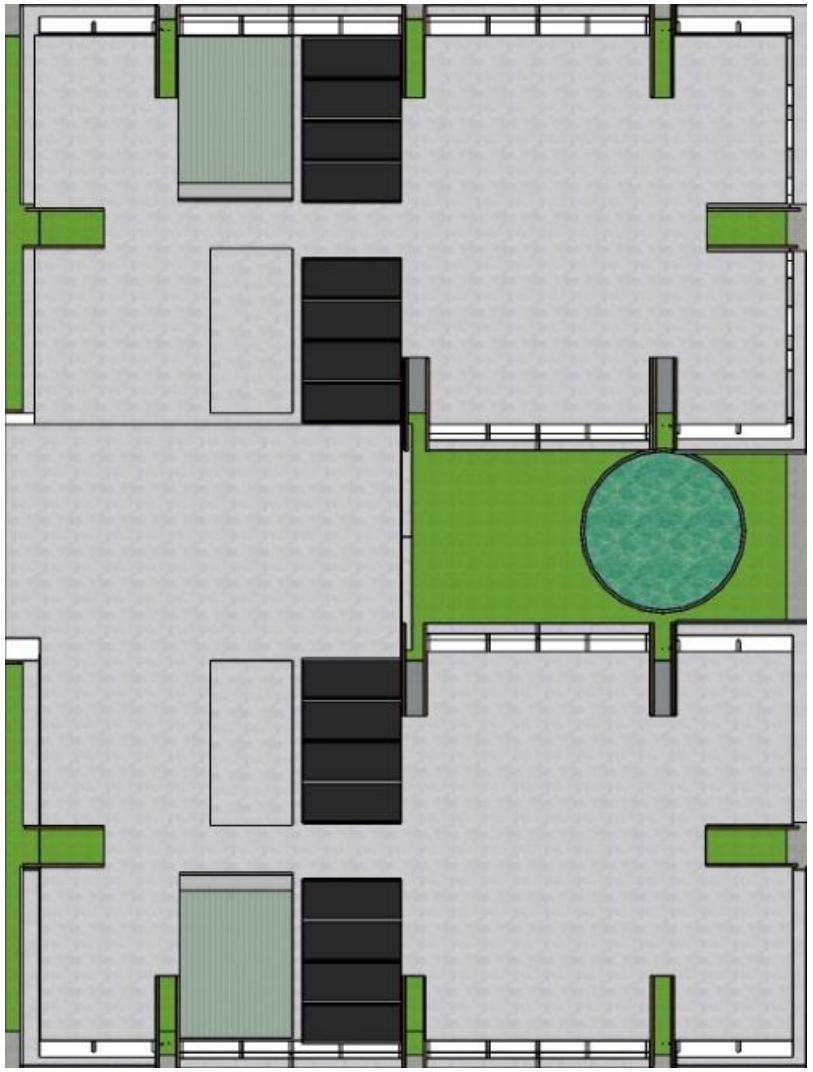
APARTMEN HO CHI MINH

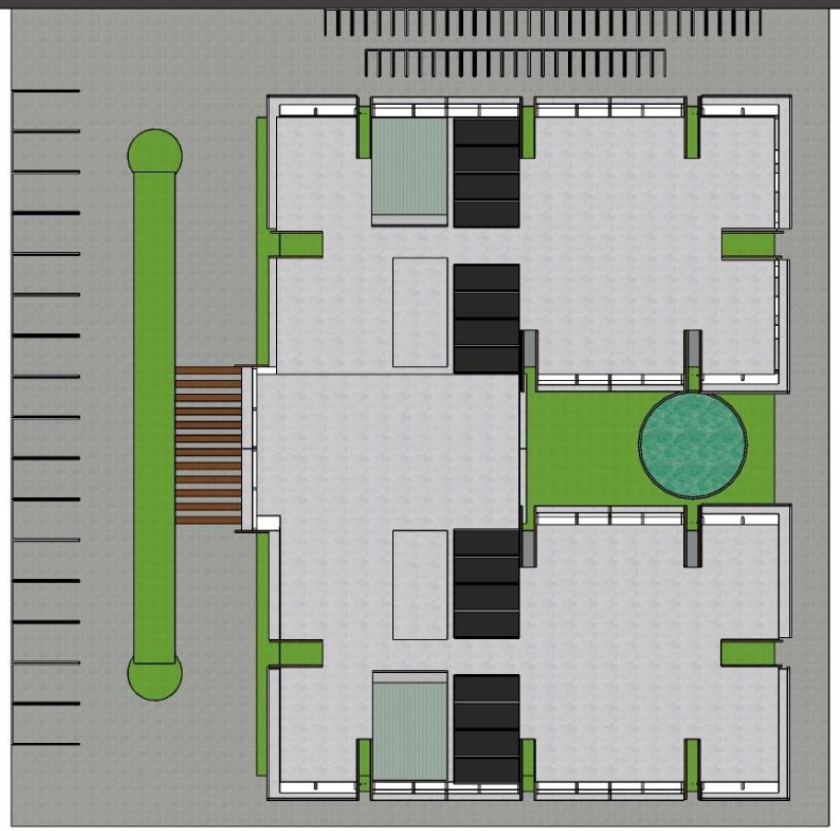
HILMA LAILATUL HUSNA

PROJECT	: LOW-INCOME APARTMEN	UNIT	: 100
LOCATION	: HO CHI MINH, VIETNAM	UNIT AREA	: 50 m2
LAND AREA	: 3600 m2	OCCUPANCY	: 4 PEOPLE/UNIT
FLOOR AREA	: 5950 m2	TOTAL CO2 SAVING	: 147.36 tCO_2/Year

KONSEP DESAIN

INTERLOCK GREENSPACE



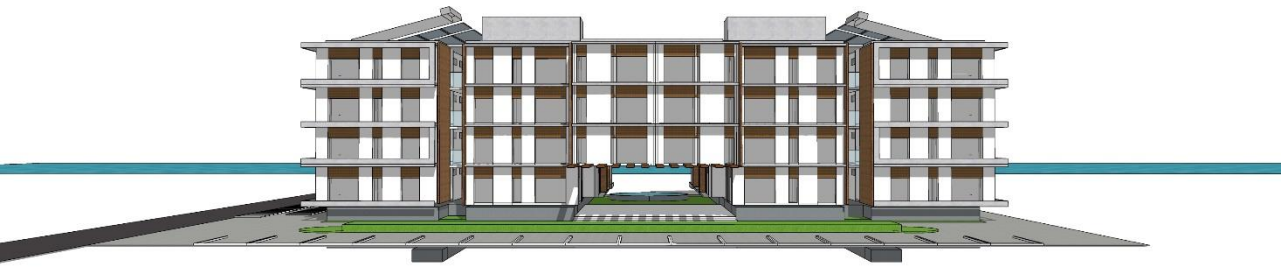


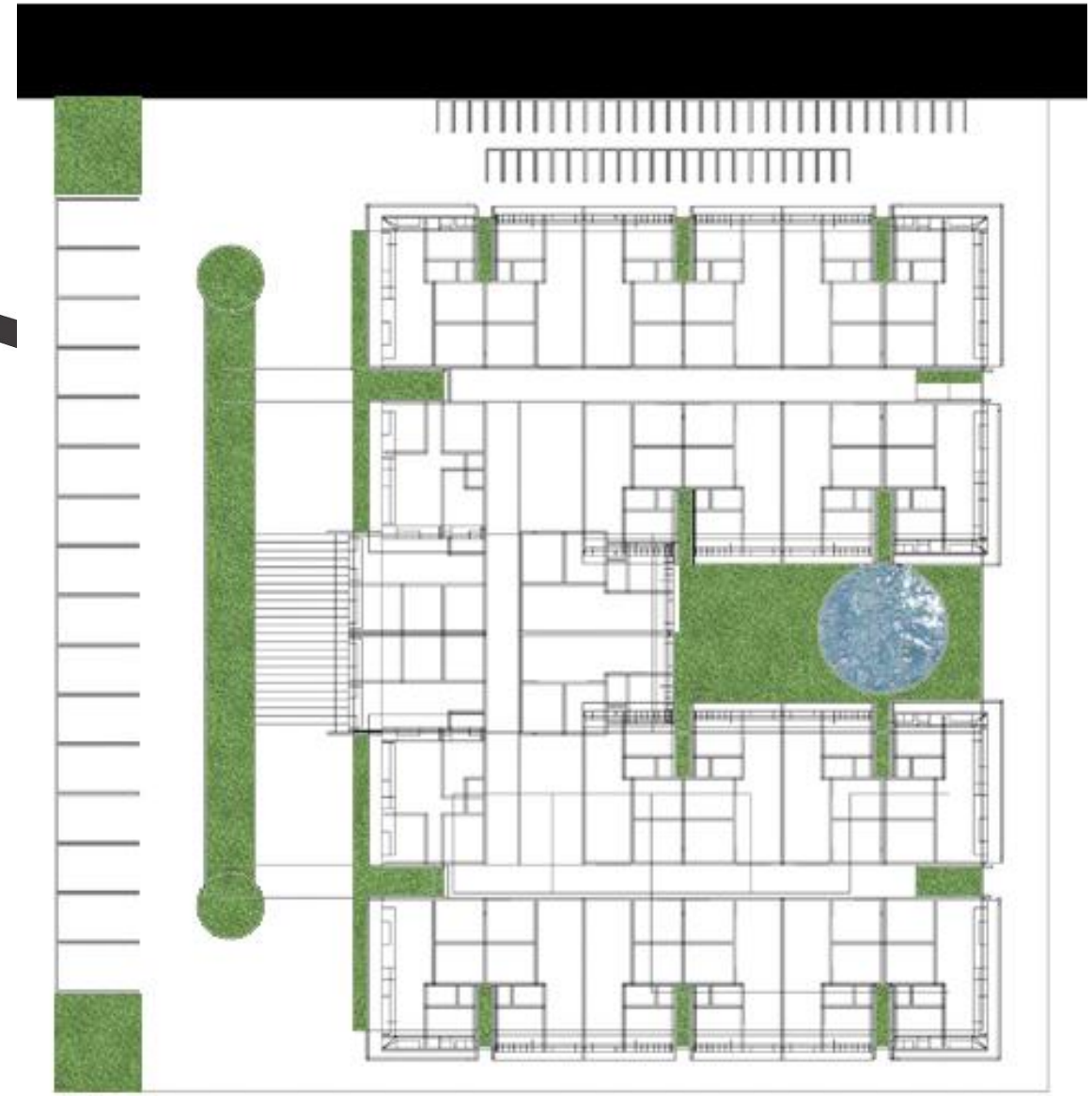
LUAS LAHAN : 3600 m2

LUAS DASAR BANGUNAN : 1500 m2

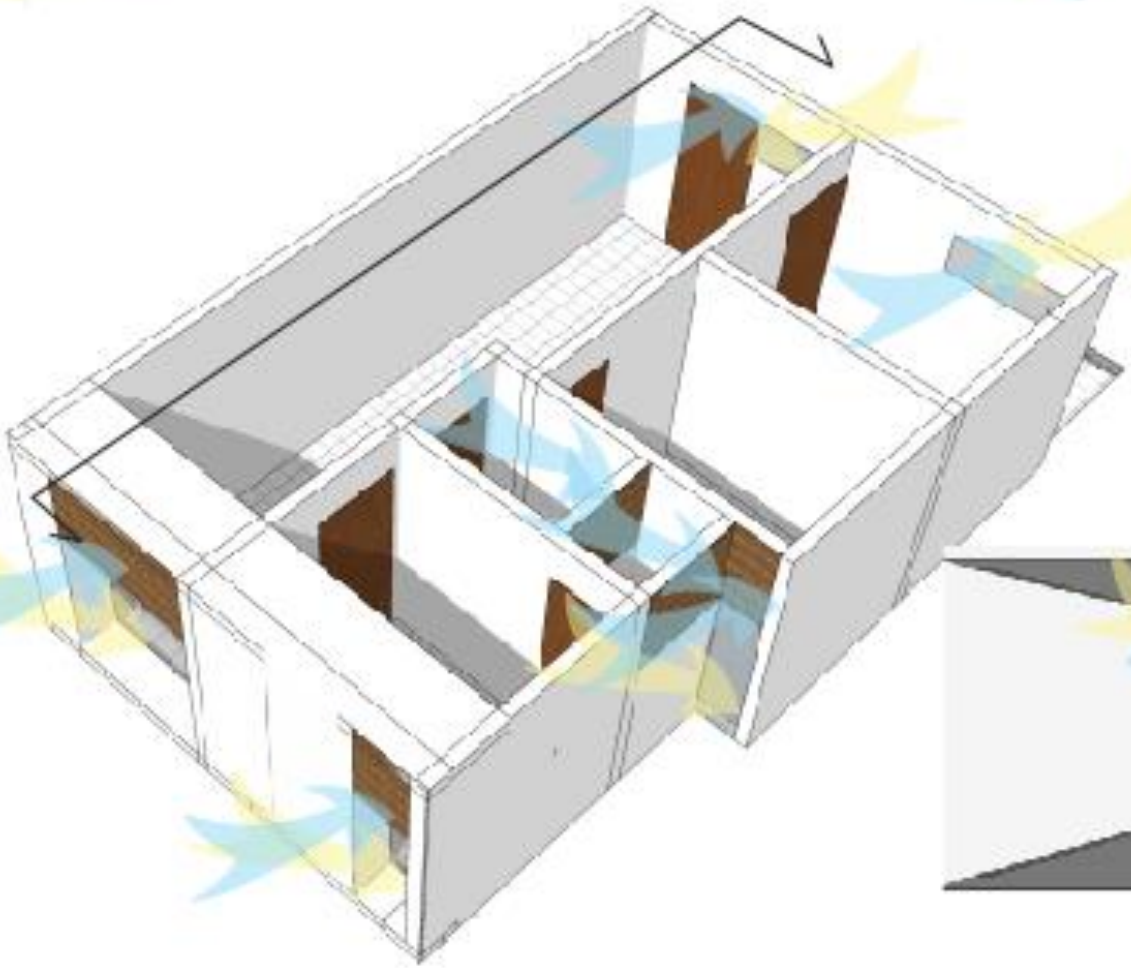
LUAS LANTAI : 5950 m2

LUAS AREA HIJAU : 500 m2

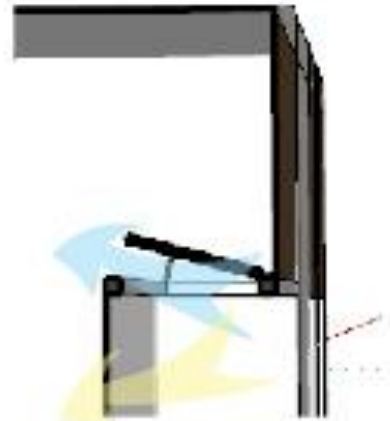


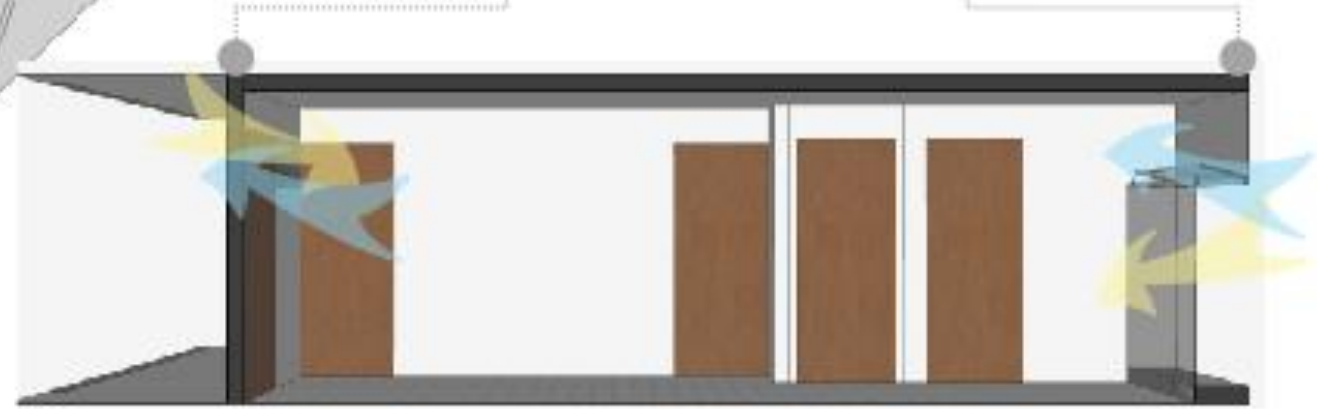


NATURAL LIGHT



NATURAL VENTILATION





DESIGN STRATEGY

Technical Solutions

ENERGY

Reduced Window to Wall Ratio - WWR of 30%
Natural Ventilation
Air Conditioning System - COP of 3.5
Energy-Saving Light Bulbs - Common Areas and External Spaces
Solar Hot Water Collectors - 100% of Hot Water Demand
Solar Photovoltaics - 25% of Total Energy Demand.

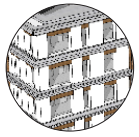
WATER

Low-Flow Showerheads - 8 L/min
Low-Flow Faucets for Kitchen Sinks - 6 L/min
Low-Flow Faucets in All Bathrooms - 6 L/min
Dual Flush for Water Closets in All Bathrooms
Recycled Grey Water for Flushing

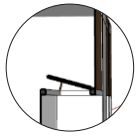
MATERIALS

Composite in situ concrete and steel deck floor slab
Concrete filler slab with polystyrene block for roof
Cellular light weight concrete block for exterior-indoor wall
Parquet/wood block finishes floor
Timber window frame

DESIGN STRATEGY



WWR of 30%
Reduced Window to Wall Ratio



Natural Ventilation

AC System - COP of 3.5

Energy-Saving Light Bulbs - Common Areas and External Spaces

Solar Hot Water Collectors - 100% of Hot Water Demand

Solar Photovoltaics - 25% of Total Energy Demand.

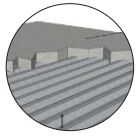
Low-Flow Showerheads - 8 L/min

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

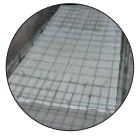
Low-Flow Faucets in All Bathrooms - 6 L/min

Dual Flush for Water Closets in All Bathrooms

Recycled Grey Water for Flushing



Composite in situ concrete and steel deck floor slab



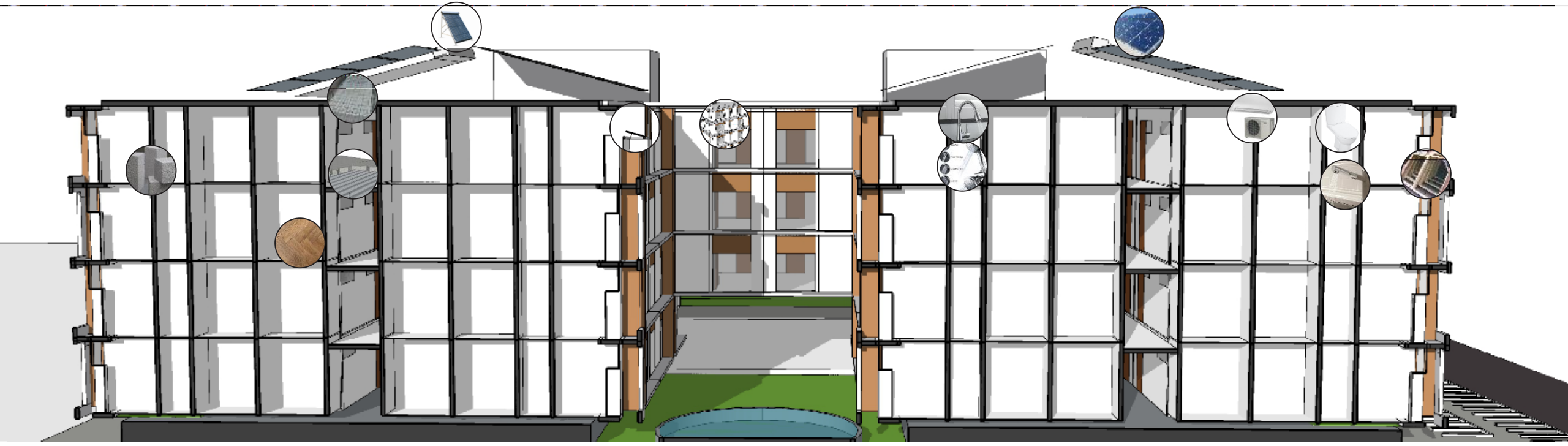
Concrete filler slab with polystyrene block for roof

Cellular light weight concrete block for exterior-

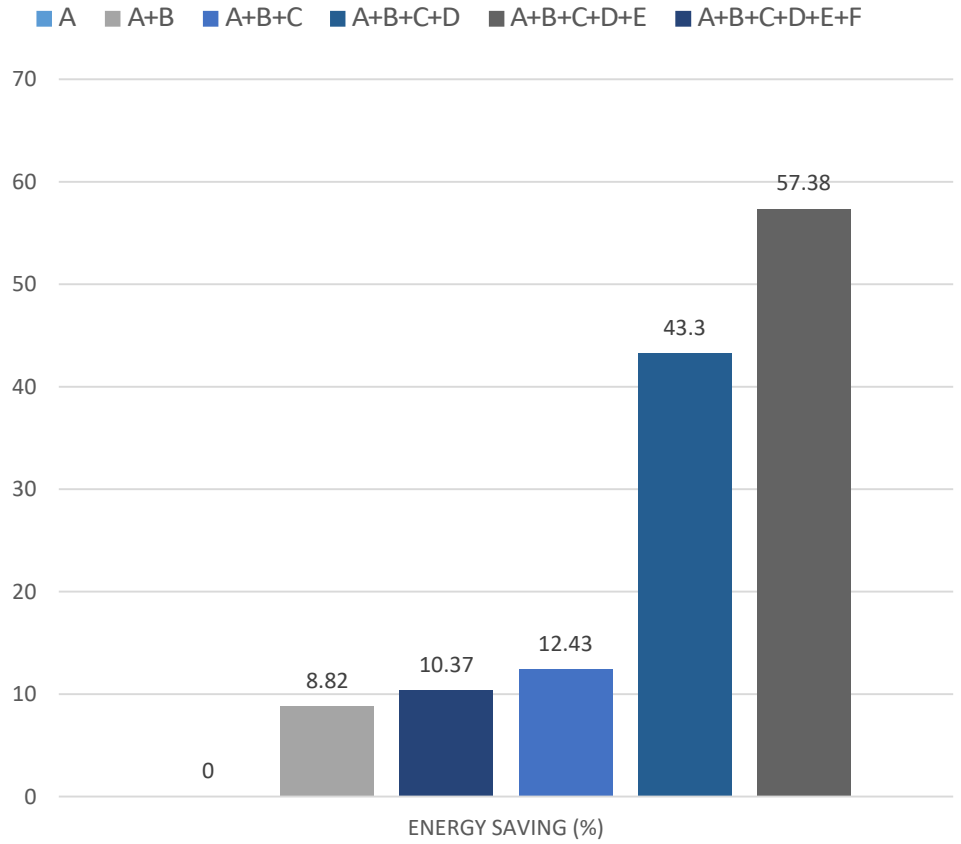
Cellular light weight concrete block for interior

Parquet/wood block finishes floor

Timber window frame



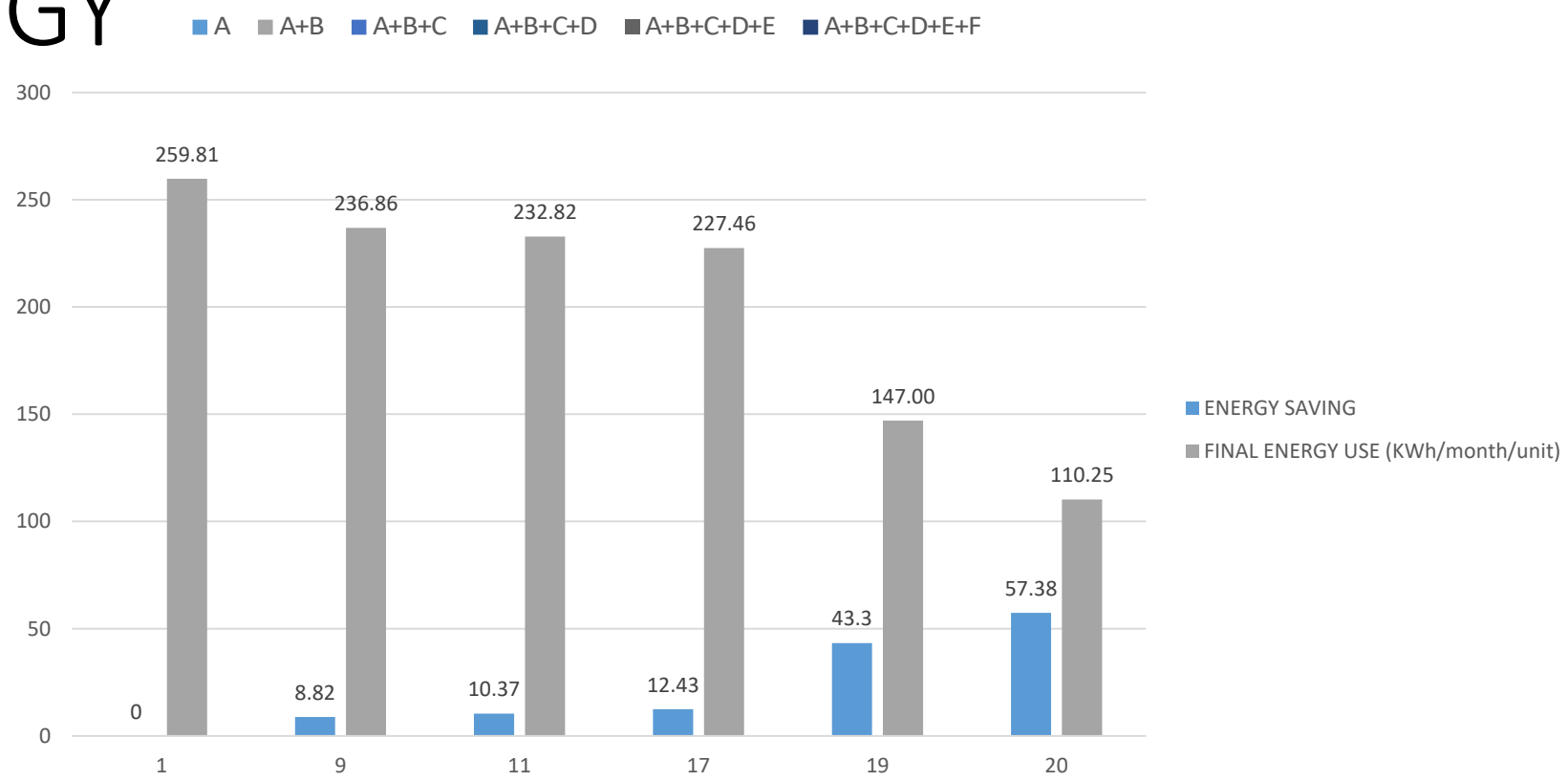
ENERGY



ENERGY

A. HME 1 Reduced Window to Wall Ratio - WWR of 30%
B. HME 9 Natural Ventilation
C. HME 11 Air Conditioning System - COP of 3.5
D. HME 17 Energy-Saving Light Bulbs - Common Areas and External Spaces
E. HME 19 Solar Hot Water Collectors - 100% of Hot Water Demand
F. HME 20 Solar Photovoltaics - 25% of Total Energy Demand.

ENERGY



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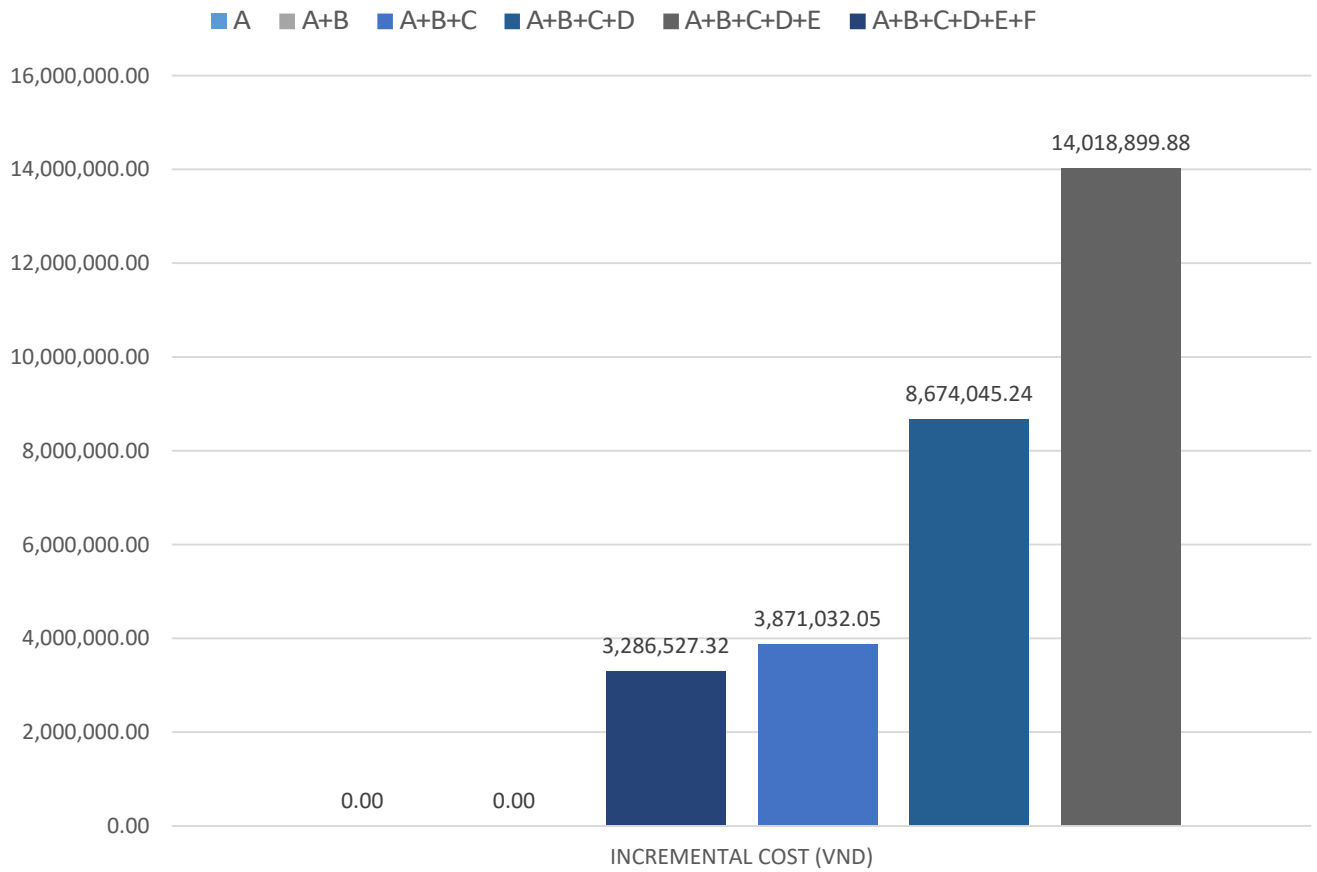

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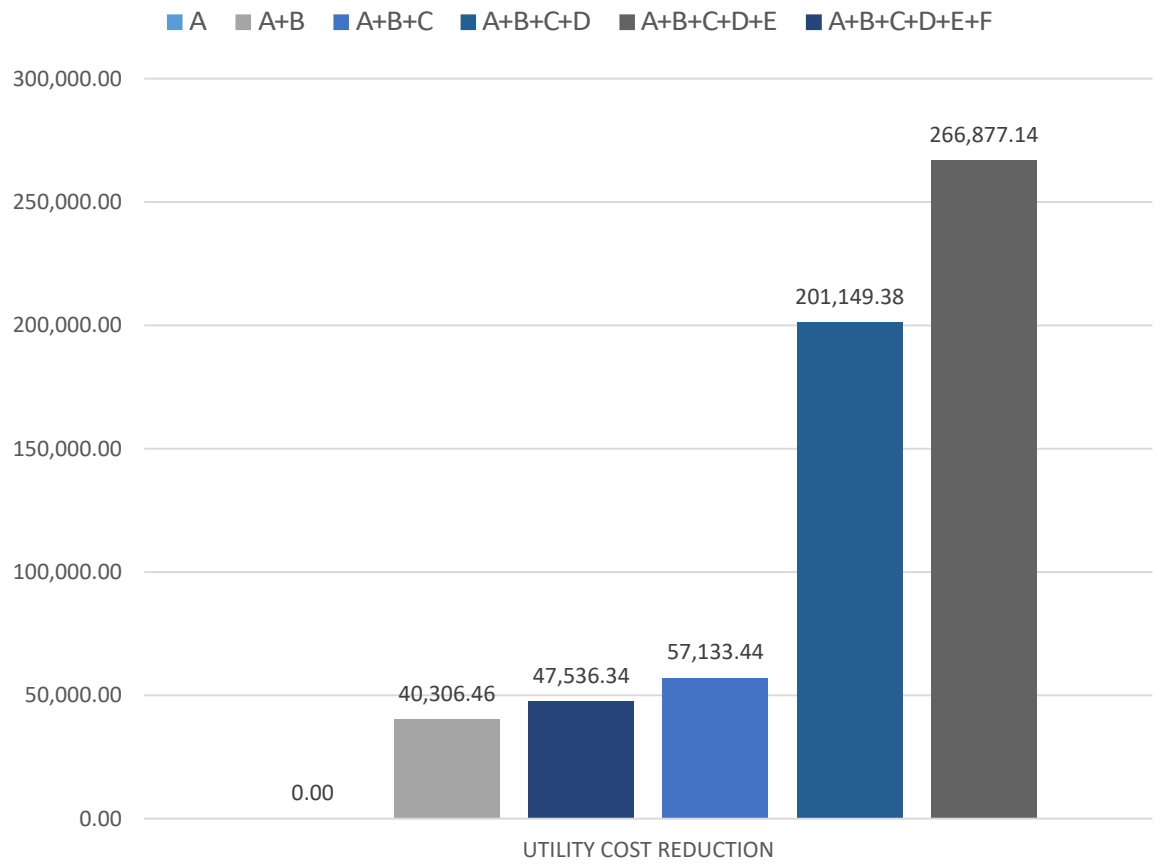

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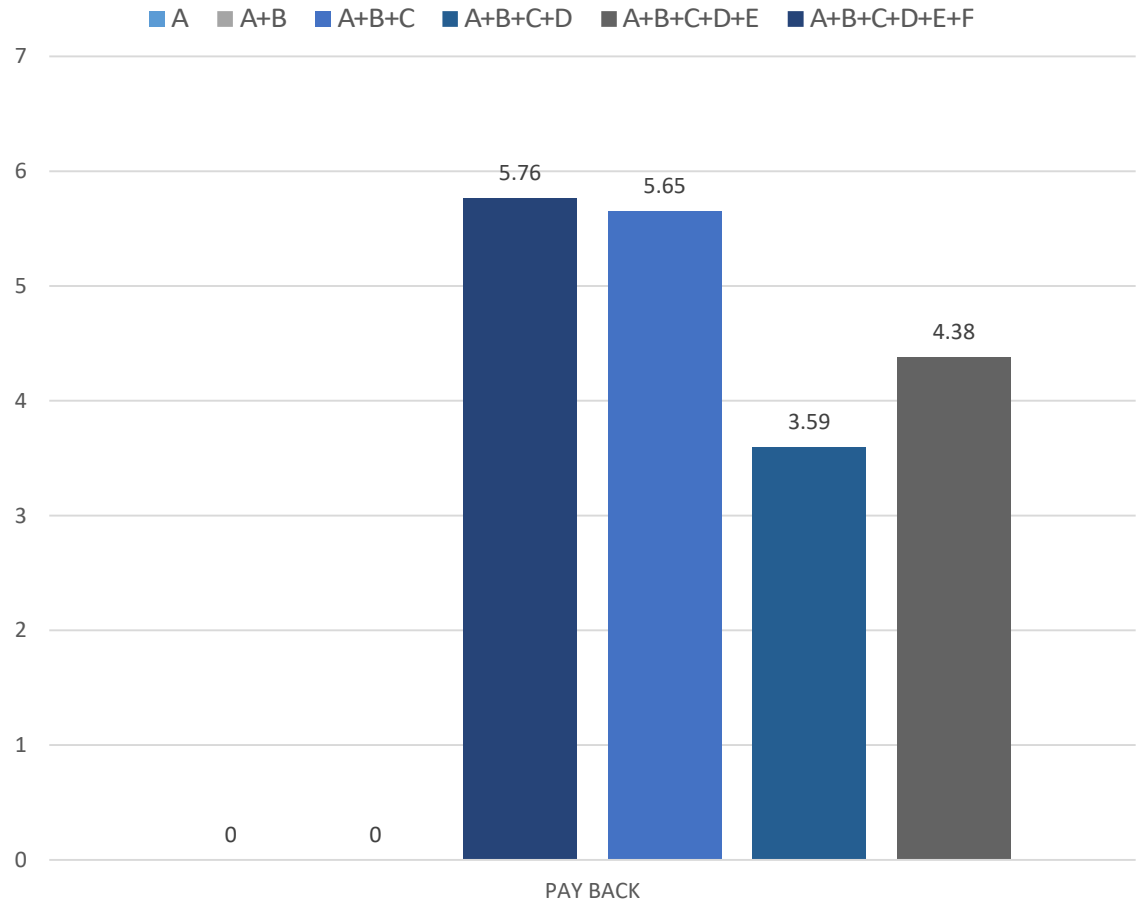

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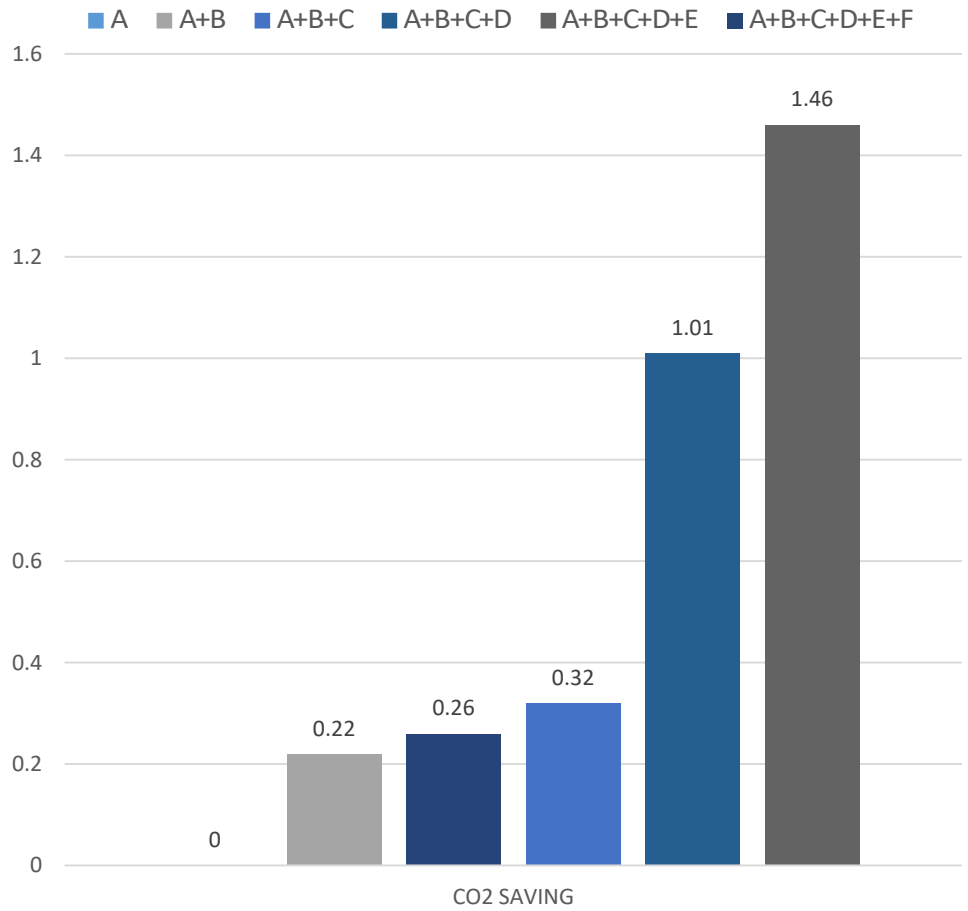

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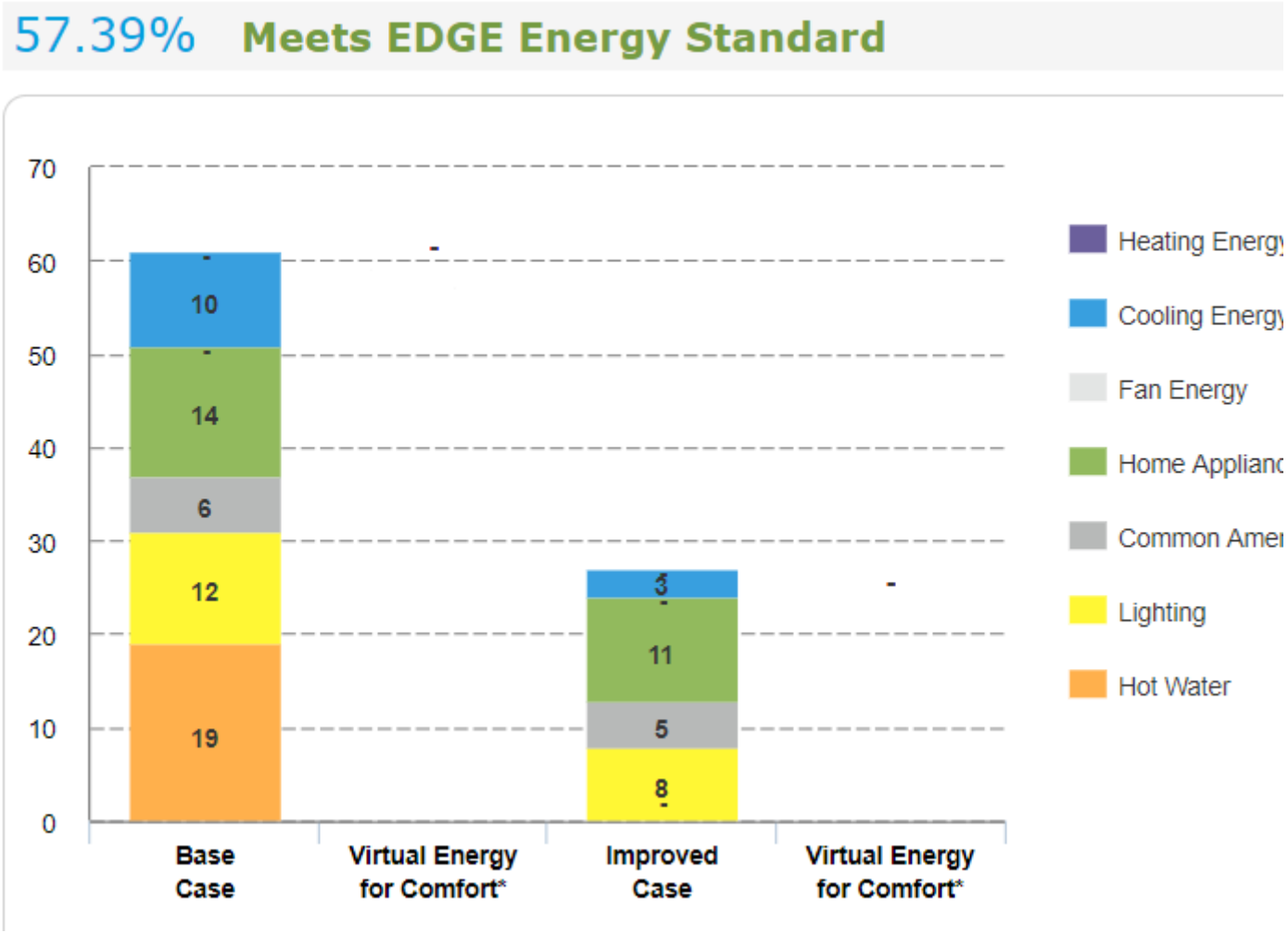
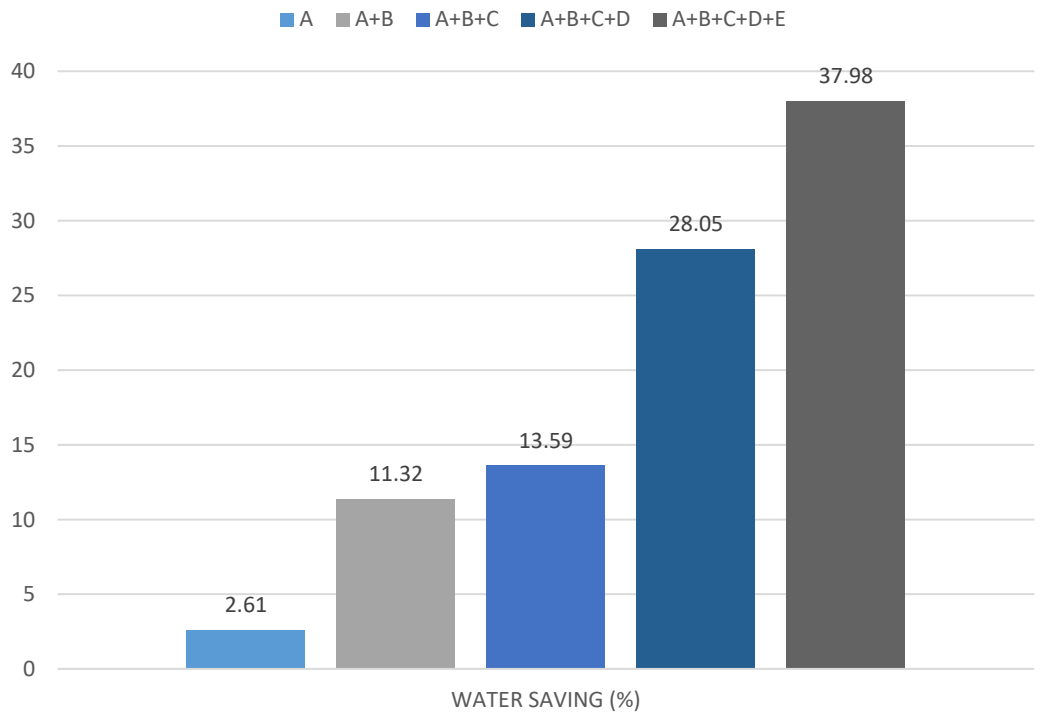
RESULT


57.39%
Meets EDGE Energy Standard
70
60
50
40
30
20
10
0
10
14
6
12
19
3
11
5
8
Base Case
Virtual Energy for Comfort*
Improved Case
Virtual Energy for Comfort*
Heating Energy
Cooling Energy
Fan Energy
Home Applianc
Common Amer
Lighting
Hot Water

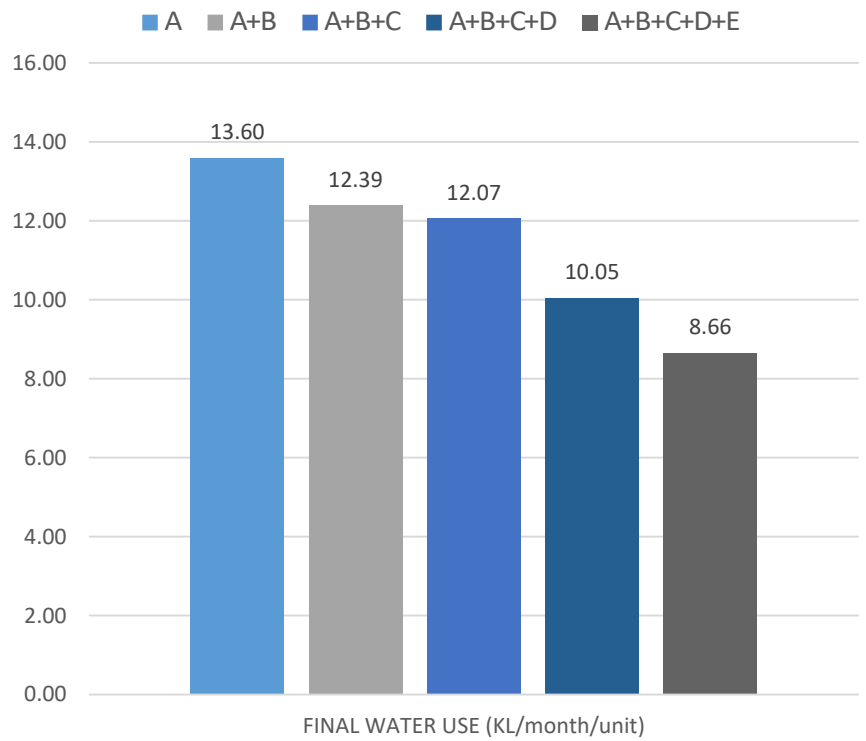
WATER



WATER

A. Low-Flow Showerheads - 8 L/min
B. Low-Flow Faucets for Kitchen Sinks - 6 L/min
C. Low-Flow Faucets in All Bathrooms - 6 L/min
D. Dual Flush for Water Closets in All Bathrooms
E. Recycled Grey Water for Flushing

WATER



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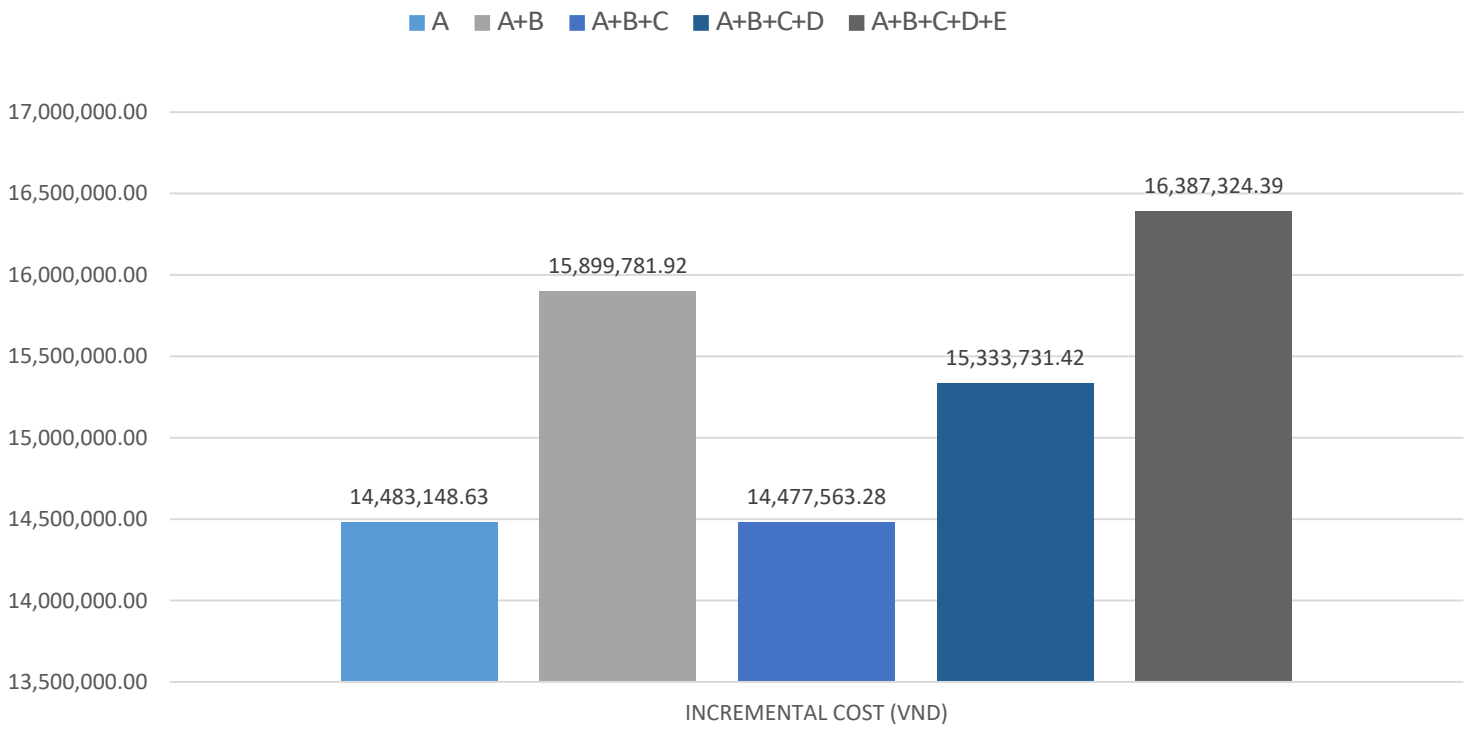

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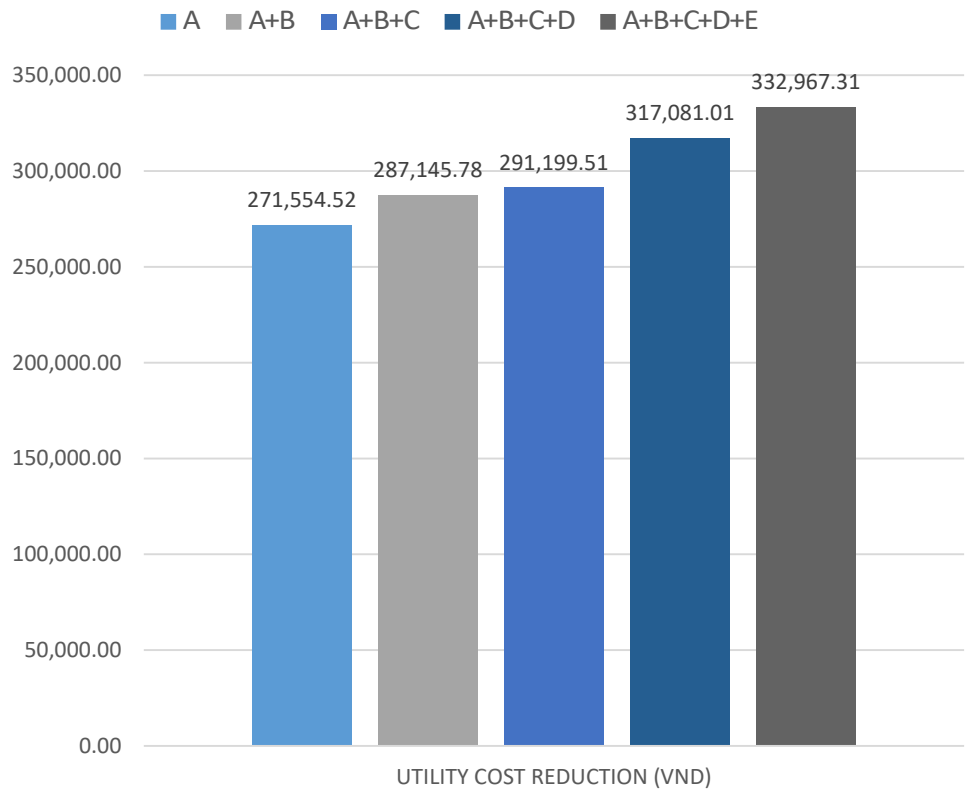

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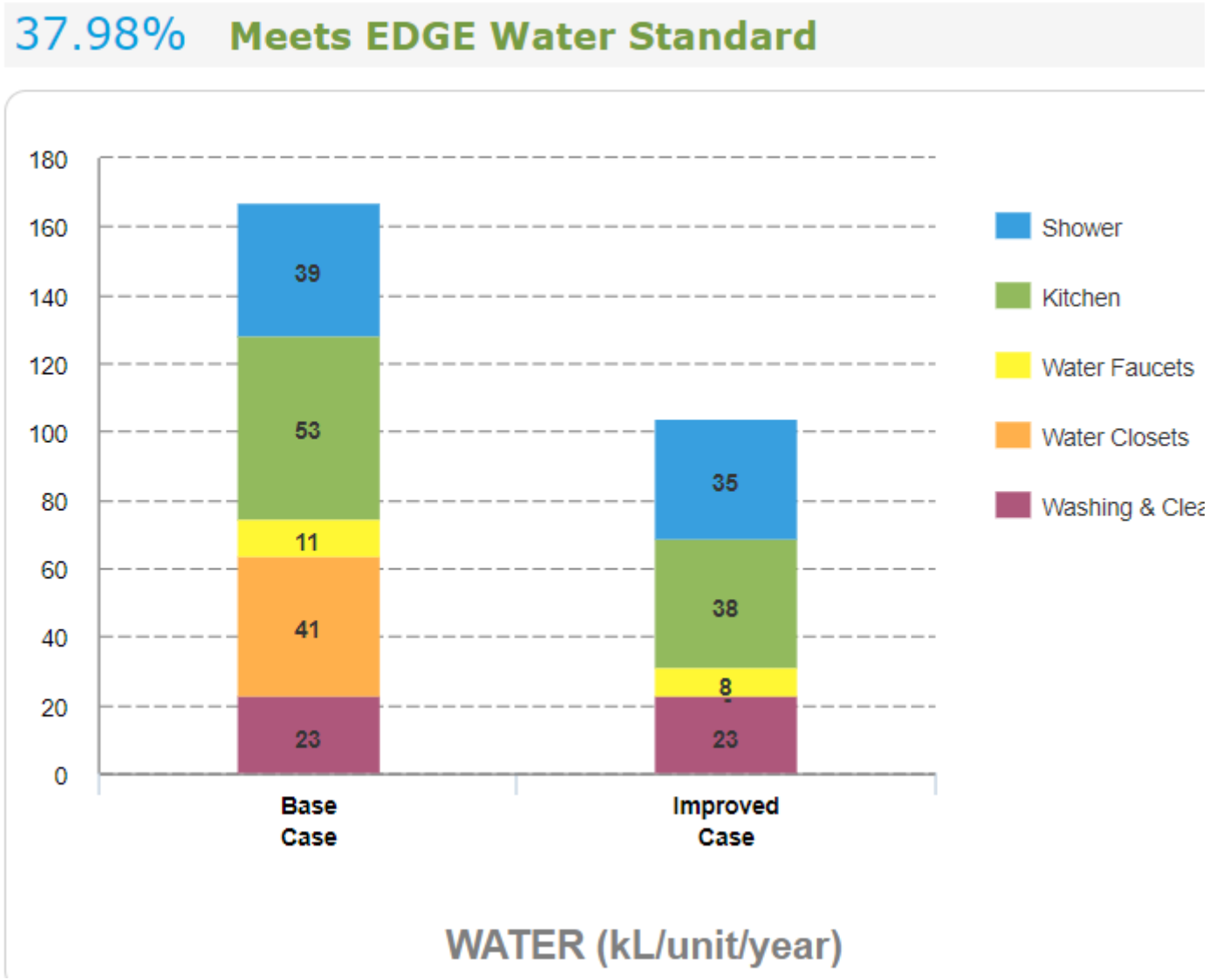
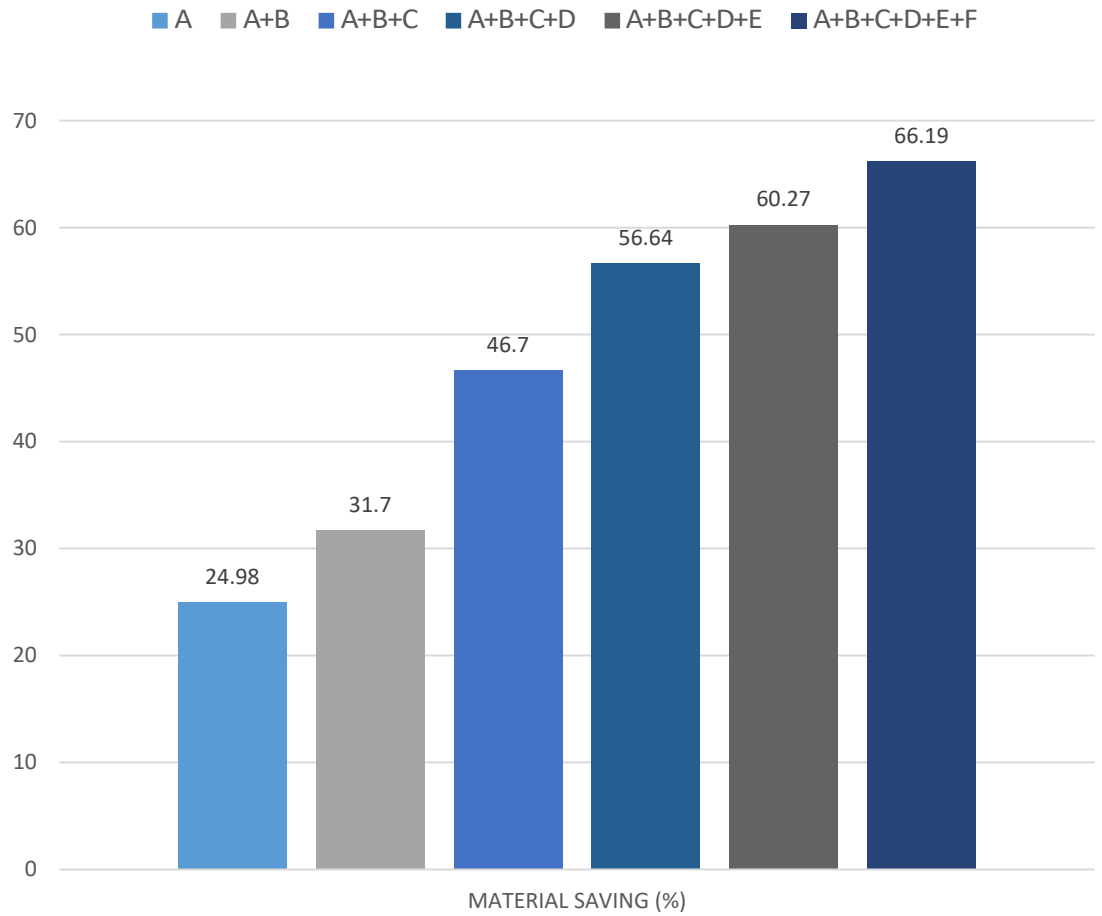
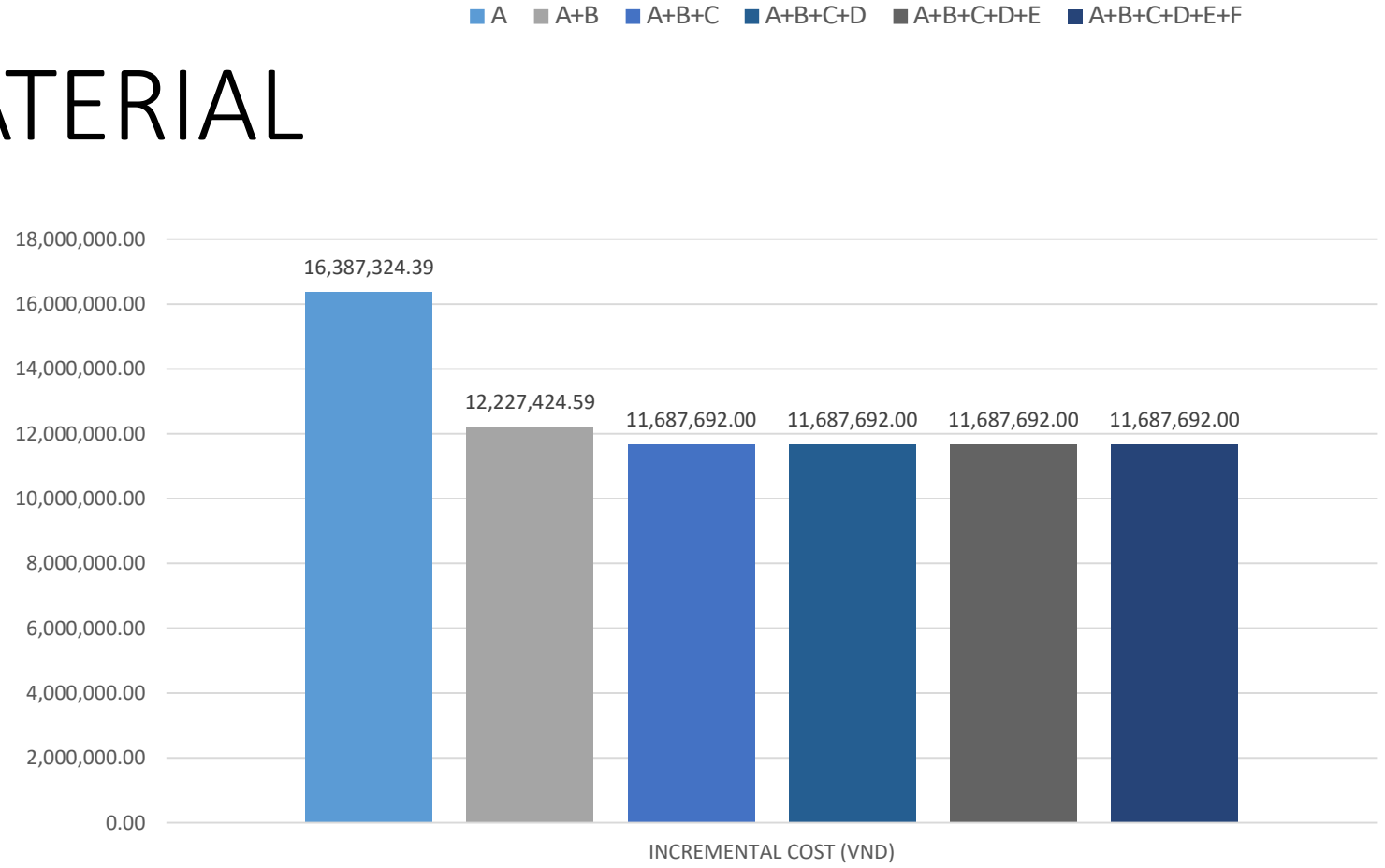

37.98%
Meets EDGE Water Standard
180
160
140
120
100
80
60
40
20
0
39
53
11
41
23
35
38
8
23
Base Case
Improved Case
Shower
Kitchen
Water Faucets
Water Closets
Washing & Clea
WATER (kL/unit/year)

MATERIAL



BEFORE	MATERIALS	AFTER
In situ reinforce concrete slab	A (floor slab)	Composite in situ concrete and steel deck
In situ reinforce concrete slab	B (roof)	Concrete filler slab with polystyrene block
Common brick with internal-external plaster	C (exterior wall)	Cellular light weight concrete block for exterior wall
Common brick with plaster on both side	D (indoor wall)	Cellular light weight concrete block for indoor wall
Ceramic tile	E (floor)	Parquet/wood block finishes
Aluminium	F (window frame)	Timber

MATERIAL



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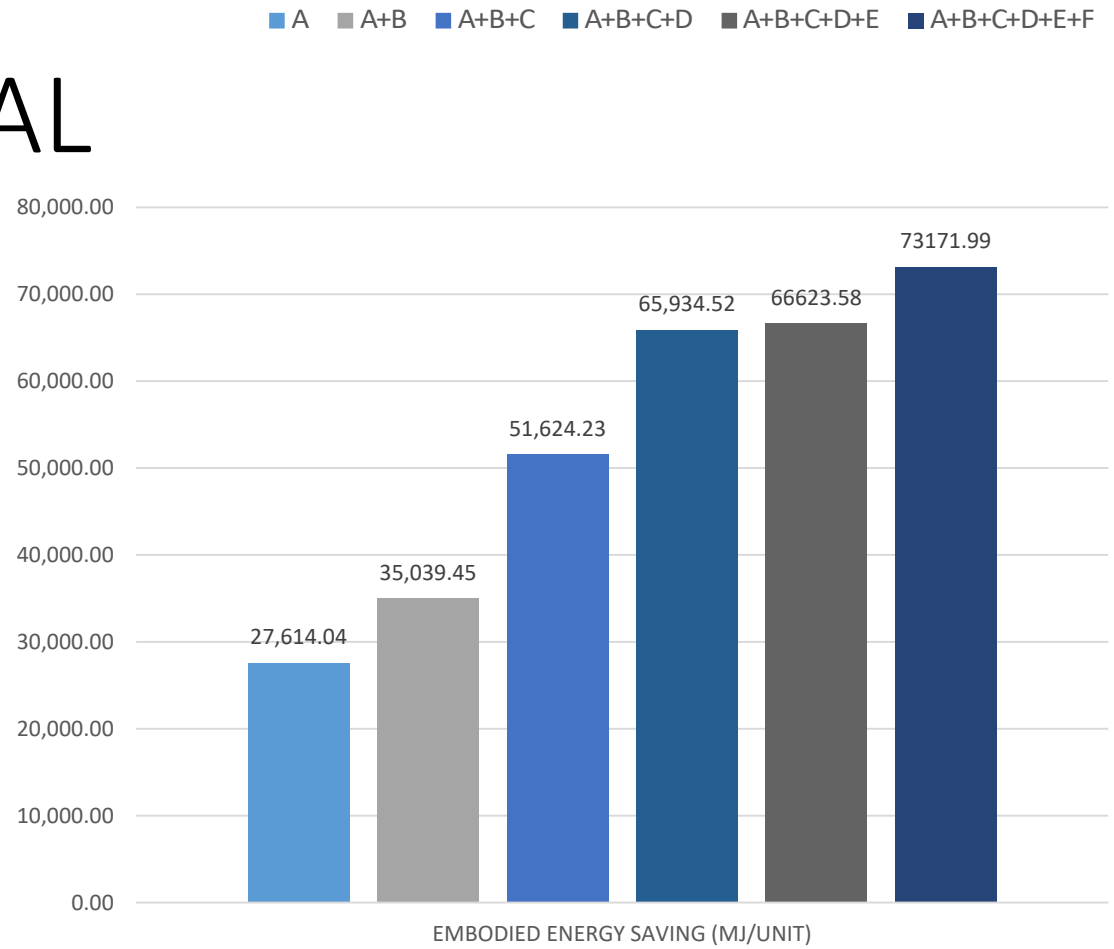

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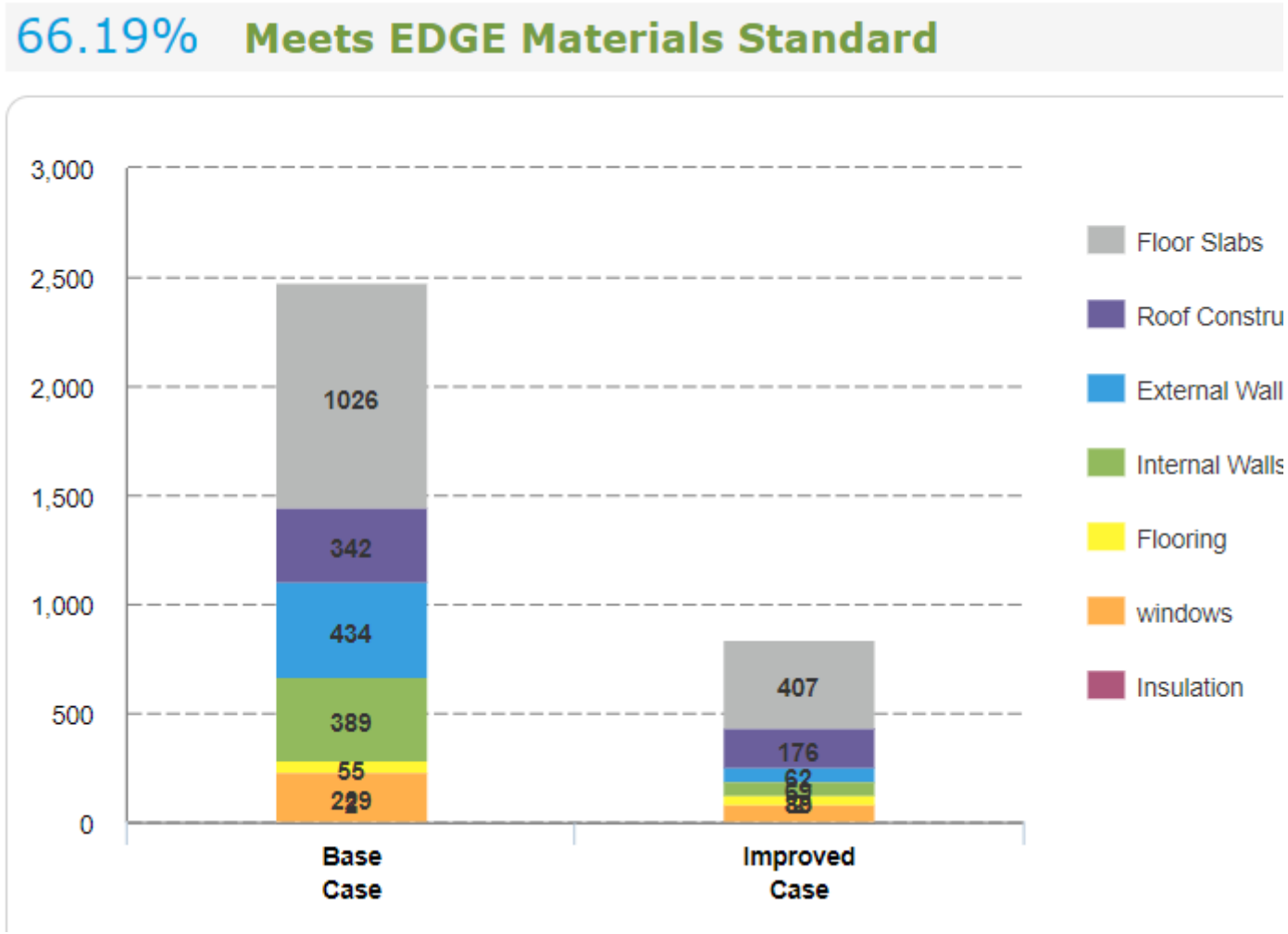
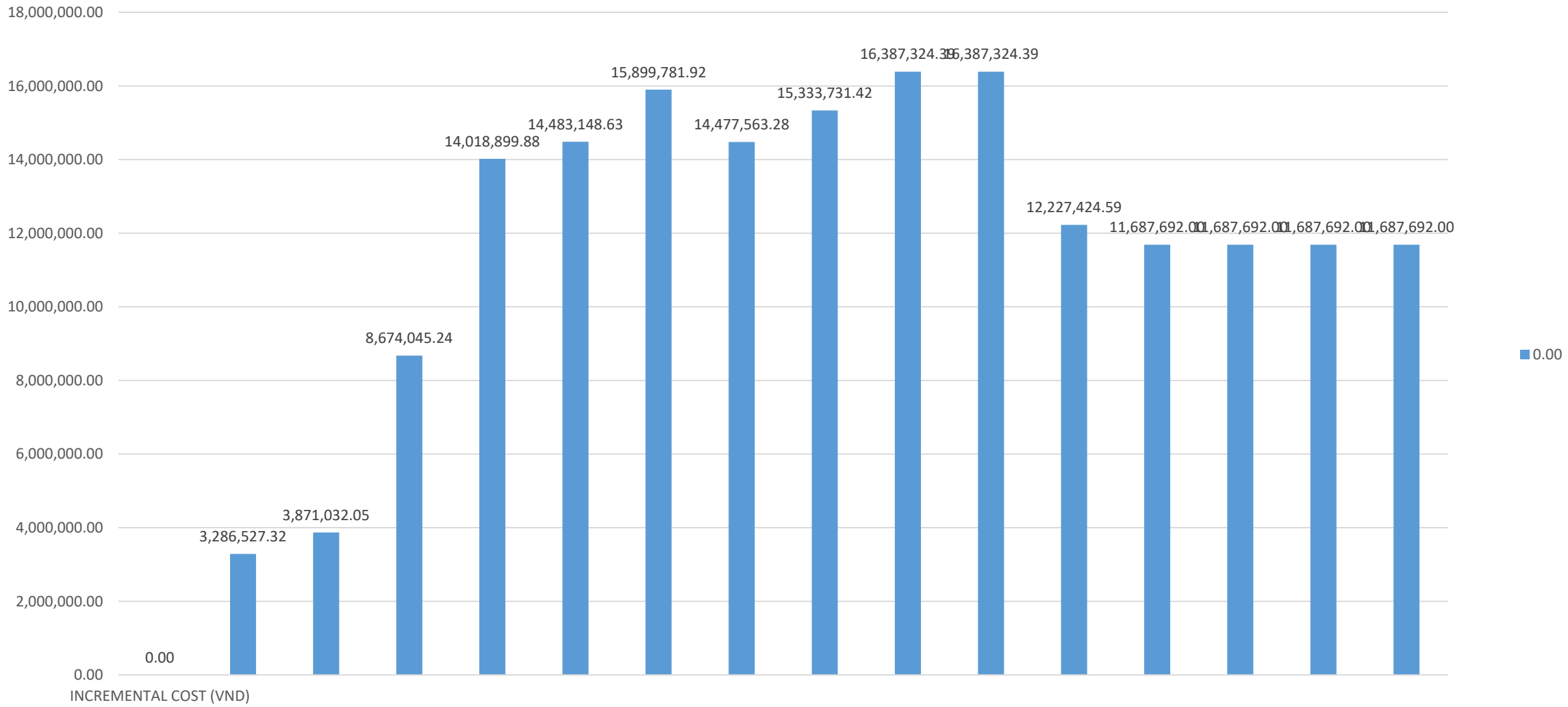

66.19%
Meets EDGE Materials Standard
3,000
2,500
2,000
1,500
1,000
500
0
1026
342
434
389
55
229
407
176
62
Base Case
Improved Case
Floor Slabs
Roof Constru
External Wall
Internal Walls
Flooring
windows
Insulation


18,000,000.00
16,000,000.00
14,000,000.00
12,000,000.00
10,000,000.00
8,000,000.00
6,000,000.00
4,000,000.00
2,000,000.00
0.00
0.00
3,286,527.32
3,871,032.05
8,674,045.24
14,018,899.88
14,483,148.63
15,899,781.92
14,477,563.28
15,333,731.42
16,387,324.39
16,387,324.39
12,227,424.59
11,687,692.00
11,687,692.00
11,687,692.00
11,687,692.00
11,687,692.00
INCREMENTAL COST (VND)
0.00

FINAL RESULT

57,39%

Energy Savings*

37.98%

Water Savings

66.19%

Less Embodied Energy in Materials

TOTAL ENERGY USE

109.21

kWh/Month/Unit

TOTAL WATER USE

8.66

kL/Month/Unit

EMBODIED ENERGY SAVED

73171.99

MJ/Unit

TOTAL CO2 SAVING

147.36

tCO_2/Year

BASECASE UTILITY COST

641169.27

VND/MONTH/UNIT

UTILITY COST REDUCTION

335,973.56

VND/MONTH/UNIT

INCREMENTAL COST

11,687,692.00

VND/UNIT

PAY BACK PERIODE

2.90

Year

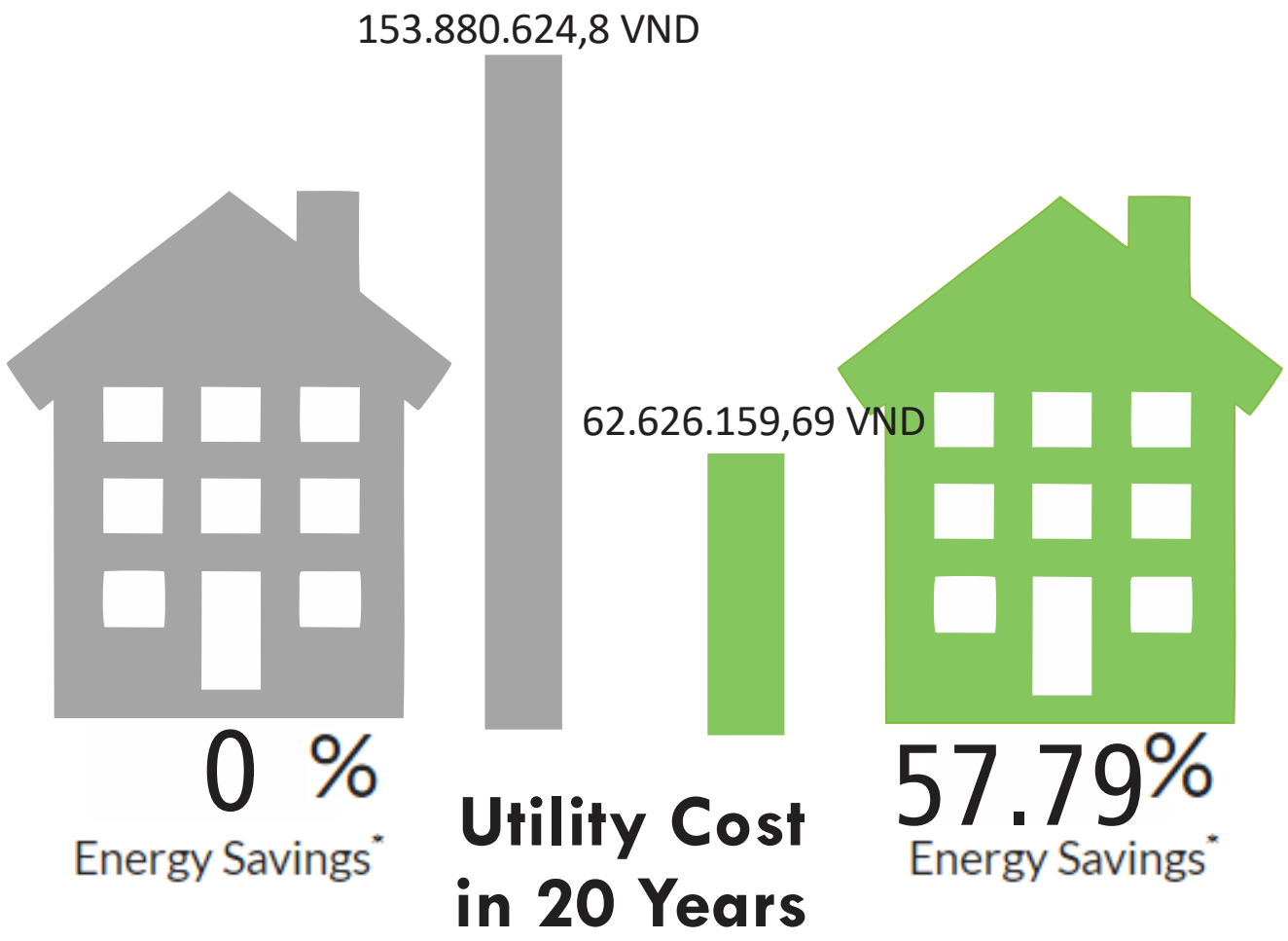
UTILITY COST REDUCTION

335,973.56

1/2

BASECASE UTILITY COST

641169.27


153.880.624,8 VND
62.626.159,69 VND
0 %
Energy Savings*
Utility Cost
in 20 Years
57.79%
Energy Savings*