MINISTRY OF ENERGY AND MINERAL RESOURCES
REPUBLIC OF INDONESIA
DIRECTORATE GENERAL OF ELECTRICITY
COUNTRY REPORT
“ELECTRICITY SECTOR IN INDONESIA”

Presented by
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at Energy Policy Training Course Japan International Cooperation Agency

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MANAGEMENT OF ELECTRICITY SUPPLY IN INDONESIA
(Law No. 30/2009 on Electricity)

AUTHORIZATION

• Regulation, policy, standard
• Provides funding for:
  ✓ Low income society
  ✓ Development of electricity supply infrastructure in undeveloped regions
  ✓ Development of electricity in remote and border areas
  ✓ Development of rural electricity

STATE GOVERNMENT REGIONAL GOVERNMENT

BUSINESS

ELECTRICITY BUSINESS LICENSE HOLDER

STATE-OWNED ENTERPRISE* REGION-OWNED ENTERPRISE** PRIVATE ENTITIES** COOPERATIVES** SELF-RELIANT COMMUNITIES**

* : First Priority
** : Given the opportunity as integrated electricity business license organizer for not electrified areas
GOVERNMENT POLICY ON ELECTRICITY SECTOR

1 ELECTRICITY DEVELOPMENT

NATIONAL DEVELOPMENT OBJECTIVES

NAWA CITA

ELECTRICITY

PROSPEROUS SOCIETY
MATERIAL EQUITABLE
SPIRITUAL EQUITABLE

Available:
- Sufficient
- Good quality
- Reasonable price

2 UTILIZATION OF PRIMARY ENERGY

NEP → Optimization → Continuous Determination

NRE Priority

Domestic Sources → National Interest

ELECTRICITY

AVAILABILITY GUARANTEE

NEP: National Energy Policy
An energy management policy based on the principles of justice, sustainable, and environmentally-friendly in order to create energy independence and national energy security

Prepared by the National Energy Council

Stipulated by the Government after the approval of Parliament

General Plan of National Energy (RUEN)

The central government policy on the national level energy management plan as an elaboration and the implementation plan of KEN using multi-sectoral approaches in order to achieve the target of KEN.

Prepared by the Government and stipulated by National Energy Council

General Plan of National Electricity (RUKN)

A plan for developing electricity supply system prepared by the central government which includes power generation, transmission and distribution required to meet national electricity needs.

Prepared by the Minister based on KEN.

Stipulated by the Minister after consultation with Parliament.

General Plan of Local Energy (RUED)

Prepared by the local government based on RUEN and stipulated under the local regulation.

General Plan of Local Electricity (RUKD)

Prepared by the local government based on RUKN and stipulated by the Governor after consultation with Local Parliament.

Business Plan for Electricity Provision (RUPTL)

As a basis for implementing the electricity supply business for public interest

Prepared by electricity business who has special business areas

Prepared by taking into account the Electricity General Plan*)

Approved by the Minister/Governor in accordance with their authority.

*) Electricity General Plan consists of General Plan of National Electricity and General Plan of Local Electricity
Directed to meet the growing electricity demand, increase reserves, and the fulfillment of reserve margin.

- **CFPP** can still be developed, however it should be prioritizing the use of environmentally sound technology and has a high efficiency (CCT/HELE) for the mature electricity system (i.e. Java-Bali system and Sumatera system).

- The criteria used in the preparation of the power requirement is using deterministic methods in percentages, targeted power reserve of at least about 35% for a period of twenty years in the future, on the basis of Ability Power Net.

- **GFPP** and **Hydropower - pump storage** should be developed in order to meet peak load demand and to minimize or limited the utilization of diesel power plant during peak load period.

- **NRE-PP** will be developed in order not only to meet the growing electricity demand but also reducing CO2 emission level.

- **NPP** can be considered to be developed as the last option if NRE’s target of 25% by 2025 cannot be achieved by considering high safety factor.

Note:
- CFPP : Coal Fired Power Plant
- CCT : Clean Coal Technology
- HELE : High Efficiency and Low Emission
- GFPP : Gas Fired Power Plant
- NRE-PP : New and Renewable Power Plant
- NPP: Nuclear Power Plant
Provide greater participation for private participation in PIK.

- Implementation of the accelerated development of electricity infrastructure (PIK) will be conducted by PLN through “self-management” in terms of:
  - PLN having financial capability for equity and source of low funding;
  - Construction risk is low;
  - Fuel supply is available;
  - Peaker power plant with the function is to control reliability of system operation; and/or
  - Isolated system development.

- Implementation of PIK can be conducted by PLN through “cooperation” with other electricity supplies in terms of:
  - The project needs a huge funding;
  - Construction risk is high;
  - The risk of fuel supply is high or do not have a secure supply of gas and/or infrastructure;
  - New and renewable power plants;
  - Expansion of existing power plant;
  - There is more than one developer who interested to develop power plant in the area.
Directed to the growth of the electricity system, increasing system reliability and reducing constraints on the delivery of electricity to the system as well as evacuating electricity from new power plants.

- In the upcoming 2-5 years, the transmission network development will be prioritized to deliver electricity from new power plants under the 35,000 MW program.
- 500 kV Transmission network in outside Jawa-Bali and Sumatera systems, HVDC and smart grid technologies are possible to be developed by considering the needs of the local electricity system, meet the system requirements, economic considerations and availability of the technology.
- Transmission network using under ground cable is possible to be implemented at certain places as long as meets technical and economic aspects.
- Additional transformer or new construction of substation should be prioritized when loading capacity of existing transformer or transformer capacity in existing substation has already reached 70% of total its capacity for outside Java-Bali system and 80% for the Java-Bali system.
- Back-up systems can be considered to increase the reliability of the electricity system.
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POLICY ON DISTRIBUTION – DIRECTION OF DEVELOPMENT
(Based on Draft General Plan for National Electricity – RUKN 2015-2034)

Directed to anticipate the growth of electricity sales, maintaining the desired level of reliability and efficiency and improve service quality.

- Isolated distribution network can be developed if the compliance to fulfil electricity needs through electricity integrated system is less or not efficient.
- Distribution network using under ground cable is possible to be implemented at certain places as long as meets technical and economic aspects.
- Distribution network using smart grid technology and submarine cable between the islands can be implemented as long as meet the system requirements and availability of technology.
- Micro grid can be considered developed in order to improve reliability and optimize the energy mix of generation in a remote area which is far from large electricity system.
Construction of power plants can be carried out by PLN if having sufficient funding after the development of rural electrification, construction of transmission and distribution and substation have been implemented.

Funding capacity owned by PLN should be prioritized to:

• Implement the rural electrification program;
• Construct and strengthen transmission and distribution of electricity;
• Construct and strengthen substations;
• Construct Peaker power plant; and
• Construct power plants in remote areas.
PRESIDENTIAL REGULATION NO. 4/2016 amended by PR No. 11/2017

THE BUSINESS MODEL

• The regulation is emphases to solve some issues related to among others:
  o Primary Energy Source Supply
  o Renewable Energy Utilization
  o One stop service on permitting
  o Spatial solution
  o Land Use Facility
  o Alternative Dispute Resolution

PT PLN (PERSERO)
(State Owned Electricity Company)

Self-Management

It will be carried out by PLN with the conditions:
• PLN having financial capability for equity and source of low funding;
• Construction risk is low;
• Fuel supply is available;
• Peaker power plant with the function is to control reliability of system operation; and/or
• Isolated system development

Cooperation with Others

It can be done with domestic and/foreign company if this company:
• Providing funding to PLN; and/or
• Having energy that can be used by PLN.
• Technology transfer
• Enhancement of local content

Requirement:
• The share of PLN or the PLN’s subsidiary company in the joint venture should be at least 51%.

Joint Venture with PLN or PLN’s Subsidiary

Power Plant Developer

It will be offered to developer with the conditions:
• The project needs a huge funding;
• Construction risk is high;
• The risk of fuel supply is high or do not have a secure supply of gas and/or infrastructure;
• New and renewable power plants;
• Expansion of existing power plant;
• There is more than one developer who interested to develop power plant in the area.
POWER GENERATION ENERGY MIX POLICY

PRIMARY ENERGY MIX
(National Energy Policy, GR No.79/2014)

REALIZATION
2013

ENERGY MIX OF POWER GENERATION
(Draft of RUKN 2015-2034)

REALIZATION
2014

TARGET 2025

TARGET 2025 REALIZATION
2014

New and Renewable Energy
Oil
Gas
Coal
NATIONAL ELECTRICITY CONDITION
## GENERAL OVERVIEW

### INSTALLED CAPACITY

<table>
<thead>
<tr>
<th>Source</th>
<th>MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLN</td>
<td>41.049</td>
</tr>
<tr>
<td>IPP</td>
<td>13.781</td>
</tr>
<tr>
<td>PPU</td>
<td>2.434</td>
</tr>
<tr>
<td>Non Oil Op. License</td>
<td>2.392</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>59.656</strong></td>
</tr>
</tbody>
</table>

### ELECTRICITY PRODUCTION

- 290 TWh

### ELECTRICITY CONSUMPTION

- 247 TWh

### ELECTRIFICATION RATIO

- 91.16%

### kWh PER CAPITA

- 956 kWh

### TRANSMISSION LINES

- 49.799 kmc

### DISTRIBUTION LINES

- 946.101 kmc

### ENERGY MIX

- Gas: 26%
- Oil: 7%
- Coal: 55%
- Renewable Energy: 12%

### ELECTRICITY CONSUMPTION PER CUSTOMER GROUP

- Residential: 38%
- Business: 16%
- Public: 6%
- Industry: 40%

*) Include Non-PLN License
CONDITIONS OF PLN'S POWER SUPPLY
(BASED ON DAILY OPERATIONAL RESERVE – APRIL 16, 2017)

STATUS:
- 12 Normal (Insufficient reserve margin)
- 11 Alert (reserve margin < the biggest capacity of generation unit)
- 0 Deficit (Partially blackout)

- Aceh Sumut (SBU) 1,838 MW 0,53 %
- Batam 274 MW 21,92 %
- Bangka 119 MW 16,21 %
- Kaltim 570 MW 18,09 %
- Kalbar 384 MW 17,93 %
- Palu 126 MW 2,11 %
- Sumbawesi Selatan 958 MW 20,51 %
- Sulawesi Tengah 351 MW 19,16 %
- Ternate + Maluku Isolated 92 MW 27,22 %
- Sorong + Papua Isolated 163 MW 18,51 %
- Jayapura 67 MW 29,63 %
- Kendari 73 MW 15,56 %
- Ambon 52 MW 126,87 %
- Kupang 65 MW 45,58 %
- NTT Isolated 83 MW 21,44 %
- Bima Sumbawa 78 MW 5,70 %
- Lombok 216 MW 26,08 %
- Jawa Bali 21,462 MW 10,90 %
- Sumsel Bengkulu Lampung (SBS) 1,633 MW 0,00 %

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3 ELECTRICITY DEVELOPMENT PLAN
POLICY FOR ADDITIONAL ELECTRICITY SUPPLY (2015-2034)
(Based on Draft General Plan for National Electricity (RUKN) 2015-2034)

<table>
<thead>
<tr>
<th>Year</th>
<th>Non PLN System</th>
<th>IPP &amp; Excess Power</th>
<th>PLN</th>
<th>Total Additional (Based on 2014)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>2</td>
<td>12</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>2016</td>
<td>4</td>
<td>28</td>
<td>9</td>
<td>41</td>
</tr>
<tr>
<td>2017</td>
<td>6</td>
<td>45</td>
<td>15</td>
<td>66</td>
</tr>
<tr>
<td>2018</td>
<td>8</td>
<td>64</td>
<td>21</td>
<td>94</td>
</tr>
<tr>
<td>2019</td>
<td>11</td>
<td>86</td>
<td>29</td>
<td>126</td>
</tr>
<tr>
<td>2020</td>
<td>14</td>
<td>110</td>
<td>37</td>
<td>161</td>
</tr>
<tr>
<td>2025</td>
<td>32</td>
<td>272</td>
<td>91</td>
<td>395</td>
</tr>
<tr>
<td>2030</td>
<td>44</td>
<td>412</td>
<td>137</td>
<td>593</td>
</tr>
<tr>
<td>2034</td>
<td>55</td>
<td>547</td>
<td>182</td>
<td>784</td>
</tr>
</tbody>
</table>

**Notes:**
- PLN’s Business Area (90%)
- IPP and Excess Power (10%)
- PLN (25%)
• Power plant with the capacity less than 1 MW is dedicated 100% for domestic investment.
• Small scale of power plant with the capacity is 1 MW up to 10 MW, the maximum share of foreign direct investment (FDI) is 49%.
• Geothermal power plant with the capacity up to 10 MW, the maximum share of FDI is 67%.
• Power plant with the capacity above 10 MW, the maximum share of FDI is 95% (max. 100% if under PPP scheme during the concession period).
In addition, there are power generations that have been COD:
- DPP Outer Islands and the Border Region (68 MW)
- MVPP Amurang (120 MW)
- MVPP Kupang (60 MW)

There are also around 0.8 GW of power generation under Regular projects which the original COD target is beyond 2019 but since the PPAs has been signed then the COD of those power generations might be accelerated in 2019 by considering the progress of the projects made by the developers.
PROGRESS OF 35,000 MW PROGRAM
(MARCH 2017)

SUMATERA
8.481 MW
- Planning: 2.164 MW (25%)
- Procurement: 3.287 MW (39%)
- Contracted/PPA, not yet Construction: 1.854 MW (22%)
- Contracted/PPA, On going Construction: 816 MW (10%)

KALIMANTAN
1.671 MW
- Planning: 770 MW (46%)
- Procurement: 251 MW (15%)
- Contracted/PPA, not yet Construction: 100 MW (6%)
- Contracted/PPA, On going Construction: 1,030 MW (63%)

JBB
6.225 MW
- Planning: 3,623 MW (58%)
- Procurement: 2,500 MW (40%)
- Contracted/PPA, not yet Construction: 2 MW (2%)
- Contracted/PPA, On going Construction: 100 MW (2%)

JBTB
1.901 MW
- Planning: 601 MW (32%)
- Procurement: 500 MW (26%)
- Contracted/PPA, not yet Construction: 800 MW (42%)
- Contracted/PPA, On going Construction: 2,542 MW (49%)

JBT
13.126 MW
- Planning: 4,755 MW (36%)
- Procurement: 6,199 MW (47%)
- Contracted/PPA, not yet Construction: 1,150 MW (9%)
- Contracted/PPA, On going Construction: 1,000 MW (8%)

SULAWESI
3.254 MW
- Planning: 2,164 MW (67%)
- Procurement: 940 MW (29%)
- Contracted/PPA, not yet Construction: 90 MW (3%)
- Contracted/PPA, On going Construction: 770 MW (24%)

NUŠRA
969 MW
- Planning: 568 MW (59%)
- Procurement: 272 MW (28%)
- Contracted/PPA, not yet Construction: 28 MW (3%)
- Contracted/PPA, On going Construction: 1,000 MW (10%)

MALUKU
568 MW
- Planning: 1,422 MW (44%)
- Procurement: 2,500 MW (40%)
- Contracted/PPA, not yet Construction: 272 MW (28%)
- Contracted/PPA, On going Construction: 28 MW (3%)

PAPUA
6,199 MW
- Planning: 4,755 MW (77%)
- Procurement: 6,199 MW (100%)
- Contracted/PPA, not yet Construction: 1,150 MW (18%)
- Contracted/PPA, On going Construction: 1,000 MW (16%)

DIRECTORATE GENERAL OF ELECTRICITY
MINISTRY OF ENERGY AND MINERAL RESOURCES
PROGRESS OF 7,000 MW (MARCH 2017)

TOTAL

- 7,512 MW
- 4,564 MW (61%)
- 1,922 MW (25%)
- 1,025 MW (14%)

FTP 1

- 2,543 MW
- 2,193 MW (86%)
- 255 MW (10%)
- 35 MW (4%)

FTP 2

- 1,550 MW
- 1,060 MW (69%)
- 316 MW (20%)
- 174 MW (11%)

FTP 2

- 3,419 MW
- 2,056 MW (60%)
- 756 MW (22%)
- 607 MW (18%)

Legend:
- Construction
- Commissioning
- OAS/COD
PROGRESS OF 7,000 MW
(MARCH 2017)

SUMATERA
- 2.679 MW
  - 1666 MW (62%)
  - 903 MW (34%)
  - 110 MW (4%)

KALIMANTAN
- 981 MW
  - 451 MW (46%)
  - 440 MW (45%)
  - 90 MW (9%)

SULAWESI
- 756 MW
  - 144 MW (19%)
  - 135 MW (18%)
  - 440 MW (45%)

MALUKU PAPUA
- 118 MW
  - 44 MW (37%)
  - 10 MW (9%)
  - 64 MW (54%)

NUSRA
- 930 MW
  - 903 MW (34%)
  - 625 MW (62%)
  - 63 MW (9%)

JBB
- 632 MW
  - 625 MW (99%)
  - 7 MW (1%)

JBTB
- 1.415 MW
  - 1327 MW (94%)
  - 89 MW (6%)

JBT
- 930 MW
  - 930 MW (100%)

: Construction
: Commissioning
: OAS/COD
TRANSMISSION LINES DEVELOPMENT PROGRESS
(MARCH 2017)

INDONESIA

19.133 KMS
2.533 KMS
7.897 KMS
7.207 KMS
1.017 KMS
46.254 KMS

SUMATERA
KALIMANTAN
SULAWESI NUSRA
MALUKU PAPUA

JBB
JBB
JBTB
JBT

PRE CONSTRUCTION
CONSTRUCTION
ENERGIZE

: Pre Construction
: Construction
: Energize

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SUBSTATION DEVELOPMENT PROGRESS
(MARCH 2017)

INDONESIA

- SUMATERA: 32,176 MVA (57%: Pre Construction, 24%: Construction, 19%: Energize)
- KALIMANTAN: 3,910 MVA (48%: Pre Construction, 31%: Construction, 21%: Energize)
- SULAWESI NUSRA: 5,600 MVA (67%: Pre Construction, 15%: Construction, 18%: Energize)
- MALUKU PAPUA: 770 MVA (85%: Pre Construction, 10%: Construction, 5%: Energize)
- JBB: 19,329 MVA (55%: Pre Construction, 21%: Construction, 24%: Energize)
- JBTB: 13,418 MVA (63%: Pre Construction, 18%: Construction, 13%: Energize)
- JBT: 33,276 MVA (58%: Pre Construction, 16%: Construction, 26%: Energize)

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ACCELERATION STRATEGY
## POLICY FOR OVERCOMING OBSTACLES (LESSON LEARNT FROM FTP I & II)

<table>
<thead>
<tr>
<th>OBSTACLES</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Acquisition</td>
<td>Implement Law No 2/2012 and Presidential Regulation No. 4/2016</td>
</tr>
<tr>
<td>Price Negotiation</td>
<td>Electricity purchased by PLN from IPP and Excess Power is carried out based on ceiling electricity price does not need the approval from Minister of Energy and Mineral Resources (MEMR Regulation No.3/2015)</td>
</tr>
<tr>
<td>Procurement of power generation from IPP</td>
<td>Accelerate procurement process through “Direct Appointment &amp; Direct Selection” for renewable energy, mine mouth, marginal gas, expansion, &amp; excess power (MEMR Regulation No.3/2015)</td>
</tr>
<tr>
<td>Permitting process</td>
<td>Establish “One stop service on permitting (Pelayanan Terpadu Satu Pintu - PTSP)” at BKPM (MEMR Regulation No. 35/2014 &amp; Presidential Regulation No. 4/2016), reducing number and time for issuing licenses from 52 licenses (923 days) to 22 licenses (256 days).</td>
</tr>
<tr>
<td>Developer &amp; Contractor Performance</td>
<td>Conduct Due Diligence to the IPP developer and EPC contractor’s candidates, both from the technical and financial aspects which is carried out by Independent Procurement Agent (MEMR Regulation No.3/2015)</td>
</tr>
<tr>
<td>Coordination Across Sectors</td>
<td>Establish a Working Team in Acceleration of Infrastructure Provision of Electricity (Coordinating Minister Decree No. 129/2015) which is formed by the Coordinating Minister for Economy Affairs as Chairman of Committee for the Acceleration of Infrastructure Provision Priority (KPPIP)</td>
</tr>
</tbody>
</table>
| Government Guarantee, Regional spatial planning, and Legal Issue | Presidential Regulation No.4 year 2016:  
  • The government provides a guarantee of PLN’s payment obligations to the lenders and guarantees of PLN’s business feasibility to its financial obligations to the IPPs.  
  • In the event that the project site is not in accordance with the regional spatial planning then the spatial planning can be changed in accordance with the legislation.  
  • Administrative mistakes should be resolved by improving the administration and the state loss should be resolved by repayment of indemnification to the state. |