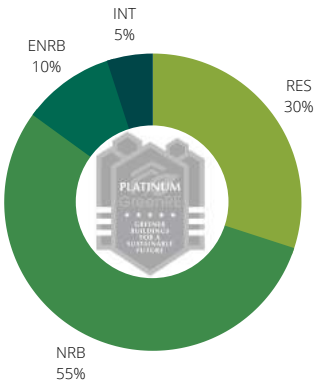
Project Distribution

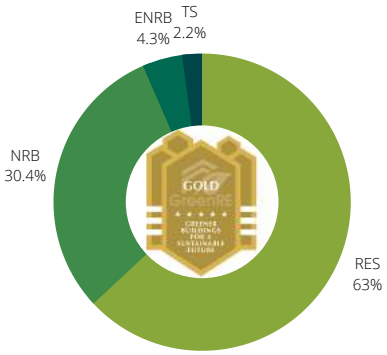
As of December 2021

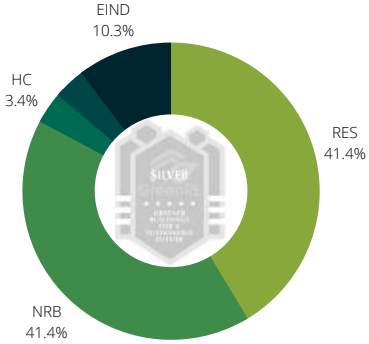


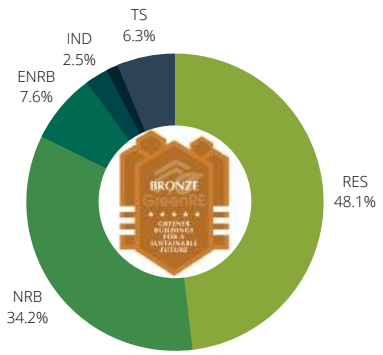
Projects Certified by Rating

Use this section to talk about main points in the infographic.









Legend

- Residential (RES)
- Non Residential (NRB)
- Existing Non Residential (ENRB)
- Healthcare Facilities (HC)
- Industrial Facilities (IND)
- Existing Industrial Facilities (EIND)
- Office Interior (INT)
- Data Centre (NDC)
- Township (TS)