INDONESIA’S 35 GW PROGRAM: THE RELEVANCE OF COAL

Agung Wicaksono, Vice Chairman of PMO for 35 GW – Ministry of Energy & Mineral Resources
1. 35 GW: WHY AND WHAT?
2. ROLE OF COAL AND THE POLICY
3. CHALLENGES: HOW TO OVERCOME?
• Electrification ratio in 2015 is 87.7%.
• Electrification ratio target in 2019: 97.4%
Government must take corrective measures required in energy crisis and emergency (Law on Energy No. 30/2007, Article 6 (3))

31,951 MW power system
24,924 MW sufficient
813 MW deficit
6,214 MW crisis! (8 systems)
### 35 GW Program for Indonesia – 72.9 Billion $ Investment

#### Sumatera
- MW: 11,327
- Powerplant: 76
- Kms: 19,305
- Transmission: 210
- MVA: 32,406
- Substation: 398
- Mio USD: 14,282

#### Kalimantan
- MW: 2,852
- Powerplant: 40
- Kms: 7,883
- Transmission: 68
- MVA: 3,910
- Substation: 115
- Mio USD: 4000

#### Sulawesi & Nusa Tenggara
- MW: 4,159
- Powerplant: 83
- Kms: 7,207
- Transmission: 90
- MVA: 5,620
- Substation: 165
- Mio USD: 5434

#### Total Indonesia
- MW: 42,940
- Powerplant: 291
- Kms: 46,597
- Transmission: 732
- MVA: 108,789
- Substation: 1,375
- Mio USD: 53,663

#### Jawa-Bali
- MW: 23,863
- Powerplant: 49
- Kms: 11,185
- Transmission: 349
- MVA: 66,083
- Substation: 672
- Mio USD: 28,955

#### Maluku & Papua
- MW: 739
- Powerplant: 43
- Kms: 1,017
- Transmission: 15
- MVA: 770
- Substation: 25
- Mio USD: 992

---

*not incl. land acquisition, interest during construction (IDC) and taxes

**Legend:**
- MW: Megawatt
- kms: Kilometer-circuit
- MVA: Mega-volt ampere
PROGRESS TO DATE: 17.3 GW OUT OF 35 GW CONTRACTED

- PLN’s EPC: 2883 MW
- IPP: 14453 MW

Total by end 2015: 17336 MW

source: PLN’s report
INVESTORS VARIED, THOUGH TWO COUNTRIES DOMINATE

<table>
<thead>
<tr>
<th>No</th>
<th>Country of Origin</th>
<th>Capacity (MW)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>8008</td>
<td>46%</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>5195</td>
<td>30%</td>
</tr>
<tr>
<td>3</td>
<td>Korea</td>
<td>1490</td>
<td>9%</td>
</tr>
<tr>
<td>4</td>
<td>Malaysia</td>
<td>1390</td>
<td>8%</td>
</tr>
<tr>
<td>5</td>
<td>Indonesia</td>
<td>1078</td>
<td>6%</td>
</tr>
<tr>
<td>6</td>
<td>Turkey</td>
<td>120</td>
<td>1%</td>
</tr>
<tr>
<td>7</td>
<td>USA</td>
<td>120</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>17331</td>
<td>100%</td>
</tr>
</tbody>
</table>

source: PLN's report
1. 35 GW: WHY AND WHAT?
2. ROLE OF COAL AND THE POLICY FOR CLEANER COAL
3. CHALLENGES: HOW TO OVERCOME?
1. 1st Fast-Track Project (FTP1) **QUALITY** issues

- 2x315 MW CFPP in Rembang, Central Java
- Damaged CWP pump
- DELAY 14 months

2. Environmental perception of **SUSTAINABILITY** and **SOCIAL RESISTANCE** slowing the project

- Celukanbawang 380 MW in Bali
- Protest against Central Java Power Plant (CJPP)
THE NECESSARY ROLE OF IPP & CHANGE IN ENERGY MIX

From...

PLN: 10,233 MW

IPP: 30,000 MW

To...

IPP: 25,305 MW

5,000 MW

From... 

RUPTL 2014-2019

Energy Mix Target for Electricity (GR No. 79/2014)

To...

Energy Mix Target

- Gas: 32%
- Coal: 63%
- NRE: 5%

- Gas: 25%
- Coal: 50%
- NRE: 25%
1. MINE-MOUTH coal power plant

2. LARGER unit size, CLEANER technology

3. INTERCONNECTION to allow for larger unit sizes
MINE-MOUTH POWER PLANT AND POTENTIAL INTERESTS

**SUMSEL (14)**
- 5 PT BARA MITRA PERKASA (PLTU MT 4X150 / 2X300 MW)
- 8 PT. BHINAMITRA USAHAPERKASA (PLTU MT 2X300 MW)
- 11 PT ADHI KARYA (PERSERO) TBK. (PLTU 2X150 MW)
- 12 KONSORSIUM UCCAL-CHEC (PLTU MT 3600 MW)
- 14 PT GUMAY NIAGA ENERGI (PLTU MT 25 MW)
- 21 PT TRIRIKA HUADIAN (PLTU MT 2X600 MW)
- 27 PT BBM MEGA ENERGI (PLTU MT 2X600 MW)
- 31 PT JAMBI LESTARI POWER (PLTU MT 2X600 MW)
- 35 KONSORSIUM UCCAL-CHEC (PLTU MT 2X300 MW)
- 36 PT TITAN MULTI POWER (PLTU MT 2X150 MW)
- 37 PT ENERGI INDONESIA BERSAMA (PLTU MT 2X600 MW)
- 42 PT INTITIRTA PRIMA SAKTI (PLTU MT 2X6000)

**KALSEL (3)**
- 3 PT. GOLDEN ENERGY MINES (PLTU MT 2X100 MW)
- 15 PT MOFATAMA (PLTU MT 2X100 MW)
- 22 JHONLIN ENERGI KALIMANTAN (PLTU MT 2X100 MW)

**KALTENG (6)**
- 1 PT. KATINGAN RIA (PLTU MT)
- 2 PT. KORINDO (PLTU MT 2X50 MW)
- 9 PT. METRO ENERGY (PLTU MT 2X100 MW)
- 19 PT PJB DAN PT PRIMA MULTI ARTHA (PLTU MT 2X100 MW)
- 29 PT PANDU ADIDAYA (PLTU MT 2X100 MW)
- 43 PT UNGGUL PARAMITRA TEKNOLOGI (PLTU MT 2X135 MW)

**KALTIM (13)**
- 6 PT RESOURCE ALAM INDONESIA (PLTU 2X100 MW)
- 10 ESSAR GROUP (PLTU MT 2X50 MW)
- 16 PT KIDEKO JAYA AGUNG
- 17 PT ADIMITRA BARATAMA NUSANTARA (PLTU MT 2X100 MW)
- 18 PT MUARA WAHAI ENERGY (PLTU MT 100 MW, 200 MW, 300 MW)
- 20 PT POWER ALAM LESTARI (PLTU 2X100 MW)
- 25 PT MEC (PLTU 300 MW)
- 26 PT ADARO (PLTU MT 2X100)
- 41 PT BUMI RESOURCES TBK (PLTU MT 2X200)
- 44 PT. TEKNOLOGI PERMATA INDONESIA (PLTU MT 2X150 MW)
- 45 KUTAI BARAT ENERGI (PLTU MT 2X100 MW)

**JAMBI (8)**
- 3 PT. GOLDEN ENERGY MINES (PLTU MT 2X600 MW, 2X100 MW)
- 7 MNC ENERGY AND NATURAL RESOURCES
- 31 PT BBM MEGA ENERGI (PLTU MT 2X600 MW)
- 32 PT. JAMBI LESTARI POWER (PLTU MT 2X600 MW)
- 33 PT PEMBANGKOTAN PETRA DAYA (PLTU MT 2X600 MW)
- 36 PT TITAN MULTI POWER (PLTU MT 2X150 MW)
- 37 PT ENERGI INDONESIA BERSAMA (PLTU MT 2X600 MW)
- 42 PT INTITIRTA PRIMA SAKTI (PLTU MT 2X6000)

**ACEH (2)**
- 23 PT. ABM INVESTAMA TBK (PLTU MT)
- 34 AGRABUDI JASA BERSAMA-SATRIA MANGGALA-SHANGHAI PPE-SKODA ENERGO-VTKOVICE (PLTU MT 2X100 MW)

**RIAU (4)**
- 4 PT PERTAMATAMA ENERGI (PLTU MT)
- 13 PT. SAMANTAKA BATUBARA (PLTU MT 2X300 MW)
- 24 PT BUKIT ASAM (TBK) (PLTU MT 2X200 MW)
- 27 PT TRIKI HUADIAN (PLTU MT 2X600 MW)

* DISCLAIMER: DATA AS PER REPORT TO VICE PRESIDENT OFFICE ON JANUARY’16*
### Already contracted before 2015

<table>
<thead>
<tr>
<th>Note</th>
<th>Type</th>
<th>Name</th>
<th>Developer</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mine-mouth</td>
<td>CFPP</td>
<td>Sumsel-8</td>
<td>IPP</td>
<td>2x600</td>
</tr>
<tr>
<td>PPP</td>
<td>CFPP</td>
<td>Central Java (Batang)</td>
<td>IPP</td>
<td>2x950</td>
</tr>
</tbody>
</table>

### Contracted in 2015

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Developer</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expansion CFPP</td>
<td>Jawa-1 (FTP2) (Cirebon Exp)</td>
<td>IPP</td>
<td>1x1000</td>
</tr>
<tr>
<td>Expansion CFPP</td>
<td>Jawa-8 (Cilacap Exp)</td>
<td>IPP</td>
<td>1x1000</td>
</tr>
<tr>
<td>Expansion CFPP</td>
<td>Jawa-4/ (Tj Jati B Exp)</td>
<td>IPP</td>
<td>2 x 1000</td>
</tr>
<tr>
<td>Open tender CFPP</td>
<td>Jawa 7</td>
<td>IPP</td>
<td>2 x 1000</td>
</tr>
<tr>
<td>Open tender CFPP</td>
<td>Jawa 3</td>
<td>IPP</td>
<td>2 x 660</td>
</tr>
</tbody>
</table>

### Currently under procurement (based on PLN’s business plan 2015-2024)

<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>Name</th>
<th>Location</th>
<th>Capacity (MW)</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CFPP</td>
<td>Sumsel-9 (9A &amp; 9B) &amp; 10</td>
<td>Sumatera Selatan</td>
<td>3x1x600</td>
<td>June 2016</td>
</tr>
<tr>
<td>2</td>
<td>CFPP</td>
<td>Jawa-5 (FTP2)</td>
<td>Jawa Barat - Banten</td>
<td>2x1000</td>
<td>March 2016</td>
</tr>
<tr>
<td>3</td>
<td>CFPP</td>
<td>Jawa-9</td>
<td>Jawa Barat - Banten</td>
<td>1x600</td>
<td>June 2016</td>
</tr>
<tr>
<td>4</td>
<td>CFPP</td>
<td>Jawa-10</td>
<td>Jawa Barat - Banten</td>
<td>1x660</td>
<td>June 2016</td>
</tr>
</tbody>
</table>
THE VALUE OF HVDC

- CLEANER - Higher unit size of 600 MW units, applying super-critical tech
- SMARTER - Optimizing the use of low-ranked coal, for South Sumatera regional economy
- STRONGER – Energy resilience with more stable Java-Sumatra system
1. 35 GW: WHY AND WHAT?
2. ROLE OF COAL AND THE POLICY FOR CLEANER COAL
3. CHALLENGES: HOW TO OVERCOME?
Result of PLN’s simulation on Sumatera system stability with 600 MW unit size:
• Largest existing unit size (below the 600 MW) is 200 MW, total load in Sumatera is 8189 MW by 2019.
• Stability test caused the 600 MW unit to trip, and frequency remains unstable.
• System will require at least on 300 MW unit size to stabilize, or ...a larger system through interconnection with Java.
### Challenges and Solutions

<table>
<thead>
<tr>
<th>No</th>
<th>Challenges</th>
<th>Solution</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Land Acquisition</td>
<td>Applying Law No 2/2012</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Tariff Negotiation</td>
<td>Setting up ceiling tariff for IPP and Excess Power (Minister’s Decree No. 3/2015)</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Selection and Appointment of IPP</td>
<td>Acceleration by direct appointment and direct selection for Mine Mouth, Marginal Gas, Expansion, and Excess Power (Minister’s Decree No. 3/2015)</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Permit Issuance</td>
<td>One Stop Service (PTSP) at BKPM</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Performance of Contractor and Developer</td>
<td>Due Dilligence by Independent Procurement Agent (Minister’s Decree No. 3/2015)</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Project Management Capacity</td>
<td>Establishment of PMO (Project Management Office), both at GOI and PLN</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Cross-Sectoral Coordination</td>
<td>KPPIP led by Coordinating Minister for Economy</td>
<td></td>
</tr>
</tbody>
</table>
Construction Kick-Off After 4 Years Delay Due to Land Acquisition
28 August 2015

• Remaining area of 9 ha (yellow spots) under land acquisition completion.
• Law No. 2/2012 on Land Acquisition for Public Infrastructure being used for the first time.
Matsuura CFPP 2x1000 MW, Nagasaki-Japan

- Located near fisherman area, like in Batang.
- Coal from Indonesia, why not used in Indonesia.
- Cleanness depends on technology and work culture.
A Case in Point: 1x1000 MW Expansion in Cirebon

- Power projects determined nationally,
- Spatial planning determined by local government.

**Bureaucratic Challenges**

- Utilization of government-owned land as potential locations for power plant and transmission line.
- Agreement on transfer of state-asset upon the end of PPA period.
- Power projects determined nationally, spatial-planning determined by local government.
Challenges:

- **Lower price impacting on mineable resources**: falling profitability, decreasing capex, unsustained reserves.
- **Sterilized reserves**: falling stripping ratio, making reserves more costly/uneconomical to extract
- Reserves could **run out by 2036**, less than 20 years into the lifecycle of plants
HRSG MADE BY ALSTOM IN SURABAYA, INDONESIA FOR ASTORIA ENERGY (2x575 MW, NEW YORK)

- Example of welding and machining capacity in Indonesia.
- Ability to manufacture boiler up to 1000 MW.
- Procurement policy should prioritize locally manufactured components for job creation.

35 GW economies of scale should attract manufacturing in Indonesia.
Key features:

- **government guarantee** both for projects by IPP and PLN, and its subsidiaries
- **accelerated permits** to be obtained with shorter time period
- **land acquisition** reform, especially in forest area
- **“de-criminalization”** of PLN’s actions
- **renewable energy** prioritization, through potential subsidy and special SOE
- **Article 16**: PLN works with foreign companies committed to localization of components, human resource development and technology transfer.
FURTHER ISSUES TO PONDER

1. Paris COP21 and INDC

2. The risk of “stranded assets”

3. Coal-pricing and impact on mineable resource
TERIMA KASIH
THANK YOU
धन्यवाद
dhanyavaad

agungwicaksono@35gw.esdm.go.id
17 March 2016