









Renewable Energy Investment in Indonesia

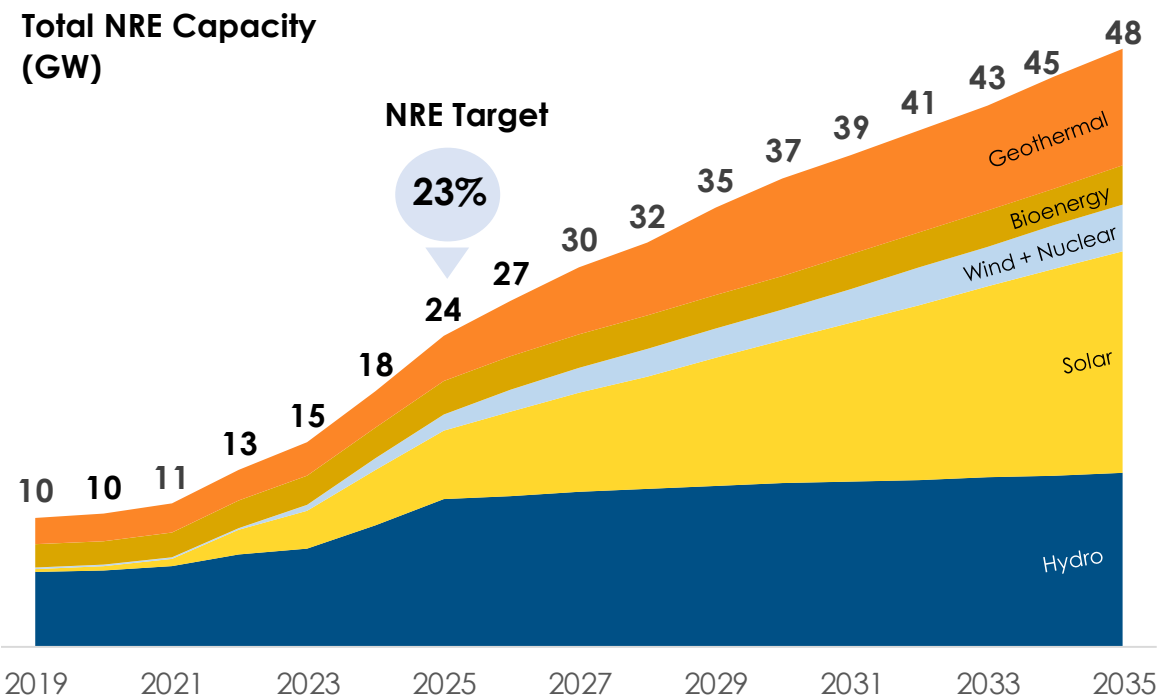
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RENEWABLE ENERGY: POTENTIAL, INSTALLED CAPACITY & DEVELOPMENT PLAN

Total Potential 417.8 GW		Total Installed Capacity 10.5 GW *) (2.5%)	
17.9 GW	 OCEAN	0 MW*) (0%)	
23.9 GW	 GEOTHERMAL	2,130.7 MW (8.8%)	
32.6 GW	 BIOENERGY	1,903.5 MW (5.8%)	
60.6 GW	 WIND	154.3 MW (0.25%)	
75 GW	 HYDRO	6,121 MW (8.2%)	
207.8 GW	 SOLAR	153.8 MWp (0.07%)	<small>MWp : Mega Watt Peak</small>



Source: National Grand Strategy for Energy Concept

01 An additional capacity of **38 GW** power plant by 2035, opens up the opportunities to export renewable energy through the ASEAN Power Grid.

02 **NRE is prioritized for solar power** (lower investment costs). East Nusa Tenggara Province will be designated as national solar energy barn.

- 03 **Efforts to accelerate:**
- Increasing the use of Battery Based Electric Vehicle (BBEV);
 - Accelerating the use of renewable energy power plant (dominated by solar power plant) and optimization biodiesel or bio-hydrocarbon production;
 - Accelerating the use of electric stoves;
 - Developing dimethyl ether, methanol, fertilizer, and syngas production; and
 - Developing electric transmission and distribution lines, smart grid, off-grid based power plant and small scale nuclear power plant

GEOHERMAL DEVELOPMENT PROGRAM 2020-2035



Target
9.3 GW

A

GOVERNMENT DRILLING

In order to improve data quality before an area is offered to a business entity, MEMR c.q. The Geological Agency will carry out geothermal exploration to drilling in 20 GWAs with expected total capacity of 683 MW.

B

SOE SYNERGY IN GEOTHERMAL DEVELOPMENT

C

EXPANSION OF EXISTING PLANT AND THE DEVELOPMENT OF SMALL-SCALE POWER PLANTS

Small scale Binary Plant in Salak 15 MW, Dieng small scale 10 MW, etc.

D

UTILIZATION OF PISP FUND (INFRASTRUCTURE FINANCING FOR GEOTHERMAL SECTOR) AND GREM (GEOTHERMAL RESOURCE RISK MITIGATION)



SOLAR PV / ROOFTOP DEVELOPMENT PROGRAM

SOLAR ROOFTOP DEVELOPMENT PROGRAM 2021 - 2030



Target: 2,145 GW

GHG reduction:

3,2 million tonnes of CO₂e

- Government Building (42.9 MW)
- SOE Owned Building and Facilities (742 MW)
- PLN Customer and Social Institutions (68.8 MW)
- Industry and Business (624.2 MW)
- Household (648.7 MW)

Installed Capacity: 21,40 MWp (3,007 Customers)

Existing Regulation:

MEMR Regulation no. 49/ 2018 jo. 13 / 2019 jo. 16/2019

LARGE SCALE SOLAR PV DEVELOPMENT PROGRAM 2020 - 2035



Target: 13.57 GW

- 2 GW Solar PP in NTT Sumba
- 0.5 – 1 GW Solar PP in West Kalimantan (combined with imported electricity from Sabah)
- 0.5 – 1 GW Floating Solar PV in Singkarak (ex-tin mining site), Bangka Belitung

Solar PP in **ex mining areas, non productive lands, reservoirs and lakes**

FLOATING SOLAR PV RESERVOIR / LAKE



Floating Solar PV
In existing Hydro Power Plant:

Potential :12,055 MW (28 locations)

Reservoir: 3,068.6 MW (24 locations)

Lake: 8,987.2 MW (4 locations)

Total Potential (all existing reservoirs/lakes) : 28,197.6 MW

Reservoir: 6,348.1 MW (211 locations)

Lake: 21,849.5 MW (164 locations)

RENEWABLE ENERGY BASED INDUSTRIAL DEVELOPMENT (REBID)

Hydro power Resources for REBID Program :

Region	Resources (MW)
North Kalimantan, East Kalimantan, South Kalimantan	16,844
South Sulawesi, Southeast Sulawesi	6,340
Aceh	5,062
Papua	22,371



Objection:

Large-scale renewable energy development to create industrial demand as an effort to produce global end product with REBID schemes.

Programs:

- Developing large-scale hydro power plant integrated with industrial area.
- Synergizing between renewable energy development and economic cluster.

Progres of REBID (Hydro power plant):

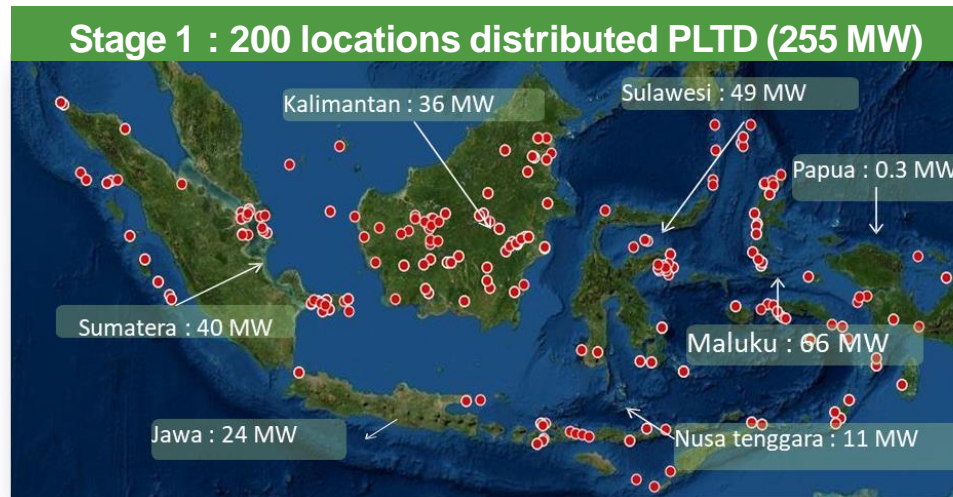
- HPP Kayan: 9,000 MW for Industrial Manufacture (Preparing for construction)
- HPP Mentarang: 1,375 MW for Industrial Smelter (Feasibility Study and Permit)
- HPP Sembakung: 250 MW (Planning)
- HPP Bahao: 1,300 MW (Planning)
- HPP Mahakam and Kelai: 2,500 MW for Industrial Smelter (Planning, cooperate with FMG Australia)
- HPP Membramo: 20,000 MW for Industrial Smelter (Planning, cooperate with FMG Australia)

PRIMARY ENERGY CONVERSION & SUBSTITUTION PROGRAM

THE CONVERSION OF DIESEL TO RENEWABLE ENERGY POWER PLANT

± 5200-unit, spread over 2130 locations

- Reducing the use of Diesel Fuel will reduce import costs and save state financial spending, in addition to reducing emissions from the operation of a Diesel Fuel PP.
- Diesel power plant shall be replaced by NRE.



Criteria

- Isolated Areas (offgrid).
- Has been operated for more than 15 years.
- Some areas operated < 24 hours/day.

PRIMARY ENERGY SUBSTITUTION BIOMASS COFIRING @ EXISTING CFPP

- Electricity production target : 0,76 million BOE.
- The mixture percentage of biomass fuels for cofiring:
 - In 2020 up to 2025 for PC = 3%, CFB = 5% and Stoker = 15%
 - In 2026 up to 2029 for PC = 5%, CFB = 5% and Stoker = 15%
 - In 2030 up to 2035 for PC = 5%, CFB = 15% and Stoker = 50%
 - The feedstock availability refers to the study result of PSE UGM which supplied from energy forest and waste surrounding CFPP, with calorie value of 4200 kCal/kg (energy crops) and 3200 kCal/kg (waste-based)
- The NRE calculation for cofiring biomass is started from commercial year (cofiring implementation) for each CFPP. For CFPP under construction, will be calculated upon COD.
- CF is assumed at 70%.

