

UAS AR6054 *GREEN BUILDING* **EDGE EXERCISE :** **AEGIS PRIMERA**



MAHASISWA / NIM : CHRISTIANTO S. / 15215066



PROJECT REQUIREMENTS | ZERO NET CARBON

The government plans to create housing for low income families in the given location, and is providing incentives for the following

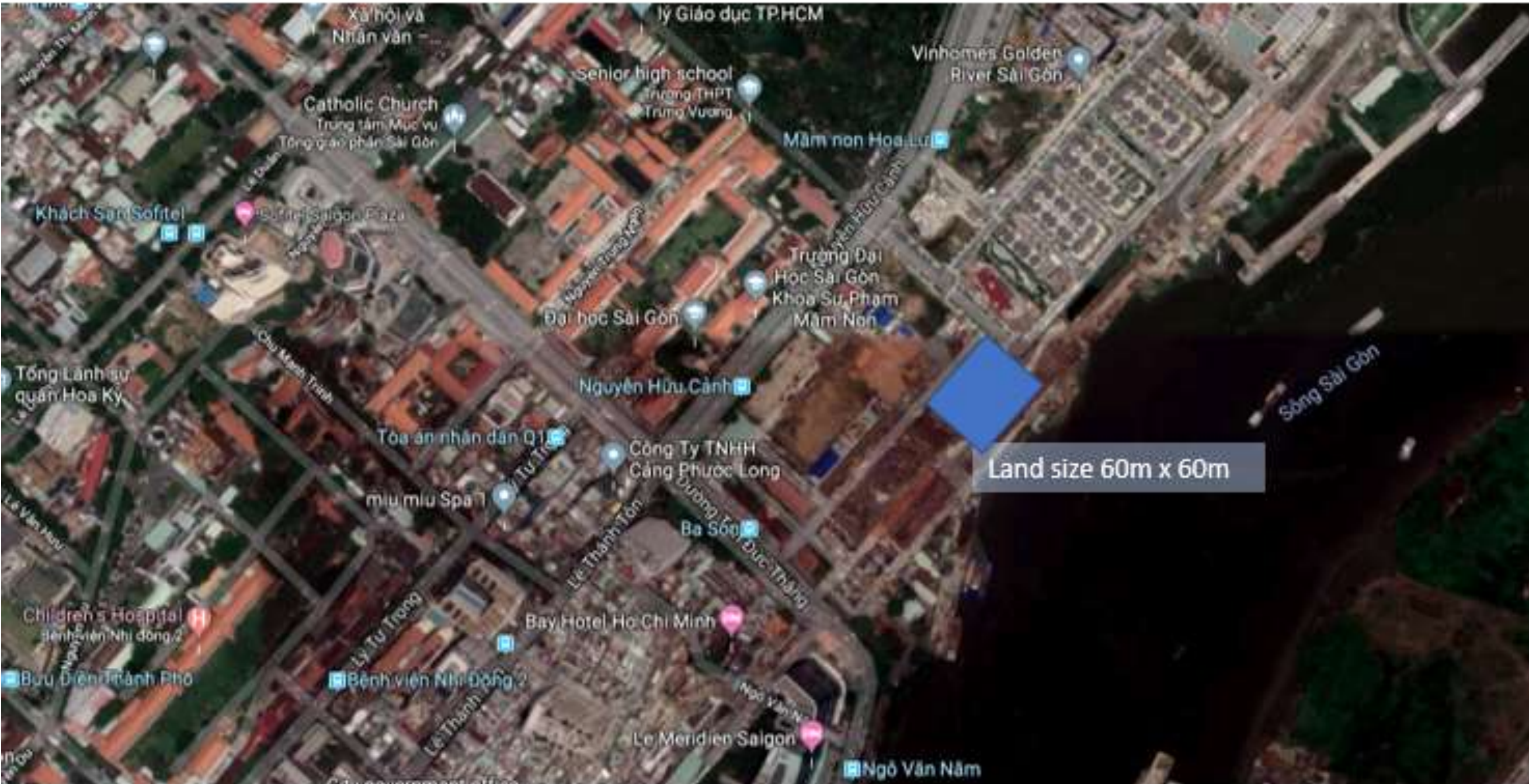
DESIGN REQUIREMENTS:

1. Designed to achieve Zero Net Carbon
2. Lowest possible Water use and embodied energy of Materials
3. A high level of daylight and design for natural ventilation
4. An iconic aesthetic which brings green, affordable, and local design together

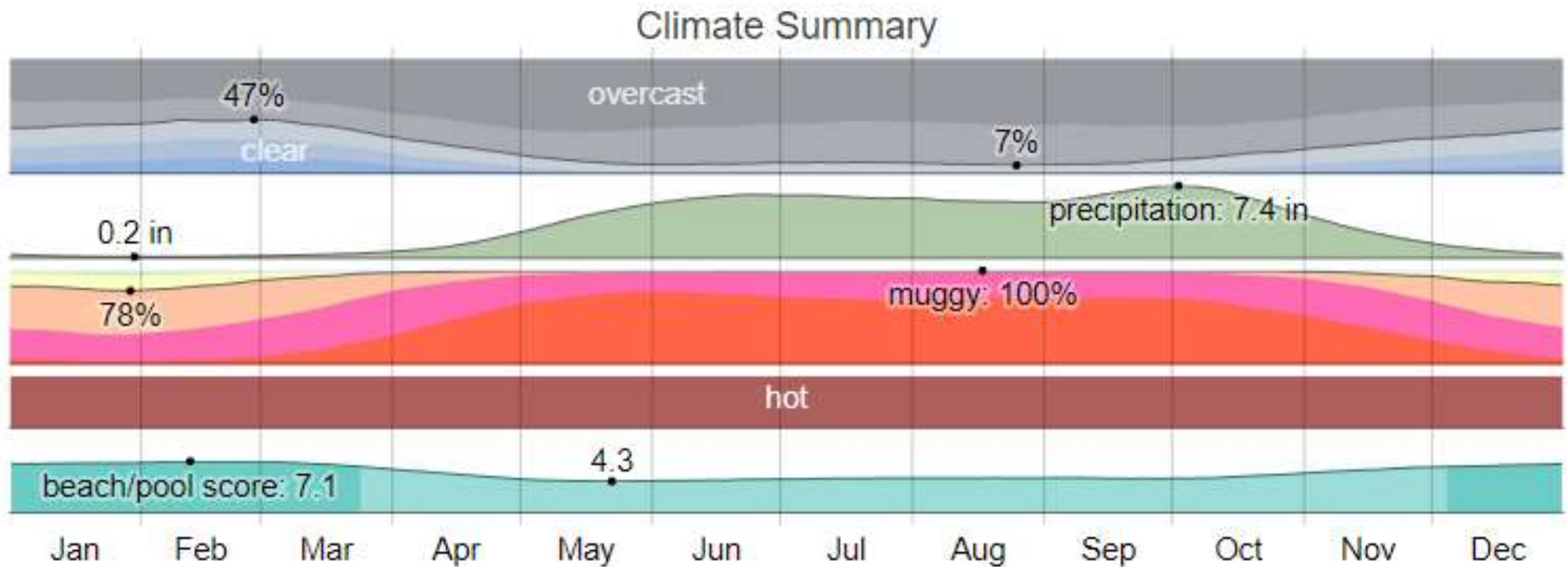
The land area is 3600 sq m. Homes will include the following:

- Total internal floor area of 5000sqm (100 units of 50sqm each)
- Occupancy is 4 persons for each unit
- Parking spaces for cars and bikes

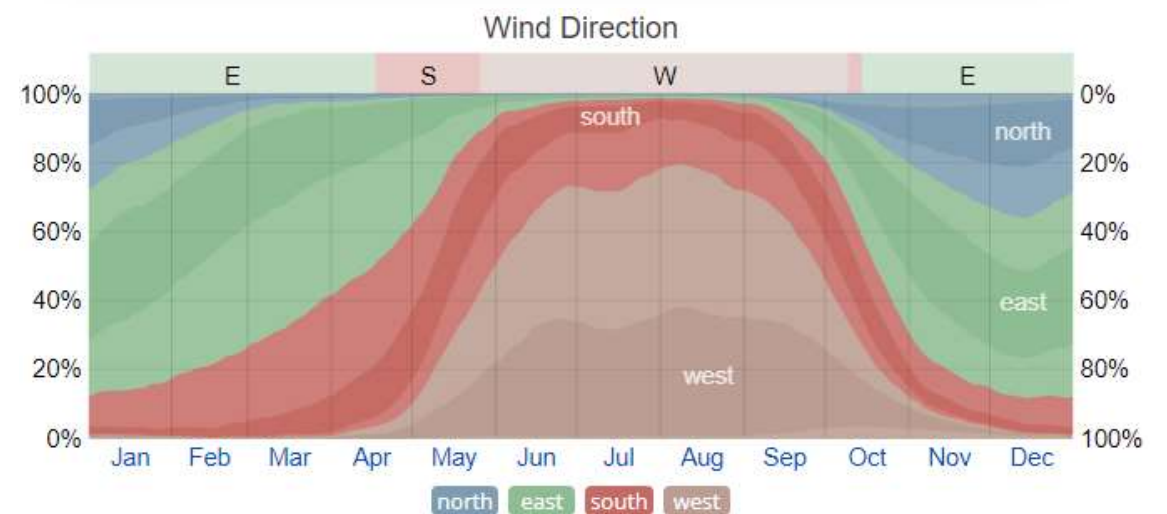
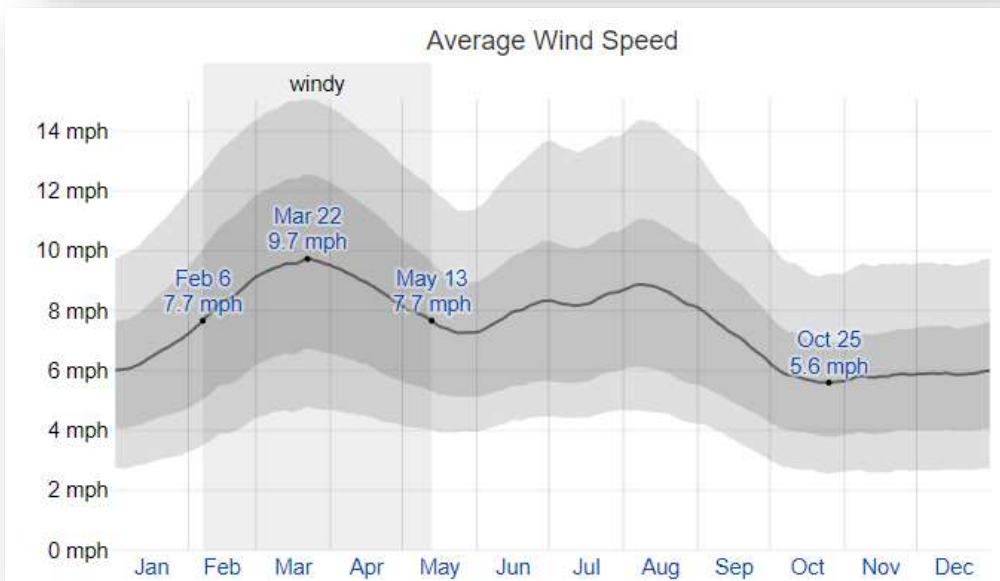
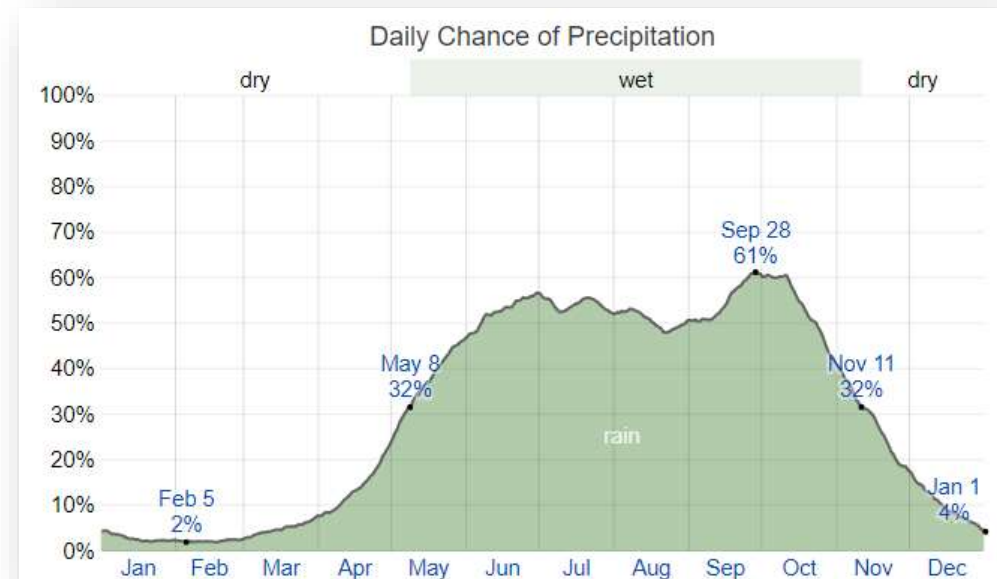
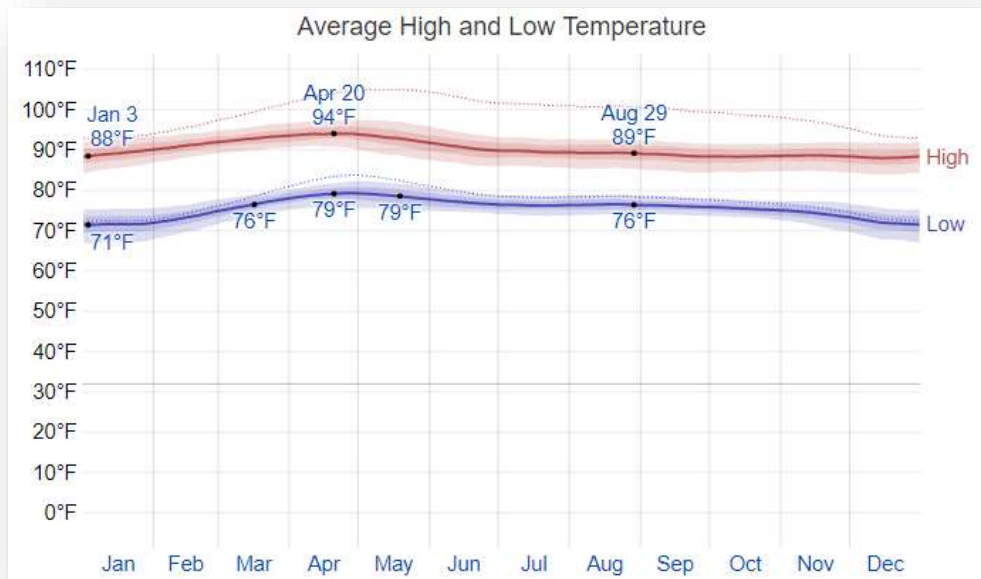
PROJECT SITE- HO CHI MINH CITY



ANALISIS IKLIM



ANALISIS IKLIM



INPUT DATA BANGUNAN

Location Data

Enter Context Data

Country	Vietnam	▼
City	Ho Chi Minh	▼
Income Category	Low	▼



Building Data

Enter Building Data

Type of Unit	Flats/Apartments	▼
Average Unit Area	50	m ²
Bedrooms/Unit	4	no.
Floors	7	no.
Units	100	no.
Occupancy (People/Unit)	4	no.

Area Details

	Default	User Entry	
Bedroom	12	<input type="text"/>	m ²
Kitchen	15	<input type="text"/>	m ²
Living/Dining	8	<input type="text"/>	m ²
Bathroom	3	<input type="text"/>	m ²
Utility, Balcony, Service Shaft**		11.75	m ²
Gross Internal Area	50	<input type="text"/>	m ²
External Wall Length m/Unit	8	<input type="text"/>	m
Roof Area/Unit	7	<input type="text"/>	m ²
Window to Floor Ratio	13.6%	<input type="text"/>	
Common Area/Unit	10	<input type="text"/>	m ²

INITIAL RESULT

Excellence In Design For Greater Efficiencies
Edge

IFC International Finance Corporation
WORLD BANK GROUP
Creating Markets, Creating Opportunities

Homes Hospitality Retail Offices Hospitals Education

RESULTS	Final Energy Use	265.45 kWh/Month/Unit	Operational CO ₂ Savings	0.00 tCO ₂ /Year...	Base Case Utility Cost	652243.58 VND/Month...	Incremental Cost	- VND/...
	Final Water Use	13.97 kL/Month/Unit	Embodied Energy Savings	0.00 MJ/Unit	Utility Cost Reduction	- VND/Month...	Payback in Years	NA Yrs.

Save Dashboard Version 2.1.5

Design Energy: 0.00% Water: 0.00% Materials: 0.00%

File

Excellence In Design For Greater Efficiencies
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Homes Hospitality

Final Energy Use	265.45 kWh/Month/Unit
Final Water Use	13.97 kL/Month/Unit

Dashboard Version 2.1.5

gn Energy: 0.00% Water: 0.00%

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Retail

Operational CO ₂ Savings	0.00 tCO ₂ /Year...
Embodied Energy Savings	0.00 MJ/Unit

Materials: 0.00%

ENERGY SAVING



	Homes	Hospitality	Retail	Offices	Hospitals	Education
RESULTS	Final Energy Use: 153.32 kWh/Month/Unit	Operational CO ₂ Savings: 1.10 tCO ₂ /Year...	Base Case Utility Cost: 652243.58 VND/Month...	Incremental Cost: 21,414,231 VND/...		
	Final Water Use: 8.66 kL/Month/Unit	Embodied Energy Savings: 44257.46 MJ/Unit	Utility Cost Reduction: 267,988.46 VND/Month...	Payback in Years: 6.66 Yrs.		

Version 2.1.5 v

Design
Energy: 42.24%
Water: 37.99%
Materials: 35.21%

Aegis: Preliminary



Energy Efficiency Measures

Choose energy efficiency measures to achieve savings of at least 20%.

- HME01* Reduced Window to Wall Ratio - WWR of 10%

WWR %

[Upload Document\(s\)](#) | [Calculator](#)
- HME02 Reflective Paint/Tiles for Roof - Solar Reflectivity (albedo) of 0.7
- HME03 Reflective Paint for External Walls - Solar Reflectivity (albedo) of 0.7
- HME04 External Shading Devices - Annual Average Shading Factor (AASF) of 0.51

AASF

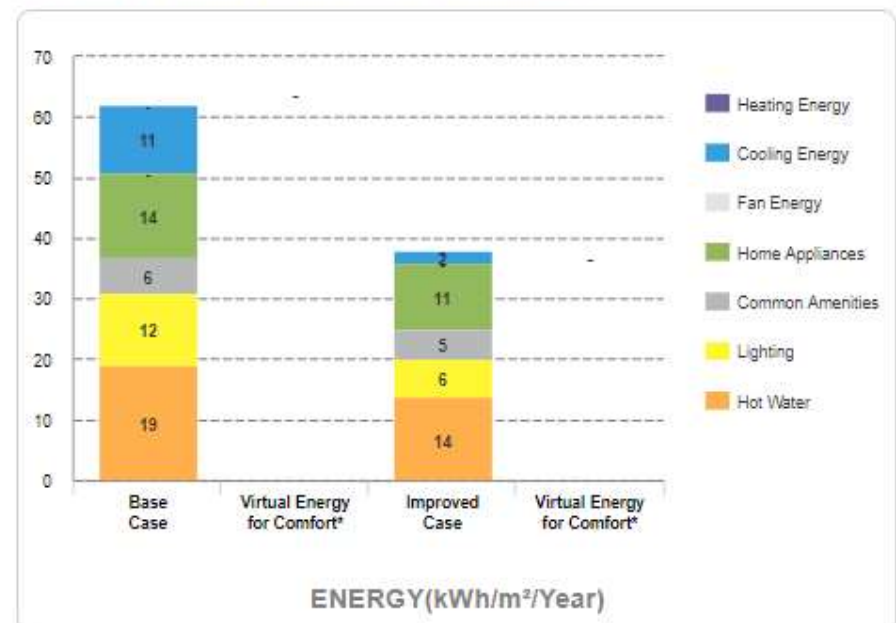
[Upload Document\(s\)](#) | [Calculator](#)
- HME05 Insulation of Roof : U-value of 0.44
- HME06 Insulation of External Walls : U-value of 0.12
- HME07 Low-E Coated Glass : U-value of 3 W/m².K and SHGC of 0.45

[W/m².K] SHGC

[Upload Document\(s\)](#) | [Calculator](#)
- HME08 Higher Thermal Performance Glass : U-value of 1.9 W/m².K and SHGC of 0.28

[W/m².K] SHGC

42.24% Meets EDGE Energy Standard



Hide the Carbon Emissions/Offset

CARBON EMISSIONS: 1.50 tCO₂/Year/Unit

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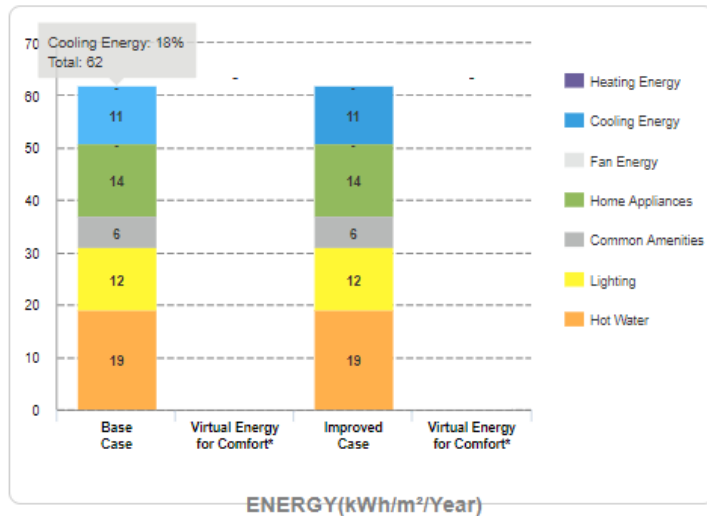
By. Christianto S. 15215066

Save Energy Up to 41.67 %



Before Implementation

0.00% ENERGY SAVINGS

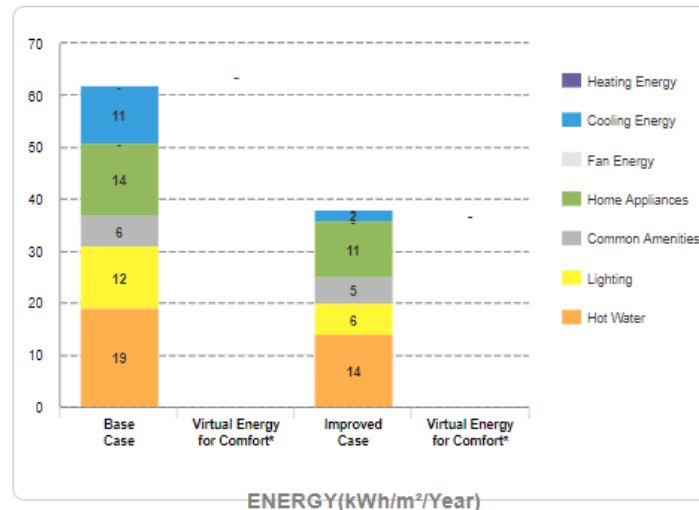


Show the Carbon Emissions/Offset

*Virtual energy is the amount of energy that will be required based on the assumption that the home or flat will eventually install air conditioning or heating.

After Implementation

41.67% Meets EDGE Energy Standard



Hide the Carbon Emissions/Offset

CARBON EMISSIONS: 1.52 tCO₂/Year/Unit

10.22%

Energy Saving Bulb

14.38%

High Performance Glass

9.25%

Reduce WWR

6.2%

IoT Smart Sensors

11.22%

Shading Device

23.07%

Solar Photovoltaics

Design Strategy

EDGE IFC International Finance Corporation WORLD BANK GROUP

Creating Markets, Creating Opportunities

Homes Hospitality

RESULTS Final Energy Use 265.45 kWh/Month/Unit Final Water Use 13.97 kL/Month/Unit

Save Dashboard Version 2.1.5

Design Energy: 0.00% Water: 0.00%



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Creating Markets, Creating Opportunities

Homes Hospitality

RESULTS Final Energy Use 153.32 kWh/Month/Unit Final Water Use 8.57 kL/Month/Unit

Save Dashboard Version 2.1.5

WATER SAVING

	Homes	Hospitality	Retail	Offices	Hospitals	Education
RESULTS	Final Energy Use	155.35 kWh/Month/Unit	Operational CO ₂ Savings	1.08 tCO ₂ /Year...	Base Case Utility Cost	652243.58 VND/Month...
	Final Water Use	8.66 kL/Month/Unit	Embodied Energy Savings	894.91 MJ/Unit	Utility Cost Reduction	264,358.98 VND/Month...
					Incremental Cost	25,449,894. VND/...
					Payback in Years	8.02 Yrs.

Save Dashboard Version 2.1.5

Design Energy: 41.48% Water: 37.99% Materials: 0.71%

Water Efficiency Measures

Choose water efficiency measures to achieve savings of at least 20%.

HMW01* Low-Flow Showerheads - 8 L/min

HMW02* Low-Flow Faucets for Kitchen Sinks - 6 L/min

L/min

[Upload Document\(s\)](#) | [Calculator](#)

HMW03* Low-Flow Faucets in All Bathrooms - 6 L/min

L/min

[Upload Document\(s\)](#) | [Calculator](#)

HMW04* Dual Flush for Water Closets in All Bathrooms - 6 L/first flush and 3 L/second flush

1st - L/flush

2nd - L/flush

[Upload Document\(s\)](#)

HMW05* Single Flush for Water Closets - 6 L/flush

HMW06 Rainwater Harvesting System - 50% of Roof Area Used for Rainwater Collection

% of Roof Area Used

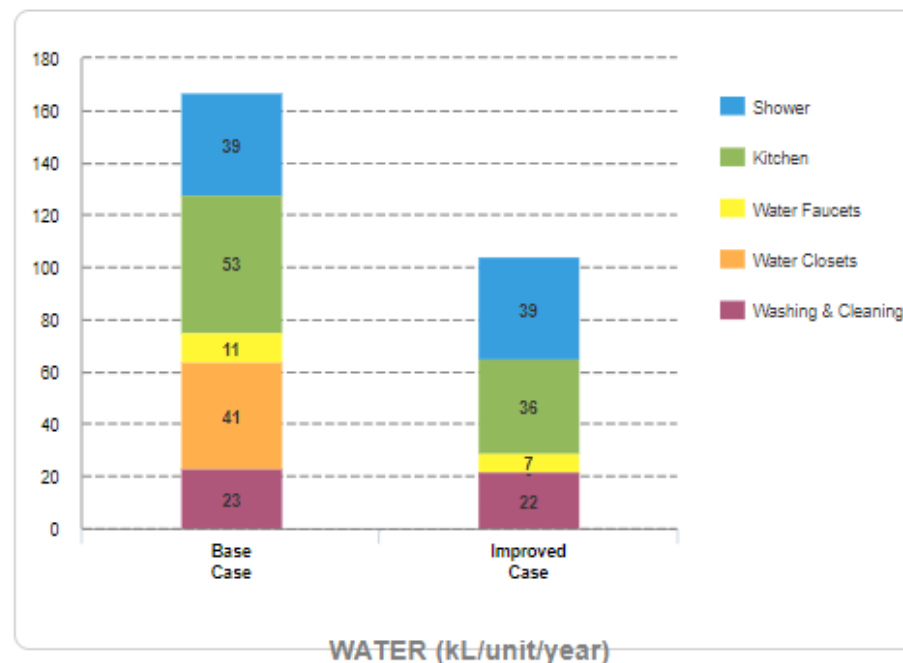
[Upload Document\(s\)](#)

HMW07 Recycled Grey Water for Flushing

[Upload Document\(s\)](#)

HMW08 Recycled Black Water for Flushing

37.99% Meets EDGE Water Standard



Disclaimer: EDGE is designed as comparative software and is not a design tool. Therefore predicted results for energy, water and materials may vary from actuals.

Save

Next Step: Materials

AR6054 - EDGE ANALYSIST AEGIS PRIMERA

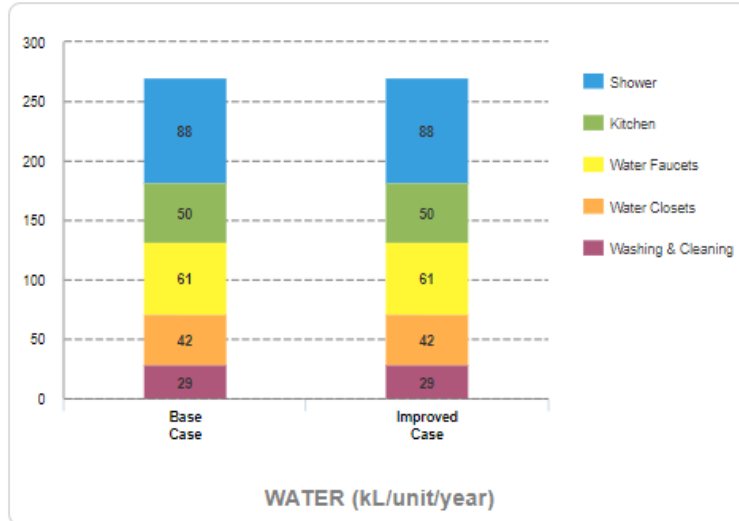
By. Christianto S. 15215066

Save Water Up to 37.99 %



Before Implementation

0.00% WATER SAVINGS



8.18 %

Low Flow Faucet

1.30 %

Dual Flush Closet

9.25 %

Rain Water Harvesting

2.61 %

Low Flow Shower Head

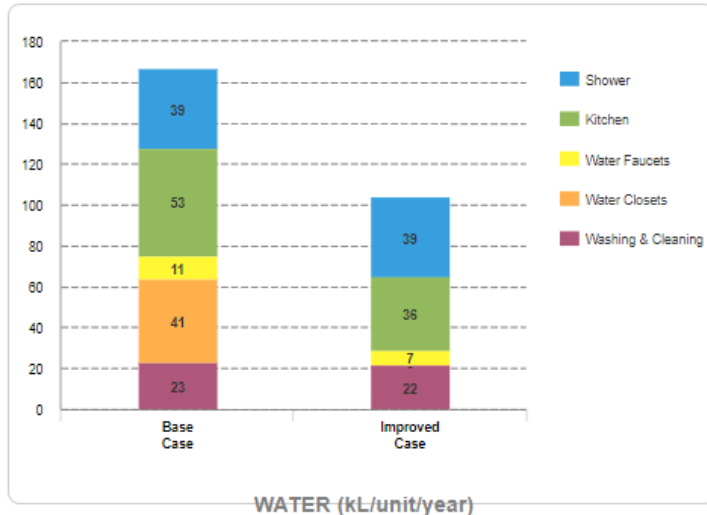


24.25 %

Final Energy Use: 265.45 kWh/Month/Unit
Final Water Use: 13.97 kL/Month/Unit

After Implementation

37.99% Meets EDGE Water Standard



Design Strategy

Final Energy Use: 148.12 kWh/Month/Unit
Final Water Use: 8.66 kL/Month/Unit

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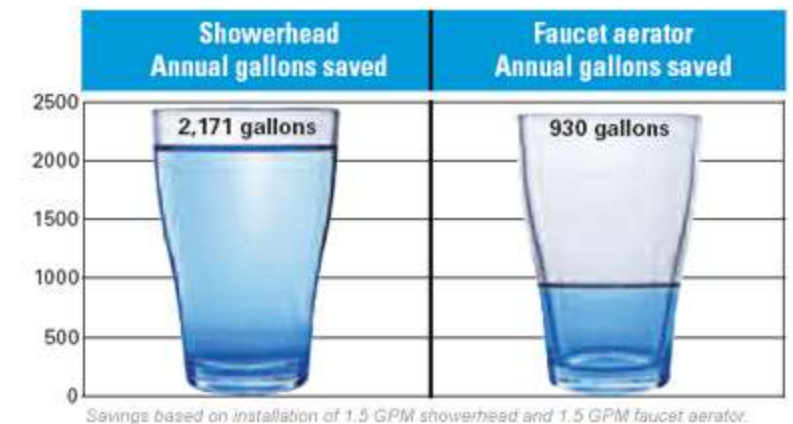
Low Flow Faucet & Sink (+- 10 % savings)

Options for reducing demand for water

Water flow controls on faucets and showers

Beam activated tapware

Push operated tapware



Source : Module 5.0 Water and Material

Water Closet & Urinals

Key Options	Waterless urinals
	Low Flush Urinals
	Combined WC / Basin
	Air-Assisted WC's
	Low flush and double flush WCs



Useful websites:
<https://www.epa.gov/watersense>
<https://www.map-testing.com/>

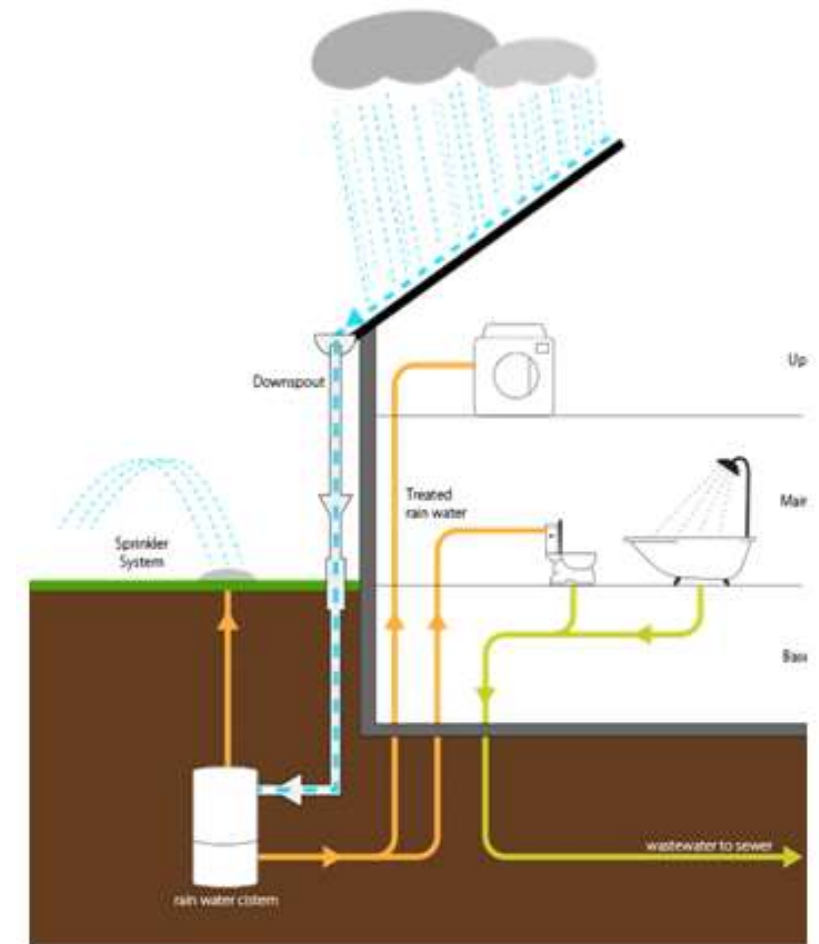
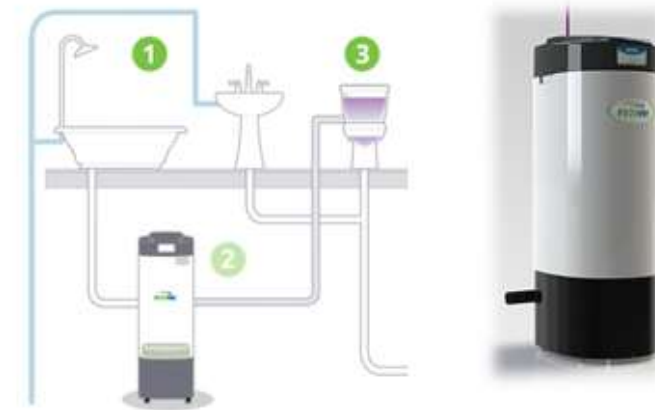
Grey Water Recycling & Rainwater Harvesting

Key Options

Laundry-to-landscape systems

Simple Greywater Filter

Active Greywater System





Premier Inn, Abu Dhabi
 Shower water from 300 rooms treated through an ultra-filtration membrane and feed back for use in flushing toilets. 40% savings [waterscan.com]

Source : Module 5.0 Water and Material

EMBODIED ENERGY SAVING



	Homes	Hospitality	Retail	Offices	Hospitals	Education
RESULTS	Final Energy Use	153.32 kWh/Month/Unit	Operational CO ₂ Savings	1.10 tCO ₂ /Year...	Base Case Utility Cost	652243.58 VND/Month...
	Final Water Use	8.66 kL/Month/Unit	Embodied Energy Savings	44257.46 MJ/Unit	Utility Cost Reduction	267,988.46 VND/Month...
					Incremental Cost	21,414,231 VND/...
					Payback in Years	6.66 Yrs.

[Save](#) | [Dashboard](#) | Version 2.1.5 ▼
Design | Energy: 42.24% | Water: 37.99% | Materials: 35.21%

File ▼

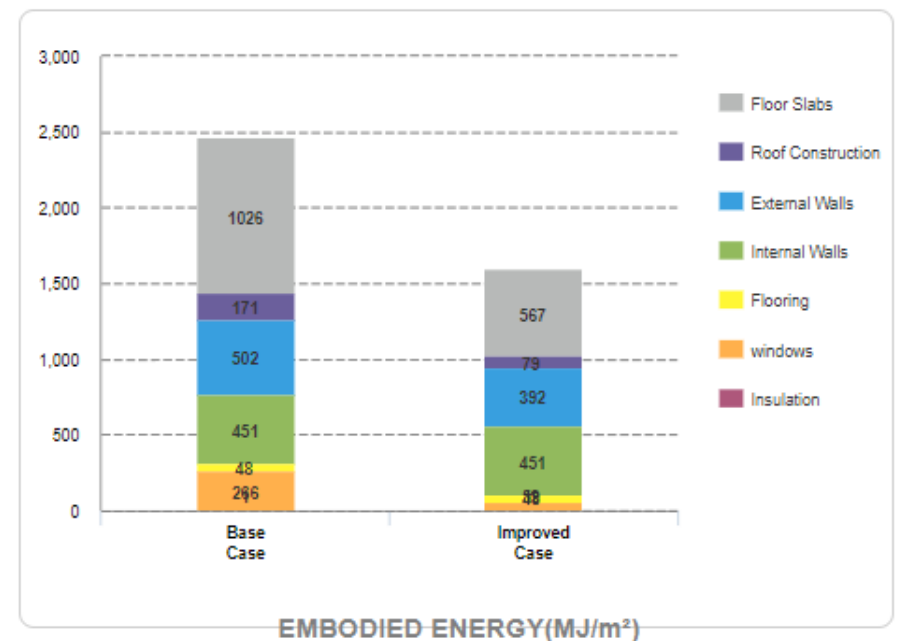
Materials Efficiency Measures

Choose building material options to achieve savings of at least 20%, indicating thickness.

Ref	Building Material	Improved Case Selection	Proportion %	Thickness	Steel Rebar
HMM01*	Floor Slabs Upload Document(s)	Precast Concrete Double Tee Units ▼		<input type="text"/> mm	<input type="text"/> kg/m ²
HMM02*	Roof Construction Upload Document(s)	Type 1 Concrete Filler Slab ▼	100 %	<input type="text"/> mm	<input type="text"/> kg/m ²
HMM03*	External Walls Upload Document(s)	Type 1 Facing Brick and Hollow Concrete Blocks ▼	100 %	<input type="text"/> mm	
HMM04*	Internal Walls Upload Document(s)	Type 1 Common Brick Wall with Plaster on Both Sides ▼	100 %	<input type="text"/> mm	
HMM05*	Flooring Upload Document(s)	Type 1 Ceramic Tile ▼	100 %		
HMM06*	Window Frames Upload Document(s)	Type 1 Aluminium Clad Timber: Aluminium ▼	100 %		Double Glazing

*A selection must be made for each measure with a thickness entered for floor, roof, and walls.

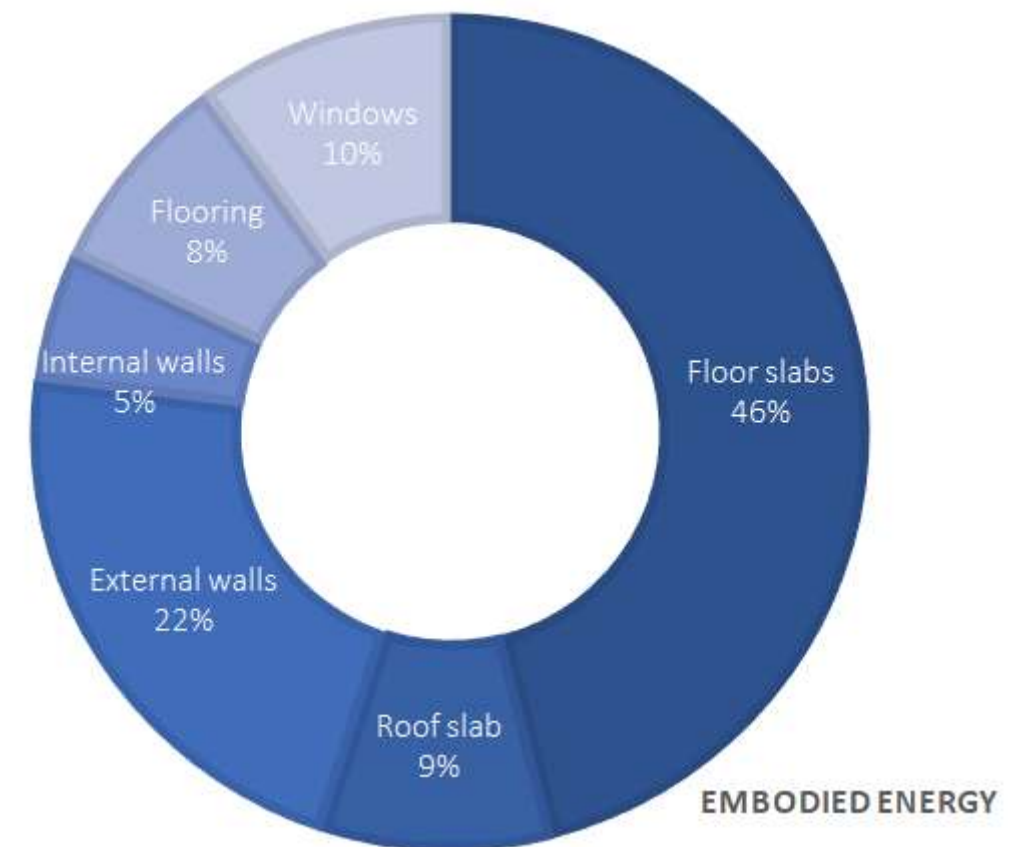
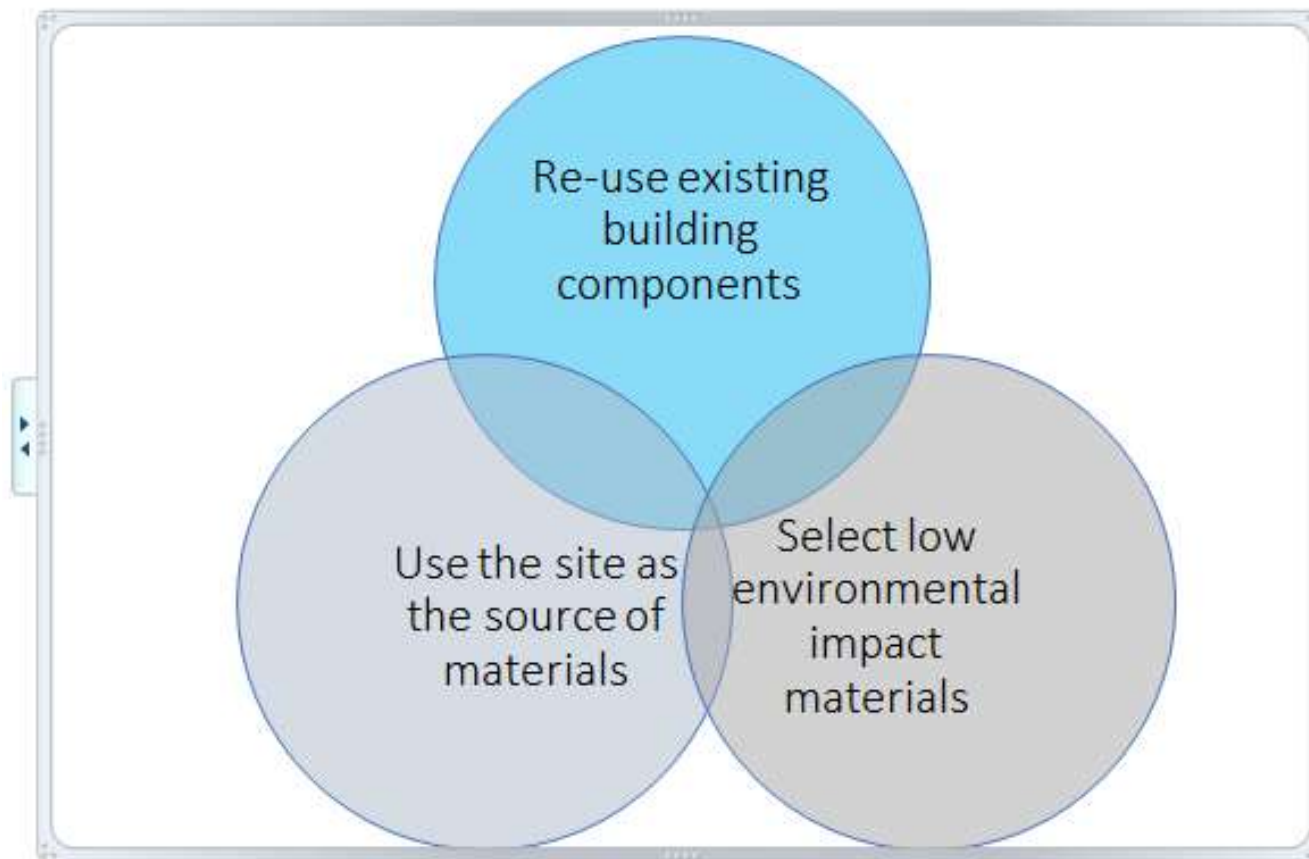
35.21% Meets EDGE Materials Standard



Disclaimer: EDGE is designed as comparative software and is not a design tool. Therefore predicted results for energy, water and materials may vary from actuals.

[Save](#) | [Next Step: Express Interest](#)

Embodied Energy Efficiency



Source : Module 5.0 Water and Material

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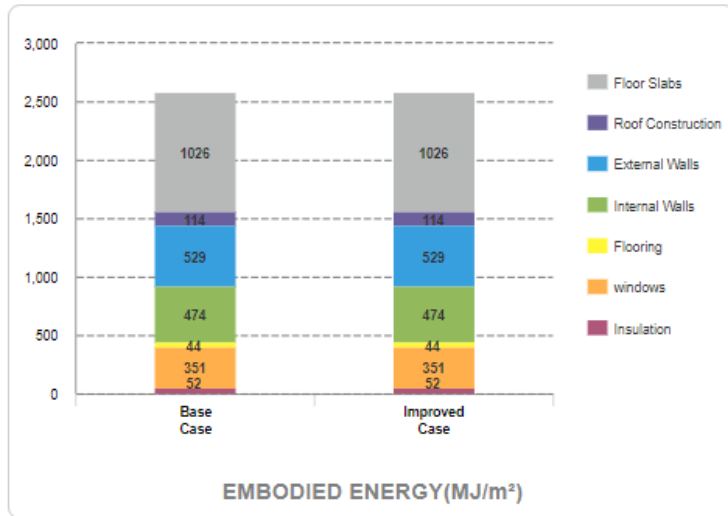
By. Christianto S. 15215066

Embodied Energy Saving Up to 35.21 %



Before Implementation

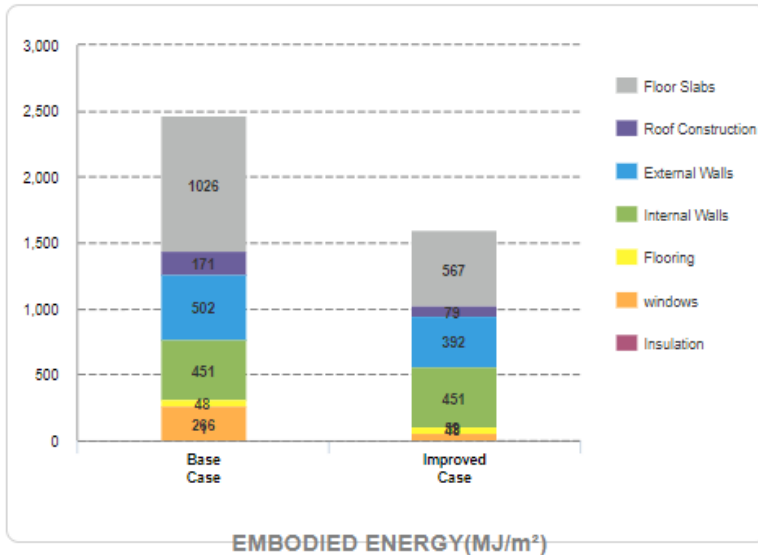
0.00% EMBODIED ENERGY SAVINGS



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After Implementation

35.21% Meets EDGE Materials Standard



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6.22%

Floor Slabs – Precast Concrete

6.38%

Roof Construction – Concrete Filler Slab

7.25%

External Walls – Facing Brick and Hollow Concrete

6.2%

Internal Walls – Common Brick Walls plastered

7.22%

Flooring – Ceramic Tile

8.07%

Windows Frames – Aluminium Clad

Design Strategy

Retail	
Operational CO ₂ Savings	0.00 tCO ₂ /Year...
Embodied Energy Savings	0.00 MJ/Unit
Materials: 0.00%	



Retail		Offices	
Operational CO ₂ Savings	1.10 tCO ₂ /Year...		
Embodied Energy Savings	44257.46 MJ/Unit		
Materials: 35.21%			

6.22%

**Floor Slabs –
Precast Concrete**

6.38%

**Roof Construction –
Concrete Filler Slab**

7.25%

**External Walls – Facing
Brick and Hollow
Concrete**

6.2%

**Internal Walls – Common
Brick Walls plastered**

**Windows Frames –
Aluminium Clad**

10.22%

Energy Saving Bulb

6.2%

IoT Smart Sensors

14.38%

High Performance Glass

9.25%

Reduce WWR

Embodied

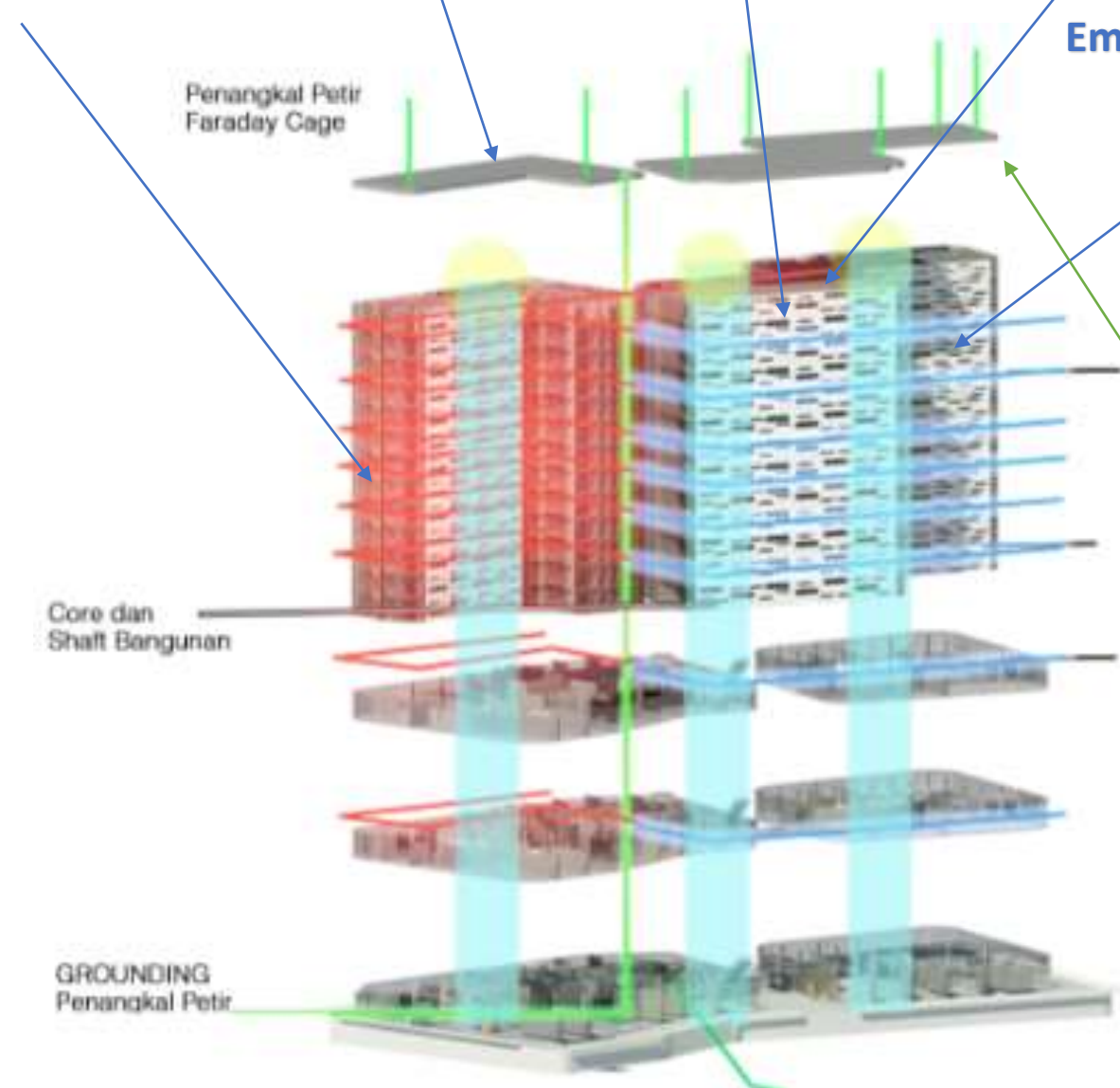
11.22%

Shading Device

Solar Photovoltaics

Energy

Water



8.18%

Low Flow Faucet

1.30%

Dual Flush Closet

9.25%

Rain Water Harvesting

2.61%

Low Flow Shower Head

Overall Schematic

Sekian dan Terima Kasih

Salam Pembangunan Indonesia Berkelanjutan

