SINAR MAS LAND'S GREEN INITIATIVES AND ENERGY EFFICIENCY IN BUILDING SECTOR

Prepared By

ILHAM WAHYUDI

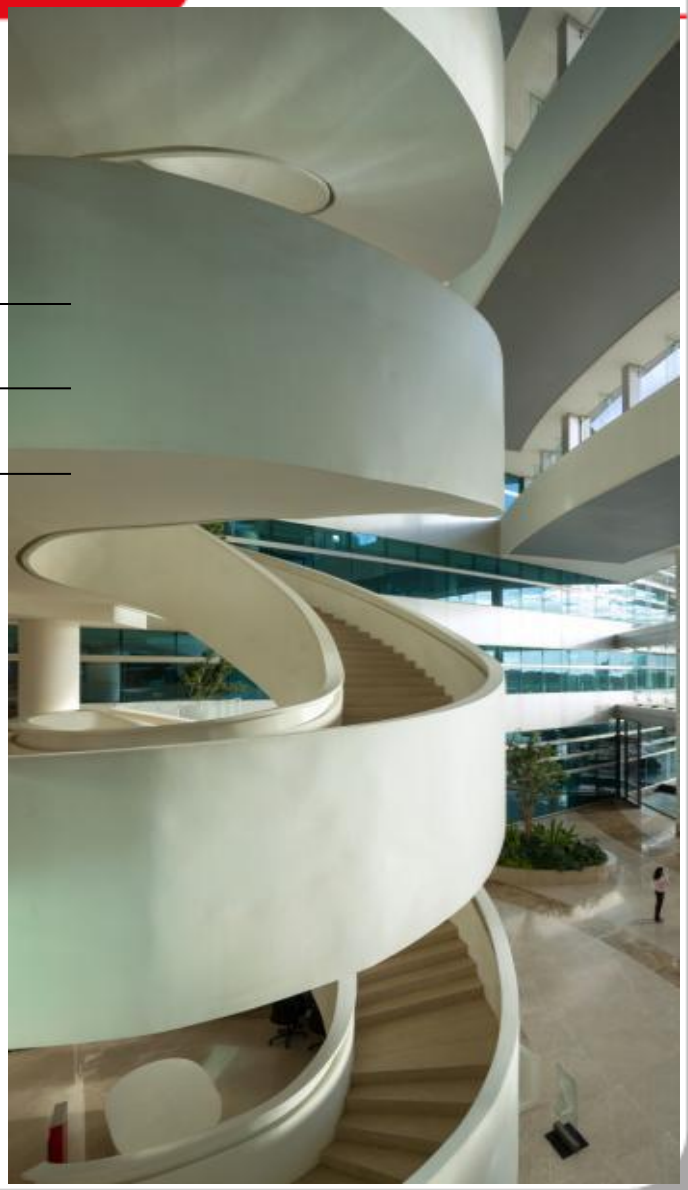
Environment Enhance and Sustainability Development

Corporate Governance President Office- Sinar Mas Land

Balai Kartini Jakarta, 15 September-2017

PRESENTATION OUTLINE

1. General Information Company
2. Sinar Mas Land's Green Initiatives
   a. Green District and Green Building
   b. Energy Efficiency at Sinar Mas Land Building
   c. Others Sinar Mas Land's Green Initiatives
3. Next Project & Closing



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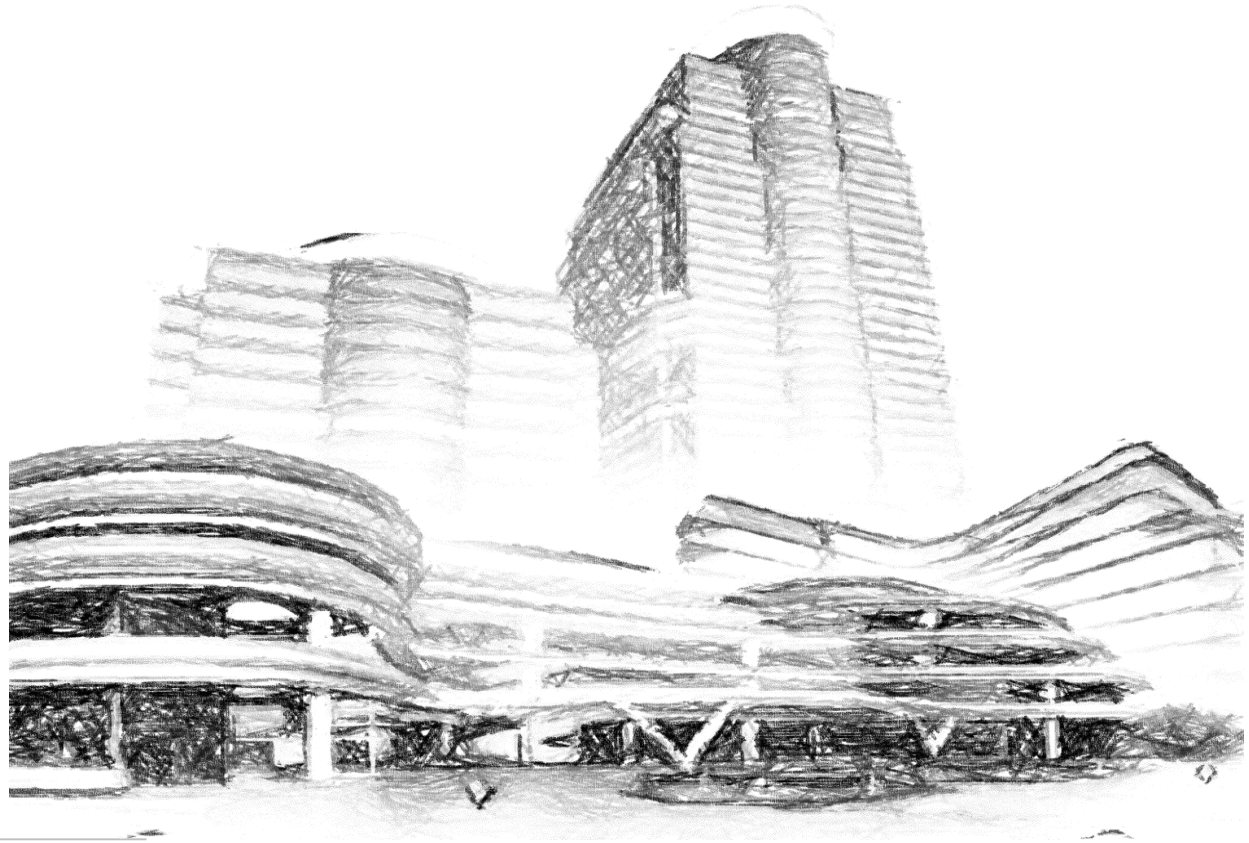


General Information

Company

1. General Information Company

sinarmas land

sinarmas

Sinar Mas is one of Asia's leading businesses

Committed to the highest technical, environmental and social standards

Operating according to Good Corporate Governance principles

1. General Information Company

sinarmas land

SINARMAS GROUP OF COMPANIES

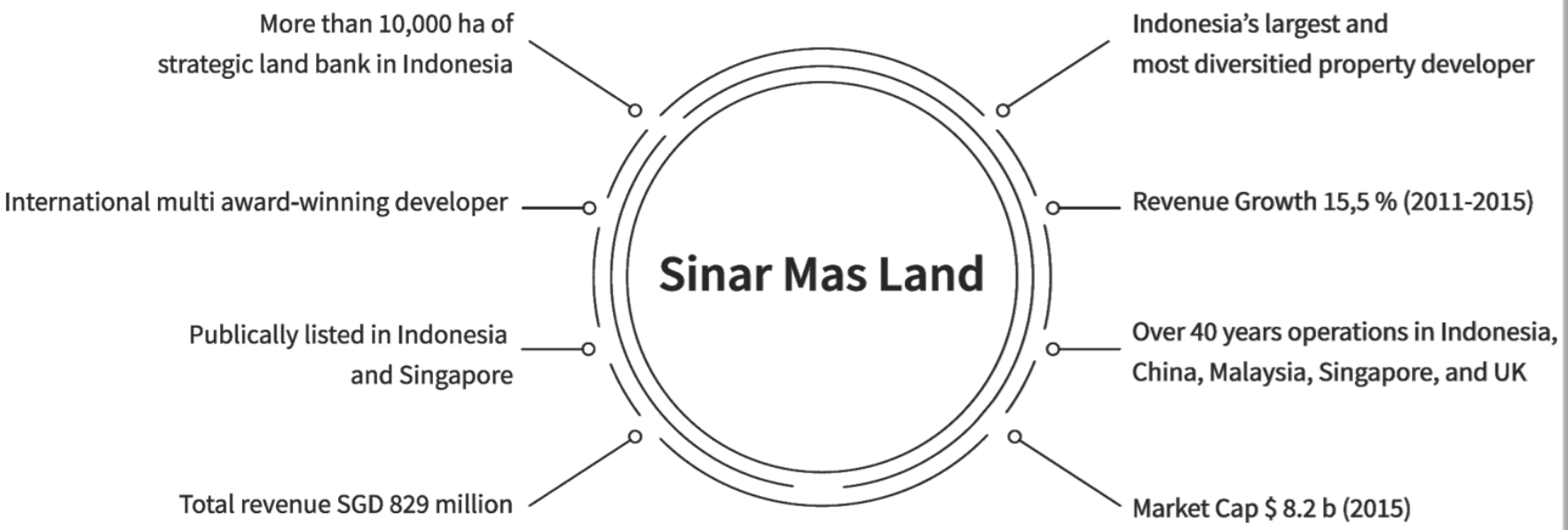
- **Start the Indonesia business operation in 1938**
- As **one of Asia's leading enterprises**
- Creates **300,000 jobs** and supports **500,000 additional jobs** in Indonesia
- Consisting **6 main business pillars** and also undertaking important initiatives in healthcare & education

APP pulp and paper products	sinarmas financial services	sinarmas land real estate and development
smart agribusiness and food	smartfren live smart telecommunications	DSS energy and infrastructure

1. General Information Company

sinarmas land

1. General Information Company

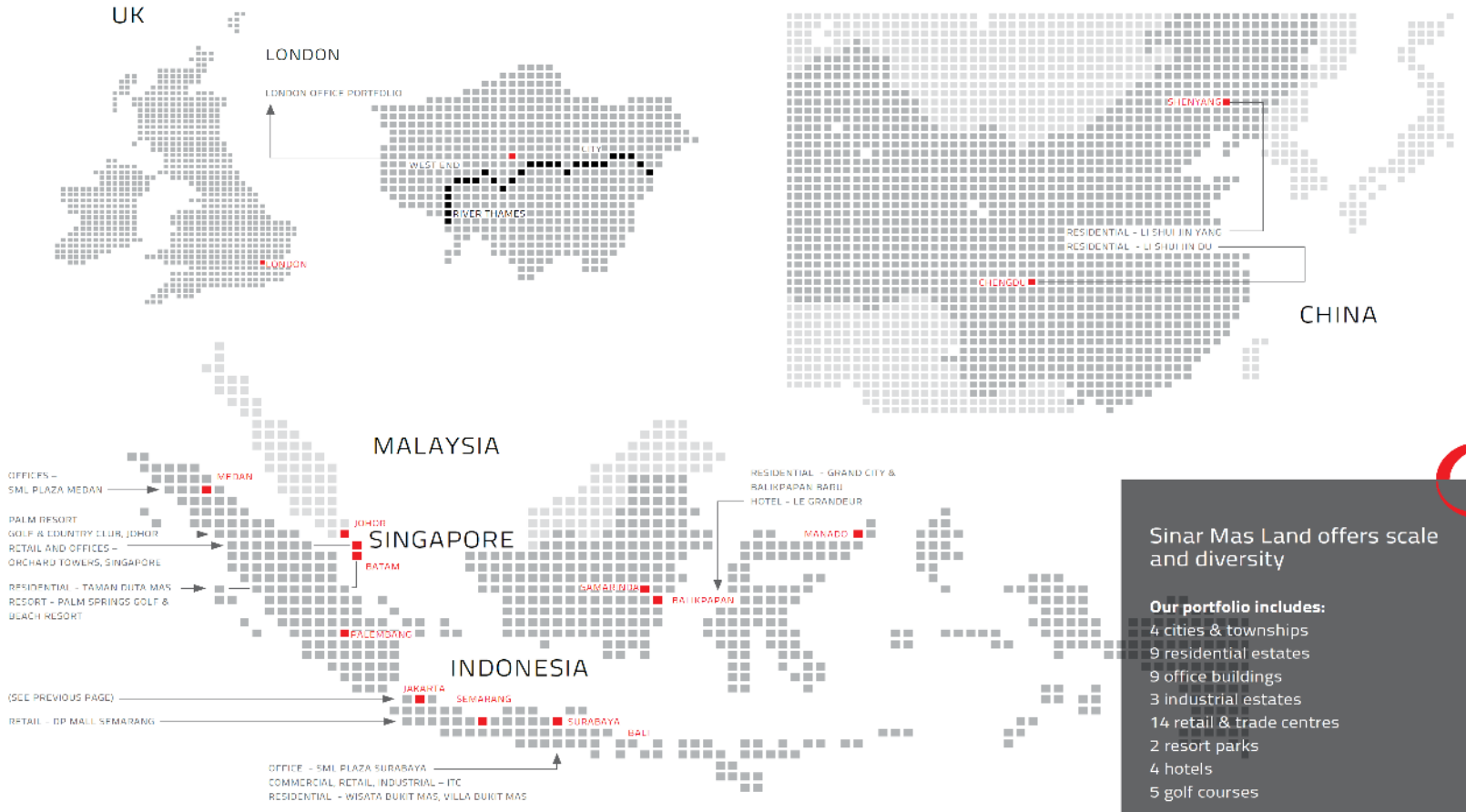


Strong presence in Indonesia and abroad

Our Vision

"To be the leading property developer in South East Asia, trusted by customers, employees, society and other stakeholders"

1. General Information Company



Sinar Mas Land offers scale and diversity

Our portfolio includes:

- 4 cities & townships
- 9 residential estates
- 9 office buildings
- 3 industrial estates
- 14 retail & trade centres
- 2 resort parks
- 4 hotels
- 5 golf courses

1. General Information Company

sinarmas land

Indonesia

- 04 Integrated township
- 09 Residential estates
- 05 Hotels & golf course, resort
- 14 Retail & trade centers
- 03 Industrial estates
- 07 Office buildings

Abroad

UK-London
- Warwick House
- Alphabeta Building

Malaysia
- La Grandeur
- Palm Resort Golf & Country Club

Singapore
- Orchard Towers

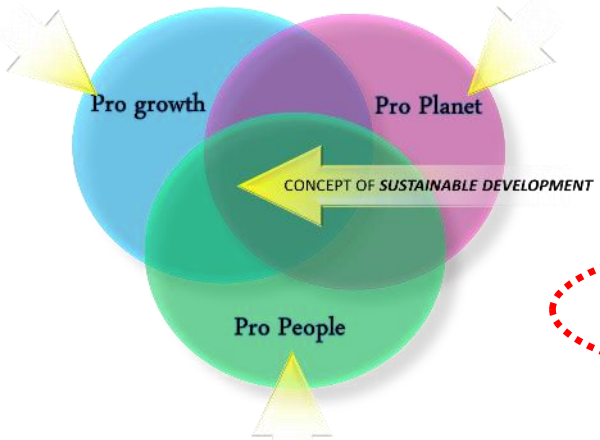
China
- Li Shui Jin Du
- Li Shui Jin Yang

Partners

Hongkong Land · Kompas Gramedia Group of Magazine · sojitz · Itochu · Aeon Mall

Sinar Mas Triple Bottom line

Balance between Pro Growth –Pro Planet – Pro People



Sinar Mas Land has designed the company's **Sustainable Programs** is based **on 8 of 17 visions SDGs 2030** declared by the United Nations

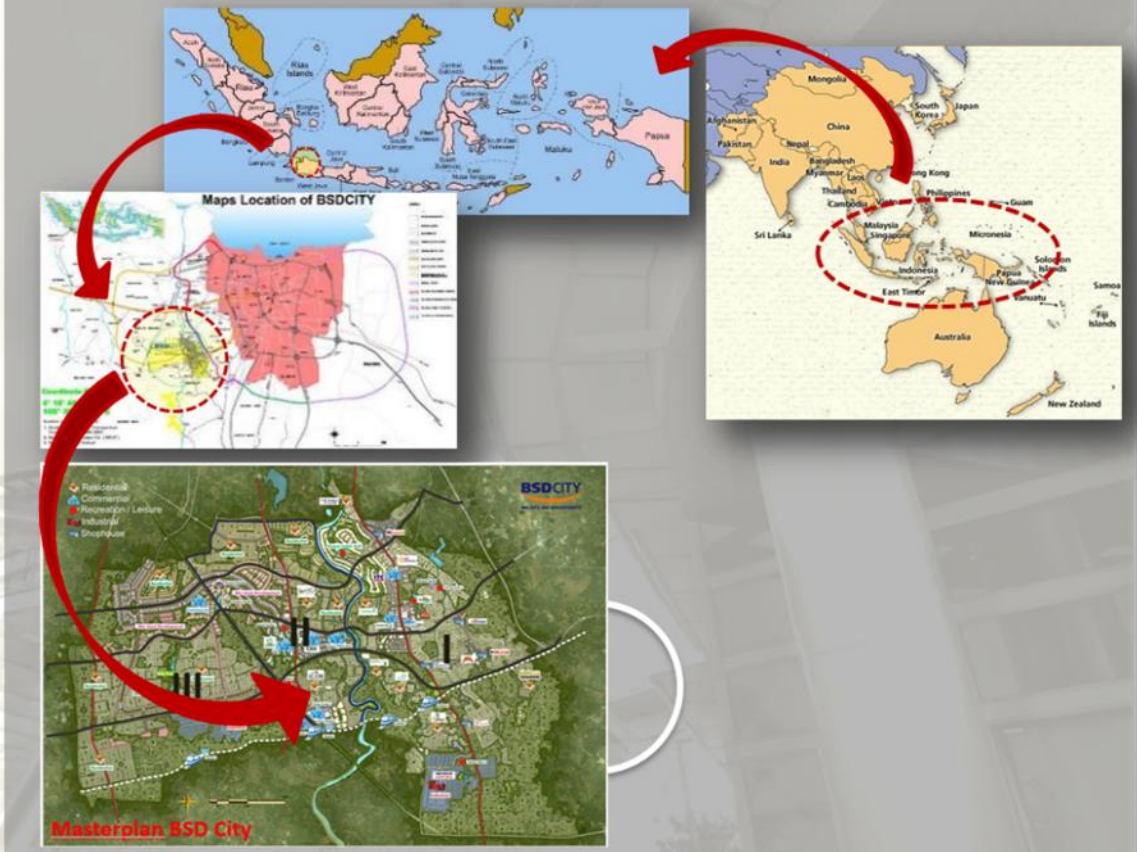
SDGs	***Goals***	***Commitment***	***SML activities example***
1 NO POVERTY	To reduce poverty in all forms	SML become partner of People to develp economy and reduce gap of poverty	Psupply of People basic need (sembako) Job opportunity priority for wxisting peoplw
4 QUALITY EDUCATION	Towarsd improvement of quality and fair education and to promote opportunities of getting education long life for all	Focused on Corporate Social Activity to benefit and positive contribution which is sustaibable forimprovement of environment	• People 's Market School • Smart home oprertional • Education Festival • School rehabilitation
6 CLEAN WATER AND SANITATION	To support water and good sanitation for all	To suport activities for healthy water	Clean water supply
11 SUSTAINABLE CITIES AND COMMUNITIES	Towards city and human settlement become inklusif,save,smart and sustainable	To support sustainabile commitment as well as developing infratsrtucture	• Revitalization program • Training program for comminitiy • Savety concern • Mosque rehabilitation • Homes rehabilitation
13 CLIMATE ACTION	Towards effort into climate change impact	SML to support business activities and to kkep the environment	• Green Festival • Trees planting • Green movement in Industrial area • Green Building • Sustainability Program

1. General Information Company

BSDCITY

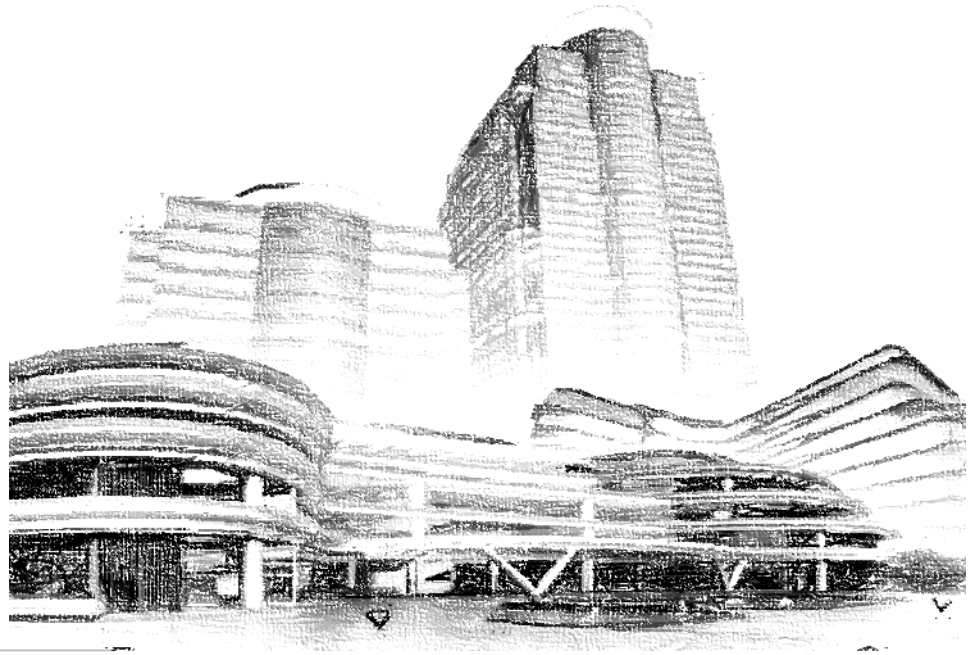
Big City. Big Opportunity

- **Most ambitious Urban Planning project to become Independent City** in Indonesia
- Located in **South West of Jakarta**
- Has been **developed over the last 25 years**
- Combine **housing, business and commercial properties**
- **2,000 ha developed** area, **35,000 houses, 180,000 people**
- **+/- 30 min from City Center , Accessible from 2 major toll roads** (Kebon Jeruk & Pondok Indah)



VIDEO

2



Sinar Mas Land's

Green Initiatives

2. Sinar Mas Land's Green Initiatives

A. Green District & Green Building

Key Features of Green District

- 25 ha Green Office Park district located in the heart of BSD City, Part of 8 low-rise Green office buildings and has build **6 building**.
- **80% of the buildings with north-south orientation** within 22.5 degrees of east/west axis and aerodynamically shaped to catch the prevailing west and south-west wind.
- **Integrated Connectivity, Supporting Facility and transportation systems** (Shuttle, Bicycle Track, etc), and **provide of pedestrian track**
- Every Building Developed With **High Efficiency for Energy and Water, and** used **LED lamp and Photovoltaic for Street Lighting**
- **Large green-open landscape spaces between buildings** and **green roofs** on most buildings to **reduce heat island effect**
- **Zero run off technology**, with rainwater harvesting tank each building, natural infiltration wells, modern infiltration wells, and large of lakes, Lake used for rainwater retention and irrigation
- Achievement **Green Mark Gold District, FIABCI Prix d'Excellence Award Gold Winner, Asia Pacific Property Award, and Others**

2. Sinar Mas Land's Green Initiatives

A. Green District & Green Building

Key Features of Green District

Source :
https://www.bca.gov.sg/GreenMark/others/gm2011.pdf

BCA GREEN MARK FOR DISTRICTS AWARD (OVERSEAS)

★ Gold

BSD Green Office Park, Indonesia

Client / Developer
PT. Bumi Serpong Damai

Architect
Aedas Pte Ltd, Singapore

M&E Engineer
Beca Carter Hollings & Ferner (S.E.Asia) Pte Ltd

Infrastructure Engineer
PT. BITA Enarcon Engineering, Indonesia

Landscape Consultant
Aedas Urban Design and Landscape Limited

ESD Consultant
Aedas Pte Ltd, Singapore

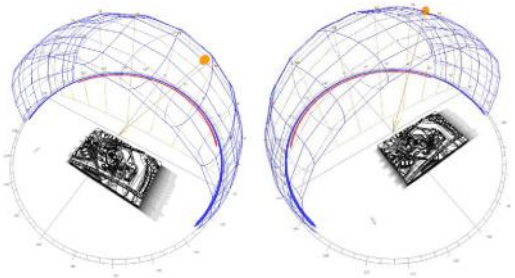
Key Features

- Estimated energy savings: 46,720 kWh/yr; Estimated water savings: 50,406,301 m^3/yr.
- 80% of the buildings with north-south orientation within 22.5 degrees of east/west axis and aerodynamically shaped to catch the prevailing west and south-west wind.
- The use of LED for street lighting.
- Large green-open landscape spaces between buildings and green roofs on most buildings to reduce heat island effect.
- Lake used for rainwater retention and irrigation.

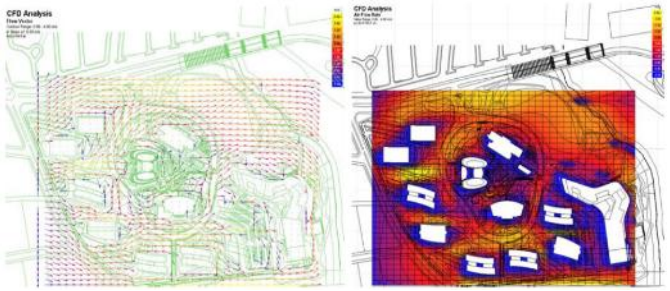
2. Sinar Mas Land's Green Initiatives

A. Green District & Green Building

a) Solar Analysis (Sun path Analysis)



b) Wind environment simulation



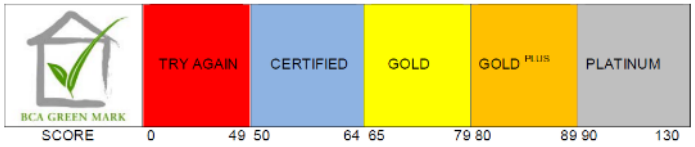
passive design for minimize the heat gain

1.5 Integrated Connectivity

e) Permeable paving >40%

1.4 Conducive Park Environment

Integrated Connectivity, Support Facility & Large Green Area



Zero Run Off, Eco Friendly and Saving Energy & Water

2. Sinar Mas Land's Green Initiatives

A. Green District & Green Building

Green Building Certification

SINAR MAS LAND PLAZA

GOLD

Location
BSD City - Serpong, Banten

Achieved Ranking
PLATINUM (total point : 82.5)

Certification
GREEN MARK NEW BUILDING - 2010

Energy Efficiency	50
Water Efficiency	8
Environmental Protection	16.5
Indoor Environment Quality	7
Other Green Features	0.5
Sub-total	82.5

MY REPUBLIC PLAZA

GOLD

Location
BSD City - Serpong, Banten

Achieved Ranking
GOLD (total point : 67)

Certification
GREENSHIP NEW BUILDING - Mei 2015

NILAI

ASD	12	MRC	4
EEC	15	IHC	8
WAC	18	BEM	10

GREEN OFFICE PARK 9

PLATINUM

Location
BSD City - Serpong, Banten

Achieved Ranking
PLATINUM (total point : 81)

Certification
GREENSHIP NEW BUILDING - Jan 2017

GRADE

ASD	16	MRC	10
EEC	18	IHC	9
WAC	18	BEM	10

2. Sinar Mas Land's Green Initiatives
A. Green District & Green Building

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Sinar Mas Land Plaza Features

Source :
https://www.bca.gov.sg/GreenMark/others/gm2013.pdf

GOLD

BCA GREEN MARK AWARD FOR BUILDINGS (OVERSEAS)

Sinarmasland Plaza, Indonesia
New Non-Residential Buildings

Client / Developer
PT Bumi Serpong Damai Tbk

Architect
Aedas (Singapore) Pte Ltd

M&E Engineer
Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

Structural Engineer
PT Haerte Widya Konsultan

Landscape Consultant
Aedas Landscape Ltd

ESD Consultant
Beca Carter Hollings & Ferner (S.E. Asia) Pte Ltd

Key Features

- Estimated energy savings: 1,200,216 kWh/yr; estimated water savings: 19,134 m^3/yr; ETTV: 42.0 W/m^2.
- Energy efficient chiller plant system.
- Naturally ventilated atrium.
- Grey water recycling.

2. Sinar Mas Land's Green Initiatives

A. Green District & Green Building

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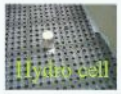
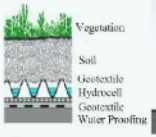
Sinar Mas Land Plaza Building Features

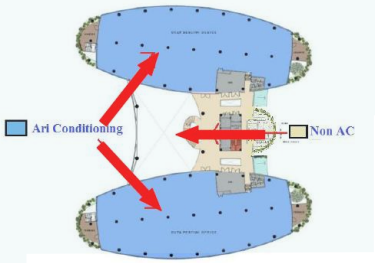




NRB 1-1 Building ETTV	Max Points	Target Points
ETTV = 42W/m²	15	15

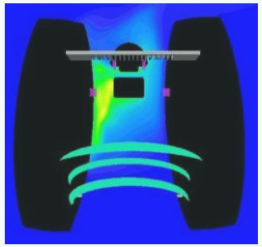
Enhancement Features :

- Large Overhangs on the East-West facing Facade
- Building Orientation – N-S Orientated
- Façade Materials – Glass selection of **SC = 0.38 and U value = 2.2**
- Dual-purpose sunshade lightshelves around the building parameter



Passive Design

(Green Open Space, Building Orientation, Façade (ETTV), Natural Ventilation, Natural Lighting)



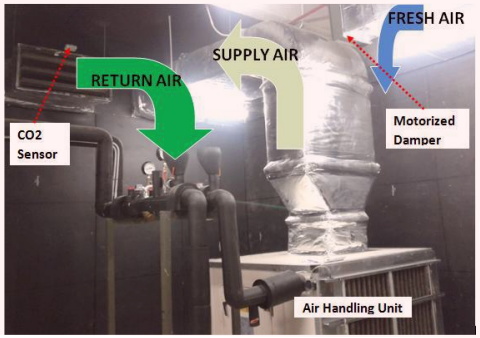
Active Design

(Efficiency of Chiller Plant, IAQ /Use CO2 Sensor and CO Sensor)

COOLING TOWER

VARIABLE SPEED DRIVE

CHILLER SCREW TYPE



Others Design

Saving Water Fixture and ECO Friendly Material

2. Sinar Mas Land's Green Initiatives
A. Green District & Green Building

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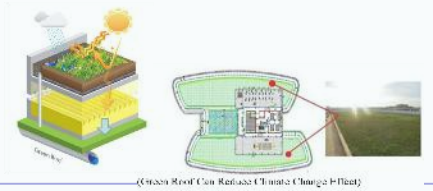
My Republic Plaza (GOP-6) Building Features

PASSIVE DESIGN

GREEN AREA (ROOF)



(Green Roof Can Reduce Climate Change Effect)

GREEN AREA (NON ROOF)

My Republic Plaza (GOP 6) has an area of green area of **7064 m**, or about **55% of total area**. It was planted by many types of the plant such as grass, trees of shrubs and Perdue (little tree). The plant has many functions, they are **ground cover, reduce NOX pollutant, absorb CO_2 and increase production of O_2, shade, preventing erosion, repair soil fertility, and a windbreaker**. Moreover, the benefit of planted many vegetation can **reduce the temperature of macro climate** around the building.

ORIENTATION

BUILDING ORIENTATION & BUILDING MASSING

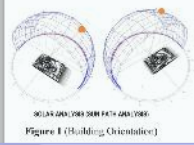
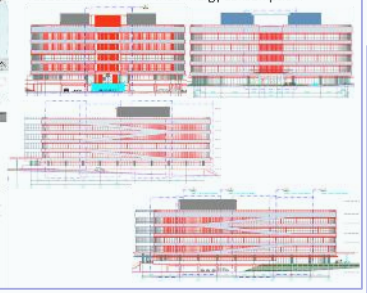
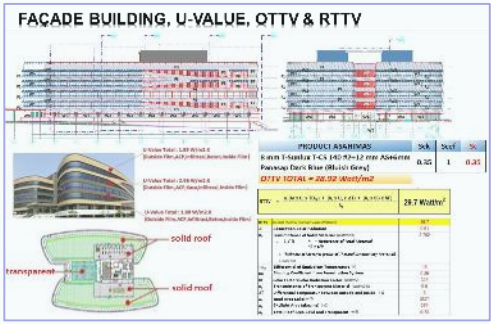


Figure 1 (Building Orientation)

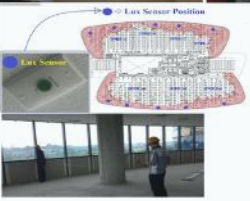
GOP 6 Building Orientation is **located 22.5° to west** and **east** for **Active Work Room (Occupant)** Face to **North and South, (two wings)**. The design was made to help reduce solar heat and thus energy consumption.



FAÇADE BUILDING, U-VALUE, OTTV & RTTV



NATURAL LIGHTING



FLOOR	PERCENTAGE OF DAYLIGHT (%)	AVERAGE DAYLIGHT (%)
1	52%	34%
2	36%	
3	35%	
4	27%	
5	20%	

NATURAL VENTILATION

Type of Natural ventilation is **Stack Effect Ventilation**, when the air (wind) from outside entering cooling surrounding, also the hot air and dirty air wasted to the outside via to windows above in this building

Figure 5 (Natural Ventilation in Main Lobby)

ACTIVE DESIGN

CHILLER PLANT	EFFICIENCY (KW/TON)
Chiller (A)	0.568
Chilled Water Pump (B)	0.055
Condenser Water Pump (C)	0.048
Cooling Tower (D)	0.021
System Efficiency (A+B+C+D)	**0.692**

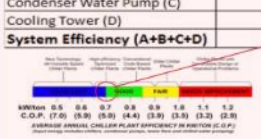
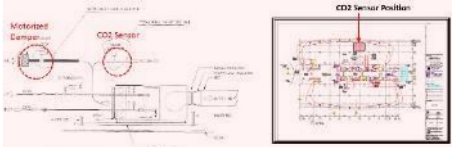


Figure 15. (Chiller Plant Efficiency)



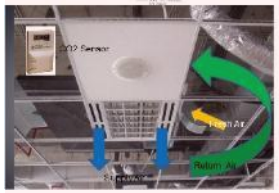
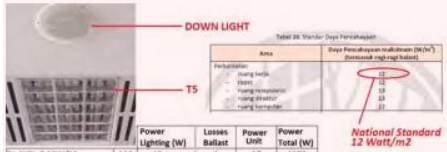


Figure 12
(CO2 Sensor and Motorized Damper in AHU)



	Power Lighting (W)	Losses Ballast	Power Unit	Power Total (W)
DL 1XPL-C 13W/84	116	13	4	17	1972
T5 1XT5-14W/840	636	42	4	46	29256

National Standard 12 Watt/m2

Lighting System : 9.8 Watt/m2

OTHERS DESIGN

No	Code	Type	Model	Measured Capacity	Average Capacity
1	ECW822 Dual Flush	WC Flush Valve		Big Flush (l/flush) 3.6 Little Flush (l/flush) 0.4	1.04
2	UW350HIT1M Automatic	Urinoir		Urinal I (l/flush) 1.9 Urinal II (l/flush) 2 Urinal III (l/flush) 2	1.97
3	TEN45AV400 Automatic	Washafel Faucet		Faucet 1 (l/min) 1.5 Faucet 2 (l/min) 1.8 Faucet 3 (l/min) 1.8	1.70

Figure 24. (Water Fittings/Water Fixture Type and Capacity)

Figure 26. (Recycle System and Irrigation System)

Figure 34 Certified Material GOP 6

2. Sinar Mas Land's Green Initiatives
A. Green District & Green Building

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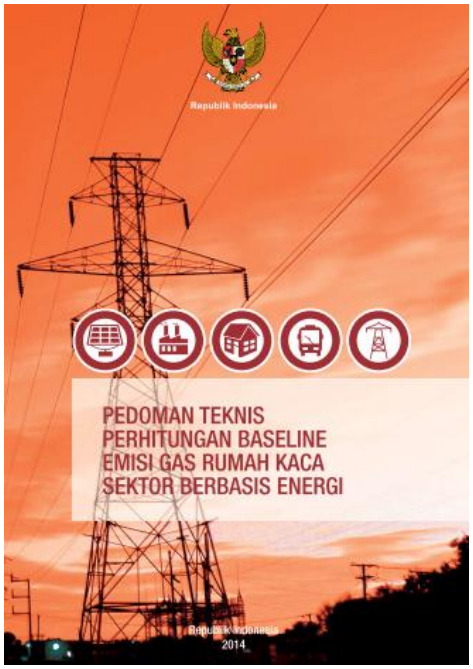
My Republic Plaza (GOP-6) Building Features

Tabel 5: Faktor emisi jaringan ketenagalistrikan

Sistem Ketenagalistrikan	Baseline Faktor Emisi ($kgCO_2/kWh$)
Jawa-Madura-Bali	0,725
Sumatera	0.743
Kaltim	0,742
Kalbar	0,775
Kateng dan Kalsel	1,273
Sulut, Sulteng, Gorontalo	0,161
Sulsel, Sulbar, Sultra	0,269

Sumber: Petunjuk Teknis Pemantauan, Evaluasi, dan Pelaporan (PEP) Pelaksanaan RAD-GRK



USAGE LOAD MONTHLY AND ENERGY EFFICIENCY INDEX

Building Name : My Republic Plaza (GOP-6)
Periode : 2016

PT. PLN (PERSERO) DISTRIBUSI JAKARTA RAYA & TANGERANG
APJ Prima Tangerang
UPJ Prima Tangerang

NO	MONTH	USAGE OF LOAD	UNITS
1	January 2016	193680	kWh
2	February 2016	206120	kWh
3	March 2016	192440	kWh
4	April 2016	207600	kWh
5	May 2016	205720	kWh
6	Juny 2016	206960	kWh
7	July 2016	179720	kWh
8	August 2016	152240	kWh
9	September 2016	174760	kWh
10	October 2016	182280	kWh
11	November 2016	187480	kWh
12	December 2016	185880	kWh

SUMMARY		
TOTAL LOAD (2460 Hours)	2274880	kWh/Years
TOTAL LOAD (2000 Hours)	1849496	kWh/Years
NLA (NETT LETTABLE AREA	15832	m2
ENERGY EFFICIENCY INDEX (2460 Hours)	144	kWh/m2/Years
ENERGY EFFICIENCY INDEX (2000 Hours)	**117**	**kWh/m2/Years**

No.	Energy Consumption Description	Total Energy Consumption		Index Energy Consumption
		kWH/year	MWH/year	kWH/m2/year
1	Energy Consumption Baseline	2,533,120	2,533	160
2	Energy Consumption Design	1,849,496	1,849	117
Difference Energy Consumption		**683,624**	**684**	**43**

No.	Description	Energy Consumption	Conversion (Kg/CO2eq/kWh/Years)	Emission CO2 (ton/year)
1	Baseline	2,533,120	0.725	1,849
2	Design	1,849,496	0.725	1,340
Reduction CO2 Emmision				**508**

2. Green Initiative Sinar Mas Land

A. Green District & Green Building

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Green Office Park 9 Building Features

PASSIVE DESIGN

FIGURE 1 Area Hijau dan Jenis Tanaman dan Pohon besar di GOP-9

Green Open Space & Green Roof

FIGURE - 2 Roof Garden Effect

Combine Cross and Stack Effect Ventilation

FIGURE 15 Jenis Aliran Ventilasi Alami Area Main Lobby

Natural Ventilation

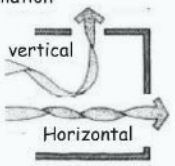
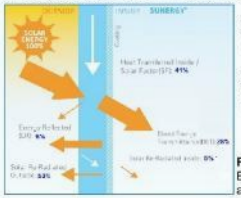


FIGURE 16 Jenis Arah Aliran Area Corridor

Building Orientation & OTTV

TYPE OF GLASS -GOP 9 (ASAHIMAS)	Sc	Uv
6mm Surnergy Euro Grey #2 + A12 + 6mm Planibel C	0.36	1.8



Perforated Metal
Colours : Grey
α_{value} : 0.572

Glass
Colours : Grey
α_{value} : 0.570

FIGURE-11 Envelope Building Material value and Type of Glass

FIGURE 12 OTTV & RTTV Value

Natural Lighting

FIGURE 13 Area Pencahayaan Buatan dan Pengukuran Kuat Pencahayaan

ACTIVE DESIGN

SYSTEM CHILLER PLANT	EFFICIENCY (KW/TON)
Chiller Plant (A)	0.557
Chilled Water Pump (B)	0.0507
Condenser Water Pump (C)	0.0338
Cooling Tower (D)	0.0113
System Efficiency (A+B+C+D)	0.6528

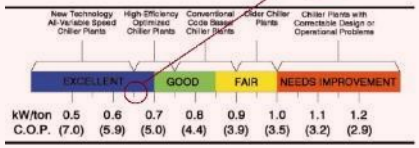


FIGURE 20. Equipment Chiller Plant & Control Inverter (VSD)

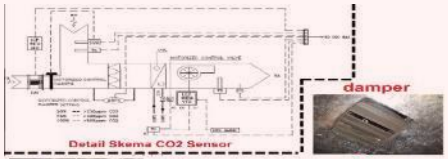


FIGURE 25 CO2 Sensor GOP-9

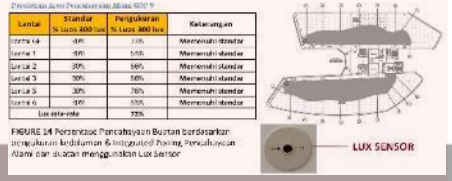


FIGURE 14 Persentase Pencahayaan Buatan berdasarkan pengukuran kedalaman & Integrated Daylig, Pencahayaan Alami dan buatan menggunakan Lux Sensor

OTHERS DESIGN

FIGURE 29. Sub Metering dan Sistem Pengolahan Air Limbah

Sistem Pengelolaan Limbah Padat (Organik, Anorganik, dan B3)

FIGURE 37. Sistem Pengelolaan Limbah Cair dan Limbah Padat GOP 9

RESUME COMPARISON GREEN BUILDING

	CRITERIA	SINAR MAS LAND PLAZA	MY REPUBLIC PLAZA	GREEN OFFICE PARK 9
1	**SITE DEVELOPMENT**			
1A	Green Open Space	GnP > 3 (Total Green Area/Site area) and Provide Green Roof	Green Area is 55% from total site area and Provide Green Roof	Green Area is 48% from total site area and Provide Green Roof, and Sky Garden
1B	Public Transport Facilities	Good Access<500m to Public Transport, and Provision for adequate bicycle parking lots	Good Access<300m to Public Transport, public facilities and Provision for adequate bicycle parking lots	Good Access<300m to Public Transport, public facilities and Provision for adequate bicycle parking lots
2	**ENERGY EFFICIENCY**			
2A	OTTV/ETTV	ETTV = 42 W/m2	OTTV = 28.9 W/m2	OTTV = 27.68 W/m3
2B	Chiller Plant Efficiency	Total Efficiency is 0.66 kW/TR	Total Efficiency is 0.69 kW/TR	Total Efficiency is 0.65 kW/TR
2C	Natural Lighting	Office Space, Atrium Lobby, and Toilet	Office Space, Atrium Lobby, and Toilet	Office Space, Main Lobby, Toilet, Corridor
2D	Artificial Lighting Efficiency	Used High Ballast Electronic and Lux Sensor in Office Space	Used High Ballast Electronic and Lux Sensor in Office Space	Used High Ballast Electronic and Lux Sensor and Motion Sensor in Office Space
3	**WATER EFFICIENCY**			
3A	Water Fixture/Water Fitting Efficiency	Faucet Sensor and High Saving Water Fixture	Faucet Sensor and High Saving Water Fixture	Faucet Sensor and High Saving Water Fixture
3B	Water Recycling/Rainwater Harvesting	Available For Irrigation, and Cooling Tower	Available For Irrigation, Cooling Tower, and Flushing	Available For Irrigation and Cooling Tower
4	**MATERIAL ENVIRONMENT FRIENDLY**			
4A	Green/Environment Label Material	ISO 14000 and Green Label	ISO 14000 and Green Label	ISO 14000 and Green Label
4B	Material Recycle	Use of compost recycled from horticulture waste	Construction Material	Construction Material
5	**INDOOR AIR QUALITY**			
5A	NaturaL Ventilation	Atrium Lobby, Toilet, Basement	Terrace Lobby, Toilet, Basement	Main Lobby, Toilet, Corridor, Basement
5B	CO2 Sensor and CO Sensor	Use CO2 Sensor Every Fresh Air to Office Space, and CO Sensor at Parking Basement	Use CO2 Sensor at Meeting Room	Use CO2 Sensor at Auditorium
5C	Material Low VOC and Non Formaldehida	Paint and Glue Use Low VOC and Non Formaldehida	Paint and Glue Use Low VOC and Non Formaldehida	Paint and Glue Use Low VOC and Non Formaldehida
6	**BUILDING ENVIRONMENT MANAGEMENT**			
6A	Waste Management	Use of 3 Type Recycle Bin Organic, Anorganic and B3	Use of 3 Type Recycle Bin Organic, Anorganic and B4	Use of 3 Type Recycle Bin Organic, Anorganic and B5

2. Sinar Mas Land's Green Initiatives

B. Energy Efficiency at Sinar Mas Land Buildings

sinarmas land

POTENSI PENGHEMATAN ENERGI

Sektor	Konsumsi Energi per Sektor (Juta SBM)*	Potensi Penghematan Energi (%)	Target Penghematan Energi Sektoral **)
Industri	355 (42%)	10–30	17%
Transportasi	324 (39%)	15–35	20%
Rumah Tangga	100 (12%)	15–30	15%
Bangunan Gedung	36 (4%)	10–30	15%
Lainnya ***	23 (3%)	25	

Keterangan

* Berdasarkan *Handbook of Energy & Economic Statistics of Indonesia 2015*

** Tahun 2025

*** Lainnya terdiri dari sektor Pertanian, Konstruksi, dan Pertambangan tidak termasuk biomasa dan penggunaan non-energi

Sumber: Kementerian ESDM 2013

2. Green Initiatives Sinar Mas Land's

B. Energy Efficiency at Sinar Mas Land Buildings

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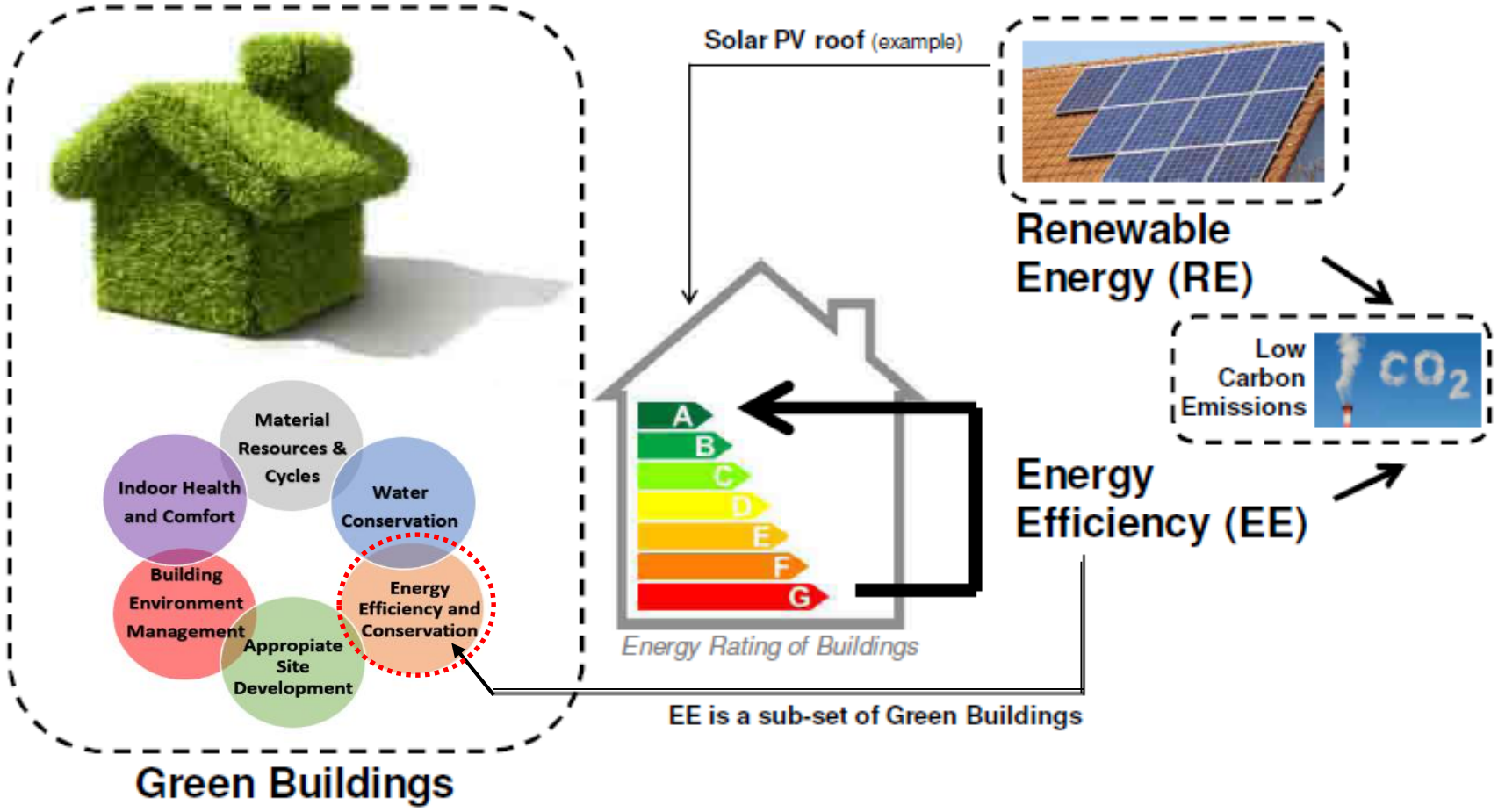
Building Terminology



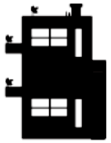
2. Sinar Mas Land's Green Initiatives

B. Energy Efficiency at Sinar Mas Land Buildings

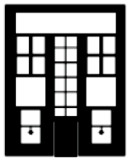
Buku Pedoman Energi Efisiensi untuk Desain Bangunan Gedung di Indonesia - 1 Pengembang dan Pemilik Bangunan Gedung

Mall, Toko den Jasa = 350 - 500 kWh/m²/y

Ruman Sakit = 320 - 450 kWh/m²/y



Apartemen = 300 - 400 kWh/m²/y

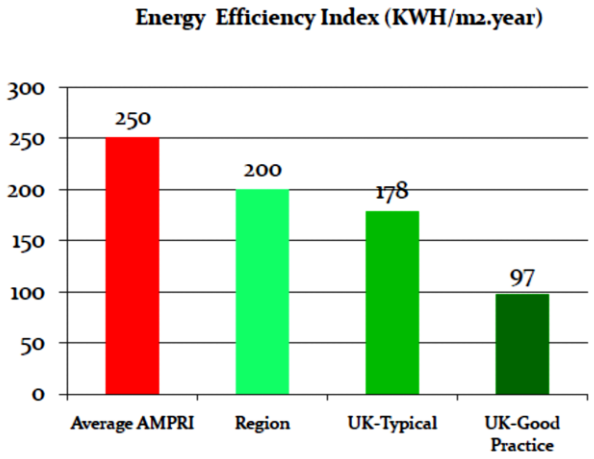


Hotel = 290 - 400 kWh/m²/y

Perkantoran = 210 - 285 kWh/m²/y

Pendidikan = 165 - 295 kWh/m²/y

Energy Efficiency Index in Building Sector



2. Sinar Mas Land's Green Initiatives

B. Energy Efficiency at Sinar Mas Land Buildings

FIGURE. 01

Energy consumption breakdown for various building type[1]

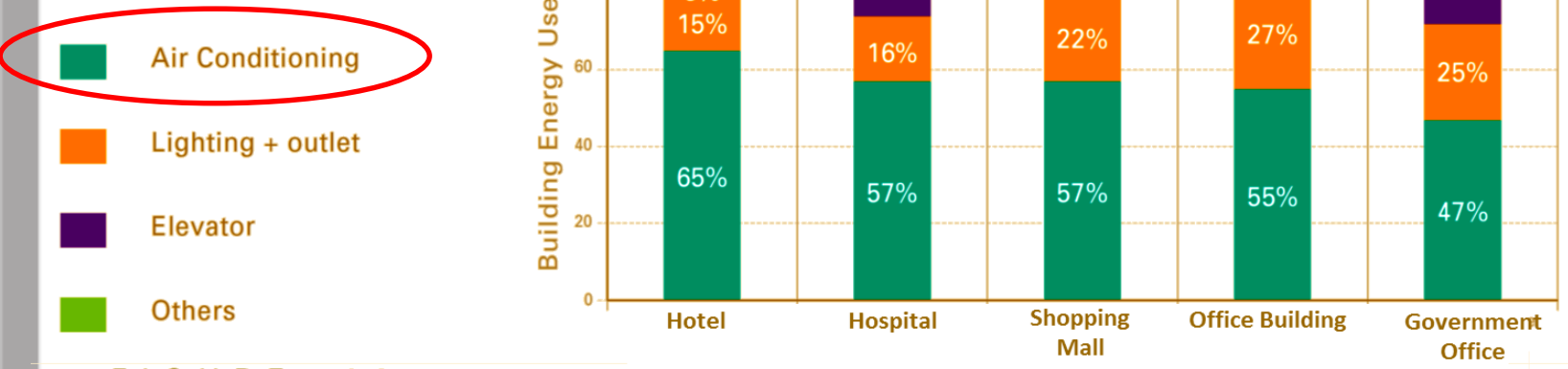
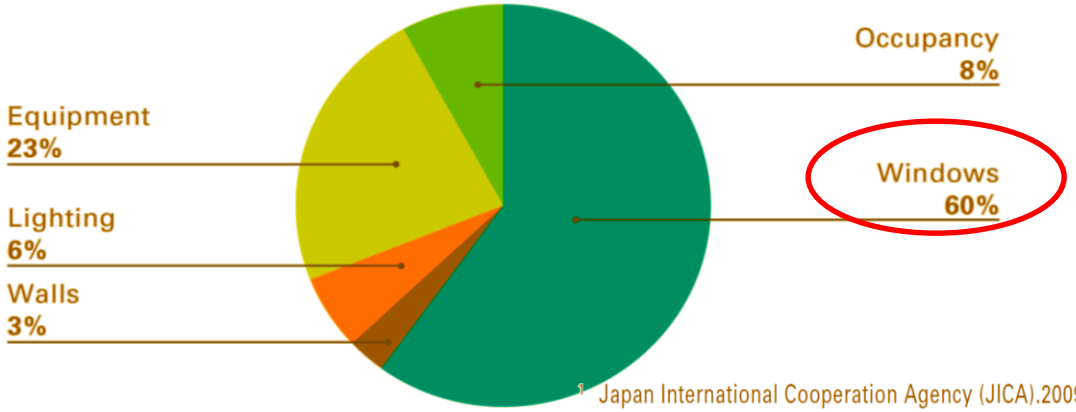


FIGURE. 02

Breakdown of cooling load for a typical Jakarta office building[2]



[1] Japan International Cooperation Agency (JICA).2009. A Study of Electricity Use in Multiple Jakarta Buildings.

[2] International Finance Corporation (IFC). 2011. *Jakarta Building Energy Efficiency Baseline and Saving Potential: Sensitivity Analysis.*

2. Sinar Mas Land's Green Initiatives

B. Energy Efficiency at Sinar Mas Land Buildings

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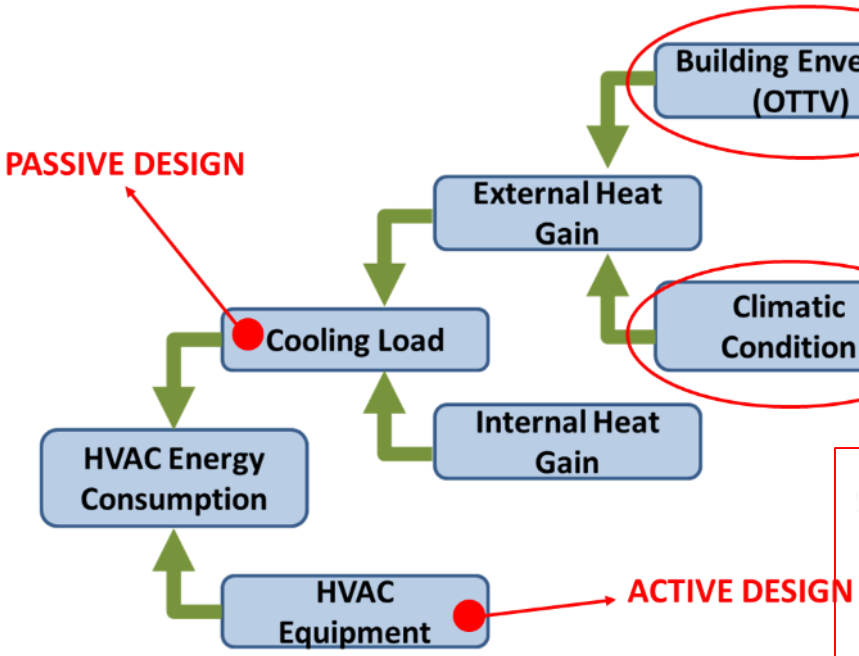
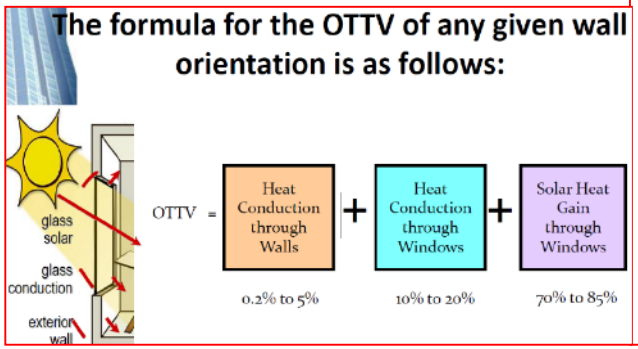
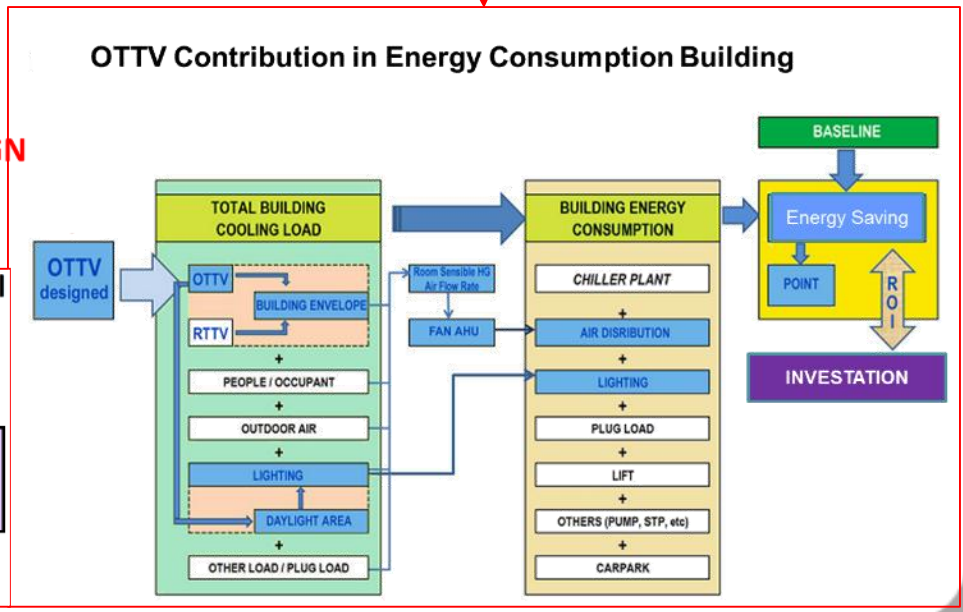
Method Active and Passive Design Air Conditioning







2. Green Initiatives Sinar Mas Land's

B. Energy Efficiency at Sinar Mas Land Buildings

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Energy Efficiency Awards Achievement

STANDARD ENERGY EFFICIENCY INDEX FOR ASEAN ENERGY AWARDS

No.	Type Of Building	Energy Efficiency Index
	Office	160 kWh/m2/yr
	Library	160 kWh/m2/yr
	Retail/Shoping Malls	192 kWh/m2/yr
	Hotels	216 kWh/m2/yr
	Hospital	288 kWh/m2/yr

2. Green Initiatives Sinar Mas Land's
B. Energy Efficiency at Sinar Mas Land Buildings

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Energy Efficiency Awards Achievement

SINAR MAS LAND PLAZA (1ST WINNER 2013, FOR CATEGORY NEW BUILDING AND GREEN BUILDING NATIONAL ENERGY AWARDS 2012 & 2013, AND ASEAN ENERGY AWARDS 2013 & 2014)

Pre-Qualification	
- Energy Efficiency Index of Occupied Air-conditioned Area: Office: 160 kWh/m^2/yr; Library: 160 kWh/ m^2/yr; Retail/Shopping Malls: 192 kWh/ m^2/yr; Hotels: 216 kWh/ m^2/yr; Hospital: 288 kWh/m^2/yr	99.5 kWh/m^2/yr
- Temperature and Other Settings: Not less than 21°C but not more than 26°C; RH: max 70% (applies to air-conditioning. Not pre-requisite - Higher score for having RH control system (below 65%).	22.5 to 25 'C
- Lighting Load: Office - Max 12 watts/m^2; Others - Max 20 watts/m^2	6,5 watts/m^2 (GFA)
- Operating hours/yr: 2,000 hours/year	2000 hour/yr
- At least 1 full-year of operation prior to nomination in national competition	2,5 years

THE BREEZE MALL (1ST WINNER 2015 FOR CATEGORY TROPICAL BUILDING NATIONAL ENERGY AWARDS 2014 AND ASEAN ENERGY AWARDS 2015)

Pre-Qualification	Data
-Energy Efficiency Index :(150 kWh/m2/yr based on GFA) 75kWH	72.5 kWh/m²/thn
- Air-conditioning up to 50 percent of total gross floor area (GFA)	38 %
- Temperature and Other Settings : Not less than 21oC but not more than 26oC RH <70%	25°C
- Lighting Load : (Office – max 15 W/m2 of GFA); (Others – max 25 W/m2 of GFA)	13.3W/m² (GFA)
- Operating Hours /yr.: based on 2,000 hours/year	2000 jam
- At least 1 full-year of operation prior to nomination on national competition	1 year 7 months

2. Green Initiatives Sinar Mas Land's

B. Energy Efficiency at Sinar Mas Land Buildings

Energy Efficiency Awards Achievement

ICE CONVENTION HALL (1ST AND 2ND WINNER 2015 FOR CATEGORY NEW BUILDING NATIONAL ENERGY AWARDS 2015 AND ASEAN ENERGY AWARDS 2016)

Pre-Qualification	Data
- Energy Efficiency Index of Occupied Air-conditioned Area: Office: 160 kWh/m²/yr; Library: 160 kWh/ m²/yr; Retail/Shopping Malls: 192 kWh/ m²/yr; Hotels: 216 kWh/ m²/yr; Hospital: 288 kWh/m²/yr	107 kWh/m²/yr
- Temperature and Other Settings: Not less than 21°C but not more than 26°C; RH: max 70% (applies to air-conditioning. Not pre-requisite - Higher score for having RH control system (below 65%).	25-26°C / 63%
- Lighting Load: Office - Max 12 watts/m²; Others - Max 20 watts/m²	8 watts/m² (GFA)
- Operating hours/yr: 2,000 hours/year	
- At least 1 full-year of operation prior to nomination in national competition	1 years 3months

ICE CONVENTION HALL (1ST WINNER 2015 FOR CATEGORY NEW BUILDING AND GREEN BUILDING NATIONAL ENERGY AWARDS 2016 AND ASEAN ENERGY AWARDS 2017)

Pre-Qualification	
- Energy Efficiency Index of Occupied Air-conditioned Area: Office: 160 kWh/m²/yr; Library: 160 kWh/ m²/yr; Retail/Shopping Malls: 192 kWh/ m²/yr; Hotels: 216 kWh/ m²/yr; Hospital: 288 kWh/ m²/yr	117 kWh/m²/thn (Base on NLA : 15832 m²)
- Temperature and Other Settings: Not less than 21°C but not more than 26°C; RH: max 70% (applies to air-conditioning. Not pre-requisite - Higher score for having RH control system (below 65%).	24.8°C /RH 60.8%
- Lighting Load: Office - Max 12 watts/m²; Others - Max 20 watts/m²	9.8 W/m² (GFA)
- Operating hours/yr: 2,000 hours/year	2000
- At least 1 full-year of operation prior to nomination in national competition	1 years 3 months

2. Green Initiative Sinar Mas Land

B. Others Green Initiatives Sinar Mas Land's

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GREEN ENVIRONMENT CSR/CSV

Green Festival

Since 2004, the Company has held BSD City Green Festival annually in June to campaign for the importance of protecting and conserving the environment among the local community. **The BSD City Green Festival** is often held together with the Environment Campaign organized by Banten Province Government, Tangerang Regency Government and South Tangerang City Government.

The Company donated more than 3.000 trees to the surrounding community, government agencies, educational institutions, NGOs, and other institutions. It consists of a wide array of plants that are now classified as rare. To date, the Company has planted over 3 million trees in commercial, pedestrian areas, road medians, neighborhood parks and other locations.

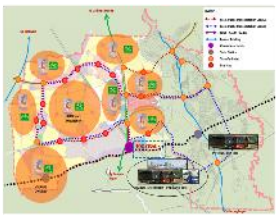
RTH/RPTRA Kalijodo

VIDEO

GREEN PUBLIC TRANSPORTATION

MINIMIZE CARBON PRINT THROUGH MINIMAL USE OF CAR AND TO PUSH USING PUBLIC TRANSPORT SYSTEM

PEOPLE FROM RESIDENTIAL AREA → INTERNAL LOOP → PARK AND RIDE→USING TRAIN TO GO TO JAKARTA→MRT→BACK TO BSD

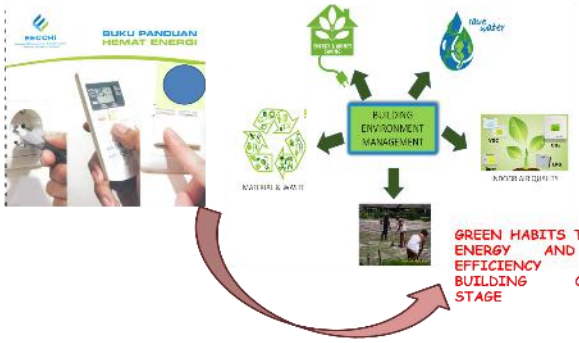


GREEN LAKE

GREEN OPEN SPACES

GREEN HABITS PROGRAMME

BUILDING MANAGEMENT TOOLS AND HABITS
BUILDING OCCUPIER GUIDANCE AND HABITS



GREEN HABITS TO ENSURE ENERGY AND WATER EFFICIENCY DURING BUILDING OPERATION STAGE

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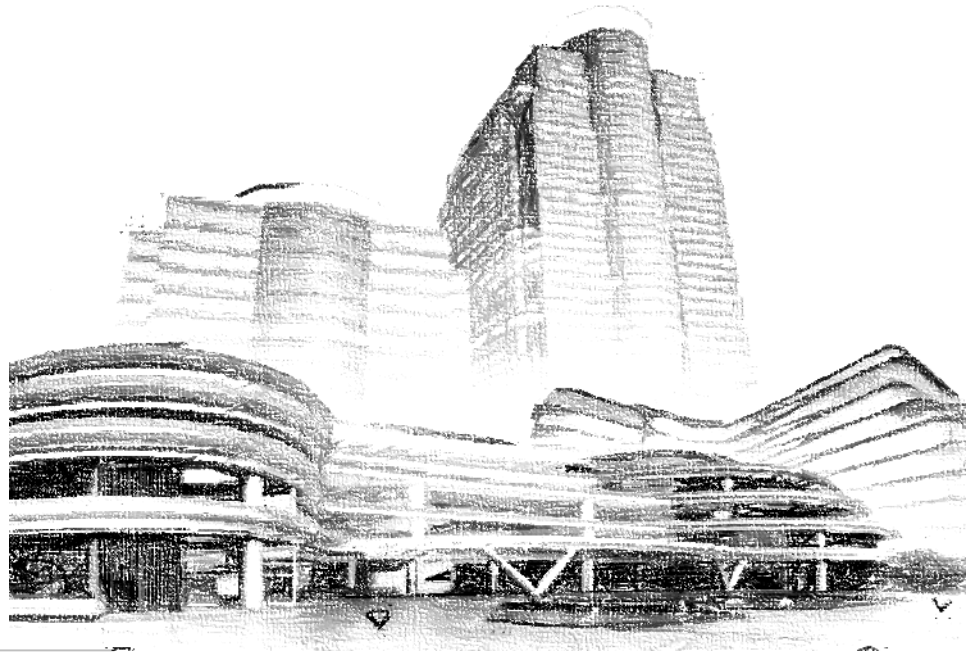
3



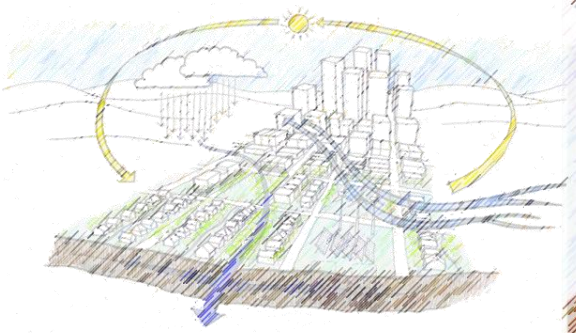
Next Projects

3. Next Projects

- Digital Hub is an **area of 25.86 hectares** in BSD City developed Sinar Mas Land for **Community Start Up Company, Technology Leader and Digital Community**

- Digital Hub is an innovation Sinar Mas Land answer the needs of the area that has the **technological infrastructure, complete facilities, centrally located with multiple access**, which was developed with consideration of **environmentally friendly and nature conservation**

- Easy of access through **green transportation**, recreational facilities, knowledge sharing and event space, **digital connectivity**, as well as the inspiration to **improve productivity with a green environment**



Energy Efficiency

Lower

Lower

Thank You