



COUNTRY REPORT

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Presented in : 2017 Seminar on Electrification Mode
based on Clean Energy in Hangzhou, China

COUNTRY REPORT OUTLINE



1. General Information (About Indonesia)

Power Supply System & Power Facilities

PLN Operational Highlights

2. Power Development Plan

3. Renewable Energy Development Plan (Wind, Solar)

4. Hydropower Development Plan

5. Rural Electrification

6. Electricity Tariff

GENERAL INFORMATION



PETA WILAYAH KEDAULATAN DAN YURIDIKSI NASIONAL REPUBLIK INDONESIA

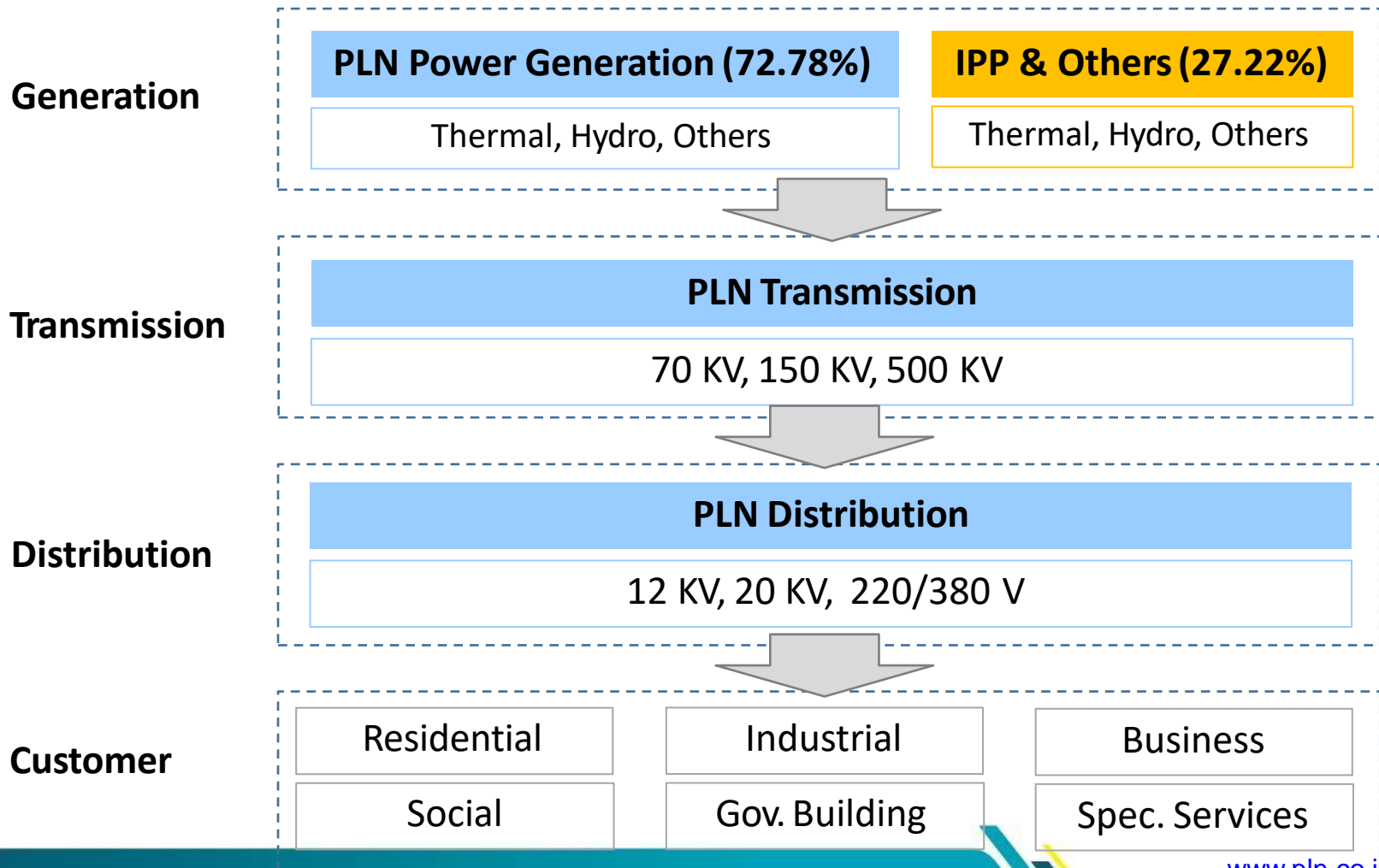


| | |
|---------------------------|-------------|
| Population (2016) | 255,182,144 |
| Land Area (Km2) | 1,919,440 |
| Power Consumption (GWh) | 248,611 |
| Installed Capacity (MW) | 54,665 |
| Electrification Ratio (%) | 91.27 |

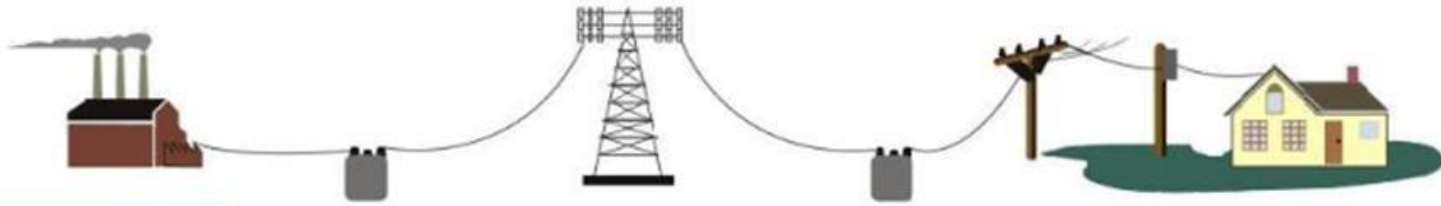
POWER SUPPLY SYSTEM



PLN is the only fully-integrated power utility company in Indonesia, controls the majority of generation capacity and is the sole transmission and distribution provider



POWER FACILITIES



Generation

Transmission

Distribution

- Total installed capacity 54,664.49 MW. PLN (72.78%), IPP's (20.80%) & Leased 6.42%.
- PLN's Powerplants are more than 5,218 units

- Transmission line length reaches 46,266 kms.
- The installed capacity and the number of Transmission Transformers 114,348 MVA and more than 1,499 units

- Distribution line length reaches 946,101 kms.
- The installed capacity and the number of Distribution Transformer 50,151 MVA dan 406,758 units

PLN OPERATIONAL HIGHLIGHTS



| Keterangan | Unit | 2016 | 2015 | 2014 | Description |
|-----------------------------|---|---------|---------|---------|----------------------------|
| Kapasitas Terpasang* | MW | 54.665 | 50.859 | 49.591 | Installed Capacity |
| Penjualan | GWh | 216.004 | 202.846 | 198.602 | Sales |
| Instalasi | | | | | Installation |
| Daya Tersambung | MVA | 114.348 | 106.582 | 100.031 | Installed Capacity |
| Panjang Transmisi | kms | 46.266 | 41.683 | 39.91 | Transmission Length |
| Kapasitas Gardu Induk | MVA | 108.479 | 92.651 | 86.472 | Substation Capacity |
| Produksi | GWh | 248.611 | 233.982 | 228.553 | Production |
| Produksi Sendiri | GWh | 166.457 | 156.631 | 152.853 | Own Production |
| Sewa Diesel | GWh | 17.352 | 19.841 | 22.443 | Diesel Rent |
| Pembelian | GWh | 64.802 | 57.510 | 53.257 | Purchase |
| Mutu | | | | | Quality |
| Susut Jaringan | Persen Percentage | 9,48% | 9,77% | 9,71 | Network Losses |
| Jumlah Pelanggan | Ribu pelanggan Thousand customers | 64.282 | 61.167 | 57.493 | Number of Customers |
| Jumlah Karyawan** | Orang | 51.158 | 47.610 | 48.068 | Number of Employees |

* Termasuk IPP dan Sewa
Including IPP and Rent

** Termasuk jumlah karyawan anak Perusahaan
Including subsidiaries' employees

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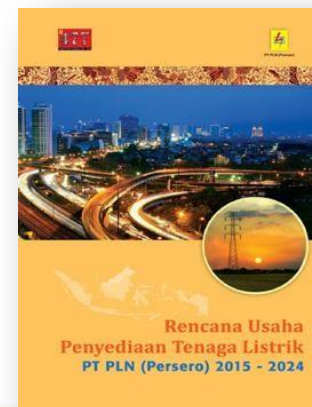
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POWER DEVELOPMENT PLAN



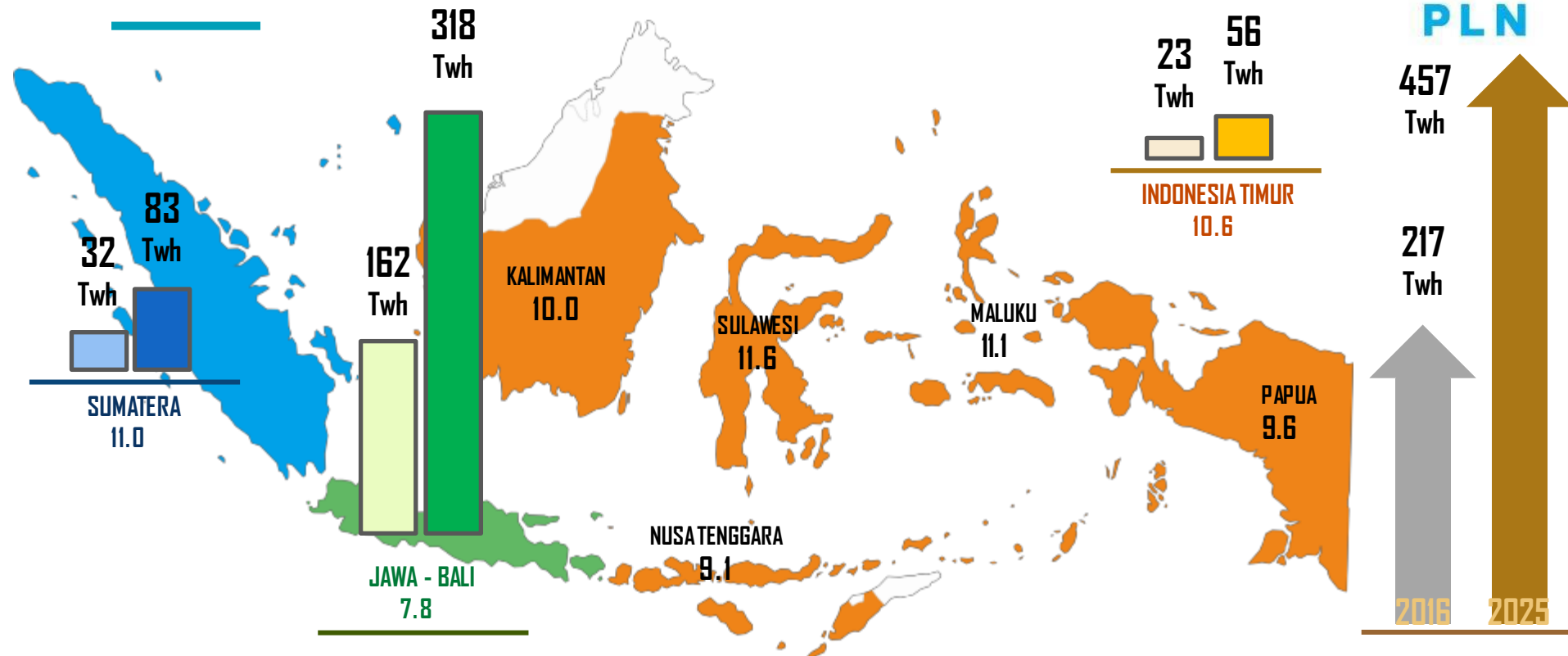
- The Power Supply Business Plan (RUPTL) by PLN for the period of 2017 – 2026 has been issued to fulfill the mandate of the Government Regulation No.14/2012 on Power Supply Operations
- RUPTL issued to serve as a guidance for the development of power infrastructure to meet electricity demand within PLN business areas
- RUPTL covers electricity demand load forecasts, generation capacity expansion plans and the development plans related to transmission, substation and distribution
- <http://www.djk.esdm.go.id/index.php/rencana-ketenagalistrikan/ruptl-pln>



ELECTRICITY FORECAST DEMANDS



PLN

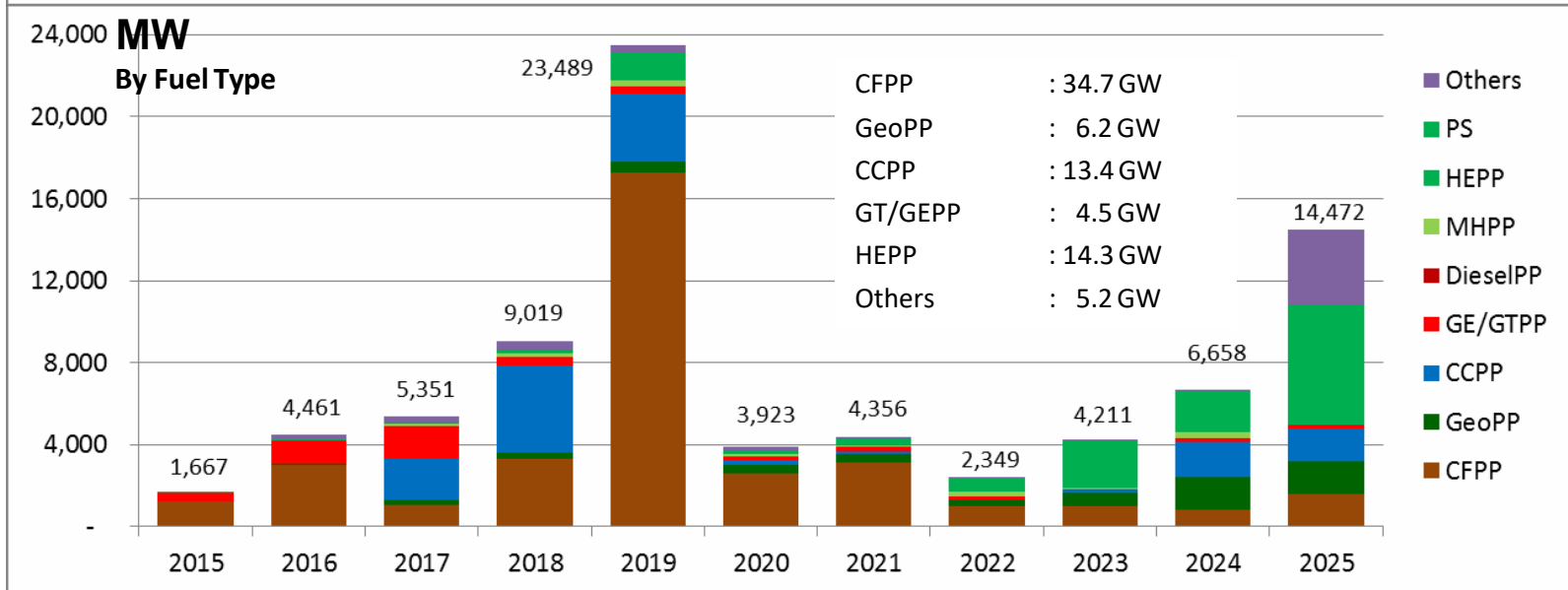
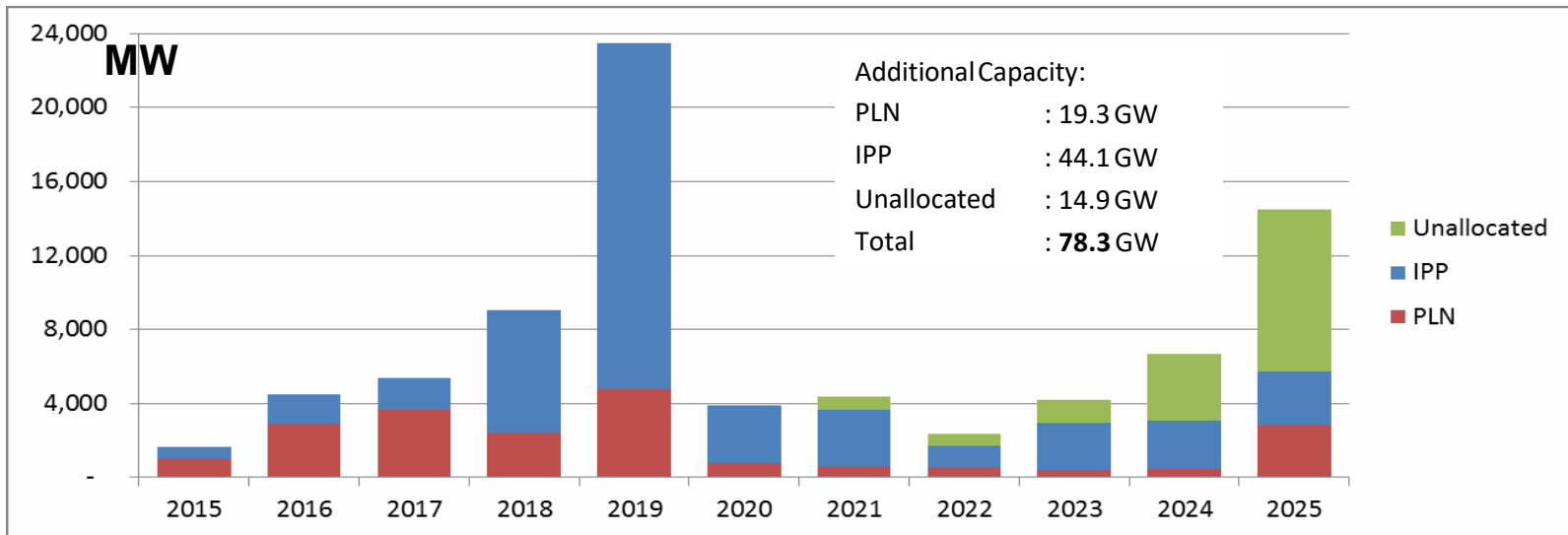


Electricity needs will continue to grow at a higher rate, 8.6% per year. To achieve the electrification ratio of 99% by 2025

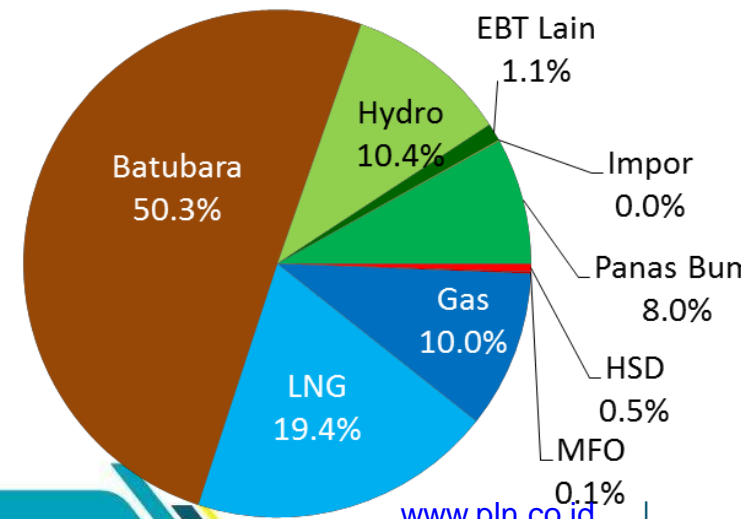
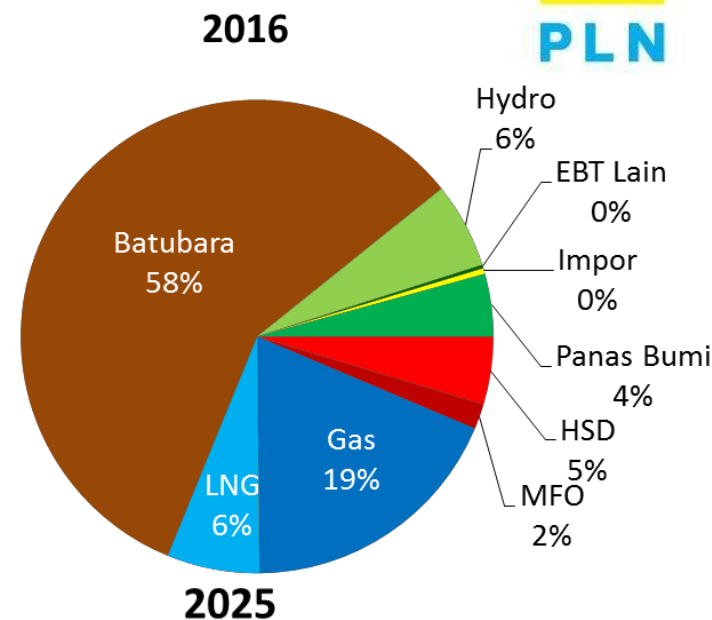
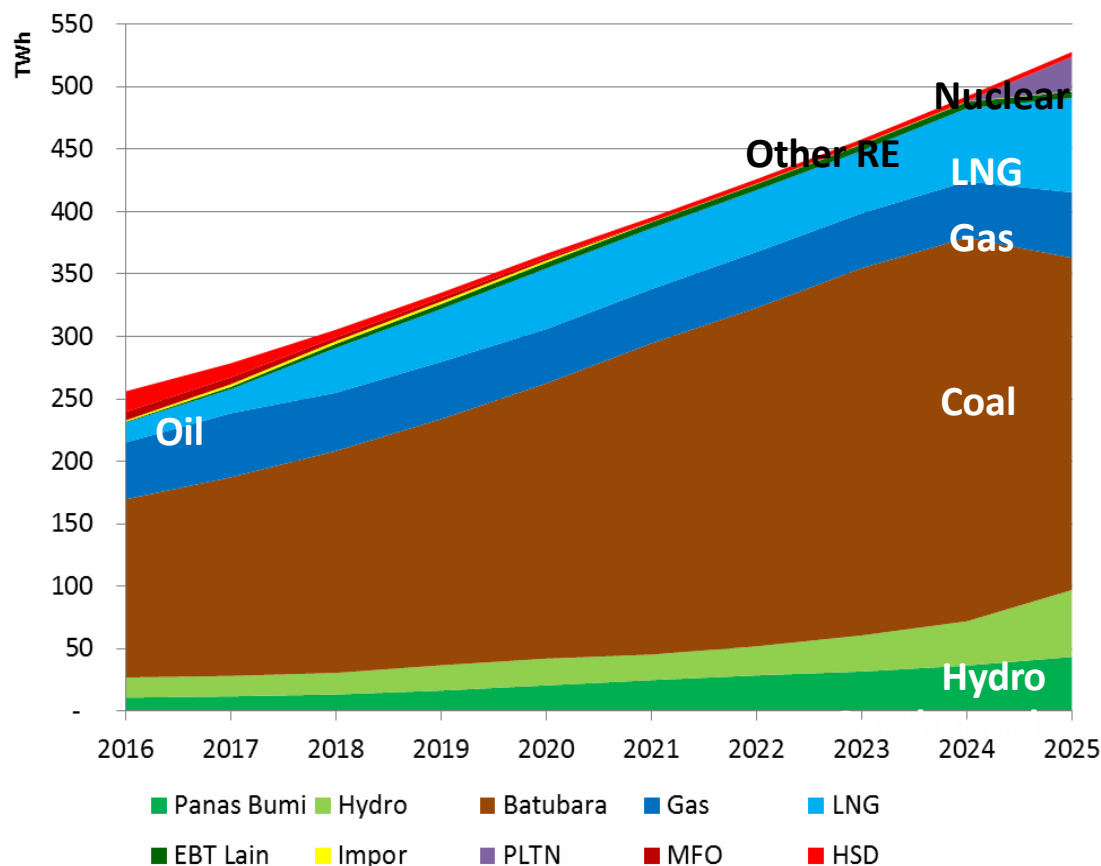
INDONESIA
8.6

| Fiscal Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Energy Demand (TWh) | 200 | 217 | 244 | 268 | 292 | 315 | 340 | 366 | 394 | 425 | 457 |
| Electrification Ratio (PLN) | 85.4 | 88.5 | 91.1 | 93.6 | 95.4 | 96.8 | 97.5 | 97.9 | 98.2 | 98.4 | 98.5 |
| Electrification Ratio (PLN+Non PLN) | 87.5 | 90.6 | 93.1 | 95.5 | 97.1 | 98.5 | 99.1 | 99.3 | 99.5 | 99.5 | 99.7 |

Total additional capacity until the year 2025 is about 78 GW or 8 GW/year



FUEL DIVERSIFICATION PLAN



To meet RE target at 25% in 2025, it will be achieved by adding either of the Nuclear PP with capacity 3.6 GW or other RE PP with capacity 14.4GW.

However, in the plans (RUPTL), the option of Gas PP development is chosen as contingency plan if the RE PP target not achieved

FAST TRACK PROGRAM 35 GW



Government launching 35.000 MW for Indonesia

| Pembangkit | IPP | PLN | Jumlah |
|---------------|---------------|---------------|---------------|
| PLTU | 17,598 | 2,215 | 19,813 |
| PLTA/PLTM | 582 | 1,389 | 1,971 |
| PLTG/MG/GU | 6,123 | 6,785 | 12,908 |
| PLTP | 555 | 170 | 725 |
| PLT Bayu | 180 | - | 180 |
| PLT Biomass | 30 | - | 30 |
| Jumlah | 25,068 | 10,559 | 35,627 |

PLTU : Steam Power Plant

PLTA/PLTM : Hydro Power Plant

PLTG/MG/GU : Gas / Gas Engine / Combine Cycle Power Plant

PLTP : Geothermal Power Plant

PLT Bayu : Wind Power Plant

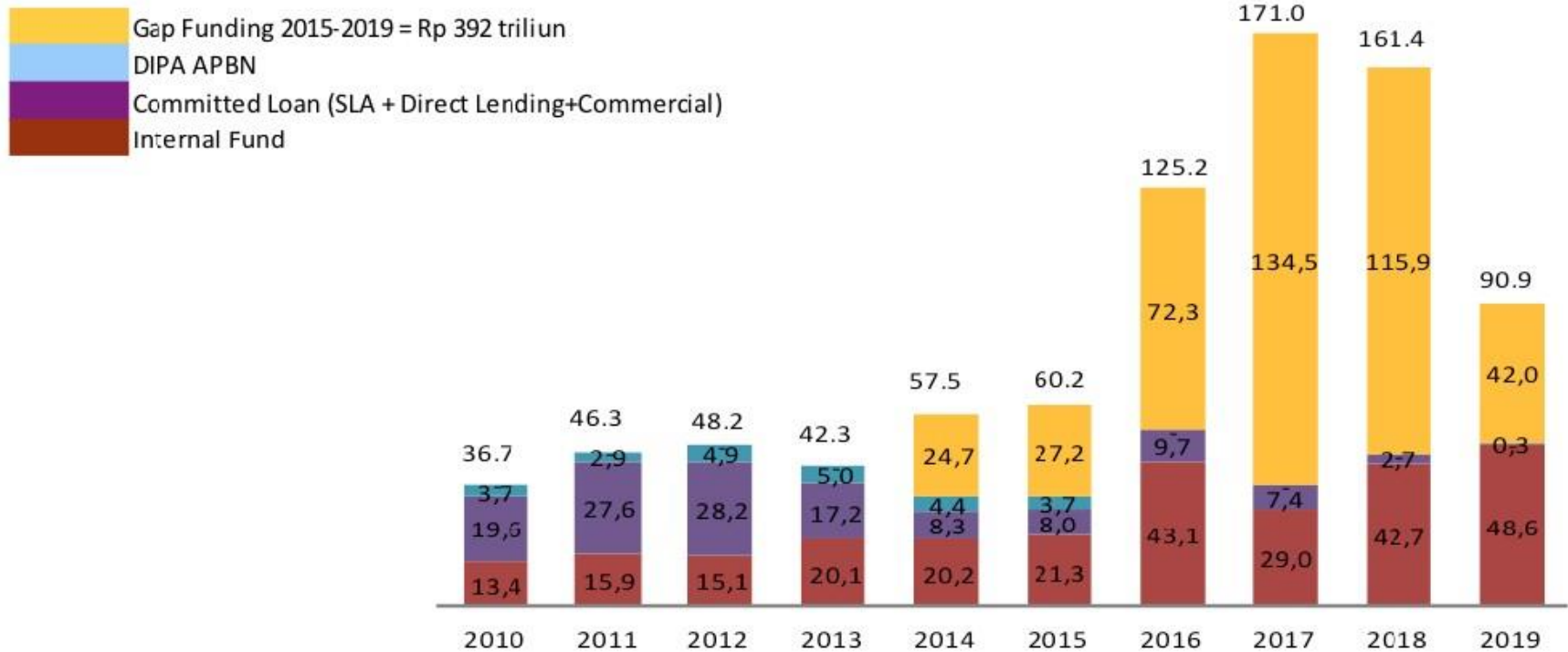
PLT Biomass : Biomass Power Plant

- This electrification program is a strategic national program as stated in the National Mid-Term Development Plan 2015-2019
- The program of 35,000 MW production will require huge investment amounting to more than Rp 1.100 trillion. In order to maintain financial capability, PLN will build power plants to produce 10,000 MW. The remaining 25,000 MW will be offered to Independent Power Producers.

OPPORTUNITY OF EP BUSSINESS



Figure 4. PLN Funding Gap, 2015-2019 (\$ billion)



Source: PT PLN. "Program Pembangunan Pembangkit 35 GW & Transmisi." Jakarta, February 2015.

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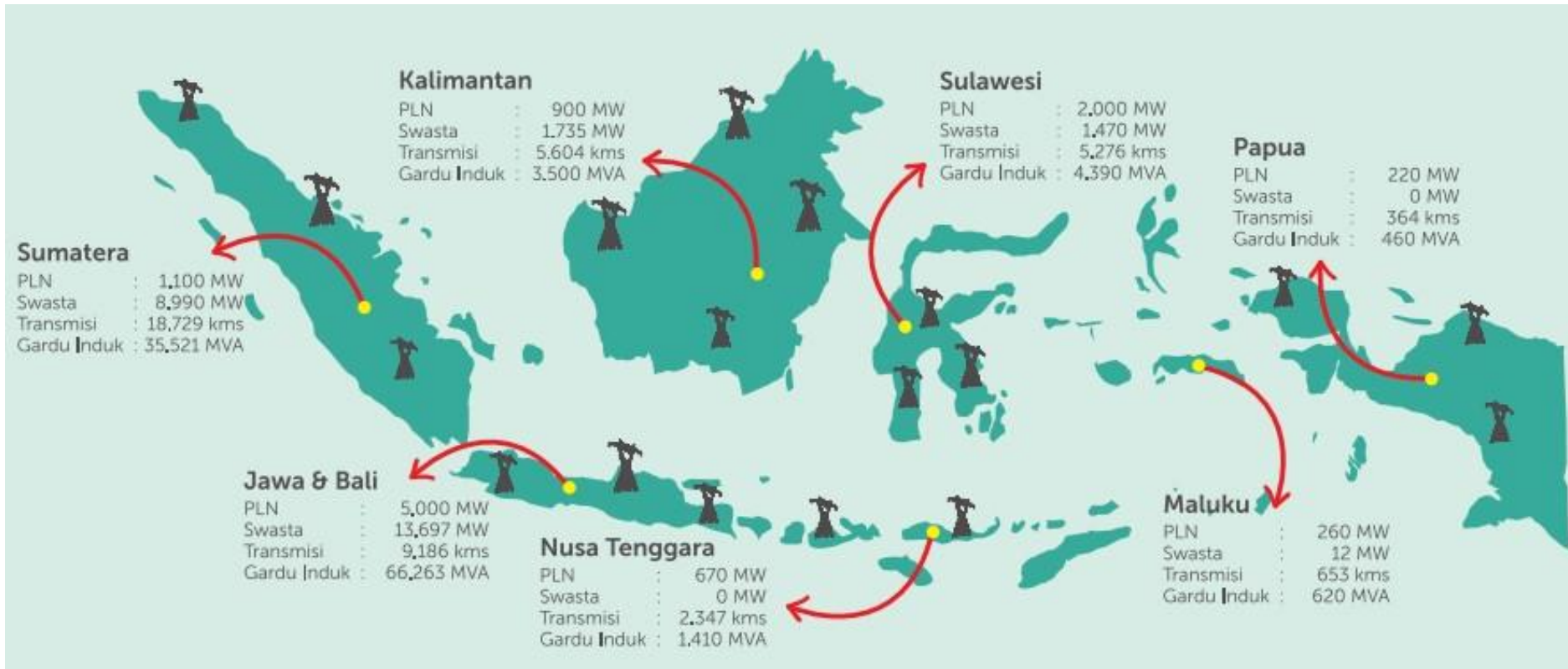
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POWER DEVELOPMENT MAP



35.000 MW Program (2014 – 2019)



<http://www.pln.co.id/35000mw/en/>

RE DEVELOPMENT PLAN



Development of Renewable Energy Power Plant

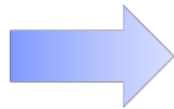
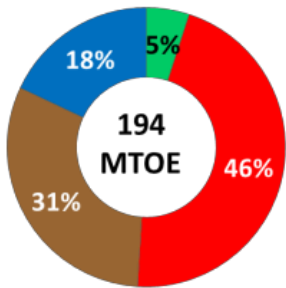
PLN has prepared renewable energy development plan as follows:

1. Hydropower: PLN will develop most of the hydropower potential in Indonesia as PLN projects.
2. Geothermal: PLN will develop geothermal power plant projects, particularly in Sumatra, Java and Sulawesi, Nusa Tenggara and Maluku.
3. Micro hydro power plant: PLN encourages development of MHP by the private sector or the public to provide electricity for local needs and/or to be distributed to the PLN's grid.
4. Wind Power: because wind energy in Indonesia is very limited, the development will be restricted to areas that have the potential.
5. Biomass: PLN intends to build biomass power plants in cooperation with several Regencies to pioneer the biomass industries.
6. Marine energy: technology and economics are still unknown; PLN will pilot a small scale research and development project.
7. Biofuel: depending on biofuels market readiness, PLN is ready to exploit biofuels wherever applicable.
8. Solar Energy: PLN will develop solar power plants in more than 1,000 locations / islands, especially the outermost and isolated regions.
9. CBM (Coal Bed Methane): CBM gas reserves are estimated to be greater than conventional gas reserves, mainly in the South Sumatra Basin (183 TCF) and Kutai Basin. PLN is eager to take advantage of this non-conventional gas when it becomes available and in sufficient quantities.
10. Coal slurry: a liquefied coal through the process of upgrading to a more environmentally friendly, more transportable, and storeable form. Coal slurry is used as a replacement for diesel in power plants for a small-scale base load. PLN has built a 500 kW pilot project plant in Karawang, West Java.
11. Nuclear: nuclear power development can only be decided upon by the government, because the decision to build nuclear power plants are not solely based on economics and profitability considerations, but also political, social acceptance, culture, climate change and environmental protection.

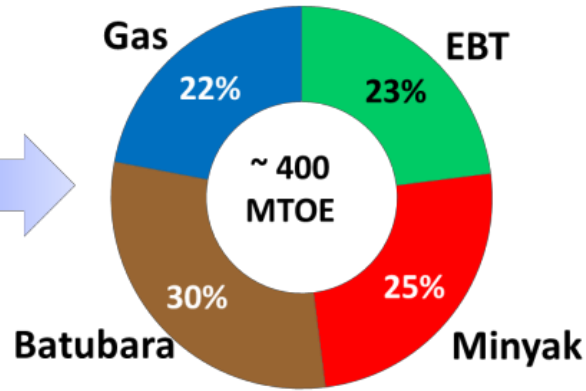
RENEWABLE ENERGY UTILIZATION



Kondisi Saat ini



Tahun 2025



| No | Energy Resources | Potential |
|--------------|------------------|--------------------|
| 1 | Hydro | 75 GW |
| 2 | Solar | 112 GWp |
| 3 | Geothermal | 28,8 GW |
| 4 | Wind | 950 MW |
| 5 | Biomass | 32 GW |
| 6 | Biofuel | 32 GW |
| 7 | Tidal | 60 MW |
| TOTAL | | > 300 GW |

Source : Rencana Umum Energi Nasional 2015-2050, Ministry of Energy and Mineral Resource

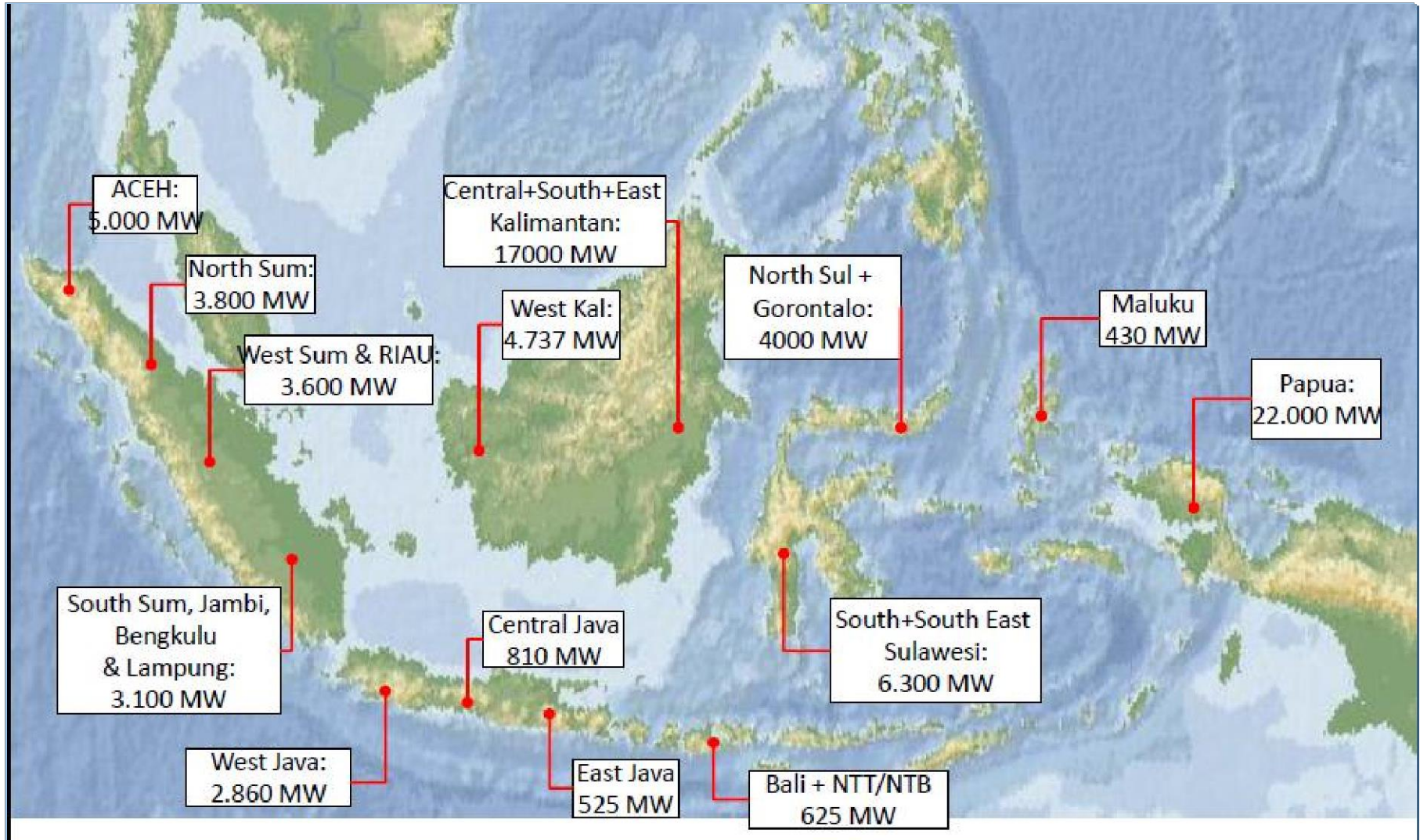
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POTENTIAL MAP OF HYDRO POWER : 75 GW

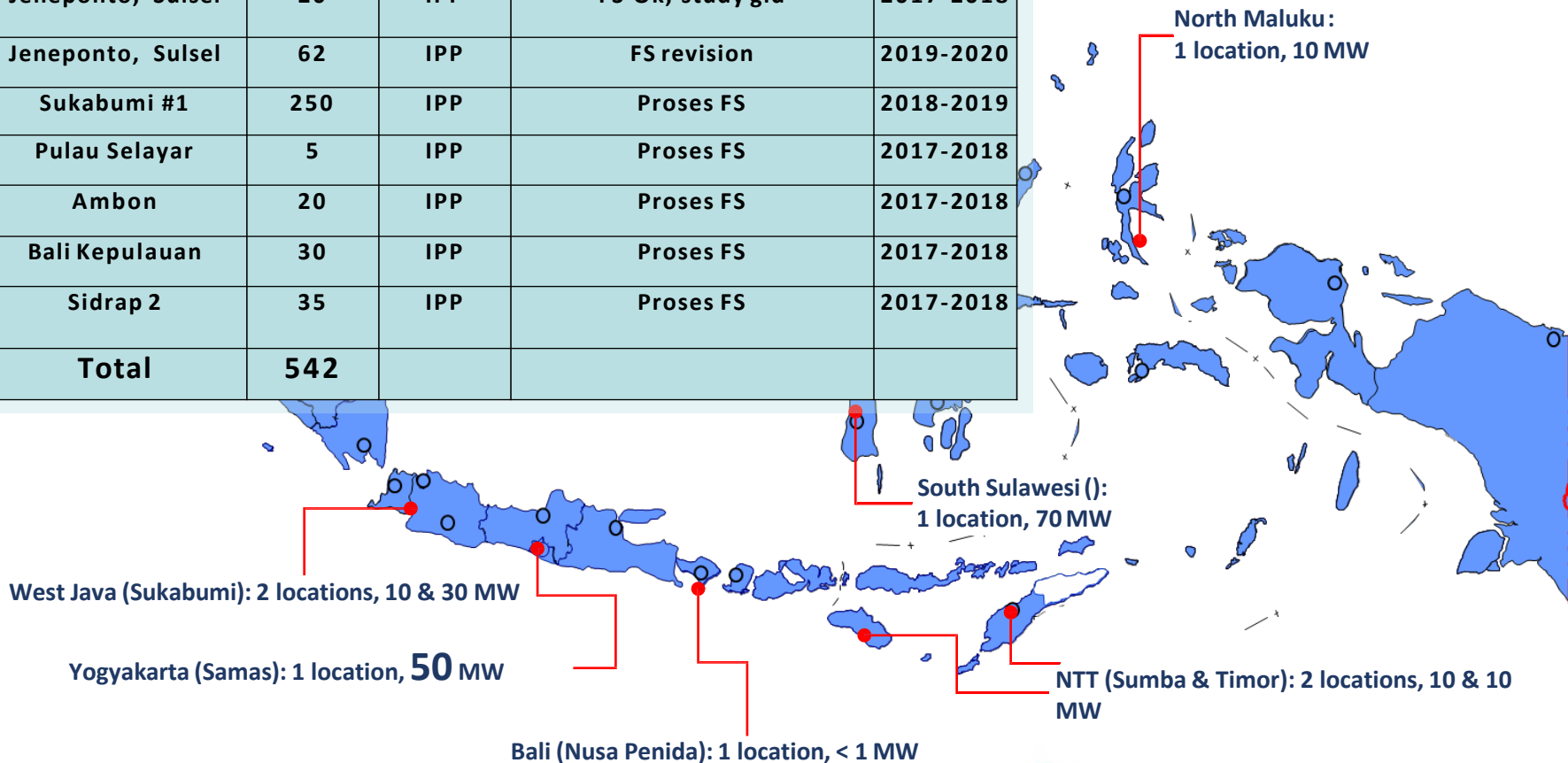
(Ref: Hydro Power Potential Study 1983, Hydro Power Inventory Study 1999)



WIND POWER DEVELOPMENT

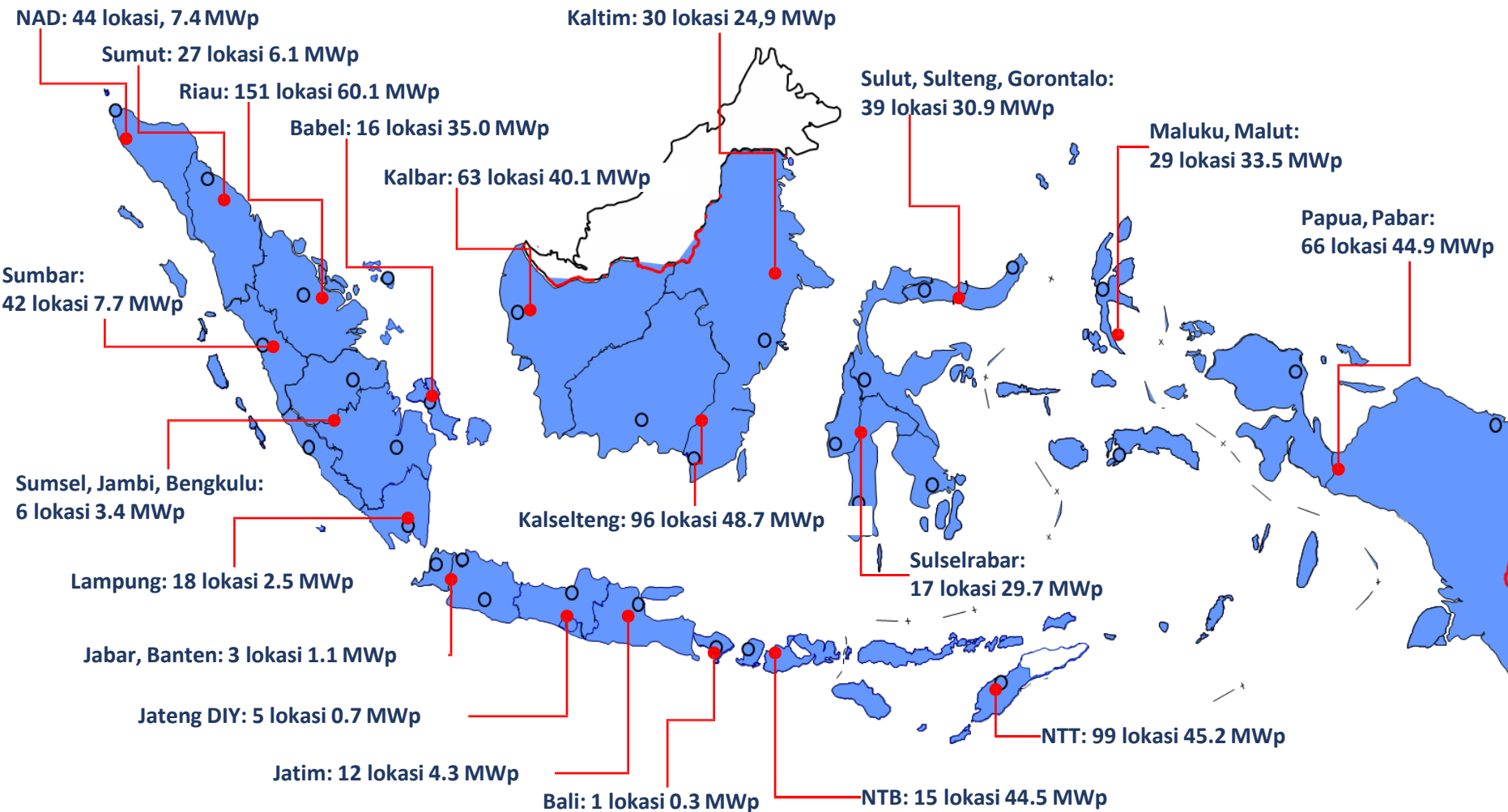


| No | Lokasi | Kapasitas MW | Jenis Kontrak | Status | Rencana COD |
|--------------|-------------------|--------------|---------------|------------------|-------------|
| 1 | Bantul, DIY#1 | 50 | IPP | Signed PPA | 2017-2018 |
| 2 | Sindrap, Sulsel | 70 | IPP | Signed PPA | 2016-2017 |
| 3 | Jeneponto, Sulsel | 20 | IPP | FS Ok, study gid | 2017-2018 |
| 4 | Jeneponto, Sulsel | 62 | IPP | FS revision | 2019-2020 |
| 5 | Sukabumi #1 | 250 | IPP | Proses FS | 2018-2019 |
| 6 | Pulau Selayar | 5 | IPP | Proses FS | 2017-2018 |
| 7 | Ambon | 20 | IPP | Proses FS | 2017-2018 |
| 8 | Bali Kepulauan | 30 | IPP | Proses FS | 2017-2018 |
| 9 | Sidrap 2 | 35 | IPP | Proses FS | 2017-2018 |
| Total | | 542 | | | |



- Potensi PLTB tidak besar karena kecepatan angin di Indonesia rata-rata rendah (< 5 m/s).
- Program pengembangan PLTB sampai dengan 2020 sebesar 200 MW dan saat ini masih dalam tahap pengadaan dan www.pln.co.id

SOLAR PV DEVELOPMENT PROGRAM UNTIL 2020 : 620 MWp



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RURAL ELECTRIFICATION



- Rural Electrification Program undertaken by PLN is expected to provide equal opportunity for all Indonesian throughout the archipelago in the pursue of prosperity. It is carried out within the framework of overall electrical system planning
- According to Government Rural Electrification Program for electrify 2510 rural district in Indonesia, PLN commit to successful this program until 2019
- PLN's Strategy to electrify 2510 rural district are distribution line development and renewable energy or hybrid system development program.
 - In 2016, PLN has been electrified amount 85 rural district.
 - In 2017, PLN target to electrify amount 88 rural district.
 - In 2018, PLN target to electrify amount 938 rural district.
 - In 2019, PLN target to electrify amount 1395 rural district.

RURAL ELECTRIFICATION METHOD



1. Power Line Extention

- Nearby from existing power line
- Potentially of Rural district
- Sufficient of Customer
- Planning for extend the power line

Note :

- Power line extended from PLN / Non PLN existing distribution line
- Make coordination with stakeholder (PLN and local government about availability power at end point of power line (grid impact study)
- In case of power is available, additional step down transformer will be installed

RURAL ELECTRIFICATION METHOD



2. Non Power Line Extention

A. Mini Grid :

- Diesel engine generating set
- Mini hydro power plant
- Center line solar photovoltaic

B. Stand Alone :

- Pico hydro
- Off grid solar photovoltaic (solar home system)

Note :

- Far away from existing power line
- Potentially rural district
- Sufficient of Customer
- Temporary diesel engine generating set (backup power)

TARIFF ADJUSTMENT MECHANISM



- Electricity Tariff are depend on Fuel Cost, Inflation and Currency
- Tariff Adjustment are validated every month

| Applied for : | Doesn't Applied for: |
|----------------------------------|-------------------------------|
| Residential min.1300 VA | Residential 450 and 900 VA |
| Business min.6600 VA | Business and small industrial |
| Industrial min 200.000 VA | Social |
| Government Building over 6600 VA | |
| Lighting way | |

ELECTRICITY TARIFF



PENETAPAN PENYESUAIAN TARIF TENAGA LISTRIK (TARIFF ADJUSTMENT)

BULAN APRIL - JUNI 2017

| NO. | GOL. TARIF | BATAS DAYA | REGULER | | PRA BAYAR (Rp/kWh) |
|-----|--------------|---------------------------|-------------------------------|---|-----------------------|
| | | | BIAYA BEBAN (Rp/kVA/bulan) | BIAYA PEMAKAIAN (Rp/kWh) DAN BIAYA kVArh (Rp/kVArh) | |
| 1. | R-1/TR | 1.300 VA | *) | 1.467,28 | 1.467,28 |
| 2. | R-1/TR | 2.200 VA | *) | 1.467,28 | 1.467,28 |
| 3. | R-2/TR | 3.500 VA s.d. 5.500 VA | *) | 1.467,28 | 1.467,28 |
| 4. | R-3/TR | 6.600 VA ke atas | *) | 1.467,28 | 1.467,28 |
| 5. | B-2/TR | 6.600 VA s.d. 200 kVA | *) | 1.467,28 | 1.467,28 |
| 6. | B-3/TM | di atas 200 kVA | **) | Blok WBP = K x 1.035,78 Blok LWBP = 1.035,78 kVArh = 1.114,74 ****) | - |
| 7. | I-3/TM | di atas 200 kVA | **) | Blok WBP = K x 1.035,78 Blok LWBP = 1.035,78 kVArh = 1.114,74 ****) | - |
| 8. | I-4/TT | 30.000 kVA ke atas | ***) | Blok WBP dan Blok LWBP = 996,74 kVArh = 996,74 ****) | - |
| 9. | P-1/TR | 6.600 VA s.d. 200 kVA | *) | 1.467,28 | 1.467,28 |
| 10. | P-2/TM | di atas 200 kVA | **) | Blok WBP = K x 1.035,78 Blok LWBP = 1.035,78 kVArh = 1.114,74 ****) | - |
| 11. | P-3/TR | | *) | 1.467,28 | 1.467,28 |
| 12. | L/TR, TM, TT | | - | 1.644,52 | - |

Catatan :

- *) Diterapkan Rekening Minimum (RM):
RM1 = 40 (Jam Nyala) x Daya tersambung (kVA) x Biaya Pemakaian.
 - **) Diterapkan Rekening Minimum (RM):
RM2 = 40 (Jam Nyala) x Daya tersambung (kVA) x Biaya Pemakaian LWBP.
Jam nyala : kWh per bulan dibagi dengan kVA tersambung.
 - ***) Diterapkan Rekening Minimum (RM):
RM3 = 40 (Jam Nyala) x Daya tersambung (kVA) x Biaya Pemakaian WBP dan LWBP.
Jam nyala : kWh per bulan dibagi dengan kVA tersambung.
 - ****) Biaya kelebihan pemakaian daya reaktif (kVArh) dikenakan dalam hal faktor daya rata-rata setiap bulan kurang dari 0,85 (delapan puluh lima per seratus).
 - K : Faktor perbandingan antara harga WBP dan LWBP sesuai dengan karakteristik beban sistem kelistrikan setempat ($1,4 \leq K \leq 2$), ditetapkan oleh Direksi Perusahaan Perseroan (Persero) PT Perusahaan Listrik Negara.
- WBP : Waktu Beban Puncak.
LWBP : Luar Waktu Beban Puncak.

Currency Exchange Rate per May 2017
1 USD \$ = Rp. 13,350
1 RMB ¥ = Rp. 1.974





PLN

Terima Kasih

