Ministry of Energy and Mineral Resources
Republic of Indonesia

"Updates on Promotions of Renewable Energy in Indonesia: Ministerial Regulation on Rooftop Solar Panel System and Role of the JCM"

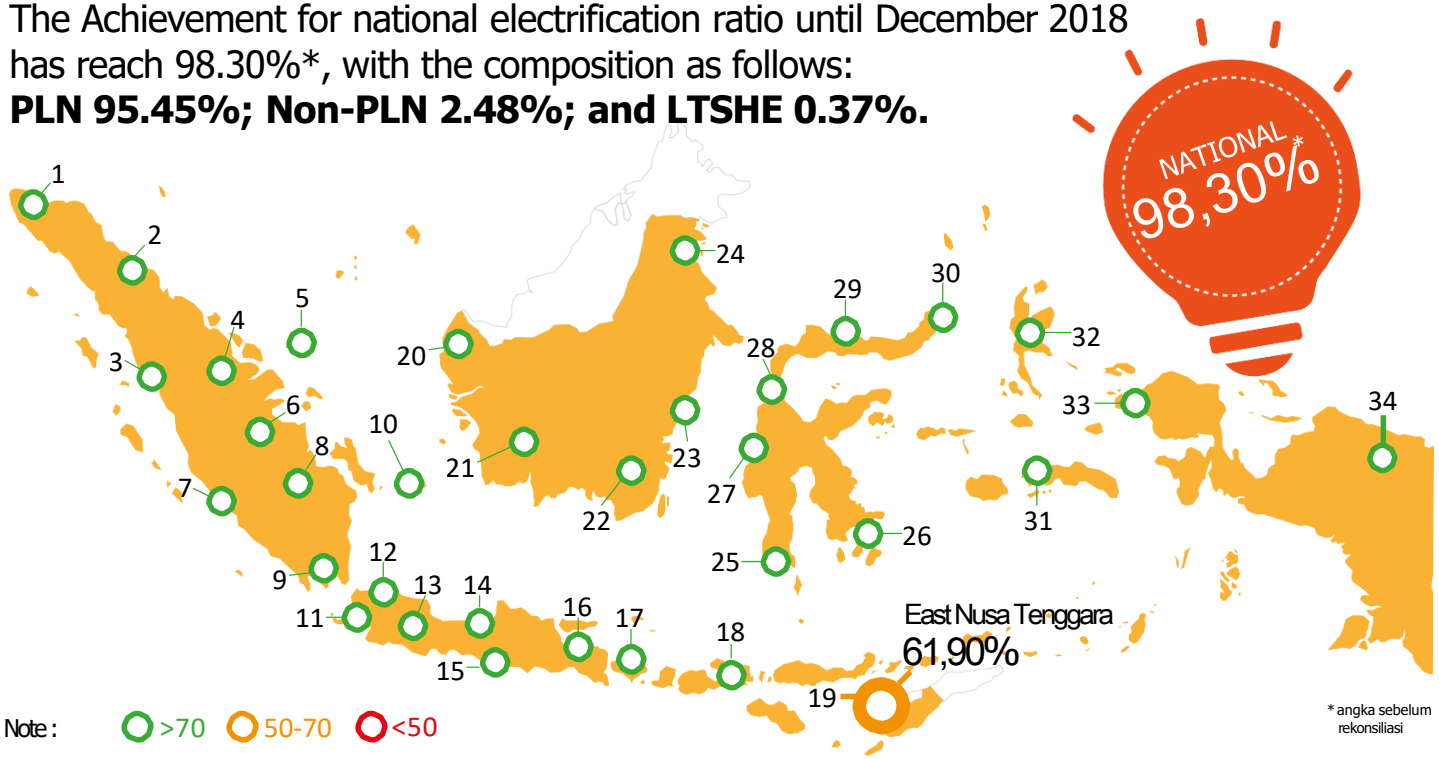


HARRIS
Director of Various New and Renewable Energy

Seminar on "Climate Actions and the Joint Crediting Mechanism in Indonesia"
Jakarta, 07th of February 2019

ELECTRIFICATION RATIO 2018

The Achievement for national electrification ratio until December 2018 has reach 98.30%*, with the composition as follows:
PLN 95.45%; Non-PLN 2.48%; and LTSHE 0.37%.



	SUMATERA	
1	Aceh	99,18
2	Sumut	99,99
3	Sumbar	91,83
4	Riau	99,00
5	Kepri	88,47
6	Jambi	97,39
7	Bengkulu	99,76
8	Sumsel	91,38
9	Lampung	95,78
10	Babel	99,99

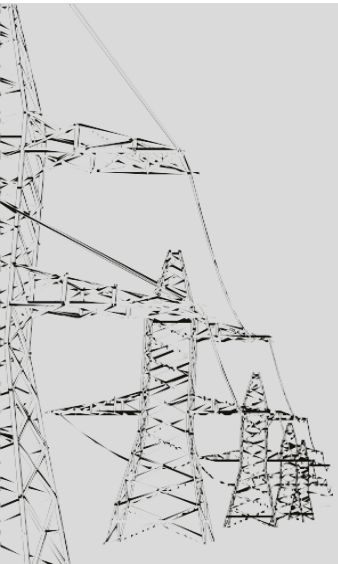
	JAWA-BALI-NUSRA	
11	Banten	99,99
12	Jakarta	99,99
13	Jabar	99,99
14	Jateng	98,38
15	DIY	99,99
16	Jatim	93,78
17	Bali	99,99
18	NTB	89,10
19	NTT	61,90

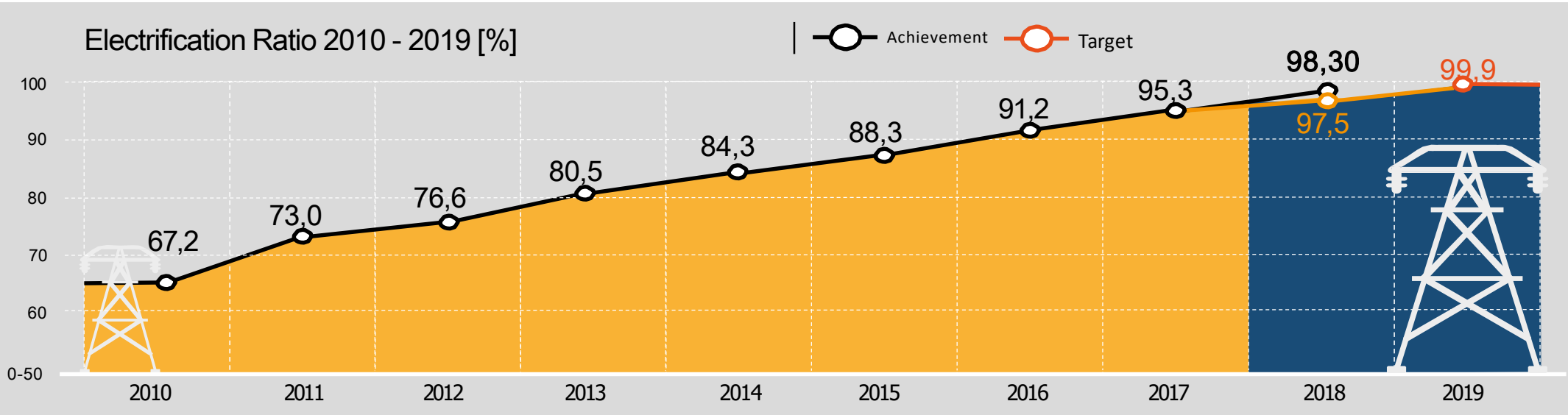
	KALIMANTAN	
20	Kalbar	87,28
21	Kalteng	84,27
22	Kalsel	95,96
23	Kaltim	99,99
24	Kaltara	84,30

	SULAWESI	
25	Sulsel	99,99
26	Sultra	89,58
27	Sulbar	99,99
28	Sulteng	91,52
29	Gorontalo	87,76
30	Sulut	96,98

	MALUKU & PAPUA	
31	Maluku	90,28
32	Malut	99,99
33	Pabar	99,99
34	Papua	90,47

*) unaudited

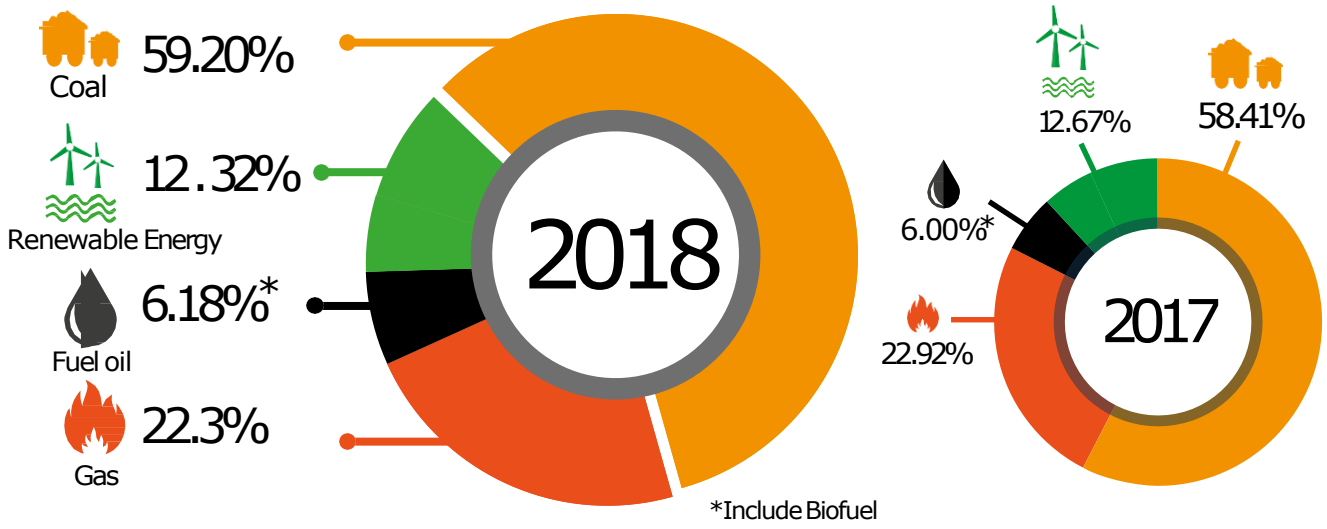




PRIMARY ENERGY MIX FOR POWER GENERATION

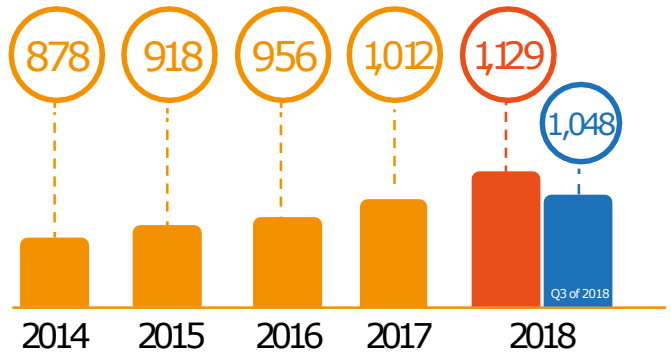
Third Quarter - 2018

- The primary energy mix in power generation is a percentage of electricity production (GWh) by each energy type.
- Reducing the electricity production cost to achieve competitive and affordable tariff.
- Decreasing the use of fuel oil power generation.



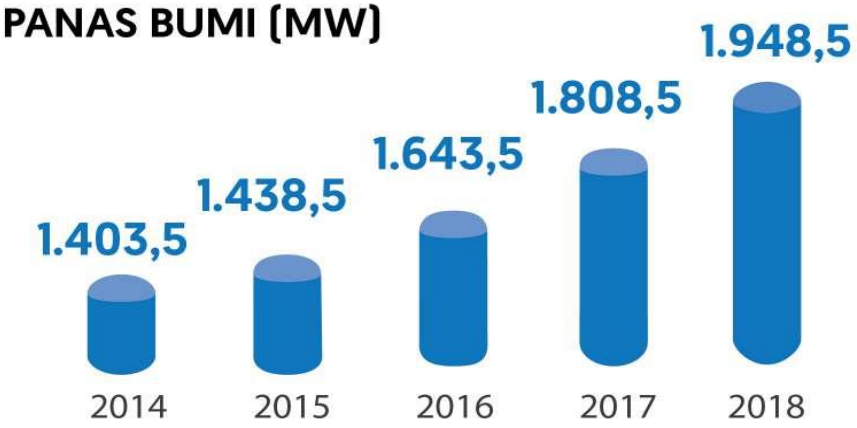
ELECTRICITY CONSUMPTION (kWh/capita)

- Electricity consumption continues to increase along with electrification accessibility expansion and economic growth
- Encourage a development of electric vehicle and utilization of electric stove



KAPASITAS PEMBANGKIT EBT TERUS MENINGKAT

KAPASITAS TERPASANG PEMBANGKIT PANAS BUMI (MW)



140 MW tambahan kapasitas terpasang Pembangkit Panas Bumi dari PLTP Karaha #1 (30 MW) & PLTP Sarulla #3 (110 MW)

National Installed Capacity (2018): **62,6 GW**

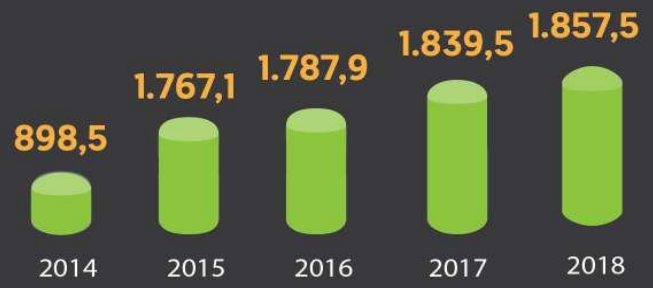
KAPASITAS TERPASANG PLTS, PLTMH (MW)

PLTS (Pembangkit Listrik Tenaga Surya), PLTMH (Pembangkit Listrik Tenaga Mikrohidro), PLTB (Pembangkit Listrik Tenaga Bayu/Angin)

75 MW tambahan kapasitas terpasang PLTB Sidrap

KAPASITAS TERPASANG PEMBANGKIT BIOENERGI (MW)

Pembangkit Listrik Tenaga Bioenergi (Biomassa, Biogas, PLTSa dan Biofuel) sebagian besar merupakan PLT off-grid



RENEWABLE ENERGY POTENTIAL

- Resource: 11,0 GW
- Reserve: 17,5 GW
- Utilization for Geothermal: 1,949 GW (0,44%)

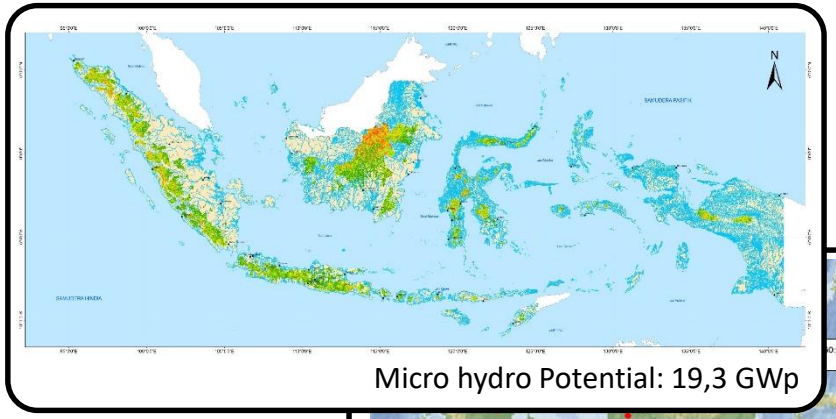
- Resource: 75 GW (19,3 GW)
- Utilization for Hydro : 5,124 GW
- For Mini/Micro Hydro: 0,225 GW (1,21%)

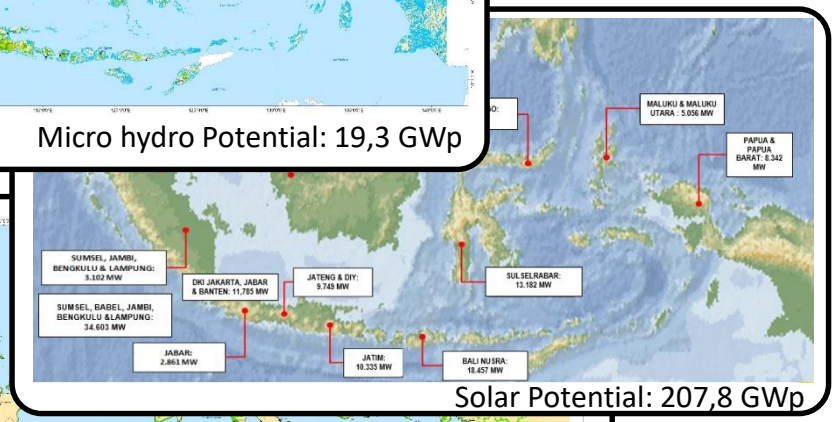
- Resource: 32,6 GW
- Resource Bio Energy: 200 Thou Bph
- Utilization for Bio PP : 1,857 GW (0,42%)
- For Biofuel: 3 million kL per year

- Resource: 60,6 GW
- Utilization for Wind: 0,076 GW (0,02%)

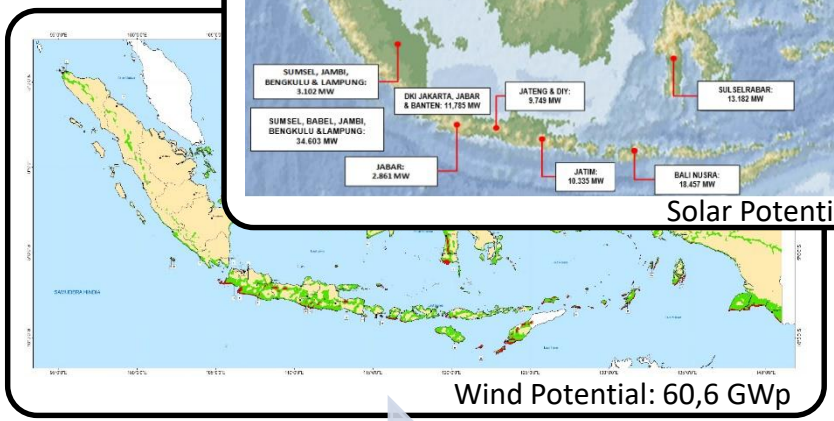
- Potential : 207,8 GWp
- Utilization for Solar PV: 0,090 GWp (0,02%)

- Potential: 17,9 GW
- Utilization: -


Micro hydro Potential: 19,3 GWp



Solar Potential: 207,8 GWp


Wind Potential: 60,6 GWp

Total Potential 442 GW **Total Installed** 9,32 GW (2%)

CLIMATE CHANGE COMMITMENT

Global Commitment

- The commitment of President Joko Widodo in COP 21 December 2015 in Paris, Indonesia will reduce GHG emissions by 29% with its own abilities and 41% with international support.
- Keep global temperature rise not exceed 2oC, and strive to reach1.5oC

National Commitment

- Mandate of Law No. 16 of 2016 on the Ratification of Reduce GHG emissions by 2030: 29% from BaU (National Effort) 41% from BaU (International Support)

Energy Sector Commitment

- Reduce GHG emissions by 314 - 398 Million Tonnes of CO2 by 2030
- PP 79/ 2014 National Energy Policy & Perpres No 22 / 2017 National Energy General Plan: Target 23% of RE on Primary Energy Mix & 17% Final Energy Saving from BAU Schenario

MITIGATION ACTION ON ENERGY SECTOR

RE & EEC

- Geothermal
- Solar PV
- Minihydro
- Micro Hydro
- Wind Energy
- Hybrid Power
- Biomass Power Plant
- Biogas
- Biodiesel
- Energy Managemen
- Partnership Program on EC
- EE Appliances
- EE Gov Building
- Smart Street Light
- LPG to DME (Biomass)

Electricity

- Hydro Power
- *Clean Coal Technology*
- *Waste Heat Recovery*
- *Coogeneration*
- Improve grid maintenance

Oil and Gas

- Kerosene to LPG
- Gas for Public Transport
- Gas pipe for Household

Coal Mining

- Post Mining Reclamation
- Increase EE Fuel use

NATIONAL ENERGY POLICY TO ACCLERATE LOW CARBON DEVELOPMENT

LAW 30/2007 ON ENERGY

LAW 30/2009 ON ELECTRICITY

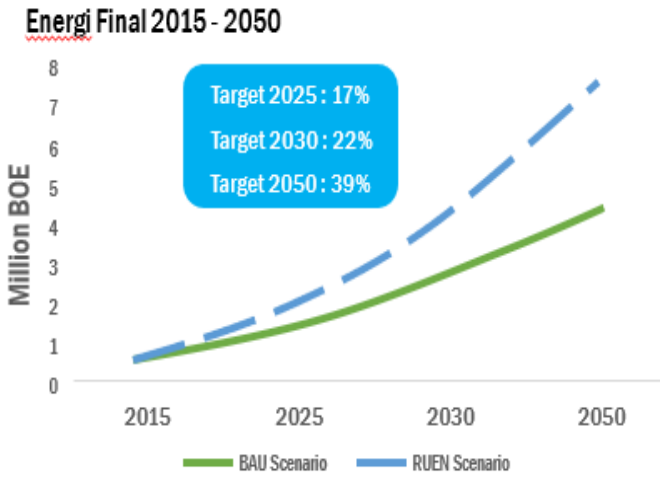
GR 70/2009 ON ENERGY CONSERVATION

GR 79/2014 ON NATIONAL ENERGY POLICY

PR 22/2017 ON NATIONAL ENERGY MASTERPLAN

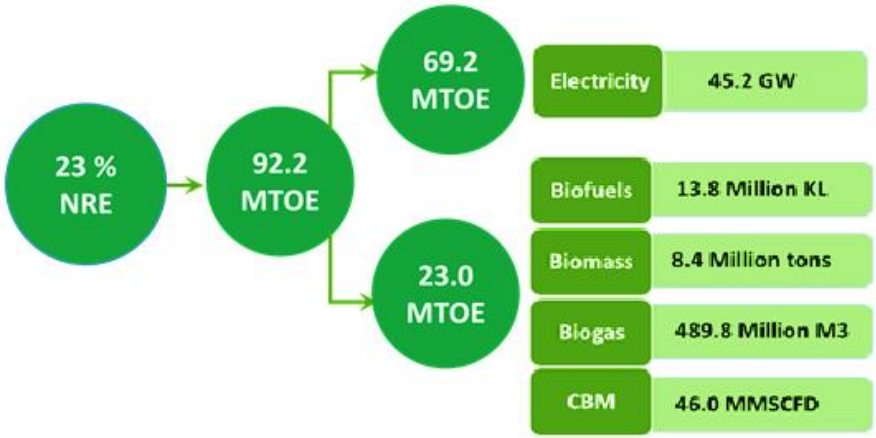
- ENERGY ELASTICITY < 1 BY 2025
- EEC TARGET 17%

Ministerial Regulation
- MEPS based on Minister Reg 57/2017
- Energy Management, Ministry Reg 14/2012
- Ground Water Saving Ministry Reg 5/2012
- Governor Reg 38/ 2012 on Green Building



Ministerial Regulation
- RE (Electricity) Price (Private) Based on Minister Reg 50/2017 and 38/2016;
- RE (Electricity) State Budget, Based on Minister Reg 39/2017;
- Biofuel Mandatory: PSO and Non PSO

RE TARGET
23% BY 2025



RENEWABLE ENERGY PROGRAM/REGULATION TO ACCELERATE ITS IMPLEMENTATION

ON-GRID (ELECTRICITY)

- MEMR Reg 50 of 2017 on Utilization of Renewable Energy Sources for the Provision of Renewable Electricty;
- Provide opportunities for the **private sector;**
- Hydro, Geothermal, PV, Wind, Municipal Waste, Biomass, Biogass, Ocean Energy

OFF-GRID/ MINI GRID (ELECTRICITY)

- MEMR Reg 38 of 2016 on Acceleration of Electrification in Undeveloped Rural Area, Remote Areas, Border Areas, and Small Island with Population through the Implementation of Small Scale Power Supply;
- Provide opportunities for the **private sector** and Local State Own Company;
- Mini/Micro Hydro, PV, etc.

BIO FUEL (NON ELECTRICITY)

- Biodiesel Mandatory Roadmap (MEMR Reg 12 of 2015);
- Indonesia started Mandatory Biodiesel Blending in 2008 with B2.5 then gradually increased to B5, B10, B15 and reached B20 in 2016;
- Provide opportunities for the **private sector** to produce more cleaner biofuel;

RE DEVELOPMENT BASED ON RUPTL PLN 2018-2027

No.	NRE - Generation	Capacity	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
1.	Geothermal Power Plant	MW	210	150	221	235	405	445	355	2.537	20	5	4.583
2.	Hydro Power Plant	MW	66	287	193	755	315	196	635	4.461	-	564	7.472
3.	Micro Hydro Power Plant	MW	108	202	366	103	31	-	-	-	-	-	811
4.	Solar Power Plant	MWp	5	22	214	281	-	200	-	325	-	-	1.047
5.	Wind Power Plant	MW	70	60	5	45	10	30	309	-	-	60	589
6.	Biomass Power Plant	MW	53	53	41	19	235	-	-	-	-	10	411
7.	Sea Power Plant	MW	-	-	-	-	-	-	-	-	-	-	0
8.	Bio-Fuel Power Plant	Thousand Kilo Liter	607	598	375	217	146	150	154	157	165	176	2.745
Total		**MW**	**512**	**774**	**1.040**	**1.438**	**996**	**871**	**1.299**	**7.323**	**20**	**639**	**14.913**

Source: Minister of Energy and Mineral Resources Decree No. 1567K/21/MEM/2018 on Ratification of Electricity Supply Business Plan (RUPTL) PT. PLN Persero 2018 - 2027

THE REGULATION OF THE MINISTER OF ENERGY AND MINERAL RESOURCES NO.49 YEAR 2018
REGARDING
THE UTILIZATION OF ROOFTOP SOLAR PV SYSTEM BY CONSUMERS OF PT PLN (PERSERO)

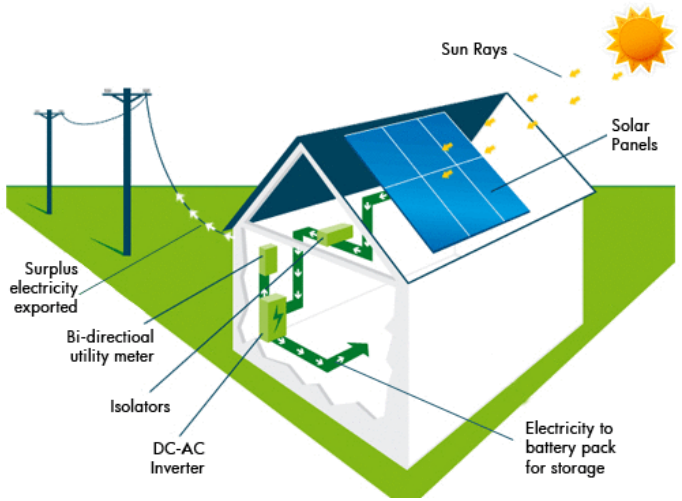
OBJECTIVES/ADVANTAGES

1. Community:

- Reducing monthly electricity bills.
- Improving the role of the community regarding the use and management of renewable energy

2. Government and PLN:

- Increasing the percentage of NRE in the national energy mix.
- Accelerating the solar energy utilization.
- Encouraging the local solar energy industry.
- Escalating the NRE investment.
- Increasing energy security and energy independency.
- Reducing green house gas emission.
- Increasing the rate of employment.



PV ROOFTOP SYSTEM

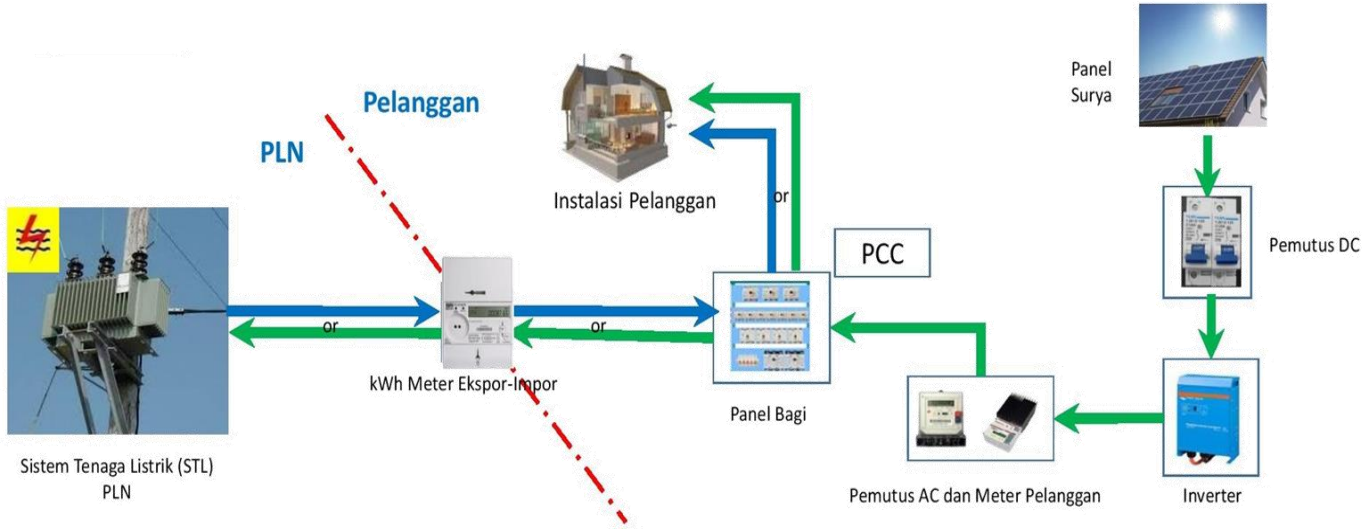
INCLUDING: solar PV, inverter, consumer electricity connection, safety system, dan export-import kWh meter.

CONSUMER: PLN Consumer including industrial sector.

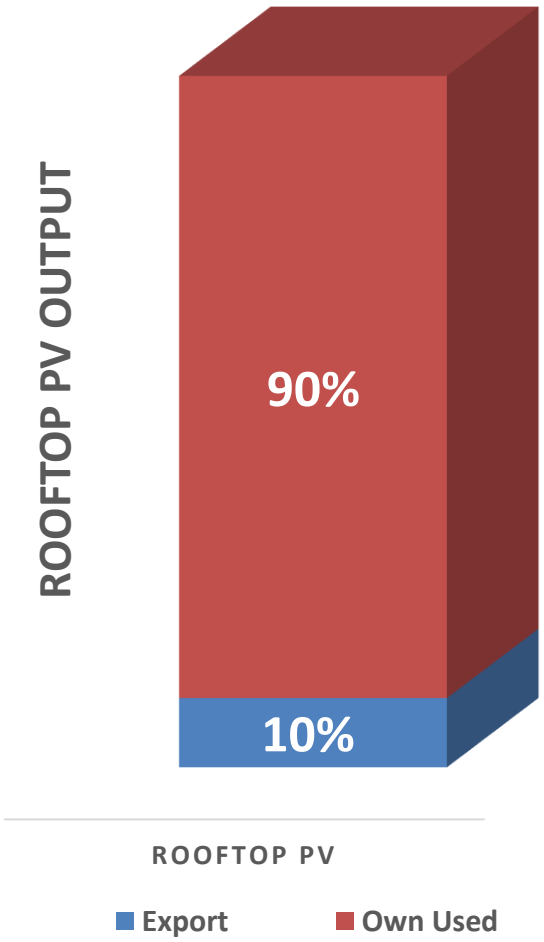
CAPACITY: 100% installed capacity of consumer electricity (Watt).

LOCATION: rooftop, wall, or other parts of building of PLN consumer

Gambar ilustrasi

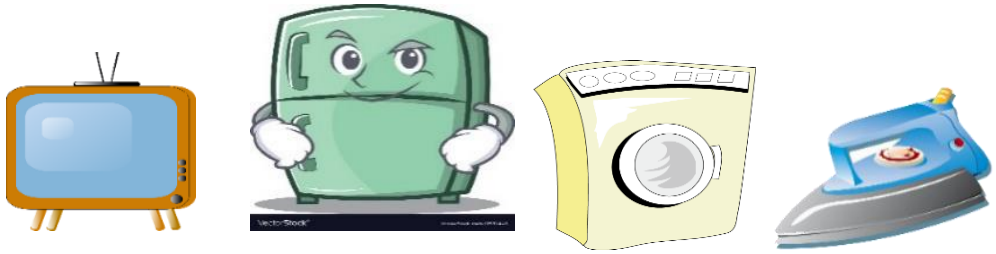


EXPORT AND IMPORT KWH VALUE



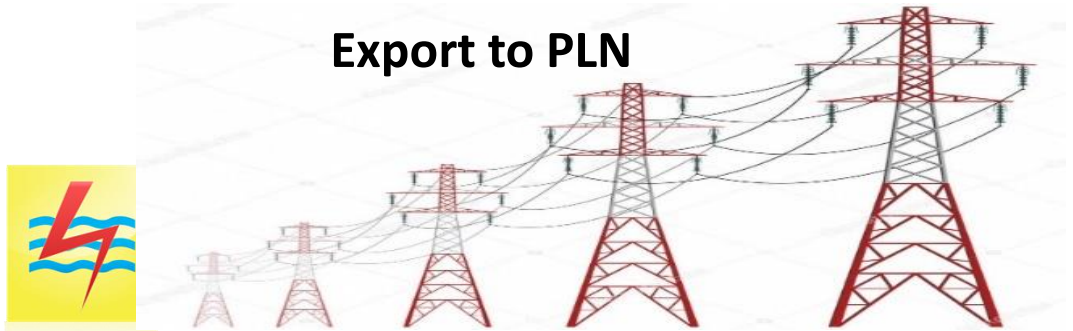
Conversion Value 1:1

Own used



Conversion Value 1:0,65

Export to PLN



** Source : Rooftop PV user

Calculation of Export and Import

The customer electricity credit transaction at the end of the month is calculated as follows :

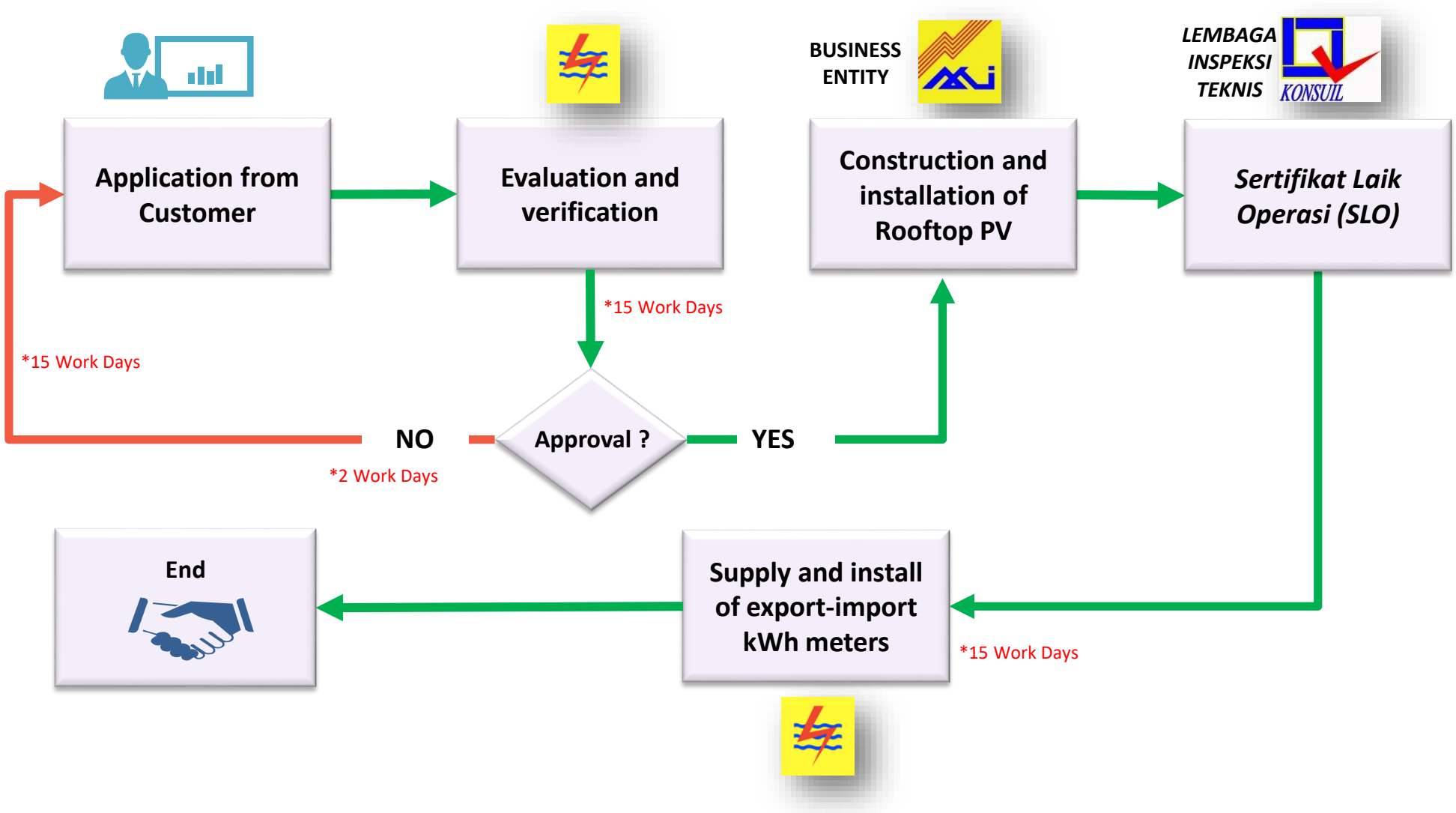
Customer Electricity Bill (kWh) = Imported kWh- 65% of Exported kWh

- **Exported kWh : Total energy exported by consumer to PLN grid per month;**
- **Imported kWh : Total energy imported from PLN grid to consumer per month;**

NOTES:

1. In the case that the amount of Exported kWh is greater than the amount of Imported kWh in the current month, the excess will be accumulated and calculated as deduction from the following month's bill.
2. the calculated excess is accumulated for a maximum of 3 months.

Rooftop PV Application Process



Other Provisions

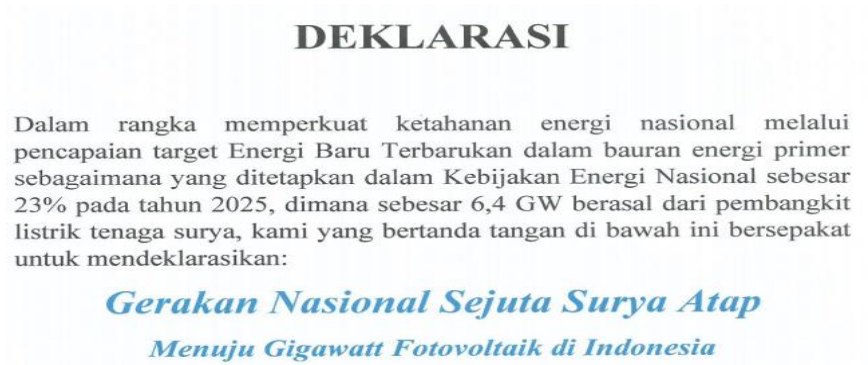
Consumers of PT PLN (Persero) from the tariff group for industrial needs

1. Industrial consumers can do the installation and construction of Rooftop PV, with the following conditions :
   - Rooftop PV **ongrid** is apply capacity charge and emergency energy charge.
   - Rooftop PV **offgrid** is not apply capacity charge and emergency energy charge
2. Rooftop PV for the benefit of Non-Consumers PT PLN (Persero), following the provisions of legislation.

1. **LOCAL CONTENT:** Follow the provisions of legislation in the field of use of goods / services in the country.
2. ***IZIN OPERASI (IO):*** Capacity of more than 200 kVA is required to have an IO.
3. ***KONSUMEN PRABAYAR*:** PLN must change the kWh meter into postpaid.
4. **INSTALLATION:** Performed by Business Entities that have *Sertifikat Badan Usaha* and *Izin Usaha Jasa Penunjang Tenaga Listrik*.
5. **INSPECTION AND TESTING:** Conducted by the *Lembaga Inspeksi Teknis (LIT)* to obtain *SLO*.
6. **INFORMATION ACCESS ABOUT *BADAN USAHA (BU)* AND *LEMBAGA INSPEKSI TEKNIS (LIT)*:** Provided on the PLN, DJK and DJE pages, including information on cost estimates.
7. **TRANSITIONAL PROVISIONS:** The export-import calculation for existing customers is valid until 31 December 2018.
8. **CLOSING:** Apply effectively January 1, 2019.

Rooftop Solar Power Plant Implementation

Gerakan Nasional Sejuta Surya Atap (GNSSA)



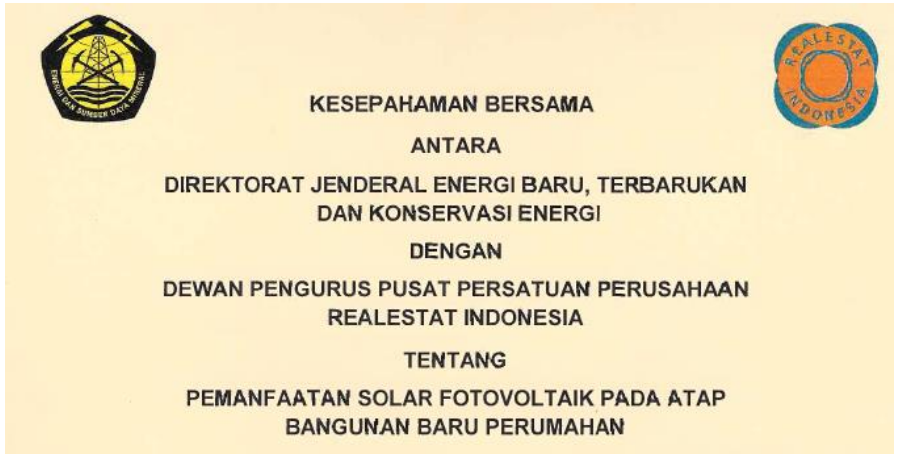
DEKLARASI

Dalam rangka memperkuat ketahanan energi nasional melalui pencapaian target Energi Baru Terbarukan dalam bauran energi primer sebagaimana yang ditetapkan dalam Kebijakan Energi Nasional sebesar 23% pada tahun 2025, dimana sebesar 6,4 GW berasal dari pembangkit listrik tenaga surya, kami yang bertanda tangan di bawah ini bersepakat untuk mendeklarasikan:

Gerakan Nasional Sejuta Surya Atap

Menuju Gigawatt Fotovoltaik di Indonesia

Kesepahaman Bersama Antara EBTKE & REI



KESEPAHAMAN BERSAMA

ANTARA

DIREKTORAT JENDERAL ENERGI BARU, TERBARUKAN DAN KONSERVASI ENERGI

DENGAN

DEWAN PENGURUS PUSAT PERSATUAN PERUSAHAAN REALESTAT INDONESIA

TENTANG

PEMANFAATAN SOLAR FOTOVOLTAIK PADA ATAP BANGUNAN BARU PERUMAHAN

PLN Customer Initiative

- ✓ More than 624 Rooftop PV have been installed, including Gelora Bung Karno, KESDM, AEON Cakung, etc.
- ✓ Total Capacity : more than 8 MW

Green House Programme – by Summarecon

- ✓ Integrating Rooftop PV with housing
- ✓ Import-Export System Energy
- ✓ The cost of Rooftop PV installation is included in the home investment package
- ✓ There are 2 types of installed capacity, 590 Wp and 1180 Wp.
- ✓ At Q2 / 2018 - Q1 / 2019 Rooftop PV will be installed in more than 700 new houses

JCM'S ROLE IN DEVELOPING SOLAR POWER PLANTS

JCM'S ROLE IN DEVELOPING SOLAR POWER PLANTS

JAKABARING SOLAR POWER PLANT

The Solar Power Plant (PLTS) has been built in the Jakabaring sports area with a capacity of 2 MW (Power Generation 1,6 MW), and it's the largest PLTS in Sumatera.

> **The Jakabaring solar power plant reduces greenhouse gas emissions significantly, with total CO2 emissions reduced by 1,303 tons CO2 / year**

The electricity production produced by Jakabaring Solar Power Plant is 1,897 MWh / year. Electricity produced by the Jakabaring solar power plant is sold to the PLN network through the Power Purchase Agreement (PPA) at a rate of 85% of the local Power Generation Cost.

The Jakabaring Solar Power Plant was inaugurated on June 30, 2018

ROOFTOP SOLAR POWER PLANT BY PT INDESSO AROMA

PT Indesso Aroma is an export company in the aroma and food industry sector located in Cileungsi kab Bogor West Java, It has inaugurated the construction of a rooftop solar power plant with a capacity of 500 KW.

> **This Rooftop PV can reduces greenhouse gas emissions significantly, with total CO2 emissions reduced by 401 tons CO2 / year**

This Solar PV development costs an investment of Rp 9 billion and PT Indesso Aroma gets a subsidy of 40% from Joint Crediting Mechanism (JCM)

ROOFTOP SOLAR POWER PLANT AT AEON MALL JAKARTA GARDEN CITY (JGC)

Aeon Mall JGC is the first shopping center in Indonesia to install a rooftop solar power plant. AEON Mall JGC uses a rooftop solar power plant with a capacity of 500 kilowatts with a power storage battery to supply the electricity needs of AEON Mall JGC.

> **This Rooftop PV can reduces greenhouse gas emissions significantly, with total CO2 emissions reduced by 401 tons CO2 / year**

Thank You

Go Green Indonesia !
GREEN ENERGY for a BETTER ENERGY

MINISTRY OF ENERGY AND MINERAL RESOURCES OF THE REPUBLIC OF INDONESIA
DIRECTORATE GENERAL OF NEW, RENEWABLE ENERGY AND ENERGY CONSERVATION

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