Progress of Indonesia’s RE Development

Sunandar
Deputy Assistant for Energy Infrastructure Coordination
Coordinating Ministry for Economic Affairs
Republic of Indonesia

Presented in APEC EGNRET 52 Meeting
Hong Kong, March 2019
Outline

- Current and Projection Status in Electricity Sector
- Renewable Energy Policies
- RE Development Main Challenges and Opportunities
Outline

Current and Projection Status in Electricity Sector

Renewable Energy Policies

RE Development Main Challenges and Opportunities
Generation Energy Mix Projection

Currently, RE portion in national generation energy mix is 12.4%, while the Government Regulation (PP) No. 79/2014 stated that Indonesia’s generation energy mix should consist of at least 23% share of RE by 2025. So, in its Power Supply Business Plan 2018-2027, PT. PLN provides their projected plan.
Renewable Energy Development Plan

In the Power Supply Business Plan of PT. PLN (Persero) for 2018-2027, there are 14.912 MW capacity of new and renewable energy-based power plants planned to build during the 10 years period.

### RE in 2017

- Geo: 1808 MW
- Bio: 1841 MW
- Hydro: 5125 MW
- Miro/mini hydro: 206 MW
- Solar PV: 90 MW
- Wind: 1.2 MW
- Biofuel: 3230 KL

### Power Plants Capacity (MW)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Geothermal</td>
<td>MW</td>
<td>210</td>
<td>150</td>
<td>221</td>
<td>235</td>
<td>405</td>
<td>445</td>
<td>355</td>
<td>2.537</td>
<td>20</td>
<td>5</td>
<td>4.583</td>
</tr>
<tr>
<td>2</td>
<td>Hydro</td>
<td>MW</td>
<td>66</td>
<td>287</td>
<td>193</td>
<td>755</td>
<td>315</td>
<td>196</td>
<td>635</td>
<td>4.461</td>
<td>-</td>
<td>564</td>
<td>7.472</td>
</tr>
<tr>
<td>3</td>
<td>Minihydro</td>
<td>MW</td>
<td>108</td>
<td>202</td>
<td>366</td>
<td>103</td>
<td>31</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>811</td>
</tr>
<tr>
<td>4</td>
<td>Solar</td>
<td>MWp</td>
<td>5</td>
<td>22</td>
<td>214</td>
<td>281</td>
<td>-</td>
<td>200</td>
<td>-</td>
<td>325</td>
<td>-</td>
<td>-</td>
<td>1.047</td>
</tr>
<tr>
<td>5</td>
<td>Wind</td>
<td>MW</td>
<td>70</td>
<td>60</td>
<td>5</td>
<td>45</td>
<td>10</td>
<td>30</td>
<td>309</td>
<td>-</td>
<td>-</td>
<td>60</td>
<td>589</td>
</tr>
<tr>
<td>6</td>
<td>Biomass/Municipal waste</td>
<td>MW</td>
<td>53</td>
<td>53</td>
<td>41</td>
<td>19</td>
<td>235</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10 411</td>
</tr>
<tr>
<td>7</td>
<td>Ocean Energy</td>
<td>MW</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Biofuel</td>
<td>Thousand dKL</td>
<td>607</td>
<td>598</td>
<td>375</td>
<td>217</td>
<td>146</td>
<td>150</td>
<td>154</td>
<td>157</td>
<td>165</td>
<td>176</td>
<td>2.745</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td>MW</td>
<td>512</td>
<td>774</td>
<td>1.040</td>
<td>1.438</td>
<td>996</td>
<td>871</td>
<td>1.296</td>
<td>7.323</td>
<td>20</td>
<td>639</td>
<td>14.912</td>
</tr>
</tbody>
</table>


Source: PT. PLN (Persero)
Outline

1. Current and Projection Status in Electricity Sector
2. Renewable Energy Policies
3. RE Development Main Challenges and Opportunities
Indonesia’s Current Energy Profile

Currently, there are still a lot of homework for Indonesia regarding the efforts to increase RE shares in the country’s energy mix (as committed in Paris Agreement).

Source: DG EBTKE, MEMR
Renewable Energy Potentials

Indonesia’s renewable energy potential is massive, yet only 2% of it has been utilized.

- **Hydro, Mini/Micro Hydro**
  - Potential: 75 GW
  - Utilized: 5.349 GW (1.21%)

- **Solar**
  - Potential: 207.08 GWp
  - Utilized: 0.090 GWp (0.02%)

- **Wind**
  - Potential: 60.6 GW
  - Utilized: 0.076 GW (0.02%)

- **Geothermal**
  - Potential: 11.0 GW (Resources), 17.5 GW (Reserve)
  - Utilized: 1.919 GW (0.44%)

- **Bioenergy/Biomass**
  - Potential: 32.6 GW (Resources), 200 MBph
  - Utilized: 1.857 GW (0.42%), 3 mio kl/year BBN

- **Tidal/Wave**
  - Potential: 17.9 GW
  - Utilized: 0 GW (0%)

**TOTAL RE POTENTIAL: 442 GW**
**UTILIZED: 9.32 GW (2%)**

Source: DG EBTKE, MEMR
Policies and Regulations in Fostering Renewable Energy Deployment

In order to boost the renewable energy development, Government of Indonesia (GoI) releases some policies and regulations which are intended to ease in doing RE business and attract investments.

• Fiscal instrument (tax incentives and tax allowance);
• Rooftop solar Photovoltaic for Buildings (MOE. Decree 49/2018);
• MEMR review the economic price for the electricity generated by renewable energy should be purchased by PT. PLN (utility). (concerned to MEMR. Decree 50/2017);
• Boosting geothermal development;
• Increasing the utilization of biofuel, to reduce imported fuel oil
Current Fiscal Incentives For Renewable Energy Projects

Several fiscal incentives provided for RE projects are facilities for income tax, VAT and import duty.

<table>
<thead>
<tr>
<th>Fiscal Incentives</th>
<th>Facilities</th>
<th>Criteria / Object</th>
<th>Regulation</th>
</tr>
</thead>
</table>
| Income Tax (PPh) Facility | Tax Allowance                                                              | ▪ Domestic business tax payer  
▪ Conducting new investment or business expansion  
▪ Meet general criteria, terms and conditions for principal approval  
▪ High investment value or for exportNilai investasi tinggi/untuk ekspor  
▪ Absorbing large workforce  
▪ High local content | PP 9/2015 jo PP 18 Tahun 2015  
PMK 89/2015                                                                 |
|                           | Exception from PPh 22 import levies                                       | ▪ Renewable energy projects: imported goods in the form of machinery and equipment both installed, detached, not including spare parts  
▪ Geothermal projects: imported goods for geothermal projects | PMK 21/2010  
PMK 16/2016                                                                 |
| VAT Facility              | VAT exemption for import and/or delivery                                   | ▪ Strategic capital goods in the form of machinery and factory equipment, whether installed or not, not including spare parts | PP 81/2015                                                                 |
|                           | Exemption from VAT (PPN) or VAT & Sales Tax on Luxurious Goods (PPN & PPhBM) on imports | ▪ Goods used for geothermal exploration and exploitation | PMK 142/2015                                                                 |
|                           | Exemption from import duties                                              | ▪ For industries that produce certain goods and services  
▪ Requirement for project completion for goods and materials import duty exemption | PMK 188/2015 jo PMK 176/2009 |
| Impot Duty Facility       | Exemption from import duty on machinery (4 years) and goods and materials (2 to 4 years) for capital investment in industry development | ▪ Business entity that gets WKP or gets a preliminary survey assignment or business licenses for Geothermal drilling | PMK 177/2007                                                                 |

Source: MOF
Renewable Energy Price and Cost of Production 2017 (centUSD/kWh) in MEMR Decree 50/2017

While the national cost of electricity stands in 7.66 centUSD/kWh, the local cost is varied. To support the RE deployment, GoI issued MEMR Decree No. 50/2017 which determined the electricity price for RE-based power generation referring to the local costs and the types of RE.

<table>
<thead>
<tr>
<th>RE Power Plants</th>
<th>Local BPP &gt; National BPP</th>
<th>Local BPP ≤ National BPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar, Wind, Biomass, Biogas, Ocean</td>
<td>85% local BPP</td>
<td>B to B</td>
</tr>
<tr>
<td>Hydro, Geothermal, Municipal Waste</td>
<td>100% local BPP</td>
<td>B to B</td>
</tr>
</tbody>
</table>

Source: PT. PLN (Persero)
Outline

1. Current and Projection Status in Electricity Sector
2. Renewable Energy Policies
3. RE Development Main Challenges and Opportunities
Challenges

In developing renewable energy, the energy access, infrastructure difficulties and uninteresting investment still being a significant challenges.

- Competing Goals
  - Affordable and equity in term of energy access

- Lack of Infrastructure
  - Frontier location and forestry

- Cost and Benefit
  - High cost of financing and low return of investment
NRE Power Plant Investment Challenges

Besides, there are several other challenges which need to be overcome to deploy the renewable energy.

**Cost Power Plant NRE vs Fossil**

Cost Power Plant NRE more expensive because always compared directly with Power Plant energy fossil without paying attention to externalities positive (energy clean) from Power Plant NRE.

**Presence Agreement Take or Pay**

Existing contract non-renewable energy generation cannot be substituted by NRE. Agreement take or pay with Power Plant fossil obliges PLN to buy power electricity, so that it could not be replaced (substitute) by Power Plant electricity NRE.

**Reduction Local BPP**

Policy EMR for lower BPP local, that is to say if there is a new Power Plant then PLN only could buy electricity from the new mentioned if BPP local into down, or at least permanent.

**Power Plant NRE which intermittent**

Power Plant NRE nature intermittent (supply electricity for the times certain, for example, PLTS only could supply electricity in daylight day) so that PLN expose risk instability supply electricity.
Attachments
## Big Wind Energy Projects

### Wind Power Plant Sidrap

(30x2.5 MW) COD April 2018

<table>
<thead>
<tr>
<th>Located at</th>
<th>Existing Renewable Energy Projects</th>
</tr>
</thead>
</table>
| Sidereng Rappang (SIDRAP) Regency South Sulawesi | PLTB Jeneponto  
Capacity 72 MW |
| Electricity Production  
247 GWh/year | PLTB Sidrap II  
Capacity 50 MW |
| PPA Price:  
US$ 11.41 cent/kWh | PLTB Tanah Laut  
Capacity 70 MW |
| Investment  
US$ 150 Million | |
| Average Wind Speed  
(85 m) 7+ m/s (25+ KPH) | |

![Wind Power Plant Sidrap](image1.png)

[Map of Indonesia](map.png)