

# **MODUL 6 ARSITEKTUR HEMAT ENERGI**

**IMAN MAIZAN KAMEMY-215060501111030**

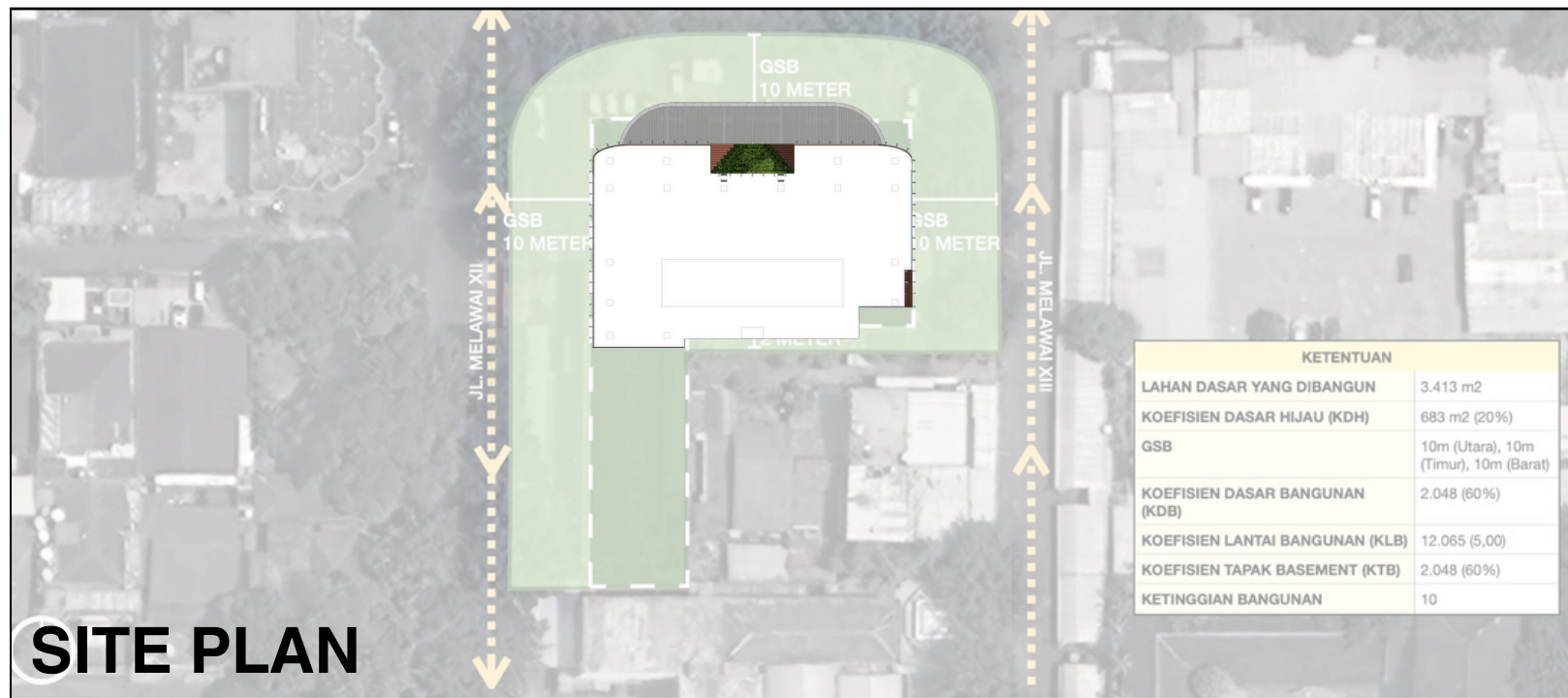
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**DOSEN PJK**

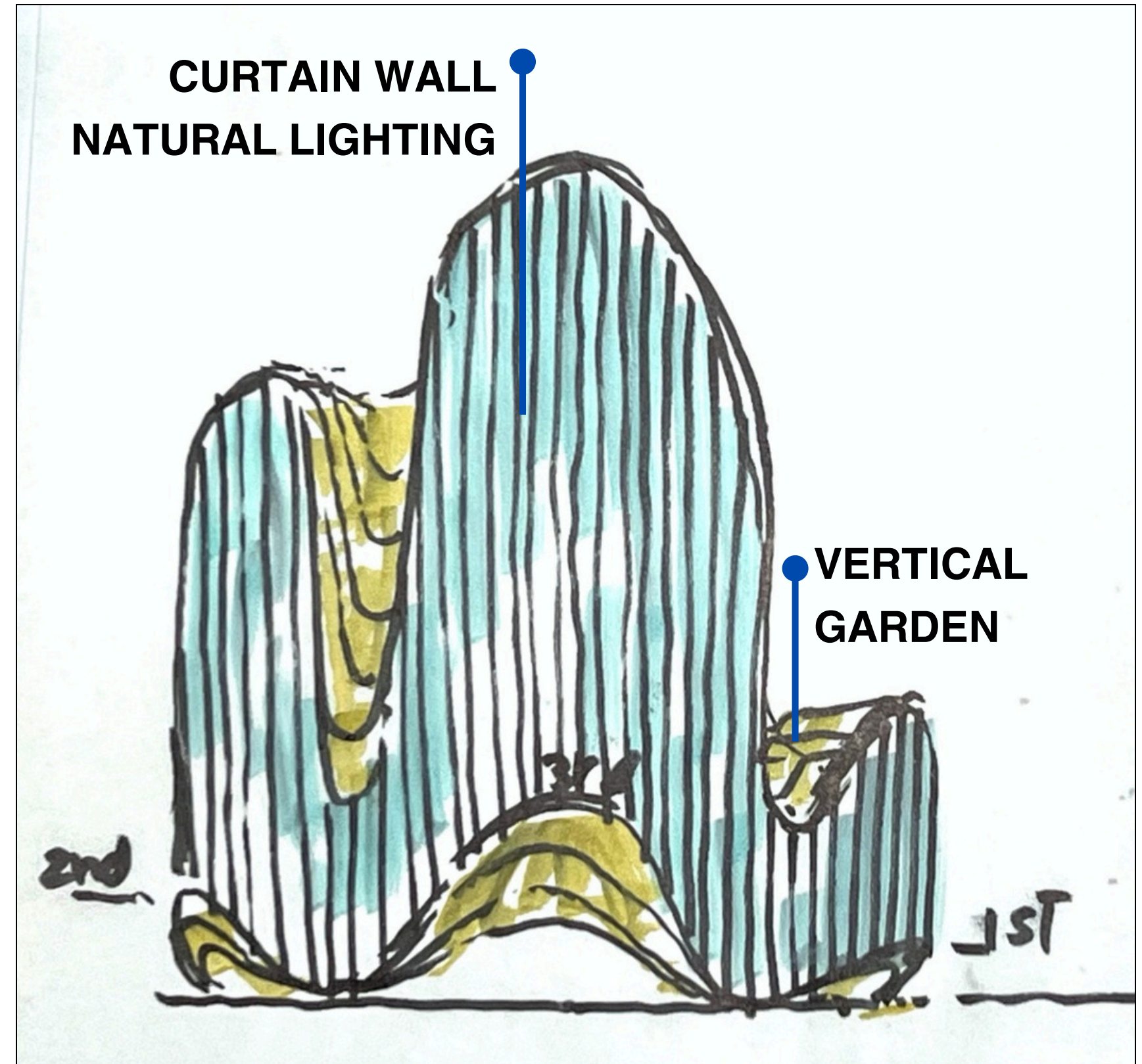
**Ir. Agung Murti Nugroho, ST., MT., Ph.D, IPM**



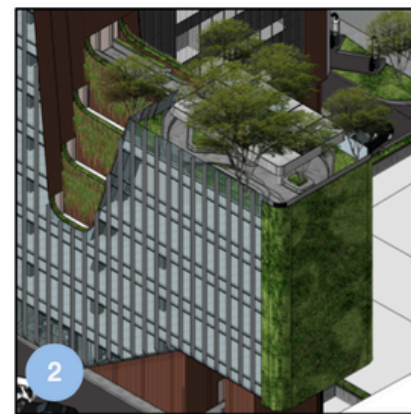
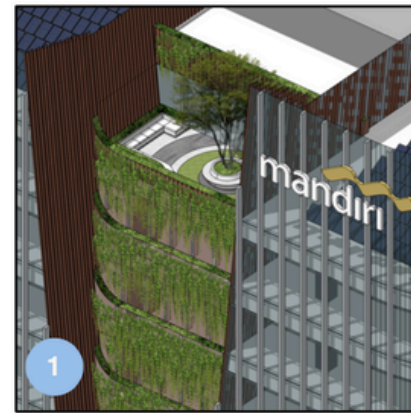




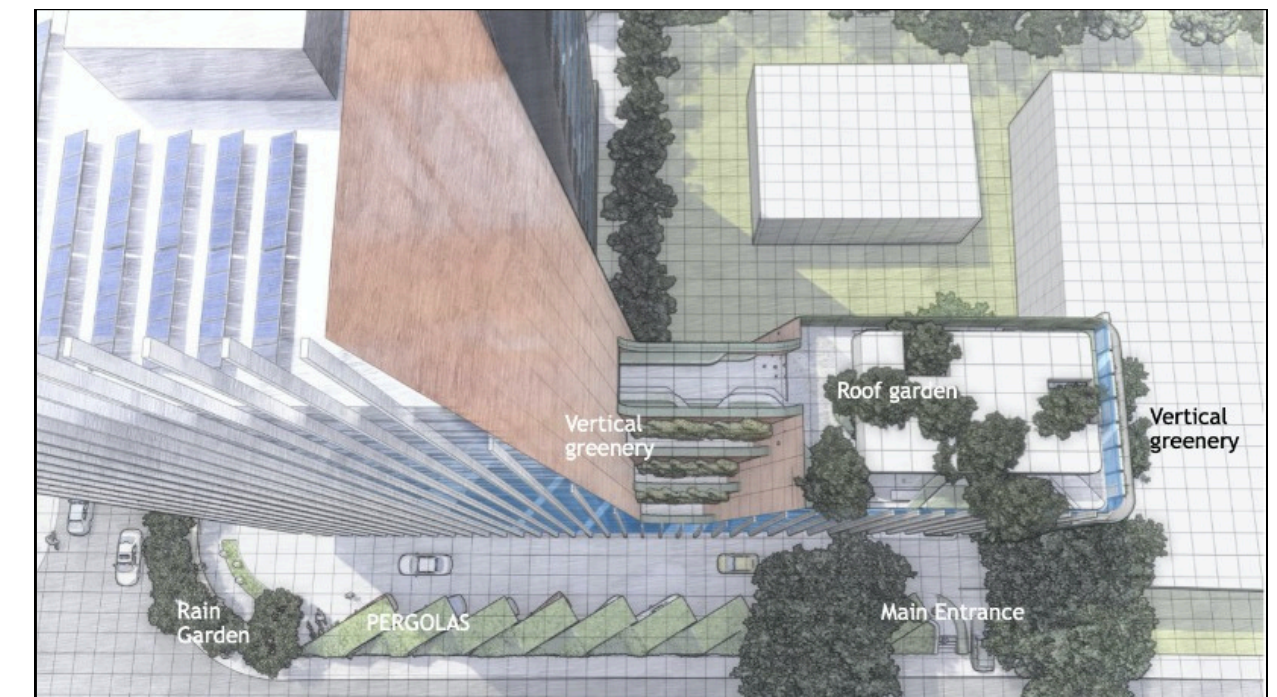
**MODUL 6 | DESIGNING FOR GREATER EFFICIENCY**







Inspired by the Urban hustle, Landscape composition should pose as calming artwork canvas complimenting Building as an artwork ; Urban landscape setting with the purpose of ecological and aesthetic goals , Limited landscape spaces generating the ideas of Rooftop gardens and secondary skin façade in vertical greeneries



### VERTICAL GARDEN

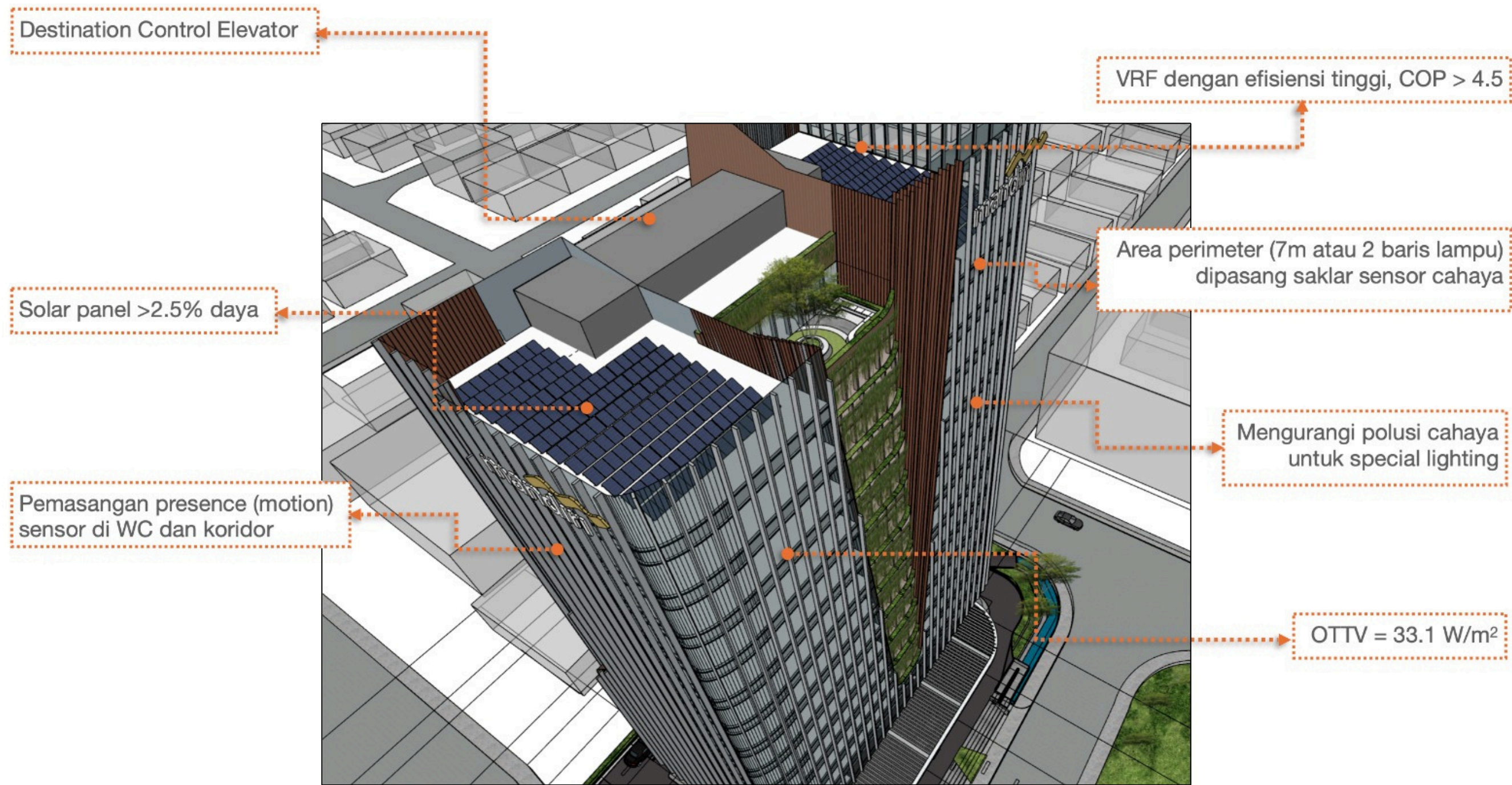
Selain vertical garden di bagian facade, terdapat juga roof garden untuk umum di atas auditorium serta executive garden di bagian teratas bangunan.

## MODUL 6 | DESIGNING FOR GREATER EFFICIENCY



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Target IKE = 140 kW/m<sup>2</sup> per tahun (penghematan >40%)  
 Standard gedung pada umumnya = 250 kWh/m<sup>2</sup> per tahun

**MODUL 6 | DESIGNING FOR GREATER EFFICIENCY**





## ENERGY EFFICIENCY

<input checked="" type="checkbox"/>	OFE02 Reflective Paint/Tiles for Roof - Solar Reflectivity (albedo) of 0.7	SR	<input type="text"/>
<input checked="" type="checkbox"/>	OFE04 External Shading Devices - Annual Average Shading Factor (AASF) of 0.58	AASF	<input type="text"/>
<input checked="" type="checkbox"/>	OFE07 Low-E Coated Glass : U-value of 3 W/m <sup>2</sup> .K and SHGC of 0.45	W/m <sup>2</sup> .K	<input type="text"/>
<input checked="" type="checkbox"/>	OFE08 Higher Thermal Performance Glass : U- value of 1.95 W/m <sup>2</sup> .K and SHGC of 0.28	W/m <sup>2</sup> .K	<input type="text"/>
<input checked="" type="checkbox"/>	OFE11* Variable Refrigerant Flow (VRF) Cooling System - COP of 3.5	COP	<input type="text"/>
<input checked="" type="checkbox"/>	OFE16 Radiant Cooling and Heating System - COP of RC 3.5		
<input checked="" type="checkbox"/>	OFE24 Energy-Saving Light Bulbs - Internal Spaces		
<input checked="" type="checkbox"/>	OFE25 Energy-Saving Light Bulbs - External Spaces		
<input checked="" type="checkbox"/>	OFE26 Lighting Controls for Corridors and Staircases		
<input checked="" type="checkbox"/>	OFE27 Occupancy Sensors in Bathrooms, Conference Rooms, and Closed Cabins		
<input checked="" type="checkbox"/>	OFE29 Daylight Photoelectric Sensors for Internal Spaces		
<input checked="" type="checkbox"/>	OFE30 Solar Photovoltaics - 25% of Total Energy Use	% of Annu...	<input type="text"/>
<input checked="" type="checkbox"/>	OFE31 Other Renewable Energy for Electricity Generation	Source Type	Biomass <input type="text"/>

## WATER EFFICIENCY

<input checked="" type="checkbox"/>	OFW01* Low-Flow Faucets in All Bathrooms - 2 L/min	L/min	<input type="text"/>
<input checked="" type="checkbox"/>	OFW02* Dual Flush for Water Closets in All Bathrooms - 6 L/first flush and 3 L/second flush	<input type="checkbox"/> Single Flush/Flush Valve	
<input checked="" type="checkbox"/>	OFW03* Water-Efficient Urinals in All Other Bathrooms - 2 L/flush	L/flush	<input type="text"/>

## MATERIAL EFFICIENCY

	Floor Slabs		
	In-Situ Concrete with >30% PFA		
OFM01*	Thickness (mm)	Steel Rebar (kg/m <sup>2</sup> )	
	Roof Construction		
	Type 1		
OFM02*	In-Situ Concrete with >30% PFA		
	Proportion %	Thickness (mm)	Steel Rebar (kg/m <sup>2</sup> )
	External Walls		
	Type 1		
OFM03*	Curtain Walling (Opaque Element)		
	Proportion %	Thickness (mm)	
	Internal Walls		
	Type 1		
OFM04*	Common Brick Wall with Plaster on Both Sides		
	Proportion %	Thickness (mm)	
	Flooring		
	Type 1		
OFM05*	Ceramic Tile		
	Proportion %		
	Window Frames		
	Type 1		
OFM06*	Aluminium Clad Timber: Aluminium		
	Proportion %	<input type="text" value="100"/>	Double Glazing <input type="checkbox"/>





### Final Energy Use

# 29,003.70

kWh/Month

### Final Water Use

# 581.64

m<sup>2</sup>/Month

### Base Case Utility Cost

# 135,532.59

Thousand Rp/Month

### Utility Cost Reduction

# 86,273.77

Thousand Rp/Month

### Incremental Cost

# 8,070,350.99

Thousand Rp

### ENERGY EFFICIENCY

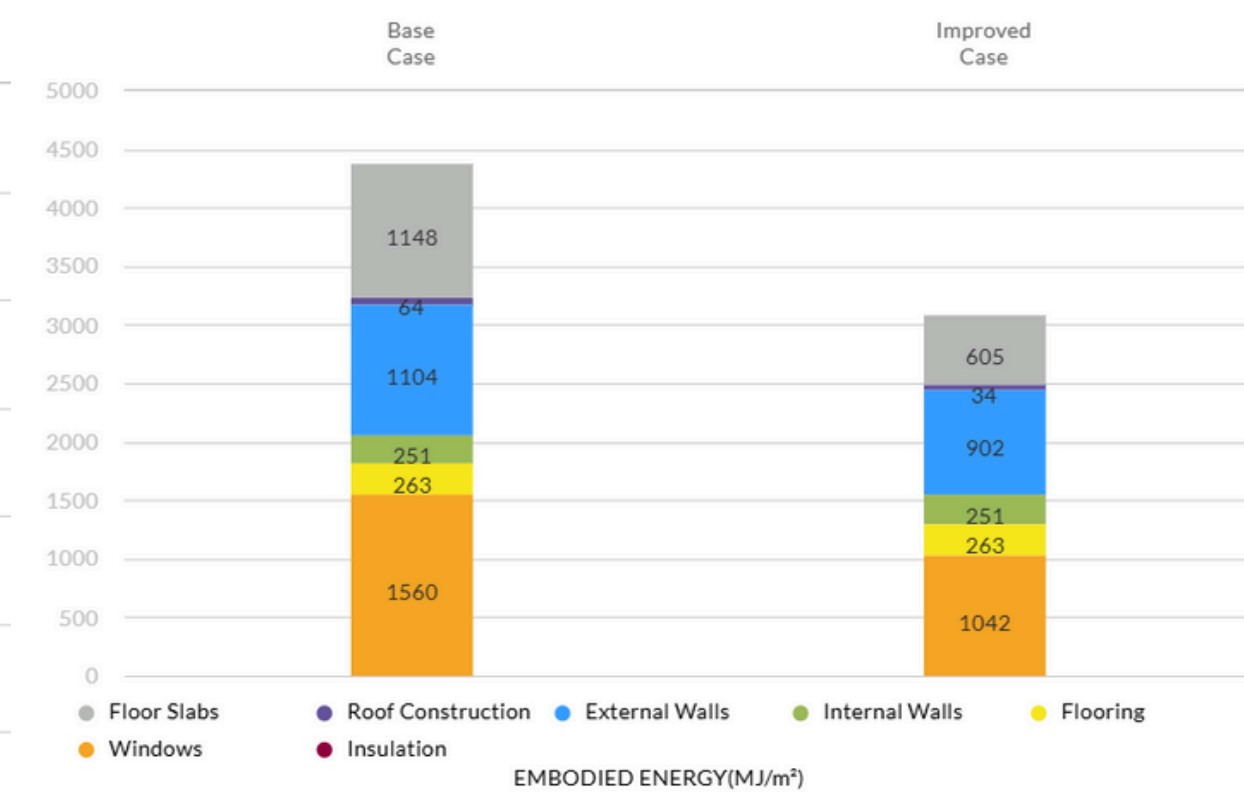
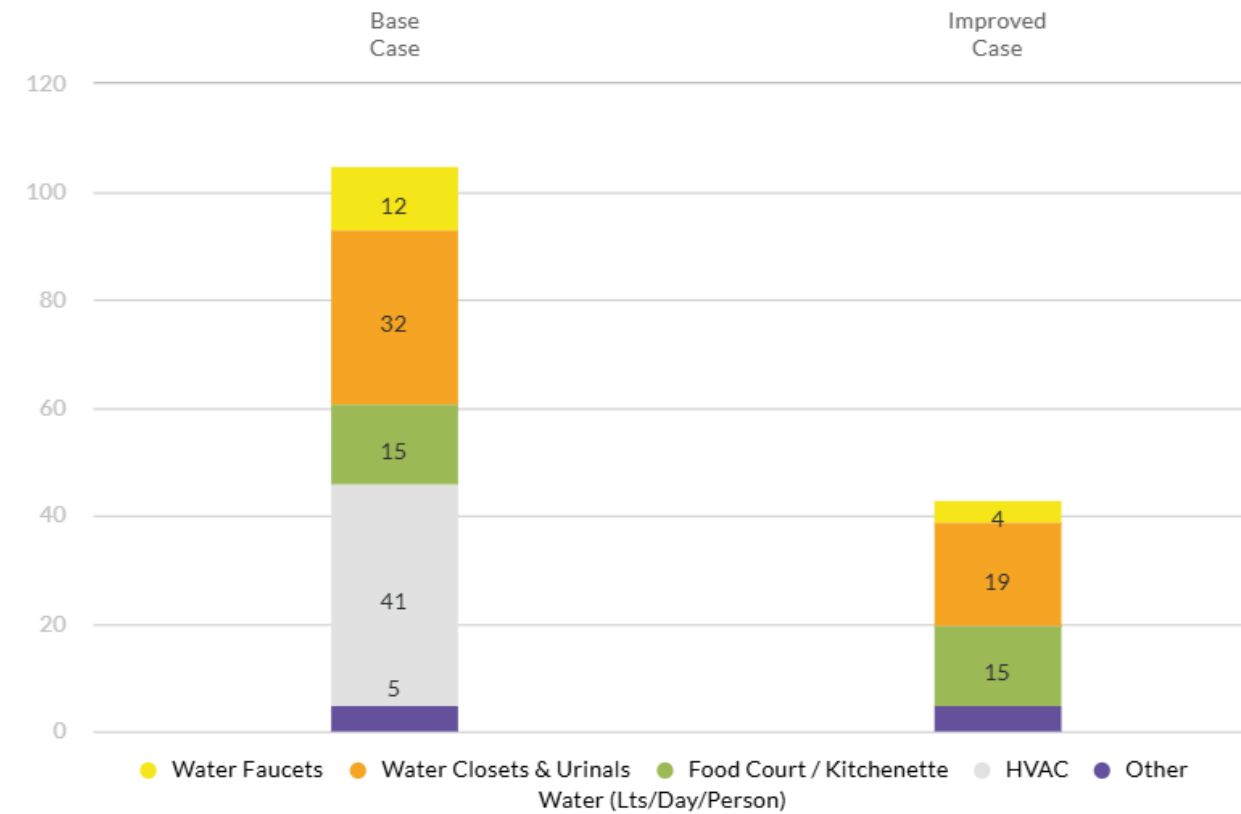
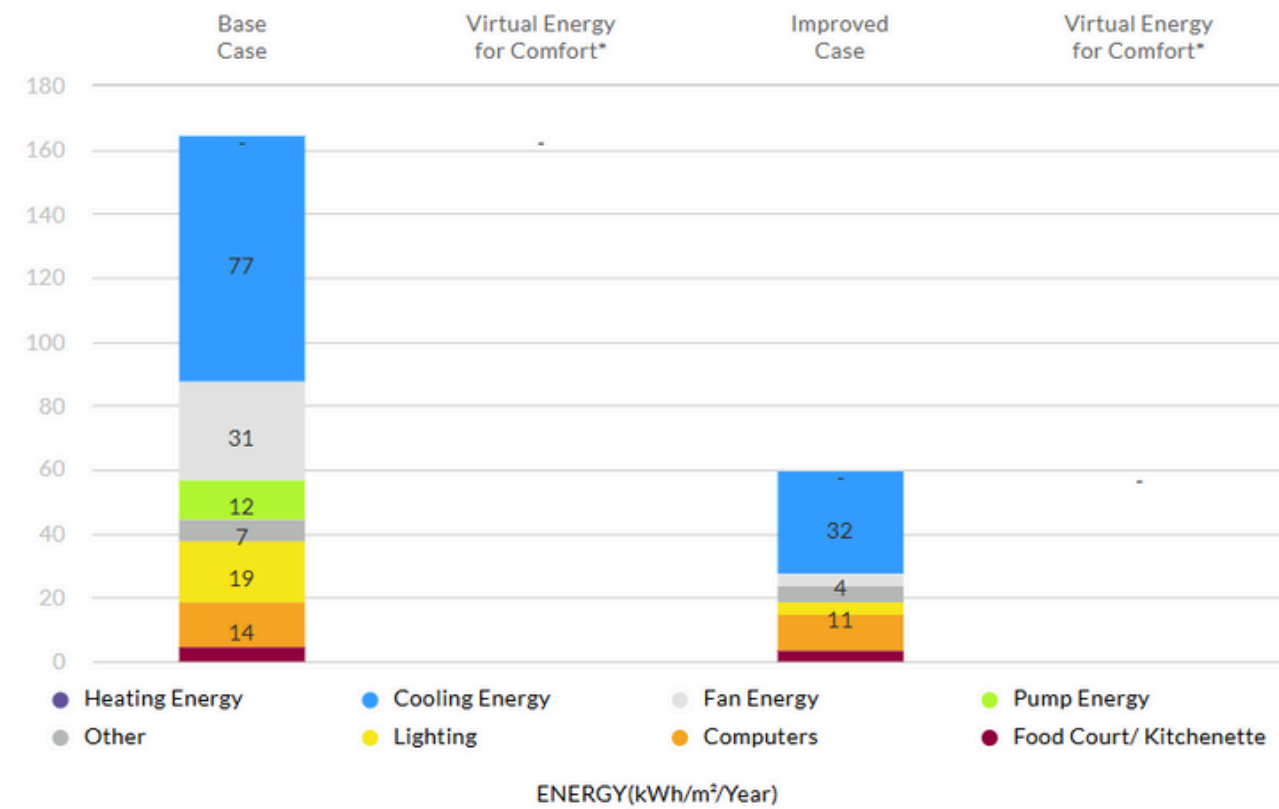
# 64,8%

### WATER EFFICIENCY

# 59,01%

### MATERIAL EFFICIENCY

# 29,46%





**TERIMA KASIH**

**MODUL 6**

**ARSITEKTUR HEMAR ENERGI**

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