NRE Development in Indonesia

PT. PLN (Persero)

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ISO 37001 ANTI-BRIBERY MANAGEMENT
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Sistem Manajemen
Anti Penyuapan (SMAP)

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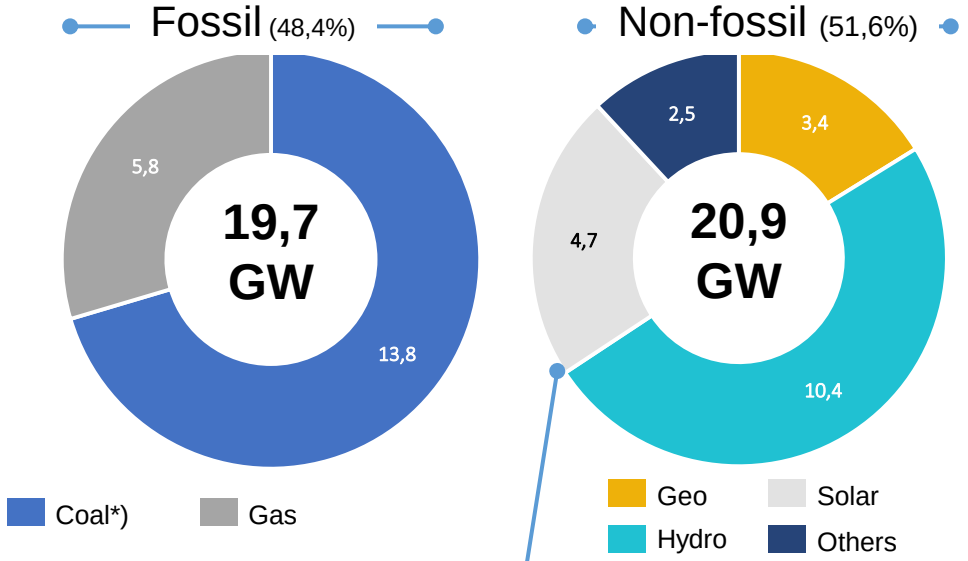
Additional capacity from NRE will reach 20,9 GW in 2030 based on RUPTL

NRE power plants will dominate the addition of generating capacity with a total energy mix of 24.8% in 2030

Total additional power generation capacity based on RUPTL 2021 - 2030

40,6 GW

Additional power generation capacity 2021 - 2030
(based on type, in GW and %, according to RUPTL 2021-2030)

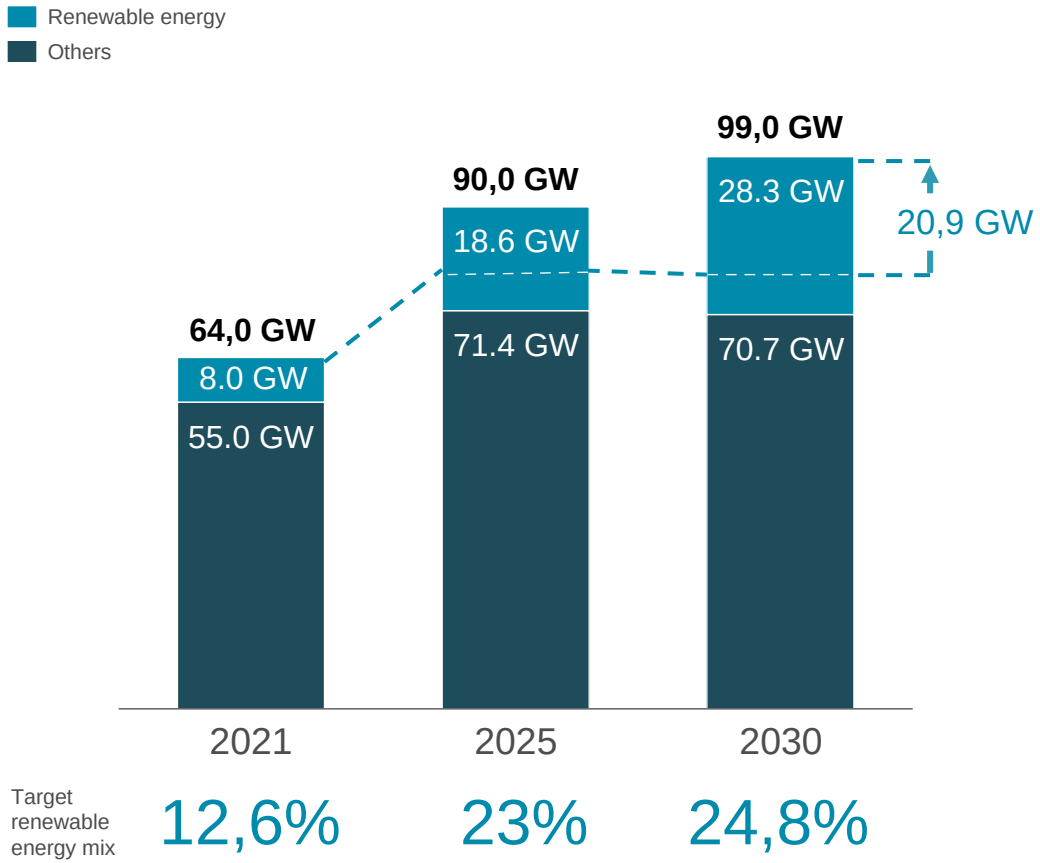


Energy Mix from NRE 24.8% in 2030

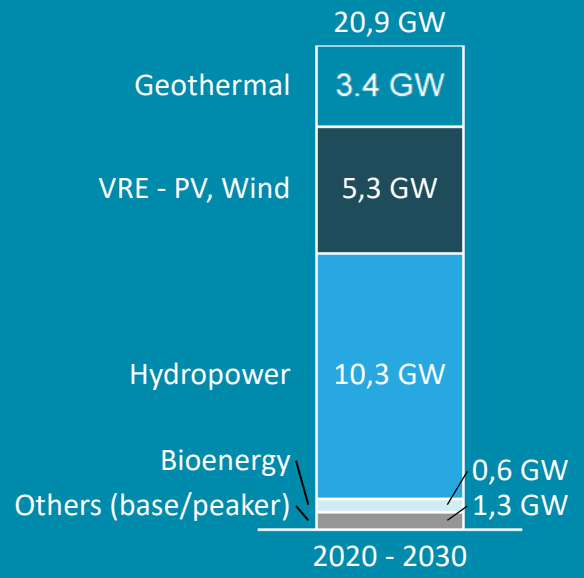
Notes :
*) Existing contract, construction stage

By 2030, 20.9 GW of New Capacity Will be Renewable Energy

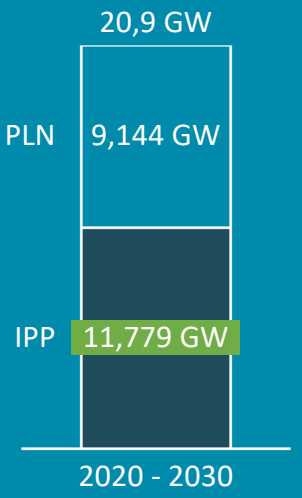
Total Planned Capacity



The RE installation is a combination of several energy sources with the allocated capacity for each →



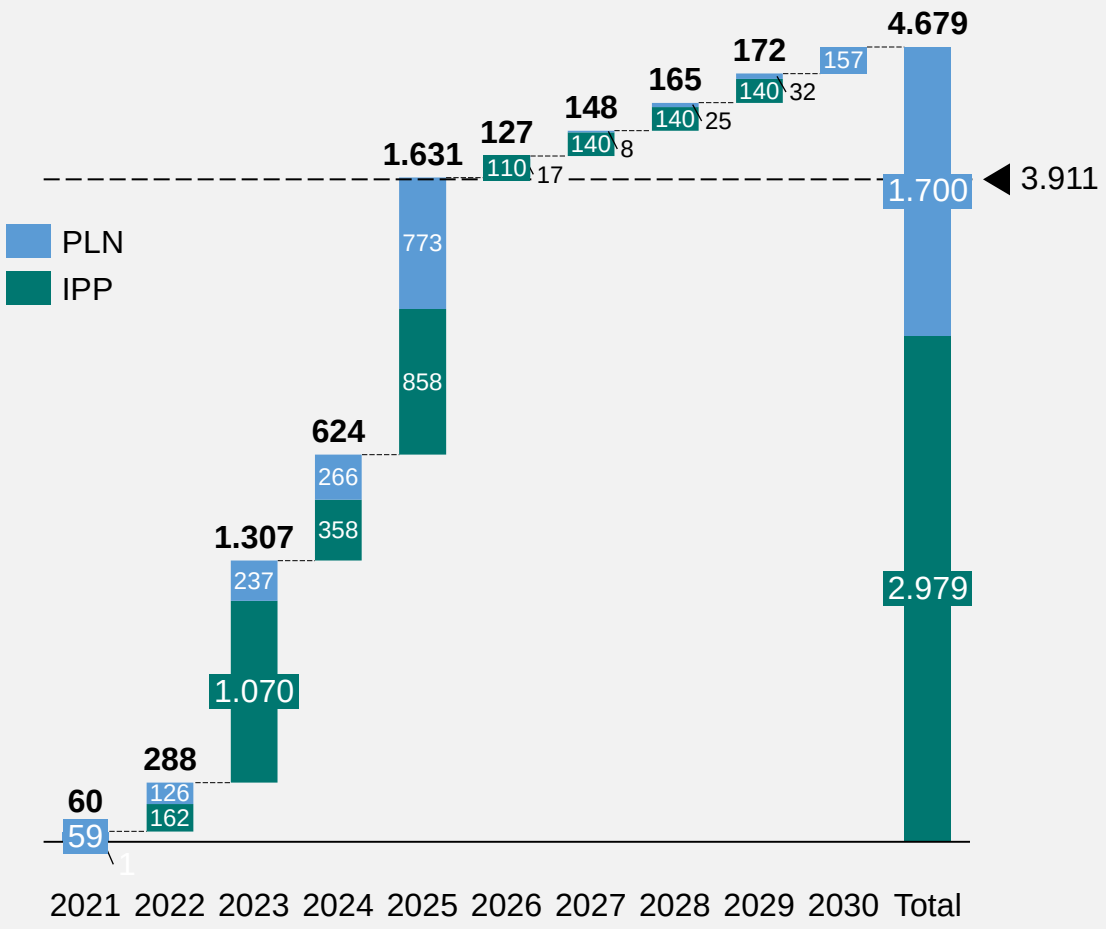
NRE development until 2030 will be carried out by PLN and IPP, with the following capacity allocations:



Solar Power Additional Capacity will reach 4.7 GW in 2030 based on RUPTL

PLTS

Additional Capacity Plan for Solar Power (MW)



Source: RUPTL 2021 -2030

Solar Power Quota based on RUPTL

1. Additional capacity plan of solar power until 2030 is 4.7 GW. However, to reach to reach 23% NRE energy mix in 2025, PLN needs to operate 3.9 GW Solar Power in 2025.
2. The Solar Power development plan in PLN is carried out by developing land based Solar power on grid, utilizing ex-mining area, floating solar power, and hybrid solar power in remote area.
3. The additional capacity of 4.7 GW is already included (±1 GW) Solar Power Plan from diesel power conversion to NRE.
4. One of the Solar PV that under construction is 145 MWp Cirata Floating PV and the development of 25 MWp West Bali and 25 MWp East Bali.

De-dieselization: Reduce CO2 emissions and improve NRE energy mix

Based on RUPTL 2021-2030

PLN's Diesel Power Plant

5200
Diesel Power Plant Unit

Scattered over
2130 locations

Fuel Consumption in 2020

Fuel Consumption
~ 2.7 Million kL

Fuel expenditure
~16 Trillion IDR

Diesel Power Plant Conversion Program (De-dieselization)

1. Diesel to NRE

499 MW

Diesel conversion to NRE → Solar Power + BESS + Hybrid Diesel Engine

Phase I
Diesel conversion ~ 212 MW di ±183 location

Hybrid Scheme
Solar + Battery + existing Diesel

Phase II
Diesel conversion ~287 MW (using available NRE potential nearby)

Benefits:

• Fuel consumption reduction	**67** Thousand kL
• CO2 emission reduction	**0.3** Million ton
• NRE Energy mix improvement	**0.15%**

2. Diesel to Gas

304 MW

Diesel conversion to Gas Power Plant / Gas Engine (gasification)

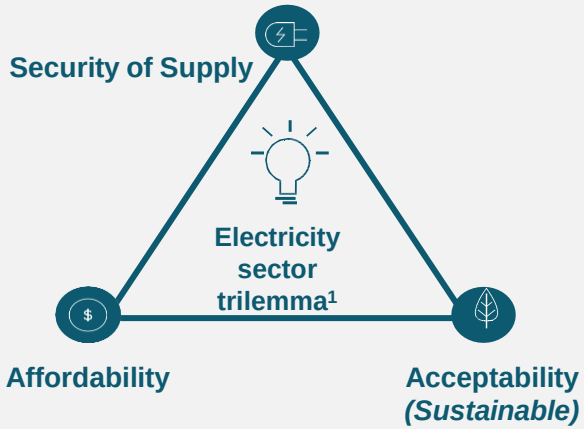
3. Diesel to Grid

1070 MW

Diesel conversion from isolated system to grid interconnection

Several consideration in the development of Solar PV

Supply & Demand



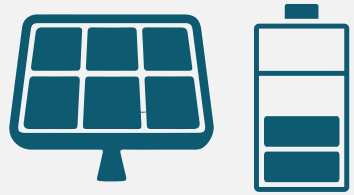
The development of solar power plants or other power plants in general, needs to consider the alignment of supply and demand, economic feasibility, reliability, energy security and sustainability

Local Content / TKDN

The development of solar PV in Indonesia needs to be supported by technological transfer and domestic industry readiness.

Government regulation (Permenperind No.05/M-IND/PER/2/2017) related to local content stated that the local content of PV modules is **60%** starting on 2022

Technology, Tariff & Funding



- Rapid advances in PV module and battery technology has an impact on the project's economy.
- Innovation in technology drives more competitive prices. Hence it is necessary to establish a fair electricity tariff based on business to business.
- Competitive and adaptive funding is necessary to adjust Indonesian regulations.

PLN

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