

## **DESIGN REFERENCE GUIDE**

# Existing Residential Building & Landed Home

Version 1.0

April 24

### **Contents**

1.	About GreenRE	1
2.	Introduction	2
	Revision Log	
	GreenRE Assessment Stages	
	GreenRE Existing Residential Building Rating System	
	GreenRE Existing Residential Building Rating System Scoring	
	GreenRE Existing Residential Building Rating System Criteria	

### 1. About GreenRE

GreenRE Sdn Bhd is a wholly owned subsidiary of the Real Estate and Housing Development Association (REHDA). The GreenRE rating tool has been developed for the purposes as mentioned herein and may be subject to updating and/or modification in the future.

Any sale, modification, reproduction, display or distribution of GreenRE criteria or any copies thereof is not allowed without GreenRE Sdn Bhd's prior written consent. This may be obtained in writing to the following address or via email to <a href="mailto:info@greenre.org">info@greenre.org</a>

GreenRE Sdn Bhd Wisma Rehda, No.2C, Jalan SS5/6D, 47301 Petaling Jaya, Selangor, Malaysia

### 2. Introduction

The GreenRE assessment scheme was established in 2013 and is a recognized green building rating system tailored for the tropical climate. GreenRE sets parameters and establishes indicators to guide the design, construction and operation of buildings towards increased energy effectiveness and enhanced environmental performance.

The intent of this Design Reference Guide for Existing Residential Buildings and Landed Homes (referred to as "this Guideline") is to establish environmentally friendly practices for the planning, design, construction and operation of buildings, which would help to mitigate the environmental impact of built structures.

This Guideline is not intended to abridge safety, health, environmental or related requirements contained in other applicable laws, codes or policies administered by relevant authorities. Where there is a conflict between a requirement of this Guideline and such other regulations affecting the design, construction and operation of the building, the building regulations shall take precedence.

### 3. Revision Log

Revision	Description	Date Effective
1.0	Issued for implementation	April 24

### 4. GreenRE Assessment Stages

The GreenRE Residential Building & Landed Home certification process is as follows:

## **Application**

Submittal of application with relevant supporting documents for certification upon strategic inception of infrastructure project.



### Pre-Assessment



### **Actual Assessment**



### Site Verification

A pre-assessment can be conducted (optional) to give the project team a better understanding of the criteria and evaluation of the certification level sought. This should be performed upon selection of suitable design option to allow teams to identify and maximise opportunities at the earliest stages of the project.

Actual assessment to be conducted once the design and documentary evidences (e.g. approved plan) are ready. After the actual assessment, our assessors will review the documents submitted.

Assessment process includes design and documentary reviews to verify if the project meets:

- (i) The intents of the criteria
- (ii) The pre-requisite requirement for GreenRE Bronze, Silver, Gold and Platinum rating where applicable.

Provisional Certificate will be issued upon completion of this stage.

Site verification to be conducted upon project completion.

A Final Certificate will be issued upon completion of this stage.

### 5. GreenRE Existing Residential Building Rating System

### Overview:

The GreenRE Existing Residential rating system is targeted for existing stratified highrise and landed residential development.

The GreenRE rating system is divided into six (6) sections as follows:

- (a) Part 1 Energy Efficiency: This category focuses on the approach that can be used in the building design and system selection to optimize the energy efficiency of buildings.
- (b) Part 2 Water Efficiency: This category focuses on the selection of fittings and strategies enabling water use efficiency during construction and building operation.
- (c) Part 3 Sustainable Operation & Management: This category focuses on the sustainability of operation and management that would reduce the environmental impacts upon building operation.
- (d) Part 4 Community & Well Being: This category focuses on the design strategies that would enhance the indoor environmental quality which include air quality, thermal comfort, acoustic control, and daylighting.
- (e) Part 5 Other Green Features: This category focuses on the adoption of green practices and new technologies that are innovative and have potential environmental benefits.
- (f) Part 6- Carbon Emission of Development: This category focuses on the use of carbon calculator to calculate the carbon emission of the development.

These environment impact categories are broadly classified under two main groups namely (I) Energy Related Requirements and (II) Other Green Requirements.

Energy Related Requirements consist of Part 1- Energy Efficiency where credits are allocated for the various energy efficient designs, practices and features used. For multi-story residential buildings a minimum of 30 credits must be obtained from this group to be eligible for certification.

Other Green Requirements consist of Part 2 – Water Efficiency; Part 3 – Sustainable Operation & Management; Part 4 – Community and wellbeing; Part 5 – Other Green Features and Part 6: Carbon Emission of Development. Credits are allocated for the water efficient features, environmentally friendly design practices, innovative green features used and carbon emission of development. A minimum of 20 credits must be obtained from this group to be eligible for certification.

The maximum GreenRE score achievable for a project is capped at 100 credits

### Framework:

#### To achieve GreenRE Award



### Prerequisite Requirement

All relevant prerequisite requirements for the specific GreenRE Rating are to be complied with

Energy Related Requirements
Minimum 30 credits



Other Green Requirements
Minimum 20 credits

## Elective Requirement for Energy Improvement ombination of the following items

(Combination of the following items to meet required credits)

### Part 1 - Energy Efficiency

ERES 1-1 Energy Usage Index

ERES 1-2 Energy Policy & Management

**ERES 1-3 Energy Monitoring** 

ERES 1-4 Natural Ventilation for Common Area & Carparks

**ERES 1-5 Lightings** 

**ERES 1-6 Lifts** 

ERES 1-7 Renewable Energy/ Energy
Efficient

## Elective Requirement for Other Areas (Combination of the following items to meet required credits)

### Part 2 - Water Efficiency

ERES 2-1 Water Efficient Fittings

**ERES 2-2 Waste Monitoring** 

ERES 2-3 Water Efficiency Improvement Plans

**ERES 2-4 Washing of Waters Tanks** 

**ERES 2-5 Irrigation System** 

ERES 2-6 Common Area Washing

## Part 3 – Sustainable Operation & Management

ERES 3-1 Building Operation & Maintenance

**ERES 3-2 Waste Management** 

**ERES 3-3 Public Transport Accessibility** 

**ERES 3-4 Stormwater Management** 

**ERES 3-5 Sustainable Products** 

ERES 3-6 Community & Connectivity

### Part 4 - Community and Well-being

ERES 4-1 Community Involvement in Green Activities

ERES 4-2 Resident's Feedback & Evaluation

**ERES 4-3 Greenery** 

ERES 4-4 Noise Level

**ERES 4-5 Lighting Quality** 

ERES 4-6 Location of Refuse Chute

### Part 5 - Other Green Features

RES 5-1 Green Features & Innovations

### Part 6 - Carbon Emission

RES 6-1 Carbon Emission of Development

### Credit Allocation:

	Category	Credits Allocations
(I)	Energy Related Requirements	Credits Allocations
	Part 1: Energy Efficiency	
Minimum 30 credits	ERES 1-1 Energy Usage Index ERES 1-2 Energy Policy & Management ERES 1-3 Energy Monitoring ERES 1-4 Natural Ventilation for Common Area & Car Parks ERES 1-5 Lightings ERES 1-6 Lifts ERES 1-7 Cool Hardscape Areas ERES 1-7 Renewable Energy  Category Score for Part 1 – Energy Efficiency	33 3 4 15 4 3 10 <b>75 (Max)</b>
(II)	Other Green Requirements	75 (Max)
(,	Part 2: Water Efficiency	
	ERES 2-1 Water Efficient Fittings ERES 2-2 Water Monitoring ERES 2-3 Water Efficiency Improvement Plans ERES 2-4 Washing of Water Tanks ERES 2-5 Irrigation System ERES 2-6 Common Area Washing	8 3 2 2 3 5
	Category Score for Part 2 – Water Efficiency	23
Minimum 20 credits	Part 3: Sustainable Operation & Management  ERES 3-1 Building Operation & Maintenance ERES 3-2 Waste Management ERES 3-3 Public Transport Accessibility ERES 3-4 Storm-water Management ERES 3-5 Sustainable Products ERES 3-6 Community & Connectivity	5 5 2 1 5
ni	Category Score for Part 3 – Environmental Protection	19
Σ	Part 4: Community and Well-being  ERES 4-1 Community Involvement in Green Activities  ERES 4-2 Residents' Feedback & Evaluation  ERES 4-3 Greenery  ERES 4-4 Noise Level  ERES 4-5 Lighting Quality  ERES 4-6 Location of Refuse Chutes  Category Score for Part 4 – Environmental Quality  Part 5: Other Green Features  ERES 5-1 Green Features & Innovations  Category Score for Part 5 – Other Green Features	7 5 7 1 1 1 22
	Part 6: Carbon Emission of Development	
	RES 6-1 Carbon Emission of Development	1
	Category Score for Part 6 – Carbon Emission of Development	1 (150 (145))
	GreenRE Score:	150 (Max)

<sup>\*</sup>Total score will be rounded to the nearest whole number

## 6. GreenRE Existing Residential Building Rating System Scoring

Score	Rating
91 and above	GreenRE Platinum
86 to ≤ 90	GreenRE Gold
76 to ≤ 85	GreenRE Silver
50 to ≤ 75	GreenRE Bronze

### 7. GreenRE Residential Building Rating System Criteria

### Pre-requisites:

### **ENERGY EFFICIENCY**

Comply with any option below:

- Option A: Demonstrate 10% energy savings over the last five years (against own historical baseline)
- Option B: Demonstrate 10% committed energy savings over the next five years (against own historical baseline)
- Provision and monthly monitoring of main electrical meter readings for the whole development
- Lighting Density: 10% better than lighting power budget in MS1525:2019
- Lifts with energy efficient features such as Variable Voltage and Variable Frequency (VVVF) motor drive and sleep mode
- Energy Policy & Management (to comply with section 1-2)

### **WATER EFFICIENCY**

- Provision and monthly monitoring of main water meter readings for the whole development
- Display of posters on water conservation
- Water Efficiency Improvement Plans
- Use of water efficient cleaning equipment

### **SUSTAINABLE OPERATION & MANAGEMENT**

- Circulation of Green Guides to residents
- Sustainable operational plans regular review of environmental policy and cleaning strategies
- · Promotional materials on recycling and provision of recycling bins
- Waste management improvement plan

### **COMMUNITY AND WELL-BEING**

- Green activities once a year
- Residents' Feedback & Evaluation (to comply with section 4-2)
- Greeneries equivalent to GnPR of 0.5 and compost recycled from horticulture waste

PREREQUISITES FOR GOLD
At least 2 green activities per year
At least 2 green activities per year
DEFECTION FOR DIATIVIA
PREREQUISITES FOR PLATINUM
At least 3 green activities per year
7 ti loast o green douvites per year

Part 1 - Energy Efficiency	GreenRE Credits
ERES 1-1 ENERGY USAGE INDEX	Ordenic Greats
a) Energy Usage Index (EUI) for Common Area	
Option A  To achieve increased building energy efficiency in common areas against other residential developments to promote efficient use of energy in common areas and facilities.  Note (i): EUI is derived using the following equation:	Option A  15 credits for EUI of 30 kWh/m²/year  Additional 0.2 point for every subsequent percentage improvement from 30 kWh/m²/year  (Up to 10 credits)
EUI = [(TBEC – CPEC) / GFA excluding carpark]  Where: TBEC = Total building energy consumption for common area(kWh/year) CPEC = Car Park Energy Consumption in (kWh/year) GFA = Gross Floor Area (exclude car park area) (m2)	
Option B  Energy savings over its own historical baseline over the last five years must be demonstrated.  b) Energy Efficiency for households  Household energy savings of the development benchmark against	Option B  15 credits for achieving 10% energy savings from own historical baseline  Additional 0.2 point for every subsequent percentage improvement from 10% savings (up to 10 credits)
baseline average consumption  Baseline consumption for household: 112 kWh/room.	0.2 point for every subsequent percentage improvement from the baseline  (Up to 8 credits)

ERES 1-2 ENERGY POLICY &	
MANAGEMENT	
a) Energy policy, energy targets and regular review as part of an environmental strategy	1 credit
b) To show intent, measures, and implementation strategies of energy efficiency improvement plans over the next five years.	1 credit
<ul> <li>c) Annual disclosure of building energy consumption data to GreenRE. Monthly energy bills and summary of energy bills should be provided.</li> </ul>	1 credit
ERES 1-3 ENERGY MONITORING	
Encourage the design of system that monitor and manage electricity consumption.	
<ul> <li>a) Provision and monthly monitoring of main electrical meter readings for the whole development.</li> </ul>	1 credit
b) Provision and monthly monitoring of electrical sub meter readings to manage the electricity use of each key building services such as common area lightings, lifts, club house, car park mechanical ventilation fans, pumps etc.	2 credits
ERES 1-4 NATURAL VENTILATION FOR	
COMMON AREA & CAR PARKS	
Encourage the use of energy efficient design and control of ventilation systems in car parks and common areas.	
a) Cross ventilation in common areas such as	1 credit
lift lobby, corridors, and staircases. b) Car park designed with 100% natural ventilation  OR	2 credits
c) CO sensors used to regulate the demand for car park mechanical ventilation	1 credit

ERES 1-LIGHTINGS	
Encourage the use of energy efficient lightings or daylighting in common areas to minimize energy consumption from lighting usage while maintaining proper lighting level  • Artificial lightings in common areas • Baseline = Maximum lighting power budget stated in MS1525: 2019	10 credits for achieving lighting power density of 10% better than lighting power budget in MS1525:2019  Additional 0.2 point for every subsequent percentage improvement (up to 5 credits)
ERES 1-6 LIFTS	
a) Encourage the use of lifts with energy efficient features such as AC Variable Voltage and Variable Frequency (VVVF) motor drive and sleep mode features	1 credit
b) Use of gearless lift	1 credit
c) Use of regenerative lift	2 credits
ERES 1-7 COOL HARDSCAPED AREAS	
All hardscaped non-roof areas are to be finished with materials or finishes with a Solar Reflective Index (SRI) value of 29 or more.  i. ≥ 50% of non-roof hardscaped area ii. ≥ 75% of non-roof hardscaped area  Note: The area of application for % calculation of hardscape material SRI will be for the ground floor site ONLY.	1 credit 2 credits
ERES 1-7 RENEWABLE ENERGY	
Provision of renewable energy Encourage the use of renewable energy sources in buildings such as solar energy.	(3 credits for every 1% replacement of electricity (based on annual electricity consumption exclude household's usage) by renewable energy  (Up to 10 credits)
Part 1 – ENERGY EFFICIENCY CATEGORY SCORE:	Sum of GreenRE credits obtained from ERES 1-1 to 1-8

Part 2 – Water Efficiency	Gı	reenRE Credi	ts
ERES 2-1 WATER EFFICIENT FITTINGS  Encourage the use of water efficient fittings covered under the Water Efficiency Product Labelling Scheme (WEPLS)			
a) Basin taps and mixers b) Flushing cistern c) Shawar tape and mixers	(۱	Up to 8 credits	)
<ul><li>c) Shower taps and mixers</li><li>d) Sink/bib taps and mixers</li></ul>	Ratino	g Based on W	EPLS
<ul><li>d) Sink/bib taps and mixers</li><li>e) Urinals and urinal flush valve</li><li>f) Showerheads</li></ul>	Efficient *	Highly Efficient **	Most Efficient ***
Note: At least 90% of each fitting type must be	0.5 credits	1 credit	2 credits
rated to be able to score for the credits			
ERES 2-2 WATER MONITORING			
Encourage the design of system that can monitor and manage water consumption.			
a) Provision and monthly monitoring of main water meter readings for the whole development.		1 credit	
b) Provision and monthly monitoring of water sub-meter readings to track water usage of major water consuming areas. (i.e. common area washing, irrigation, car washing, water feature, swimming pool etc.)		1 credit	
c) Display of promotional posters to encourage water saving practices and to prevent illegal water tapping.		1 credit	
ERES 2-3 WATER EFFICIENCY IMPROVEMENT PLAN  Set plans that include targets to improve building's water performance against its own historical baseline, a breakdown of the current water use, list of water saving measures, and implementation timelines for the measures over the next five years.  Committed water savings accrued from proposed measures should be quantified.		2 credits	

ERES 2-4 WASHING OF WATER TANKS	
Reuse the water from the annual water tank cleaning for non-potable usage such as common area washing, irrigation, etc.	2 credits
ERES 2-5 IRRIGATION SYSTEM	
Provision of suitable systems that can utilize rainwater or recycled water for landscape irrigation, and use of plants that require minimal irrigation to reduce potable water consumption.	More than 50% of the applicable area - 1 credit More than 25% of the applicable area - 0.5 credit
a) Use of non-potable water for irrigation	1 credit
<ul><li>b) Use of water efficient irrigation system</li><li>c) Use of drought tolerant plants</li></ul>	1 credit
ERES 2-6 COMMON AREA WASHING	
a) Use of water efficient cleaning equipment with a flowrate rating of; i. Less than 12 l/min ii. Less than 8.5 l/min	1 credit 2 credits
b) The lance for the cleaning equipment to be equipped with a spring-loaded ON/OFF control to ensure that the pump and flow of water is immediately turned off when the spring-loaded control on the lance is released.	1 credit
c) Use of non-potable water for common area washing	1 credit
PART 2 – WATER EFFICIENCY CATEGORY SCORE:	Sum of GreenRE credits obtained from ERES 2-1 to 2-6

Part 3 – Sustainable Operations & Management	GreenRE Credits
ERES 3-1 BUILDING OPERATION &	
MAINTENANCE	
a) Green Guides that promote best practices to reduce energy use, water use and waste generation should be documented and disseminated to residents.	2 credits
b) Operation plans that reflect the sustainability goals set for the development should be actively implemented and regularly reviewed.	
i. Environmental policy and cleaning strategies & schedule	1 credit
ii. Standard Operating Procedures (SOPs) for SARs, Bird flu, H1N1 etc. including increased frequency of cleaning common areas/ facilities.	1 credit
c) Provision of Sustainable Operational Management Guidelines (SOMG)	1 credit
ERES 3-2 WASTE MANAGEMENT	
Encourage waste recycling within development to reduce waste going to landfill.	
<ul> <li>a) Promotional materials such as posters, circulars, and recycling bags on waste sorting, collecting, and recycling of waste for households.</li> </ul>	1 credit
b) Provision of recycling bins (glass, paper, metal, nonrecyclable waste etc.)	
	1 credit
<ul><li>i. At a central location</li><li>ii. At every block</li></ul>	1 credit
c) Monthly monitoring of the amount of general waste and recyclable items	1 credit
d) Waste management improvement plan.	1 credit

ERES 3-3 PUBLIC TRANSPORT ACCESSIBILITY		
Promote the use of public transport or bicycles to reduce environmental impact by not driving individual car		
a) Provisions for access to MRT/LRT or bus stops	1 credit	
b) Provisions for adequate bicycle parking lots	1 credit	
RES 3-4 STORMWATER MANAGEMENT		
Provision of stormwater management plan	1 credit	
ERES 3-5 SUSTAINABLE PRODUCTS		
Promote use of environmentally friendly products that are certified by approved local	Extent of use of environmentally friendly product	Weightage for Credit Allocation
Promote use of environmentally friendly	environmentally	Credit
Promote use of environmentally friendly products that are certified by approved local	environmentally friendly product	Credit Allocation
Promote use of environmentally friendly products that are certified by approved local	environmentally friendly product  Low impact	Credit Allocation 0.5

#### **ERES 3-6 COMMUNITY CONNECTIVITY** Encourage development in urban area with 1 credit can be scored for project located existing infrastructure to minimize the use of within 1km (walking distance) of at least 10 private mode of transportation. Basic Services. Basic Services include, but are not limited to: Bank School • Clinic Beauty Laundry Library Police station Day care Fire Station Park Hardware Restaurant Convenience/ Grocery **PART 3 – ENVIRONMENTAL** Sum of GreenRE credits obtained from **PROTECTION CATEGORY SCORE:** ERES 3-1 to 3-6

Part 4 – Community & Well- Being	GreenRE (	Credits
ERES 4-1 COMMUNITY INVOLVEMENT	Grooming Ground	
IN GREEN ACTIVITIES		
Encourage residents to participate in green activities.	2 credits (At least 1 green activity per year)	
	Additional 1 point for ea activity organize (Up to 5 ci	ed per year
ERES 4-2 RESIDENTS FEEDBACK &		,
EVALUATION		
a) Provide effective feedback channels (i.e. hotline, email and etc.) for residents to take ownership of the precinct.	2 credits	
b) Conduct door-to-door satisfaction survey to enhance quality of the living environment in common facilities.	1 credit	
b) Provide a proper evaluation of the feedback/survey.	1 credit	
c) List of the follow-ups taken accordingly.	1 cred	lit
ERES 4-3 GREENERY		
a) Encourage greater use and maintenance of greenery to reduce heat island effect.		
	1 credit for Gr	
	Additional 0.5 cred	,
	increment in GnPR above 0.5 (up to 6 credits)	
	GnPR	Credits
		Allocation
	≥ 0.5	1
	≥ 1.0	1.5
	≥ 1.5	2
	≥ 2.0	2.5
	≥ 2.5	3
	≥ 3.0	3.5
	≥ 3.5	4.0
	≥ 4.0	4.5
	≥ 4.5	5.0
	≥5.0	5.5
	≥ 5.5	6
b) Use of compost recycled from horticulture waste	1 credit	

ERES 4-4 NOISE LEVEL  Internal noise level is maintained with good ambient sound level.	1 credit	
ERES 4-5 LIGHTING QUALITY  Encourage sufficient lighting level for visibility and security. Lighting level to comply with MS1525: 2019 for common areas.	1 credit	
ERES 4-6 LOCATION OF REFUSE CHUTES  Minimize airborne contaminants from waste by locating refuse chutes at open ventilation area such as service balconies or common corridors.	1 credit	
PART 4 – INDOOR ENVIRONMENTAL QUALITY CATEGORY SCORE:	Sum of GreenRE credits obtained from ERES 4-1 to 4-6	

Part 5 – Other Green Features	GreenRE Credits
RES 5-1 GREEN FEATURES &	
INNOVATIONS	
Encourage the use of other green features which are innovative and have positive environmental impact.	
Examples:	
<ul> <li>Pneumatic waste collection system</li> <li>Dual chute system</li> <li>Cool paints</li> <li>Self-cleaning façade system</li> <li>Grey water harvesting system</li> <li>Green roof and vertical greeneries</li> <li>Compost bins to recycle organic waste</li> <li>Siphonic rainwater discharge system</li> <li>Etc.</li> </ul>	2 credits for high impact item 1 credit for medium impact item 0.5 credit for low impact item (Up to 10 credits)
PART 5 – OTHER GREEN FEATURES CATEGORY SCORE:	Sum of GreenRE credits obtained from ERES 5-1

Part 6 – Carbon Emission of Development	GreenRE Credits	
NRB 6-1 CARBON FOOTPRINT OF DEVELOPMENT		
a) Recognize the carbon emission based on operational carbon footprint computation of the building comprising energy [B6] and water consumption [B7].	1 credit	
PART 6 – CARBON EMISSION OF DEVELOPMENT CATEGORY SCORE:	Sum of GreenRE credits obtained from ENRB 6-1	

GreenRE Score (Existing Residential Building)

GreenRE Score (ERES) = ∑Category score [(Part 1-Energy Efficiency) +

(Part 2-Water Efficiency) +

(Part 3-Sustainable Operation Management) +

(Part 4-Community & Wellbeing) +

(Part 5-Other Green Features) +

(Part 6-Carbon Emission of Development)]

Where:

Category Score for Part 1≥ 30 credits and

∑Category score for Part 2, 3, 4, 5 & 6 ≥ 20 credits