Republic of Indonesia: Sustainable and Inclusive Energy Program
(Financed by the Agence Française de Développement and the Technical Assistance Special Fund)

Appendix H: Renewable Incentives FGD 3—Lessons Learned
Appendix I: Renewable Energy Policy Paper

Prepared by Castlerock Consulting, Indonesia in association with Economic Consulting Associates Ltd, United Kingdom and PT. Q Energy South East Asia, Indonesia

For Coordinating Ministry for Economic Affairs
   Ministry of Energy and Mineral Resources
   Ministry of Finance
   Perusahaan Listrik Negara

This consultant’s report does not necessarily reflect the views of ADB or the Government concerned, and ADB and the Government cannot be held liable for its contents.

Asian Development Bank
This appendix contains four presentations from the Focus Group Discussion regarding Lessons Learned conducted on 4 September 2017:

1. Experience for Thailand
2. Experience from India
3. Experience from Geothermal Development in Indonesia
4. Experience with Pemda Involvement in Wind Development in Indonesia

These presentations are provided below.
Thailand Renewable Energy Status 2017

Asian Development Bank (ADB)
CMS: Sustainable and Inclusive Energy Program
Jakarta, Indonesia 2017

Speaker

MR. ARTHIT VECHAKIJ
- Managing Director of Excellent Energy International Company Limited (EEI)
  (The Leading ESCO in Thailand).
- President of Thai ESCO Association
- Vice President of Renewable Energy Club, Federation of Thai Industry

Besides one of the EEI founders who successfully implemented Thailand ESCO Pilot Project with excellent base of support from the Thai Government & the World Bank since 1999, he is also the founder and the president of Thai ESCO Association.

Thailand, Thai ESCO Association was established at the end of 2012 to play a central role to conduct projects. Commendation system for excellent ESCO projects is performed by government, and in Thailand, Ministry of Energy has been doing this. The role of nucleus organizations of ESCO promotion is greatly important.

In 2009 & 2012, he was invited, as the solely ESCO from Thailand, to conduct the book “ESCOs Around the World: Lesson learned in 49 Countries and World ESCO Outlook” by Shirley J. Hansen, Ph.D. with Pierre Langlois and Paolo Beroldi.

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Alternative and Renewable Energy Shares of Thailand

Final Energy Consumption
Jan–Dec 2016
Fossil Fuel 71.06% 79,929 ktoe
Renewable Energy 13.83%
Traditional Renewable Energy 5.97%
Import of Hydro Power 2.11%
*ไม่รวมไฟฟ้าจากอินเทอร์เน็ต (off grid)
*Total Domestic Electric Production (off grid)

Final Alternative Energy Consumption
Jan–Dec 2016
(Solar/Wind/Biomass/Waste to Energy/Biogas)
Electricity 2.27%

Total 11,051 ktoe

Map of Renewable Energy Power Plants in Thailand

Source: www.dede.go.th

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### Development of Thailand's RE

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-2007</td>
<td>Demo Plant + Self Gen + off grid</td>
</tr>
<tr>
<td>2007-2010</td>
<td>Quota with first come first serve</td>
</tr>
<tr>
<td>2010-2017</td>
<td>Over Quota with limited transmission</td>
</tr>
<tr>
<td>2017 onward</td>
<td>Expand quota + FIT + Bidding &amp; lucky draw</td>
</tr>
</tbody>
</table>

#### Technology
- Off-grid heavily rely on incentives
- Incentives based on technology, adder (Premium Price FIT Scheme)
- FIT parity with firm PPAs

#### Issues to be Addressed for Future Development

**COP 21 obligation**
- Emission Trading Scheme
- Carbon Tax

**Technology**
- Smart Grid Utility
- Energy Storage
- Energy Crop

**Structure of Electricity Supply Industry**
- Enhanced Single Buyer
- Centralized vs Distributed Generation

**Administrative**
- Permits, licenses, rules & regulations
- Quota and PPA
- Competitive Bidding
## VSPP FiT 2016

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Adder (Baht/kWh)</th>
<th>Special Adder for SPPs in the 3 Southemmost Provinces + 4 Districts in Songkhla (Baht/kWh)</th>
<th>Total Special Adder for SPPs in the 3 Southemmost Provinces + 4 Districts in Songkhla (Baht/kWh)</th>
<th>Duration of Adders Provision as from COD (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass</td>
<td>0.30</td>
<td>1.00</td>
<td>1.30</td>
<td>7.00</td>
</tr>
<tr>
<td>Biogas</td>
<td>0.30</td>
<td>1.00</td>
<td>1.30</td>
<td>7.00</td>
</tr>
<tr>
<td>MSW</td>
<td>2.50</td>
<td>1.00</td>
<td>3.50</td>
<td>7.00</td>
</tr>
<tr>
<td>Thermal Process</td>
<td>3.50</td>
<td>1.00</td>
<td>4.50</td>
<td>7.00</td>
</tr>
<tr>
<td>Wind</td>
<td>3.50</td>
<td>1.50</td>
<td>5.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Solar</td>
<td>8.00</td>
<td>1.50</td>
<td>9.50</td>
<td>10.00</td>
</tr>
</tbody>
</table>

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# SPP FiT Hybrid Firm 2017

## 4. Fit rate for SPP Hybrid Firm and VSPP Semi-Firm.

### (1) Fit rate for SPP Hybrid Firm

**ข้อSpec** 300MW

<table>
<thead>
<tr>
<th>Installed capacity (MW)</th>
<th>Fit (THB/kWh)</th>
<th>Period (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FIT&lt;sub&gt;r&lt;/sub&gt;</td>
<td>FIT&lt;sub&gt;15/35&lt;/sub&gt;</td>
</tr>
<tr>
<td>SPP Hybrid Firm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installed capacity &gt;10-50 MW</td>
<td>1.81</td>
<td>1.85</td>
</tr>
</tbody>
</table>

*Note:* FIT rates will be applied for projects that COD within 2017. After that, FIT<sub>15/35<sup>6</sub> rates will continuously increase by core inflation.

---

# VSPP FiT Semi-Firm 2017

## 4. Fit rate for SPP Hybrid Firm and VSPP Semi-Firm

### (2) Fit rate for VSPP Semi-Firm

**ข้อSpec** 269MW

<table>
<thead>
<tr>
<th>Installed Capacity (MW)</th>
<th>FIT (THB/kWh)</th>
<th>Period (years)</th>
<th>FIT Premium (THB/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FIT&lt;sub&gt;r&lt;/sub&gt;</td>
<td>FIT&lt;sub&gt;15/35&lt;/sub&gt;</td>
<td>(project lifetime)</td>
</tr>
<tr>
<td>1) Biomass</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Installed Capacity ≤ 3 MW</td>
<td>2.61</td>
<td>2.21</td>
<td>20 years</td>
</tr>
<tr>
<td>- Installed Capacity &gt; 3 MW</td>
<td>2.39</td>
<td>1.85</td>
<td>20 years</td>
</tr>
<tr>
<td>2) Biogas (sewage/waste)</td>
<td>3.76</td>
<td>-</td>
<td>20 years</td>
</tr>
<tr>
<td>3) Biogas (energy crops)</td>
<td>2.79</td>
<td>2.55</td>
<td>20 years</td>
</tr>
</tbody>
</table>

*Note:* (1) FIT rates will be used for projects that COD within 2017. After 2017, FIT<sub>r</sub> rates will continuously increase by core inflation.

(2) Projects in province Yala, Pattani, Narathiwat and 4 districts in Songkhla, i.e., Chana, Tapi, Saba Yai and Nethawee District.
4. FIT rate for SPP Hybrid Firm and VSPP Semi-Firm

(2) FIT rate for VSPP Semi-Firm รวมชีวิต 269MW

<table>
<thead>
<tr>
<th>Installed Capacity (MW)</th>
<th>FIT (THB/kWh)</th>
<th>FIT Premium (THB/kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FIT&lt;sub&gt;1&lt;/sub&gt;</td>
<td>FIT&lt;sub&gt;2&lt;/sub&gt;</td>
</tr>
<tr>
<td>- Installed Capacity ≤ 3 MW</td>
<td>2.61</td>
<td>2.21</td>
</tr>
<tr>
<td>- Installed Capacity &gt; 3 MW</td>
<td>2.39</td>
<td>1.65</td>
</tr>
<tr>
<td>2) Biogas (sewage/waste)</td>
<td>3.76</td>
<td>-</td>
</tr>
<tr>
<td>3) Biogas (energy crops)</td>
<td>2.70</td>
<td>2.55</td>
</tr>
</tbody>
</table>

Note:
1. FIT rates will be used for projects that COD within 2017. After 2017, FIT rates will continuously increase by core inflation.
2. Projects in province Yita, Patara, Narathiwat, and 4 districts in Songkhla, i.e., Chana, Tepa, Saba Yoi and Nathawan District

---

2017 Renewable PPA Plan

Source: Thailand Renewable Energy Report 2015 by DEDE
Biomass

Biomass is organic matter which can be converted into energy. Common examples of biomass include crops for energy, crop residues, wood waste and animal manure.

Carbon Life Cycle in Biomass

Electricity from Biomass = Neutral Carbon Emission

Sun Light + H₂O + CO₂ → Cellulose in Biomass → Biomass → Sugar Mill → Sugar Cane Field → Sugar Cane → Sugar → Biomass Power Plant → Electricity
Types of Biomass

1. By-product or waste from agricultural converting plant, i.e., rice husk, bagasse, empty fruit bunch
2. Residual left over in the farm/field, i.e., rice straw, cane leaves
3. Energy crop i.e., Napier, switchgrass

Biomass to Energy Supply Chain

- 300-400 baht/ton
- 400-600 baht/ton
- 600-800 baht/ton
- 900-1100 baht/ton
- 1000-1300 baht/ton
- 1400-2000 baht/ton

Biomass Owner → Harvest Contractor → Transport Contractor → Trader → Biomass Power Plant → Power Users
Ratio of Renewable Energy 2015

Capacity Share, MW

<table>
<thead>
<tr>
<th>Energy Type</th>
<th>MW</th>
<th>GWH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar</td>
<td>1,420</td>
<td>5,078</td>
</tr>
<tr>
<td>Wind</td>
<td>254</td>
<td>573</td>
</tr>
<tr>
<td>Small Hydro</td>
<td>177</td>
<td>584</td>
</tr>
<tr>
<td>Biomass</td>
<td>2,787</td>
<td>10,861</td>
</tr>
<tr>
<td>Biogas</td>
<td>375</td>
<td>1,081</td>
</tr>
<tr>
<td>Waste to Energy</td>
<td>182</td>
<td>520</td>
</tr>
<tr>
<td>Large Scale Hydro</td>
<td>2,400</td>
<td>7,900</td>
</tr>
</tbody>
</table>

Source: Thailand Renewable Energy Report 2015 by DEDE

Target of Renewable Energy Using

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Solar</td>
<td>MW</td>
<td>6,000.00</td>
<td>376.72</td>
<td>823.46</td>
<td>1,298.51</td>
<td>1,419.58</td>
<td>1,679.03</td>
</tr>
<tr>
<td>2. Wind</td>
<td>MW</td>
<td>3,002.00</td>
<td>111.73</td>
<td>222.71</td>
<td>224.47</td>
<td>233.90</td>
<td>255.79</td>
</tr>
<tr>
<td>3. Small Hydro</td>
<td>MW</td>
<td>376.00</td>
<td>101.75</td>
<td>108.80</td>
<td>142.01</td>
<td>172.12</td>
<td>190.42</td>
</tr>
<tr>
<td>4. Biomass</td>
<td>MW</td>
<td>5,570.00</td>
<td>1,959.95</td>
<td>2,320.78</td>
<td>2,451.82</td>
<td>2,726.60</td>
<td>2,949.46</td>
</tr>
<tr>
<td>5. Biogas</td>
<td>MW</td>
<td>1,280.00</td>
<td>193.40</td>
<td>265.23</td>
<td>311.50</td>
<td>372.51</td>
<td>375.00</td>
</tr>
<tr>
<td>6. Waste to Energy</td>
<td>MW</td>
<td>550.00</td>
<td>42.72</td>
<td>47.48</td>
<td>65.72</td>
<td>131.68</td>
<td>187.00</td>
</tr>
<tr>
<td>7. Large Scale Hydro</td>
<td>MW</td>
<td>2,906.40</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2,906.40</td>
<td>2,906.40</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>MW</strong></td>
<td><strong>19,684.40</strong></td>
<td><strong>2,786.27</strong></td>
<td><strong>3,788.46</strong></td>
<td><strong>4,494.03</strong></td>
<td><strong>7,962.79</strong></td>
<td><strong>8,543.10</strong></td>
</tr>
</tbody>
</table>

Source: Thailand Renewable Energy Report 2015 by DEDE

<table>
<thead>
<tr>
<th>Alternative Energy Investment</th>
<th>Solar Energy</th>
<th>Wind Energy</th>
<th>Samll Hydro Power</th>
<th>Biomass</th>
<th>Biogas</th>
<th>MSW</th>
<th>Biofuels</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment (million Baht)</td>
<td>86,158</td>
<td>32,814</td>
<td>278</td>
<td>33,237</td>
<td>4,238</td>
<td>1,658</td>
<td>9,229</td>
<td>167,612</td>
</tr>
</tbody>
</table>

Source: Department of Alternative Energy Development and Efficiency

Technology for Biomass to Energy

- Heat & Power
  - Gasification + Gas Engine
  - Boiler + Turbine
  - Co-Firing with coal
  - Biogas + Gas Engine
  - Gasification + Fisher-Tropsch
  - Hydrolysis + Fermentation
  - Gas Engine
  - Boiler + Turbine

Biomass

Bio-Fuel
Biomass Power Plant Status in Thailand

Biomass Power Plant
177 Plants 1,523 MW

SPP
31 Plants 631 MW

VSPP
146 Plants 892 MW

Firm
17 Plants 329 MW

Nonfirm
14 Plants 302 MW
Favorable Environmental Impacts

Stack emission: Cleaner air
- Particulate: 20 - 50 ppm (COAL: 120)
- NOx: 120 - 160 ppm (COAL: 350)
- SOx: 0 - 8 ppm (COAL: 320)

Solid waste: Recycle back to farm
ashes from boiler can be used as soil improvement substance.

Global Warming: Reduce green house gas
- Grid emission factor: 500 kg CO₂/1 MWH
Socio-Economic Benefits

- Increased business activities in the local community
- More jobs have been created
- Created value added to many agricultural waste
- New technology transfer to the industry
- Reduction of the nation’s import of fossil fuel for power generation

Factor of Biomass Development in Thailand

**Year 2006-2016**
- Target in AEDP
- Incentive PPA (Adder vs FiT)
- Non-Firm PPA
- Investment Promotion such as BOI
- Adder with First Come First Served
- Conventional technology

**Year 2017-2036**
- Target in AEDP, Feeder
- Competitive Price with Conventional
- Firm PPA
- Investment Promotion such as BOI, City Plan, Economic Zone
- FiT with Competitive bidding &Zoning
- Advance technology
Proposed Business Model for Community-Based Biomass Power Plant

Highlight of the Community-Based Biomass Power Plant

- Community own 20-40% share of the plant so the community will co-manage the power plant.
- Community does not need cash for equity share but using its biomass to pay by installments. Generally, biomass price each year could pay 10% of equity share.
- The power plant can also be equipped with an absorption chiller to make cooling system making "community cold storage" for agricultural product within the village.
- The small MW will allow the community to supply enough biomass without hauling from long distance.
- With new technology, the plant will use less water, only 10 m³/MW/day so it can be located anywhere without restriction to water supply.
- The investment should be less than 2.5 MUSD/MW to get reasonable financial return from existing FIT. Startup fund from government may be needed for initial phase.
Solar Off-Grid Application in Thailand

Solar Pump for Irrigation System
Floating Solar Applications for Factory

- Energy Saving
- Reducing evaporation rate in water pond
- Decreasing algae
- Maximize the utilization of land

Board of Investment (BOI)

- Investment Promotion
  → Announcement of BOI No.2/2557
    Service and public utilities company
    (Key: Corporate Tax = 0% for 8 years)

- Improvement of Production Efficiency
  → Announcement No.1/2557
    (Key: 3 year corporate income tax exemption on the revenue of an existing project, accounting for 50% of the investment)
1) Investment Promotion

Announcement of BOI No.2/2557

**Investment Promotion Policies**

1. Promote investment that helps enhance national competitiveness by encouraging R&D, innovation, value creation in the agricultural, industrial and services sectors, SMEs, fair competition, and reduce social and economic disparity.
2. Promote activities that are environment-friendly, save energy, or use alternative energy to drive balanced and sustainable growth.
3. Promote clusters to create investment concentration in accordance with regional potential and to strengthen value chains.
4. Promote investment in border provinces in Southern Thailand to help develop the local economy, which will support efforts to enhance security in the area.
5. Promote special economic zones, especially in border areas, both inside and outside industrial estates, to create economic connectivity with neighboring countries and to prepare for entry into the ASEAN Economic Community (AEC).
6. Promote Thai overseeing investment to enhance the competitiveness of Thai businesses and Thailand's role in the global economy.

**Criteria for Project Approval**

1. In order to develop competitiveness in the agricultural, industrial, and service sectors, projects submitted for BOI promotion must have the following qualifications:
   1.1 The value-added of the project must not be less than 20% of revenues, except for projects in agriculture and agricultural products, electronic products and parts, and coal centers, all of which must have value-added of at least 10% of revenues.
   1.2 Modern production processes must be used.
   1.3 New machinery must be used. In case of imported used machinery, the criteria for consideration will be classified into 3 cases, as follows:
2) BOI - Improvement of Production Efficiency ➔ Announcement No.1/2557

Criteria for project approval

- Apply to existing projects only, both BOI or Non-BOI. For non-BOI promoted projects, the activity must be eligible for investment promotion by the Board of investment.
- BOI-promoted projects can also apply for this measure when the corporate income tax exemption or reduction period expires or in case the respective project(s) does not receive the corporate income tax exemption.
- Minimum capital investment requirement: Not be less than 1 million Baht (excluding cost of land and working capital). Except for Small and Medium Enterprises (SMEs) projects, minimum capital investment must not be less than 500,000 Baht (excluding cost of land and working capital).

Scope of investment

- Upgrading machinery to modern technology that reduces energy consumption at the stipulated ratio
- Upgrading machinery to use alternative energy at the stipulated ratio to the total energy consumption
- Upgrading machinery to reduce environmental impacts; namely, reducing waste, wastewater or exhaust air according to the stipulated criteria

Investment Planning

Tax benefit

- Exemption of import duty for machinery regardless of zone
- Three-year corporate income tax exemption on the revenue of an existing project, accounting for 50% of the investment, excluding cost of land and working capital
- Corporate income tax exemption period shall start from the date of revenue derivation after promotion certificate issuance

Remarks!!!

- Realized tax subject to “revenue base” of company
- Saving will count on energy supply to “Non BOI”
Financial Support Situation for EE/RE

Several Innovative Programs Launched by

Several Major Government & Commercial Financial Institutes in Thailand

Thai Financial Institute Situation

- Thai Financial Institutions has launched several financial products for energy efficiency (EE) projects since 2003 in response to government’s renewable energy policy and energy conservation policy.

<table>
<thead>
<tr>
<th>Detail</th>
<th>Objective</th>
<th>Credit Line</th>
<th>Interest</th>
<th>Tenor</th>
<th>Specific Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Innovation</td>
<td>Giving business opportunities to Thai SMEs to find and access technology, research, and development for further investment in new business; Helping SMEs in industrial/manufacturing sector to create business innovation beneficial to Thailand's economy and society.</td>
<td>Subject to mutual agreement between each participating bank and customer.</td>
<td>Free on part of borrower and the National Innovation Agency will pay interest on behalf of the borrower for not more than the first three (3) years up to 5% per annum</td>
<td>Maximum 3 years</td>
<td>Customer's proposal must be approved by NIA. NIA will act as technical consultant to the project. Management fee is subject to each participating bank's consideration.</td>
</tr>
</tbody>
</table>

Good Innovation... Zero Interest

Thailand Energy Service Company (ESCO) Association

Excellent Energy International Co., Ltd.
## Commercial Bank’s Financial Product

<table>
<thead>
<tr>
<th>Detail</th>
<th>Objective</th>
<th>Credit Line</th>
<th>Interest</th>
<th>Tenor</th>
<th>Specific Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buddhiang Green Loan</td>
<td>• Investment in energy-saving projects and activities</td>
<td>1 MNI THB or more</td>
<td>MUR or lower</td>
<td>As per Bangkok Bank’s conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Development of alternative/renewable energy</td>
<td>(Long Term Loan)</td>
<td></td>
<td></td>
<td>Vary 0.25% of the approved credit limit and/or other fees, as determined by the Bank</td>
</tr>
<tr>
<td></td>
<td>• Support green label products</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Support waste management (turning waste into energy)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Development and production of bio-products (replacing chemical products)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean Energy Loan</td>
<td>• To support clients for investment in machinery and equipment in relation to energy efficiency</td>
<td>Maximum 50% MMTB</td>
<td>MUR – 1.000%</td>
<td>Maximum years</td>
<td>Qualify all expenses relating to the projects</td>
</tr>
<tr>
<td></td>
<td>• Energy Saving Projects for Manufacturing and Building</td>
<td>(Long Term Loan)</td>
<td></td>
<td></td>
<td>• Machinery, equipment and installation expenses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Project Consulting fees for Energy Saving Service (PCC)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Expenses which are necessary for the installation of machinery and equipment, such as machinery foundation, natural gas piping, transportation, removal and demonstration expenses, import tax, and Value added tax of mentioned items</td>
</tr>
</tbody>
</table>

## Commercial Bank’s Financial Product

<table>
<thead>
<tr>
<th>Detail</th>
<th>Objective</th>
<th>Credit Line</th>
<th>Interest</th>
<th>Tenor</th>
<th>Specific Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top-Up Loan for Energy-Saving (Lighting Solution)</td>
<td>The Thai Energy Saving (Lighting) solution program focuses on long-term loan assistance</td>
<td>100% of project investment or other service and consultation fees (Commercial Loan)</td>
<td>Subject to the Bank’s rules and regulations</td>
<td>Subject to the Bank’s rules and regulations</td>
<td>• Energy used for 19 households or more</td>
</tr>
<tr>
<td></td>
<td>The Thai Energy Saving (Lighting) solution program focuses on long-term loan assistance</td>
<td></td>
<td></td>
<td></td>
<td>• Energy efficiency projects with performance guaranteed or warrantited</td>
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<td></td>
<td></td>
<td></td>
<td>• Annual sales turnover of 1 billion THB or more</td>
</tr>
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### Commercial Bank's Financial Product

<table>
<thead>
<tr>
<th>Detail</th>
<th>Objective</th>
<th>Credit Line</th>
<th>Interest</th>
<th>Tenor</th>
<th>Specific Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTB Green Loan (Hunt 5,000-15,000 MM)</td>
<td>Subject to the KTB's consideration; For T/L: NLR; For W/C: Not more than 10 years; Grace period as deemed necessary and appropriate for each individual borrower/customer</td>
<td>- Term loans (T/L)</td>
<td>- 2% Bank guarantee for 7 years and grace period of not more than 2 years</td>
<td>- Not exceeding 7 years and grace period of not more than 2 years</td>
<td>Operator of business that may cause pollution with due and responsibility prescribed by law to control, treat or dispose of waste caused by their own business activities to be in compliance with the law.</td>
</tr>
</tbody>
</table>

Source: www.ktb.co.th

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### Commercial Bank's Financial Product

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<th>Tenor</th>
<th>Specific Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTB Environment Loan for Private Sector</td>
<td>The Bank is a sole fund manager of an environment fund set by the Ministry of Natural Resources and Environment that provides low interest capital funds for the private sector in the following environmental operations: - To make arrangements for treatment systems of air/water pollution, waste disposal systems, equipment for water treatment or disposal of pollution from their own business activities to be in compliance with the law. - To be employed as a service provider for waste/water treatment or waste disposal under the National Environment Promotion and Conservation Act B.E. 2535(1992).</td>
<td>Subject to the KTB's consideration (Long Term Loan)</td>
<td>- 2% Bank guarantee for 7 years and grace period of not more than 2 years</td>
<td>- Not exceeding 7 years and grace period of not more than 2 years</td>
<td>Operator of business that may cause pollution with due and responsibility prescribed by law to control, treat or dispose of waste caused by their own business activities to be in compliance with the law.</td>
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## Commercial Bank’s Financial Product

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<th>Credit Line</th>
<th>Interest</th>
<th>Tenor</th>
<th>Specific Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFL Energy Saving</td>
<td>• Use of loan proceeds in construction/renovation of factory premises/building, site and/or manufacturing/equipment/installation of machinery and equipment indicating materials used in energy saving or alternative/renewable energy. • Support and promotion of energy saving and conservation through use of renewable/alternative energy or operations for revenue. • Implementation of new or alternative energy projects such as power/electricity generating to be used in businesses, establishments and/or for sale to the Electricity Generating Authority of Thailand (EGAT)</td>
<td>Subject to the KTB’s consideration (long term loan)</td>
<td>MTH</td>
<td>Not more than 7 years with grace period or principal of not more than 1 year</td>
<td></td>
</tr>
</tbody>
</table>

Source: www.ktb.co.th

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### Thank You

Thai ESCO Association

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2. Experience from India

About the Speaker

Upendra Bhatt, Managing Director – cKinetics

Upendra Bhatt leads cKinetics, a leading sustainability insight, innovation & Capital Advisory Firm. Upendra has been engaged in infrastructure, renewable energy and resource efficiency domains with specific expertise in project development, new program design and shaping innovative market driven models for mainstreaming of technology and other interventions in the developing markets.

Upendra is also the current Chair at Alliance for Energy Efficient Economy (AEEE) and also chair of the Sustainable Business Leadership Forum.
India has committed to an annualised reduction of nearly 1200 million Tonnes of Carbon dioxide equivalent by 2030.

Visualizing India 2030: Need for focusing on Energy, Food and Water security with increasing growth

Decouple growth and measure consumption in order to meet its climate goals/sustainable development goals.

Power sector has a potential of 650 MT CO2 of reduction in GHG emissions

..... renewable energy a key component: both centralized and decentralized modes gaining momentum
Recent developments in the Renewable energy sector point to an accelerated pace of growth

- An ambitious target of achieving RE capacity of 175 GW by 2022, out of which 100 GW will come from Solar
  - 40 GW Rooftop: 20 million households injecting energy into the grid is going to make the grid different and complex
  - Solar has the highest target but also the lowest achieved at 13%: Reaching the increment for installation of solar is more than doubling every year

- 175 GW RE will contribute to 18.9% of the entire power consumption in India in 2022
  - 30.5% ROF needed for 300 GW Solar by 2022
  - At least four Indian states now have more than 1 GW of installed capacity

**Target vs Achievement for all RE segments**

**Investment a key lever to enable this RE scale**

175 GW RE plan entails investment of Approx. 5110 Billion in the next 5 years

- Domestic funds: ~10% in 2023
- Multilateral/Bilateral Agencies: ~35% in USD
- Green Bonds/Tap Bonds: ~15% in USD

**Renewable Energy Investment in India ($ Billion)**

Indian clean energy market is largely driven by asset-based finance to the extent of 94% of the total investment in the sector

Reduction in technology costs, raw material costs, improved technology, conducive policy environment, better financing structuring of projects have resulted in low capital costs.
Support Mechanism for Renewable Power In India

- National & State RF policies
- Accelerated Depreciation
- Feed in Tariffs
- Green Energy Corridor
- Exemptions and other incentives
- Peak Power Shortage and demand expected to increase
- Renewable Purchase Obligation (RPO) and RRC mechanism
- Innovative Financing Instruments
- National policy & State policies are in place
  - National policy on all RE technologies with guiding regulations for states to follow in place
  - Local policies introduced by most all states for solar technologies, incentives for wind and biomass
- AD key instrument for success of wind projects & also exist in solar projects
- Other incentives are also in place like
  - Tariff & customs duty exemptions for most of the equipment
  - 20 years use holding etc.
- Power purchase shortage and demand expected to increase
  - 250 million kwatts still un-soldified
- FIT introduced by all states for RE
- RPO mandated by the National Tariff Policy
  - RPO mandate increased to 8% for all DISCOMs
  - RRC mechanism in place to fulfill RPO
- Evacuation a major issue, hence transmission lines augmentation planned in the form of Green Corridor
- Innovative Financing Instruments introduced for RE project viability
- Solar rooftops and open access already reached grid parity in some states
  - KPI Open access provides the maximum flexibility in procuring renewable energy directly from IPP

RE is driven by the plethora of polices set by central government and the state governments

- Landscape of RE policy indicates a relatively higher focus on Solar as compared to wind and biomass
- Many states found to have broad level policy framework aimed at addressing renewables with relatively lower focus on non-solar projects
While there has been a definite policy push to Renewables, progress varying across segments

- Solar has a clear focus in terms of the policies and the number of policies launched both at the centre as well as the state has been testament to that.
  - Thrust on large scale projects through support for large scale solar parks, large scale deployment of rooftop projects and increase the base of grid connected projects.
- With wind, defined targets with aggressive frameworks for On/off shore wind, small wind, hybrid and other technologies; focus on repowering of old wind machines.
- Specific targets for biomass though several challenges; however, industrial cogeneration has high potential and is relatively untapped.

<table>
<thead>
<tr>
<th>Type of RE Project</th>
<th>Limiting Conditions</th>
<th>Pace of implementation of project</th>
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<tbody>
<tr>
<td>Utility Scale Solar-</td>
<td>Requirement of large areas of land in a constraint</td>
<td>¡ ¡ ¡ ¡ ¡</td>
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<tr>
<td>Centre Sponsored</td>
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<tr>
<td>Utility Scale Solar-</td>
<td>Delegation to Land Acquisition</td>
<td>¡ ¡ ¡ ¡ ¡</td>
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<tr>
<td>Rooftop Sponsored</td>
<td></td>
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</tr>
<tr>
<td>Solar Rooftop projects</td>
<td>Greater propensity of States to invest in renewable energy</td>
<td>¡ ¡ ¡ ¡ ¡</td>
</tr>
<tr>
<td>Solar Miniscale</td>
<td>Smaller player as Developers and larger players as owners leading to skewed MPPT terms</td>
<td>¡ ¡ ¡ ¡ ¡</td>
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<tr>
<td>Mini-grid projects</td>
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<tr>
<td>Wind Power projects</td>
<td>Lack of sufficient policy push; Incentives and exposure and outcomes likely skewed in</td>
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</tr>
<tr>
<td></td>
<td>favour of solar projects</td>
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<td></td>
<td>Limited stake from Utilities</td>
<td></td>
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<tr>
<td></td>
<td>Difficulty in Land Acquisition</td>
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</tbody>
</table>
Overview of incentives for facilitating scale of RE

<table>
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<tr>
<th>Incentives</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Income tax holiday</td>
<td>100% tax holiday on renewable energy, 10% on 20% capacity</td>
</tr>
<tr>
<td>Accelerated depreciation</td>
<td>40% as per assets, additional depreciation of 20% on new plant/modified in the last year</td>
</tr>
<tr>
<td>Technical export benefits</td>
<td>Available to specified goods manufactured and exported from export-oriented units</td>
</tr>
<tr>
<td>VAT incentives</td>
<td>Certain services were exempted from export services/reduced VAT rates; services related to distribution and equipment in electricity sector, only those below reduced VAT rates.</td>
</tr>
<tr>
<td>Customs and import duties</td>
<td>Available to renewable energy equipment.</td>
</tr>
<tr>
<td>Additional incentives</td>
<td>Available to grid connected renewable energy equipment.</td>
</tr>
<tr>
<td>Tax rebates</td>
<td>Tax rebates received from the holding company/paid to generation, distribution and transmission of power</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incentives</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Financial Assistance (CFA)</td>
<td>In the form of subsidy to the extent of 30% of the accelerated capital cost for certain segments</td>
</tr>
<tr>
<td>Feed-in tariffs</td>
<td>With an option to be paid to prime utility by the RPO</td>
</tr>
<tr>
<td>Generation based incentive</td>
<td>A general incentive in the form of guaranteed priority spot energy during peak hours</td>
</tr>
<tr>
<td>Loan under the Micro Finance Scheme (MFS)</td>
<td>Loan available to eligible renewable energy projects under the scheme</td>
</tr>
<tr>
<td>Renewable Energy Certificate (REC)</td>
<td>Issued to renewable energy generators as a certificate of compliance with the Renewable Energy Generation certificate program</td>
</tr>
<tr>
<td>Government R&amp;D programmes</td>
<td>Promote research on renewable energy technologies, innovative ideas, and development of prototypes and equipment</td>
</tr>
</tbody>
</table>

Enabling market needs standardization and long term policy direction

- **Reverse Auctions to discover price floors**: Requires standardization and optimization of transaction costs.
- **Standardization of transaction documents**:
  - Power Purchase Agreements (PPA)
  - Request for Proposal (RFP)
  - D&M Contract documents
  - Power Purchase Agreement
  - Trust & Retention Account (TRA)
- **Risk Mitigation Mechanisms**:
  - Technological risks
  - Financial risks
  - Project implementation risks
  - Power off-take risks
  - Quality issues
  - Performance & efficiency risks

Programmatic linkages focused on:

- **Enabling a strong domestic debt market**
- **Pooling of capital into specialist financing intermediaries**
  - Credit Enhancement Pools / First Loss Default Guarantees
- **Pre-requisites**
  - Exit level economics
  - Performance and Standards
  - Project development approach as a key differentiator
- **Partial Insurance support**
3. Geothermal Experience in Indonesia
A. Geothermal is Truly A Long Lead Time Investment

Pre-Exploration Drilling (2-3 years)
- Pre-Exploration Geophysical, Geologi, Geothermal, geography
- Commercial & Policy: Tenders, Mining Licenses, EIA regulation, Government Support

Pre-Exploration Infrastructure Development
- Environmental Study
- Various Permits
- Land Acquisition / Secure Tenancy
- Construction contract acquisitions and execution

Exploration, Resource Evaluation, Engineering (2 to 3 years)
- Exploration Drilling
  - Drilling Rig, drilling services and drilling materials procurement process
  - Drilling Rig mobilization and drilling operations
  - Well Drilling and Resource evaluation
  - Feasibility Study & Engineering Planning

Development
- Development (3 years)
  - Financing
  - Environmental study & various development permits
  - Procurement of Various Services and Materials (Drilling & EPC)
  - Development Drilling (production and injection wells)
  - Facilities (AG facilities and Power Generation) Engineering and construction

Time Could Be Longer
- If everything is going well it will take between 7 to 8 Years
- Lead Time may be longer due to:
  - Bureaucratic issues & regulations
  - Commercial issues
  - Drilling/Exploration Challenges
  - Topographical/Location challenges
  - Communities Issues
B. Geothermal Investment: A High Risk Investment

- Impediments:
  - Risk of Finding Geothermal Resource (quality and volume)
  - Cost (initial and ongoing)
  - C&G Study, too much involves understanding availability, distance, and capacity of geothermal resource
- Development:
  - Success of Development depends on accurate and effective injection
  - Operating Risks:
    - Reduction in productivity and impact on number of resources used and cost

C. What influences Investment Cost:

- Investment Cost varies from one development to another
- Technology and development
- Development costs
- Significant development: site selection
- Scale of Development: larger and development requirements become more complex and expensive
- Operating costs
- Infrastructure: operating and maintenance costs
- Production wells: drilling costs

D. Geothermal is a Unique Investment Undertaking

- It faces Unique Oil and Gas Risk but also represents a regulated utility market with moderate economic returns
- It has only a single and committed buyer, for reasons:

E. Financing

- In principle, exploration must be financed by investors.
- Developers' equity: limited financing (GCF) is available but significant requirement for up-front costs.
- Financing for development is relatively attractive to large financing institutions (IDB, ADB, and commercial banks)

4. Pemda Involvement in Windfarm Development in Indonesia-
PENGEMBANGAN ENERGI TERBARUAN DI JENEPERIO: INSENTIF, KENDALA, DAN PEMBESARAN

H. Manawati, S.IP., M.E.
Kepala Biro Perencanaan Model dan PTPP di Jeneponto

POTENSI PENGEMBANGAN ENERGI LISTRIK

- ENERGIEUPT
  - Luas pengembangan UPT 200 km²
  - Potensi daya 2,6 MW
  - Luas pengembangan UPT 100 km²
  - Potensi daya 1,6 MW

- ENERGIEUPT
  - Luas pengembangan UPT 200 km²
  - Potensi daya 2,6 MW
  - Luas pengembangan UPT 100 km²
  - Potensi daya 1,6 MW

- TENAGA SURYA
  - Luas pengembangan 100 km²
  - Potensi daya 5 MW

BERAGAM INISIASTIF PTPP DI JENEPERIO

Ringkasan Proyek PLTB Telo

- Nama Proyek: PLTB Telo
- Luas Proyek: 100 km²
- Potensi Daya: 5 MW
- Tujuan: Pengembangan energi terbarukan

INSENTIF DAN FASILITASI

(Perizinan)

- Uraian perizinan yang diperlukan berupa perizinan berdasarkan Presiden
- Perizinan ini diperlukan untuk melaksanakan proyek yang diatur dalam Peraturan Perizinan
- Proyek ini diperlukan untuk melaksanakan pengembangan energi terbarukan
- Proyek ini diperlukan untuk melaksanakan pengembangan energi terbarukan
- Proyek ini diperlukan untuk melaksanakan pengembangan energi terbarukan

H-35
Daftar Isi

INSENTIF DAN FASILITASI (2)
(Perizinan)

- Proaktif mengawal proses dengan selalu melakukan koordinasi dengan Pusat dan Provinsi
  - Konfirmasi dengan PIN terkait reklam jejak dan kopis yang outing “perlu” sebelum mengeluarkan izin-izin
  - Mengevaluasi Pimpinan serta Birokrasi Gubernur untuk Kajian Anda yang sebenarnya tidak diperlukan – alirannya dibacakan

INSENTIF DAN FASILITASI
(Perizinan)

- Dinantikan berkelanjutan menghadirkan point of view yang bisa memfasilitasi koordinasi dengan OPD dan instansi lain
  - Dapat membuat lebih mudah memahami faktor-faktor berikut:
    - Perizinan yang diperlukan
    - Peralatan yang diperlukan
    - Dampak keberjalanannya

- MoU Perdana dengan Fakultas sebagai alat dalam kerjasama
  - dalam hal selain dalam 2 minggu setelah kunjungan perumah

- Inisiatif untuk MoU dan Instruksi
  - Peluang pengembangan dan pelatihan yang dapat meningkatkan kualitas binaan
  - Peluang pelatihan untuk memperbaiki kesalahan yang sudah terjadi

INSENTIF dan FASILITASI
(Pembebasan Lahan)

- Menembakkan secara akurat proses sosialisasi dan pembekalan lahan, sehingga dalam waktu singkat telah rampung 100% (110 pemilik, total 59,4 ha)

- Kompensasi sudah dilakukan sesuai PP dan Permen yang berlaku

- Valuasi Independen dari KUPP Aditya Islander

- Sempat terjadi gejolak – demo – terkait lahan tapi repot tuntas dan tidak membayar
PEMBELAJARAN

• Terbatasnya pemahaman masyarakat tentang potensi angin di Jepara dan masyarakat bekerja, kebangkitan, konsekuensinya sebagai subjek pembelajaran PUPR – berlatar belakang yang intensif.

• Pembangunan Lahan
  - Keterlambatan masyarakat dalam pembangunan lahan swasta yang mengganggu pada pembahasan indenpenden terbuka dengan pembangunan lahan proyek APBN yang melalui "tim" – simpan demo.
  - Beberapa daerah masyarakat meminta setara dengan bahwa hal tersebut tidak.
  - Permenpan Otoritas landasan dengan melakukan dialog dan memberikan perpajakan.

PEMBELAJARAN

• Konsultasi pemerintah sangat penting
  - Untuk mendapatkan informasi yang benar dari KPP dari tingkat pusat yang secara langsung mengakui informasi.
  - Dalam hal ini teknologi baik, baik yang ada pada situs atau prinsipal bisa sampai pembuatan bahan baku.

• Keterkaitan, masalah dalam jalur yang muncul seperti urusan perizinan atau (tata cara) dalam pemerintah dan pengorganisasi, dll.
  - Sejauh ini masih dalam proses pelaksanaan tim evaluasi dan komitmen yang baik.
  - Pemantauan hasil program UKM, TGD, PANT, u.a. dari situ konsultasi, keterlibatan dan peran komunitas masyarakat, tajam kebijakan pemerintah.

PEMBELAJARAN

• Konsultasi untuk "repot" mengkoordinasi ke dalam dan vertikal
  - Melalui komunikasi baik dengan koperasi UKM atau satker dalam koordinasi.
  - Peraturan pemerintah terkait LKPU, KPP, dll.

• Perlu konsultasi dengan belajar secara teknis agar bisa menghasilkan kebijakan dan keputusan yang berkualitas.
  - Memperbaiki teknik menguji sesuai dasar teknis dengan tim ASI (Kementerian, inspektorat, dll).

• Studi banding ke Denmark atau menghubungi lembaga dari kedubes Denmark.
Terima Kasih

RENEWABLE ENERGY JENEPONTO

DINAS PENANAMAN MODAL DAN PELAYANAN TERPADU SATU PINTU KABUPATEN JENEPONTO
Renewable Energy Development in Jeneponto: Incentives, Challenges, and Lesson Learned

Incentives

Several Incentives and facilities have been provided by Jeneponto Regency to accelerate renewable energy (RE) development in its area. Mainly it is related to the permit for investment. One of the action is to reduce the number of permit needed from 54 to 15 and it can be taken care in 1 office which is Jeneponto’s one stop shop.

Jeneponto’s government also receives several award as a result of its action. Some of them are:

1. The best one stop shop facilities in South Sulawesi in 2015
2. National pilot project for USAID program for permit simplification

Moreover, Equis’ General Manager highly applause Jeneponto’s Government for its action. Equis recommends Jeneponto as one of the best and easiest place to obtain a permit for project development.

Other possible incentives that can be copied by other local government to help facilitate RE developments are:

- Proactively involve in the process of coordination between PLN, central government, and state government.
- Make a one stop shop office for permit as a focal point to provide coordination between the agencies within Jeneponto and South Sulawesi province.
- Make an MOU between Jeneponto’s local government and Equis to ensure support for the project development
- Actively socialize and facilitate the land clearing process until it is 100% clear. This process helps to reduce the social protest and demonstration by the communities

Challenges and Lesson Learned

Several challenges occur during the RE development process are:

1. Limited information and knowledge from the people and communities regarding the wind power potential in Jeneponto. Hence, communities need to be socialized about the benefit and consequences if a wind power plant is constructed in their areas.
2. Lack of knowledge and information from the communities about the land clearing process. Thus, protests occur repeatedly. However, local government is able to open a dialog and solve the issue.

Based on the experiences during the development process, some lesson learned can be taken, which are:

1. Strong commitment and willingness are needed from the local government to ensure that all related institutions within the local government are ready to help and facilitate the investor to obtain all the related permits, hence project can be executed.
2. Investor’s serious commitment is also needed to intensively engage and open a communication channel to the local government. Thus, two related parties can help and facilitate each other to ensure smooth project execution.
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Address</th>
<th>Type of Business</th>
<th>Email</th>
<th>Telephone</th>
<th>Remarks</th>
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## APPENDIX I: RENEWABLE ENERGY POLICY PAPER

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<thead>
<tr>
<th>Document name</th>
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<td>Policy Paper: Percepatan Investasi Energi Terbarukan</td>
<td>October 2017</td>
<td>Consultant Work</td>
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<tr>
<td>Policy Paper PPT Presentation: Percepatan Investasi Energi Terbarukan</td>
<td>November 2017</td>
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Executive Summary

Indonesia already has a policy on the optimum primary energy mix target and greenhouse gas emission reduction targets in the electricity sector. One of the major contributors to the achievement of these targets is the availability of sufficient New and Renewable Energy (EBT) plants. However, the deviation occurring in the implementation of the current policy is large enough that the risk of not achieving the set targets is large.

The high magnitude of the deviation was caused by the short-term political support on Justice Energy Concept and the need for the structuring of proper incentive structures in the EBT power generation sector in order to immediately reduce the current investment gap. The short-term Justice Energy Concept is the result of the current policy positions to prioritize the increase of access to energy with affordable prices for the community, especially poor people. However, there is a long-term cost that is not taken into consideration in this choice, that is, the negative externalities of fossil energy use. This policy paper argues that the steps must be taken gradually, through education and more effective socialization of energy as development capital so that the analysis of benefits and costs associated with energy policy options, particularly electricity, is more comprehensive. The effectiveness of education and socialization is reflected in the realization of a political process that supports sustainable energy policies integrated with efforts to reduce the impacts of climate change. The bulk of this policy paper is related to the latter. The formulation of the policy is conducted by taking into consideration the following two points: (1) institutional constraints due to the political support not yet aligned with project concept, and (2) lessons learned gained from other countries - India and Thailand - as well as from Indonesia. The first is mainly related to the unique position of PT PLN as a company with a task from the government concerning its Public Service Obligation and accelerated development of electricity infrastructure. The uniqueness of the position of PT PLN coupled with the fact that PT PLN is an agent with at least three principals, namely: Minister of ESDM, Minister of SOE and Minister of Finance. The decisions taken by PT PLN as the main buyers of electricity from PLT EBT are interrelated to the uniqueness of this position, which in reality is not always in line with the target of optimum energy mix and the target of greenhouse gas emission reduction from the electricity sector.

Lessons learned obtained from India and Thailand indicate that there are at least four factors that support the development of PLT EBT in these countries. The four factors are: (1) political support, (2) internalization of externality costs, (3) market development and lower economic prices of EBT and (4) access to financing. While lesson learned from Indonesia is the importance of permit and non-licensing permit issuance and development of standard documents both at the central and regional levels. These three things besides reducing investment risk, also help to speed up the process thereby reducing project development costs.

Based on the above two considerations, this policy paper recommends a policy consisting of three groups based on the type of workable approach. The first group is related to strengthening the implementation of existing rules:
1. Intensify the socialization of fiscal incentives and their simulation results.
2. Create knowledge sharing forum among local governments in providing licensing and non-licensing support in order to accelerate the development of EBT plants in the regions.
3. Support PT PLN to plan implementation of shared transmission infrastructure for planned EBT plants in selected locations to be included in RUPTL.
4. Establish an information center on the availability and ways to obtain financing facilities related to climate change mitigation and sustainable development.
5. Develop human resources in the banking sector and non-banking financing institutions to be able to evaluate the financing of EBT plants, including in the development of non-recourse funding schemes.
6. Reduce the risk of investment in EBT generators by improving cross-sectoral coordination, aligning central and regional policies, and accelerating the resolution of ongoing EBT generating projects.
7. Simplify procedures and increase transparency in TKDN evaluation for EBT generating components.

The second group is concerned with efforts to complement void in the mandatory legislations:
1. Immediately complete the drafting of the National Electricity Master Plan (RUKN) which can be used as a reference by local governments to make Regional Electricity Master Plan (RUKD).
2. Provide assistance to local governments to make Regional Energy Master Plan (RUED) and Regional Electricity Master Plan (RUKD).
3. Make implementing regulations of EBT industry development to support the achievement of energy mix targets in the framework of the provision and utilization of energy, strengthening the national economy and absorption of the workforce, as well as achieving the target of greenhouse gas emission reduction.
4. Create regulations which provide proper incentives for PT PLN to be able to implement Power Wheeling mechanism.
5. Establish implementing regulations to accelerate the implementation of Rooftop Solar program and integrate it into PT PLN's RUPTL.

The last group is a recommendation of regulatory changes at some level that require political process in support of the acceleration of EBT investment in the electricity sector:
1. To amend Regulation of the Minister of ESDM No. 50 of 2017 so as to accommodate the determination of Business Entity based on competitive auction as regulated in Presidential Regulation No. 38 of 2015 so that the selected Business Entity can get VGF support and Infrastructure Guarantee.
2. Identify candidates of EBT generating projects for medium and large capacity to be provided KPBU scheme in accordance with Perpres No. 38 of 2015 so as to meet the criteria to obtain VGF.
3. To amend Regulation of the Minister of ESDM No. 50 of 2017 so as to accommodate direct appointment mechanisms for EBT generating projects of the scale of 'firm' that can provide supply guarantees that do not impede the stability of PT PLN's transmission and distribution system.
4. To amend Regulation of the Minister of ESDM No. 50 of 2017 in order to allow Build-Operate-Own (BOO) contractual arrangements for EBT plants located on land owned by third parties (not owned by the State Enterprise).
5. Reallocation of DAK budget related to rural energy / small-scale EBT plant and / or infrastructure budget of Directorate General of EBTKE to support the procurement of land and infrastructure for the development of solar parks in the region.

6. Postponement of time of the imposition of sanction on non-fulfillment of TKDN requirements and changes related to provision of tax facilities related to TKDN. The implementation of this policy should be done specifically for the types of EBT technology.

The approach taken by the Coordinating Ministry for Economic Affairs in the first group is more on coordination of implementation. While in the second and third group the approach tends to be in coordination and synchronization of formulation and stipulation.
Foreword

The Government of Indonesia has ambitious targets for new and renewable energy, where the targets of new and renewable energy reaches at least 23% in the primary energy mix by 2025 (up from about 6% by 2015), as stated in the National Energy Policy of 2014 and translated into the National Energy Master Plan set forth in March 2017. In addition, in the Nationally Determined Contribution based on Paris Agreement 2015, the Government set a target of 29% reduction in greenhouse gas emissions by 2030. Major contribution is expected to come from the utilization of renewable energy.

In relation to these targets, the Government prioritizes the development of electricity from renewable energy and the expansion of program of energy conservation, which is expected to improve the security of energy supply and reduce the need for fossil fuel power generation. Indonesia has substantial renewable energy potential but the utilization of these energy sources needs to be improved and developed if it aims to achieve primary energy mix targets. Up to now, the total installed capacity of renewable energy power generation reached less than 2% of the total potential.

In 2017, the Government through the Ministry of Energy and Mineral Resources issued a regulation on the procedure for purchasing electricity from renewable energy sources in the form of Minister of ESDM Regulation No.12 / 2017 which was amended twice with the Minister of ESDM Regulation No. 43/2017 and the latest by Regulation of Minister of ESDM No. 50/2017. The regulation regulates pricing and procurement processes for all forms of renewable energy, including solar PV, wind, hydropower, biomass and biogas, waste, and geothermal. The regulation also stipulates that PLN must purchase electricity from renewable energy at a reference price to achieve national targets, prioritizing the delivery of electricity from renewable power projects under 10 MW as a "must-run" generator, and standardizing procurement documents and Power Purchase Agreements (PJBL).

In line with the Government's intention to involve the private sector to invest in infrastructure development, the private sector has shown an interest in investing in renewable energy power plants. However, there are still issues that need to be addressed in the development and utilization of renewable energy for electricity. One of the issues faced by the private sector is about the feasibility of investing in renewable energy, such as high initial investment, low investment return rate, and high interest rates from commercial banks.

In the framework to formulate the right policy, the Coordinating Ministry for Economic Affairs has conducted a series of focus group discussions (FGD) with the main theme of accelerating EBT investment in the electricity sector. The FGD involved relevant stakeholders in the public and private sectors. There are three FGDs in the series of the FGDs. The first on July 31, 2017 discussed the current situation of EBT developments in the power sector. The second on August 15, 2017 focused on fiscal and non-fiscal incentives for the development of EBT, including proposals from developers based on the type of technology. And lastly, on September 4, 2017,
the participants discussed lessons learned from India and Thailand, as well as domestic experience in the geothermal sector and local government support (for the development of thermal power plant by the local government of Jeneponto Regency).
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Background

Target of Energy Mix and Greenhouse Gas Emission Reduction

The energy sector policy in Indonesia is regulated through Law No. 30 of 2007 on Energy and Government Regulation No. 79 of 2014 on National Energy Policy. Based on these laws, energy management should be based on the principles of benefit, fair efficiency, increased added value, sustainability, community welfare, conservation of environmental functions, national resilience, and integrity by prioritizing national capabilities. While the main goal of the national energy policy is the realization of a paradigm shift, from energy considered just as a commodity to energy as development capital. In the context mentioned above, sustainable management of local energy resources is in line with national energy policy. Moreover, the portion of New and Renewable Energy (EBT) in the optimum national primary energy mix according to the energy policy is at least 23% by 2025.

The above policy source is further translated through Presidential Regulation No. 22 of 2017 on the National Energy Master Plan (RUEN). In RUEN, the target of EBT mix of 23% (92.2 MTOE) by 2025 will come from the electricity sector (69.2 MTOE or 45.2 GW of the total 135 GW) other than the fuel and gas sector (23 MTOE). The 45.2 GW target will be met by: PLT Geothermal (7.2 GW), hydro power plant (17.9 GW), Microhydro Power Plant (3 GW), Bioenergy power plant (5.5 GW), PLT Surya [Solar Power] (6, 5 GW), PLT Bayu [Wind] (1.8 GW) and other PLT EBT (3 GW).

Specifically for the geothermal sector it is targeted at 7,200 MW. The installed capacity of geothermal until December 2017 has reached 1,808.5 MW with the addition from PLTP Ulubelu Unit 4 (55 MW), PLTP Sarulla Unit 2 (110 MW) and PLTP Karaha Unit 1 (30 MW). In 2018, geothermal installed capacity is targeted to reach 2,023.5 MW (2nd rank in the world beating the

\(^1\) Rida Mulyana, “Policy on Utilizing EBT for Power Plants”, page 7 power point submitted during the first FGD on 31 July 2017 (part of a series of FGDs held by the Coordinating Ministry for the Economy in the framework of Accelerating EBT Investment in the Electrical Sector)
Philippines) and in 2023 is targeted to reach 3,559.5 MW (turning into the 1st rank in the world defeating the United States).

In addition to energy mix targets, Indonesia also has a target to reduce greenhouse gas emissions. This target is related to government policy after ratifying the commitment in relation to climate change (Paris Agreement) through Law No. 16 of 2016. Indonesia's Nationally Determined Contribution (NDC) has a target of 29% reduction in greenhouse gas emissions (without conditions, or without foreign assistance) or 41% (on condition of, or with foreign assistance); of the baseline scenario by 2030. While the target for the energy sector the emissions reduction target is 11% (unconditional) or 14% (on condition). The large share (49.9%) of the 11% emissions reduction target comes from the EBT power plant, equivalent to 156.6 million tonnes of CO2.²

Nevertheless, the growth of the current EBT mix is still below the target of RUEN. RUEN has an average growth target of 0.9% per year, but in reality the growth of EBT mix is only 0.55% per year.³ By 2016, the EBT achievement in the energy mix is only 7.7%, lower than the target set at the level of 10.7%⁴. In addition, data from the Investment Coordinating Board (BKPM) shows a gap between the EBT project's investment plan compared to its realization. The investment plan of domestic investment (PMDN) for the EBT sector in 2009 - 2016 is USD 13.69 billion, but its achievement is only USD 1.43 billion⁵. While foreign investment (PMA) in the sector of EBT worth USD 61.69 billion but its achievement is only USD 1.75 billion.⁶

2 Ibid, page 9. The target of CO2 emissions reduction with its own ability in 2030 is 340 million tons. 49.9% of the target is from EBT electricity of 156.6 million tons.


4 Ibid, page 19

5 Tamba P. Hutapea, "Update of Investment Policy Encouraging the Development of New Renewable Energy Generators", Investment Planning Sector, BKMP, page 4 power point slides submitted during the first FGD on 31 July 2017 (part of a series of FGDs held by the Coordinating Ministry for the Economy in order to Accelerate EBT Investment in the Electricity Sector)

6 Ibid, page 4
The Need for Acceleration and Challenges and Opportunities

The above conditions need to be anticipated immediately so that the optimum energy mix targets and greenhouse gas emission reduction targets can be met. This is also in line with Presidential Regulation No. 4 of 2016 jo Presidential Regulation No. 14 of 2017 on the Acceleration of Electricity Infrastructure which stipulates that the acceleration of Infrastructure Development of Electricity (PIK) prioritizes the use of EBT in order to support efforts to reduce greenhouse gas emissions.

Nevertheless, in the policy arena, the acceleration of EBT investments in the power sector faces a number of tough challenges, among them:

- The economic prices of EBT generators are often compared directly with the economic price of fossil energy generation. Whereas the price of the fossil energy economy does not take into account the costs of negative externalities brought about by higher greenhouse gas emissions and other pollutants produced. Under such circumstances (without taking into account the negative externalities), the cost of producing EBT generating electricity should not be directly compared with the cost of producing fossil energy, but compared after the cost of externalities of fossil energy is also taken into account.

- EBT generator developers have difficulties in areas where the basic cost of electricity production (BPP) is low. This is related to the policy of the Ministry of ESDM which stipulates that to lower the local BPP, PT PLN may only purchase from new plant if it can lower the local BPP of PT PLN. As a result of this, specifically, the challenges faced by this type of EBT technology are among others:

  - Potential of minihidro hydro to provide prices that can push local BPP lower becomes smaller. Locations that have the potential to offer low prices are getting harder to come by.

  - Specifically, the development of Geothermal Power Plant faces challenges from the difficulty of predicting exploration costs and low success ratio. With the application of electricity purchase based on BPP of local PT PLN, there is no possibility that the cost of this risk is transferred to PT PLN. Another cost of risk that must be absorbed by the Geothermal Power plant developers is that the risk of geothermal reserves is

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7 Imaddudin Abdullah as one of the presenters in the first FGD on 31 July 2017 explained four reasons for the importance of renewable energy development: (1) encouraging economic growth to get out of the Middle Income Trap; (2) sustaining the growth in energy demand due to increased per capita power consumption; (3) reducing dependence on energy imports; and (4) environmental protection.
smaller than the capacity listed in the Power Purchase Agreement (PPA). The costs incurred cannot be passed through to PLN due to the above mentioned BPP limitation.

- The costs of technology development of PLT waste are still relatively expensive when compared with other technologies. The opportunity for electricity production from this type of power plant to be purchased by PT PLN - based on the existing BPP - is very small unless there is government support.

- Take or pay agreements with fossil generators already in operation to date must be met by PT PLN. If there is a new EBT generator, then the power supply from the plant cannot replace the power supply from the existing fossil generator with the take or pay agreement.

- Purchase resistance from PT PLN due to the risk of lack of support for the stability of the electricity distribution system due to the intermittent supply of EBT generators.

But on the other hand, there are many opportunities that can be utilized for the development of EBT power plant investment in Indonesia, among others:

- Electrification ratio is still low in eastern Indonesia. Minister of ESDM has issued Minister of ESDM Decree No. 2268 of 2017 on the appointment of Flores Island as Geothermal Island with the aim to maximize geothermal potential in Flores island to fulfill basic power needs (base load) as well as optimization of direct use of geothermal energy for agribusiness, fishery and marine purposes.

- There is still a chance to lower the price of EBT power generation, for example from the growing economies of scale of solar panel production or the application of the more efficient minihidro technology.

- Smart grid development - such as the Bali Eco Smart Grid initiative - is more likely to include intermittent power plants such as PLT Bayu (Wind) and PLT Surya (Solar).

- Biomass feedstock and biogas reserves are still abundant and can involve local communities for their provision.

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8 The Government once issued a regulation to support the acceleration of the construction of PLT Waste through Presidential Regulation No. 18 of 2016 on the Acceleration of Waste-Based Power Plant Construction in DKI Jakarta Province, Tanggerang City, Bandung City, Semarang City, Surakarta City, Surabaya City, and Makasar City; but this regulation was annulled by the Supreme Court on November 2, 2016 because it was judged to be contrary to the higher regulation of Law No. 32 of 2009 on Environmental Protection and Management, Law No. 36 of 2009 on Health, and Law No. 12 of 2011 on the Establishment of Legislation.
• Some local governments provide positive support for the development of EBT in accordance with local potentials such as Sidrap and Jeneponto
• There are opportunities to create hybrid plants (with HSD and pump storage)

The above challenges and opportunities need to be considered in developing appropriate policies that can accelerate EBT investments in the power generation sector so that the targets set can be achieved within the remaining timeframe.

### Related Regulatory Framework

![Related Regulatory Framework Diagram](image)

Figure 1: Regulatory Framework Related to the Acceleration of EBT Investment in the Electricity Sector
The optimization of energy mix that provides sustainable guarantee is a mandate of the energy policy regulated in Law No. 30 of 2007 and PP (government regulation) No. 79 of 2014 (KEN). KEN is prepared by the National Energy Council (DEN) and set by the Government after receiving approval from the House of Representatives (DPR). Further explanation of KEN for cross-sectoral national energy management is RUEN. However, currently RUEN has not been completed by the Regional Energy Master Plan (RUED), the latest National Electricity Master Plan (RUKN) and the Regional Electricity Master Plan (RUKD).

Law No. 30 of 2009 on Electricity gives power to the Central Government and Local Government for the control of electricity through the authority in establishing policies, regulations and standards. The authority is accompanied by obligations in providing funds for disadvantaged groups, the development of electricity supply facilities in undeveloped areas, the development of power in remote and border areas, and the construction of rural electricity. Electricity business is carried out by the Holder of Power Supply License (IUPTL) of which the priority is given to PT PLN as State-Owned Enterprises (BUMN) in the electricity sector. As for the areas that have not been served by PT PLN; BUMD, private business entities, cooperatives and self-help communities can become an integrated IUPTL provider.

In line with Law No. 30 of 2007, legislation in the electricity sector mandates that the assurance of availability of electricity is supported by the optimization of sustainable energy mix, EBT preference, and ensures that domestic energy resources are prioritized for the national interest. Law No. 30 of 2009 is further translated by PP No. 14 of 2012 jo PP No. 23 of 2014 on Electricity Supply Business Activities which will be used as a reference for RUKN, RUKD and Electricity Supply Business Plan (RUPTL). However, the current RUKN completeness and its derivative RUKD has not been reached. While RUPTL is available and is regularly updated annually. RUKN is a development plan of power supply system developed by Ministry of ESDM based on KEN and established after consultation with DPR. While RUKD - as well as RUED - is prepared by the Regional Government and established by the Head of Region after consultation with the DPRD. RUPTL is the basis for the implementation of electricity supply business for public interest which is developed by business entity owning business area and authorized by Minister or Head of Region, in accordance with its authority. RUPTL of PT PLN 2017 - 2026 has a mix target of EBT power of 22.4% in 2026 from 11.9% in 2017.

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9 Paragraph (3) of Article 11 of Law No. 30 of 2009
10 Minister of Energy and Mineral Resources Decree No. 1415 K / 20 / MEM / 2017 dated March 29, 2017
Through the Presidential Decree of PIK acceleration ...

Support may be in the form of: provision of fiscal incentives, simple licensing and non-licensing, determination of the purchase price of electricity ..., the establishment of a separate business entity ... and / or subsidy provision

Perpres No. 38 of 2015 ... Government support is defined as fiscal and / or other contributions granted by the Minister / Head of Institution / Head of Region and / or Minister of Finance in accordance with the authority....

### Box 1: Focussed Policy Paper

RUPTL 2017 - 2026 has a EBT mix power generation target not the same as KEN. Although the basic of revision of RUPTL 2016-2025 one of them is the development of EBT plants in order to achieve an optimum energy mix by 2025 as long as it meets the economic level. This does not mean that PT PLN violates the rules, but this means that the rest of the mix which should be provided through plants not connected to PT PLN's network. In other words, other IUPTL holders need to prioritize the EBT generator so that KEN's mix targets can be achieved.

In order ensure that RUPTL's mix targets in line with RUEN, there should be an effort to increase the effectiveness of fiscal and non-fiscal incentives for EBT plants connected to PT PLN's network so that the economic level better for PT PLN. The latter is the focus of this policy paper. In this case regulatory umbrella for accelerated development of EBT generators is Perpres No. 4 of 2016 jo Perpres No. 14 of 2017 on the Acceleration of Development of Electricity Infrastructure and Perpres No. 38 of 2015 on Government Cooperation with Business Entities in the Provision of Infrastructure.

Another related regulation on acceleration of the provision of electricity infrastructure is Perpres No. 4 of 2016 jo Perpres No. 14 of 2017 on Acceleration of Electricity Infrastructure Development (PIK) assigned PT PLN as the implementer of PIK. The PIK includes the construction of a 35,000 MW power plant (previously regulated by Perpres No. 4 of 2010 jo Perpres No. 194 of 2014 on Assignment of PT PLN to Accelerate the Development of Power Plant Using Renewable Energy, Coal and Gas) and a 46,000 km transmission network prioritizing the use of New and Renewable Energy in order to reduce greenhouse gas emissions.

In the implementation of PIK, PT PLN can choose either self-management or cooperation in the provision of electricity supply with its subsidiaries or Power Plant Developers (PPL). Cooperation with PPL is conducted among others through the generation of new and renewable energy sources. The implementation of power supply cooperation from PPL can get government guarantee in the form of business feasibility guarantee of PT PLN (Business Viability Guarantee Letter (BVGL)) on its financial obligation pursuant to power purchase agreement (PJBL).

Through Perpres on the the accelerated PIK, the government has arranged the forms of support for feasibility and economics that can be provided by the Central Government and Local Government. The supports may include: the granting of fiscal incentives, the ease of licensing and non-licensing, the determination of the purchase price of electricity from each new and renewable energy source, the establishment of a separate business entity in the framework of the provision of electricity to be sold to PT PLN and / or the provision of subsidy.

On the other hand, in the framework of accelerating the provision of infrastructure in general, the Government also has a set of regulations concerning the Government's cooperation with the Business Entity, or commonly referred to as Public and Private Partnership (PPP). Pepres No. 38 of 2015 on Government Cooperation with Business Entities (KPBU) in the provision of infrastructure covering various sectors of infrastructure, including electricity infrastructure.
Government support can also be provided through implementation of this regulation. Government support is defined as fiscal and/or other contributions given by the Minister/Head of Institution/Head of Region and/or Minister of Finance in accordance with their respective authorities based on the laws and regulations in order to improve the financial feasibility and effectiveness of the KPBU. In this case, the Minister of Finance may provide support in the form of construction cost (Viability Gap Fund (VGF)) and/or Government Guarantee through the Infrastructure Guarantee Agency (BUPI), namely PT Penjaminan Infrastruktur Indonesia (PT PII, or Indonesia Infrastructure Guarantee Fund / IIGF).
Dynamics of EBT Price Policy

National Energy Policy and Its Implementation

National policy on energy development regulated in Government Regulation No. 79 of 2014 consists of key policies and supporting policies. Key policies include: availability of energy for national needs; energy development priorities; utilization of national energy resources; as well as national energy reserves. While supporting policies include: conservation and diversification of energy resources; environment and safety; prices, subsidies, and energy incentives; infrastructure, access for communities, and energy industry; research, development and application of energy technology; as well as institutional and funding. Implementation of this key policy and support is expected to encourage the achievement of energy mix targets as well as greenhouse gas emission reduction targets.

But what happened was not in line with the target set. This is at least caused by two factors. The first factor is the inertia of the actors in the policy arena toward change in the energy paradigm from commodity to development capital. While the second factor is the presence of regulatory gaps so that joint efforts to realize the set targets can not run optimally. For the first factor, education and socialization efforts to the stakeholders must be continued effectively, so that a paradigm shift of political power can be achieved. Of particular concern to this Policy Paper is the second factor: what policies should be chosen as the basis for establishing appropriate regulation in order to accelerate EBT investment in the electricity sector so that the established targets can be achieved in time.

The Urgency of the Right Pricing Policy

Factors causing the gap between target and achievement of EBT energy mix are as follows:

1. Weak across sectors coordination:
   - The ease of licensing at the central level is not followed by similar action at the regional level
   - Most of the sources of problems that arise come from the Regional Government, BUMN / BUMD, and other related Ministries / Institutions (eg, land allotment from the Ministry of Environment and Forestry / KLHK, etc.).
   - Unavailability of RUED and RUKD
2. The inappropriate combination of the buying price policy with the fiscal and non-fiscal incentive policies available so that the economy of EBT power generation has not been optimally realized:

- Amendment of the Ministry ESDM regulation No. 12 of 2017 with Ministry ESDM Regulation No. 43 of 2017 and with Ministerial Regulation No.50 of 2017 still has not succeeded in increasing investor interest to invest in renewable energy;
- The Ministry of ESDM with the Ministry of Finance (Fiscal Policy Office) still feels the need to jointly redefine fiscal supports which are more suitable to the needs of the realization of renewable energy investments;
- Non-fiscal incentives are also important as the factors that can drive the economics of EBT plants.

Figure 2: Dynamics of EBT Generating Power Sale Price Policy

The policies formulated in order to accelerate the growth of the EBT energy mix in the electricity sector need to consider the interaction between the main actors in the electricity sector.
currently taking place in the policy arena. The main actors are the Government, PT PLN and Private Developers.

3. Government: position of ministry of ESDM in the achievement of target of the energy mix or reduction of greenhouse gas emission from the energy sector looks inconsistent\(^\text{11}\). On the one hand, the national energy policy has mandated the targets of these achievements. But on the other hand, the desire to lower the cost of electricity production in the short-term dominates the policy. From the point of providing incentives for EBT, the Government is currently facing fiscal constraints so there is a view:

- Although the internalization of health and environmental costs does make the cost of providing fossil energy more expensive, but the initial cost for EBT is high so it is feared that it will burden the current APBN (state budget).
- The relatively cheaper price of fossil fuels is considered to be more supportive of policies that seek to provide access to electricity more affordably to poor people

4. PT PLN: PT PLN\(^\text{12}\) has the main priority in the electricity sector in Indonesia as the state-owned enterprise (BUMN) holding the electricity supply business permit which also have the assignment from the Government to accelerate the development of electricity infrastructure in Indonesia. As a state-owned company, PT PLN must obtain sufficient margin to maintain the sustainability of electricity business. On the other hand, as a government agency, PLN must provide electricity at an affordable price to the public and users in general.

5. Private EBT power generation developers: oriented toward profits so they expect an adequate rate of return to grow and expand. With the high cost of electricity production from EBT plants, the private sector seeks the purchase price from PT PLN which can give them profit margin for example through the Feed in Tariff (FiT) scheme. But at this time, the FiT policy is not an option of the Government.

The uncertainty of the Government's position and the current economic downturn caused a conflict of interest between PT PLN and private power plant developers to grow stronger:

\(^{11}\) Based on an interview with Syamsidar Thamrin, senior planner for climate and energy at Bappenas, the implementation of climate policy integration can only be effective if there is political support for climate mitigation measures in the fossil fuel sector along with the increased role of EBT in national climate policy. 
\(^{12}\) As a BUMN (SOE), PT PLN has a unique position as well. PT PLN has three principal principals, namely Minister of ESDM (EMR), Minister of SOE, and Minister of Finance. The interests of these three principals color the decisions taken by the management of PT PLN.
6. PT PLN has the objective to reduce electricity BPP so that it will buy electricity from EBT generator if it offers lower tariff compared to electricity BPP of the local PT PLN.

7. Based on the afore mentioned facts, PT PLN will at present prioritize fossil-based energy generators, especially since the cost of its externalities is not considered. By itself, the development of private EBT electricity that offers electricity with lower greenhouse gas emissions at a cost of zero externality or lower than fossil energy does not get an equivalent ratio.

8. Take or pay agreements from old generators - including fossil-generating plants - cause new plants - including EBT plants - can not simply replace the role of old generators. This condition led to the unavailability of a negotiation space between PT PLN and the developer of private EBT power plants.

Ministry of ESDM regulation No. 12 of 2017 ... is viewed by the developers as a policy inhibiting the development of renewable energy

Purchase Price of EBT Power Plant by PT PLN

Conflicts of interest among key actors in this policy arena resulted in two revisions of the Minister of Energy and Mineral Resources (ESDM) regulations regarding the utilization of renewable energy sources for electricity supply. The regulation is derived from Law No. 30 of 2007, Law No. 30 of 2009, Government Regulation No. 14 of 2012, Government Regulation No. 79 of 2014 and Presidential Regulation No. 4 of 2016.

Ministry of ESDM regulation No. 12 of 2017 stipulated on January 27, 2017, is viewed by the developers as a policy inhibiting the development of renewable energy. Implementation of maximum tariff of 85% of the Cost of Production (BPP) of electricity of local PT PLN is considered not realistic so it is counter-productive to the development of renewable energy.

It is considered not realistic because the conditions of each region vary so that it can cause the cost of electricity production from EBT generators different as well. In addition BPP PT PLN can also change over time, while the development of EBT power plants can not be completed in a short time. Such conditions ever occurred especially in geothermal power plants through Ministry of ESDM Regulation No. 14 of 2008, but the rule was finally amended.
Annex

Permen (Ministerial Regulation) No. 12 of 2017 is then amended with Ministry ESDM Regulation No. 43 of 2017 on July 17, 2017. EBT power developers outside Java can get a price of 100% price of the local BPP PT PLN. The price is the maximum price so that the tendency will be pressed hard during the negotiation. However, this Ministry of ESDM Regulation is still considered not an answer to the efforts of the acceleration of EBT power plant investment.

Minister of ESDM finally amended the regulation with Ministerial Regulation No. 50 of 2017 on August 8, 2017. Table 1 shows the latest arrangement based on the Ministry of ESDM Regulation No. 50/2017. While the BPP reference used is BPP which is in 2016 stipulated through the Ministry of ESDM Regulation No. 1404/2017 as shown in Figure 3.

Table 1: Electricity Purchase Price According to Ministry of ESDM Regulation No. 50/2017

<table>
<thead>
<tr>
<th>Types</th>
<th>Sumatra, Java, Bali</th>
<th>BPP below national average</th>
<th>BPP above national average</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLTA</td>
<td>per agreement</td>
<td>per agreement</td>
<td>≤ 100%</td>
</tr>
<tr>
<td>PLTSa</td>
<td>per agreement</td>
<td>per agreement</td>
<td>≤ 100%</td>
</tr>
<tr>
<td>PLTP</td>
<td>per agreement</td>
<td>per agreement</td>
<td>≤ 100%</td>
</tr>
<tr>
<td>PLTS</td>
<td>per agreement</td>
<td>per agreement</td>
<td>≤ 100%</td>
</tr>
<tr>
<td>PLTB</td>
<td>per agreement</td>
<td>per agreement</td>
<td>≤ 85%</td>
</tr>
<tr>
<td>PLTBm</td>
<td>per agreement</td>
<td>per agreement</td>
<td>≤ 85%</td>
</tr>
<tr>
<td>PLTBg</td>
<td>per agreement</td>
<td>per agreement</td>
<td>≤ 85%</td>
</tr>
<tr>
<td>PLTA Laut</td>
<td>per agreement</td>
<td>per agreement</td>
<td>≤ 85%</td>
</tr>
</tbody>
</table>

The purchase of electricity from an EBT generator is done through mechanism of direct selection. Whereas for PLTS and PLTB the direct selection is based on the maximum amount of generating capacity offered to the EBT generator in one period for the purchase price of specified power. In addition, PT PLN is obliged to operate an EBT plant with capacity up to 10 MW continuously (must run).

Although this electricity purchase price determination provides clarity for business actors, this decision still places the EBT plant generators compete directly with non-renewable energy generation, particularly fossil energy, without internalization of the cost of externalities.
Choice and Policy Space

The pricing policy established is still faced with a dilemma of choosing between short-term interests and long-term interests. This is related to the policy which emphasizes efficiency to obtain more affordable production costs. Interpretation of the Energy Justice is now more likely to be in the short-term interest, namely how electricity is available at a price affordable to the disadvantaged group. But if the source of electrical energy also generates negative externalities - not taken into account at this time - the cost to produce such an affordable price is not measurable properly. Such immeasurable costs can be a source of injustice, for present and future generations. Therefore the Fair Price Economy should not only measure the right selling price for electricity users but also the cost required to generate such electricity, including energy the costs of externalities. In addition thing must be done to anticipate higher price of fossil while the EBT price has a tendency to become lower in the future.

Internalization of the cost of externalities of electricity production from each primary energy source will make the EBT power plant more competitive. There is little policy space available to internalize this externality in Law No. 30 of 2007. The law regulates that the development and utilization of EBT research results is financed with state revenues derived from non-renewable energy. But there is no mechanism of levy on non-renewable energy. While the interventions that can be done by utilizing these funds only on the development and utilization of research. By comparison, in the palm oil plantation sector, Law No. 39 of 2014 on Plantations mandating that the Palm Fund can be used for various interventions, namely: human resource development, research and development, plantation promotion, plantation rejuvenation, and / or plantation facilities and infrastructure. The Palm Fund has been in operation since July 2015 and obtained funds from export levies amounting to USD 50 per ton CPO.

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13 The Ministry of ESDM creates this policy tag line as a “Fair Energy Policy”.
With the absence of an internalization mechanism of non-renewable energy externalities, the competitiveness of EBT in the electricity sector is currently heavily dependent on fiscal and non-fiscal incentives provided by the Central Government and Regional Government.

With the unavailability of internalization mechanisms of non-renewable energy externalities, particularly fossil energy, the competitiveness of EBT in the electricity sector is now heavily dependent on fiscal and non-fiscal incentives provided by the Central Government and Local Governments. Law No. 30 of 2007 stipulates that the provision of energy from new energy sources and renewable energy sources by business entities, permanent establishments and individuals may obtain the ease (of facilities) and / or incentives of the Government and / or local governments in accordance with their respective authorities for a certain period of time until they reached economic value. Nevertheless, to date there is no comprehensive policy that can ensure the selection of appropriate incentives so as to accelerate the development of EBT plants effectively so that primary energy mix targets and reductions in greenhouse gas emissions from the electricity sector can be achieved.

Figure 3: BPP Generation 2016 is Accordance to Ministerial Decree No. 1404/2017

<table>
<thead>
<tr>
<th></th>
<th>Lampung</th>
<th>S(^3)B</th>
<th>W. Sumatera</th>
<th>S. Sulawesi, Southeast</th>
<th>Kalimantan and C. I. Borneo</th>
<th>N. Sumatera</th>
<th>Riau and Riau Island</th>
<th>East and North Kalimantan</th>
<th>Aceh</th>
<th>Belitung</th>
<th>W. Kalimantan</th>
<th>N. Sulawesi</th>
<th>Papua &amp; West Papua</th>
<th>Bangka</th>
<th>W. Nusa Tenggara</th>
<th>N. Melaka &amp; N. Tenggara</th>
</tr>
</thead>
</table>

National average USD 7.39 cent / Kwh
Fiscal and Non-Fiscal Incentives

With the unavailability of a mechanism to internalize the external cost of fossil energy, the economic price of EBT relies heavily on fiscal and nonfiscal incentives. In addition, the political condition of domestic subsidies is difficult to produce policies that can be viewed as subsidies to private power plant developers.

As previously spelled out, fiscal and non-fiscal incentives related to the acceleration of EBT power generation investments are currently grounded from Presidential Regulation No. 4 of 2016 jo Presidential Regulation No. 14 of 2017 on Acceleration of Electricity Infrastructure and Presidential Regulation No. 38 of 2015 on Government Cooperation with Business Entities in the Provision of Infrastructure. The following is a review of existing instruments based on these two Presidential regulations.

Fiscal Incentives

Current fiscal incentive instruments include 15:

- PMK No. 21 / PMK.011 / 2010 on Provision of Tax Facilities and Customs for Renewable Energy Source Utilization Activities:
  - Income Tax Facilities:
    - Net income deduction of 30% of total investment, charged for 6 years, 5% per annum
    - Depreciation and accelerated amortization
    - Dividend taxes for foreign tax subjects of 10% or lower tariffs under the applicable Double Tax Avoidance Agreement
    - Compensation for losses longer than 5 years but not more than 10 years
    - Regulation of the implementation of PP. No.1/2007 on Income Tax Facilities for Investment in Certain Business Fields and / or in Specific Regions

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15 Fiscal incentive data used in this report is consistent with that provided by Sigit Dwiputra of the State Revenue Policy Center, Fiscal Policy Office of the Ministry of Finance in the third FGD on September 4, 2017. The fiscal incentives consist of: income tax facility, value added, import duties, and government-borne tax facilities. Especially for the geothermal power sector there are special PMK and KMK as well as Geothermal Fund facility. While tax holiday facility is intended for pioneer industry, therefore it can only be given to EBT power plant development project if this sector is categorized as poinir industry. Guarantees on the feasibility of PT PLN's business can also be provided by the Minister of Finance to private power developers.
• Income Tax Article 22 on imports: automatically (without Free Certificate) exempted from the collection of Income Tax 22 on the import of goods in the form of machinery and equipment required by entrepreneurs in the field of utilization of Renewable Energy Resources

• Value Added Tax Facilities
  • Exemption on the imposition of VAT on the import of Taxable Goods considered strategic in the form of machinery and equipment required by entrepreneurs in the field of utilization of Renewable Energy Resources
  • The implementing regulation of PP 12 of 2001 on the Import and / or Delivery of Certain Taxable Goods considered Strategic is Exempted from the Imposition of VAT

• Import Duty Facility:
  • PMK 176 / PMK 0.11 / 2009 on Exemption from Import Duty on the Import of Machinery and Goods and Materials for Development or Industrial Development in the Framework of Investment;

• Government-borne Tax Facilities:
  • Government-borne tax facility regulated by APBN Law

• For Geothermal:
  • Income Tax Facility (Tax Allowance):
    • Government Regulation No. 9 of 2016 on Amendment to Government Regulation No. 18 of 2015 on Income Tax Facilities for Investment in Certain Business Fields and / or in Specific Regions,
    • Minister of ESDM Regulation No. 16 of 2015 on Criteria and / or Requirements for the Utilization of Income Tax Facilities for Investment in Certain Business Fields and / or in Certain Regions in the Energy and Mineral Resources Sector,
    • Regulation of the Minister of Finance No. 89 / PMK.010/ 2015 on Procedures for Provision of Income Tax Facilities for Investment in Certain Business Fields and / or in Certain Regions and Transfer of Assets and Sanctions for Domestic Industry Taxpayers Provided with Income Tax Facilities. Income Tax Facilities granted, ie:
      (a) Net Income Deductions 30% of investment value for 6 years (investment tax credit)
      (b) Depreciation and accelerated amortization
      (c) Imposition of Income Tax for dividend 10%
      (d) 5-10 years compensation loss

• Import Duty Facility
• Regulation of the Minister of Finance No. 177 of 2007 on the Exemption of Import Duty on the Import of Goods for Upstream Oil and Natural Gas and Geothermal Activities.

• Regulation of the Minister of Finance No. 142 of 2015: Treatment of Value Added Tax and Sales Tax on Luxury Goods on the Import of Taxable Goods Exempted from Import Duty.

• Regulation of the Minister of Finance No. 107 of 2015: Income Tax Collection as stipulated in Article 22 in respect of Payment of the Delivery of Goods and Activities in the Field of Import or business activity in another field.


With requirements:
(a) Goods have not been produced domestically
(b) Goods have been produced domestically but not yet meet the required specifications
(c) Goods have been produced domestically but the quantity is not sufficient for the industry

• Exemption of Land and Building Tax (PBB):
• Regulation of the Minister of Finance No. 172 of 2016 regulates the reduction of the PBB up to 100% for the geothermal exploration stage. Facility can be obtained by holders of Geothermal Permit (IPB) for 5 years since IPB is issued and can be extended at the maximum for a period of 2 years, starting 2017.

• Tax Holiday (for a pioneer industry (new investment of at least 1 T): economic infrastructure using a scheme other than the KPBU):
• PMK 159 / PMK.010 / 2015 stdtd PMK 103 / PMK.010 / 2016: Deduction of corporate tax maximum 100%, minimum 10% of corporate income tax payable; reduction of corporate tax maximum 50% of value of new investment plan less than 1T and minimum 500 billion; a period of 5 to 15 years (with the Minister of Finance's discretion can be given for a maximum of 20 years).

• Funding:
• PMK 139/2011: procedures for granting PT PLN's business feasibility guarantee for the construction of power plants using renewable energy, coal and gas which is conducted in cooperation with private power developers
• Business Viability Guarantee Letter (BVGL)) provided to private power developers, including the EBT generator, which is included in the Phase 2 of the List of Acceleration of Electricity Generation Development (FTP - 2).
Various breakthrough taken by the government to accelerate the development of geothermal in Indonesia are:

- Acceleration of geothermal development, especially in the eastern part of Indonesia, taking into account economic prices that are more attractive to investors
- The Government assigned State Enterprises working in the geothermal field to conduct exploration, exploitation and/or utilization activities in a Geothermal Working Area
- Simplification of Licensing and Non-Licensing in the Geothermal Sector. Of the 21 types of licensing and non-licensing in the geothermal sector today has been simplified into 17 types of licensing and non-licensing, covering 4 licensing and non-licensing were assigned to BKPM, 9 proposals were abolished and 4 are still being processed at the Directorate General of EBTKE.
- The Government assigns Preliminary Geothermal Survey Works to Universities and Research Institutions, and Assignment of Preliminary Geothermal Survey and Introduction to Business Entities.
- Implementation of Geothermal Fund Program to attract investor interest in developing geothermal energy in Eastern Indonesia Region. This program aims to reduce the risk of geothermal exploitation and is expected to encourage geothermal development by private developers and SOEs.

The above fiscal instruments (which can also be seen in the appendix of the fiscal incentive matrix) may have an impact on the economic price of the EBT power plant. Here are some simulation results of the implementation of some of the above fiscal incentives. The simulation is done by using the financial model given by some developers, i.e. models of Minihidro PLT, Bioenergy PLT, and Solar PLT. Using this financial model, the effects of fiscal incentives can be calculated and observed how their affect on the economic price of renewable energy. To measure the effect, the calculated variable is the break even price with and without incentive. The break even price is the price at the Net Present Value level of the Project equal to zero.

Figure 4 shows a bar graph image of the simulated results for PLT Minihidro 10 MW located in North Sumatra. The left bar graph is the price without fiscal incentives, ie USD 7.5 cents / kWh or 81% of BPP North Sumatra according to Ministry of ESDM Decree 1404/2017 on the amount of the basic cost of generation of PT PLN of 2016. If the fiscal incentive in the form of depreciation is accelerated according to PP No. 18 of 2015, the break even price decreased by USD 0.3 cents
The right bar graph shows the simulation result with the incentive.

![Break even Price of PLTMH](image)

**Figure 4: Break even Price of PLTMH**

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Figure 5 shows the simulation result with financial model of Bioenergy PLT. The capacity of the plant is 2 MW, while the investment cost is USD 6.5 million. The left bar graph shows the break even price of the plant based on the given model, which is USD 14.3 cents / kWh. The right graph is the result of the simulation by using a 30% net Income Tax incentive of the amount of capital invested (capex) charged for 6 years, or 5% each year. This fiscal incentive is in line with PMK 21/2010. With this incentive, the break even price becomes USD 13.8 cents / kWh, down by USD 0.5 cents / kWh. However, this figure is still higher than the highest PLTBM price approved in 2017 using Ministry of ESDM Regulation. No. 12 of 2017, amounting to USD 11.61 cents / kWh.
Other incentives are those associated with access to cheap funding. This can be obtained through the provision of SJKU / BVGL (although it remains to be proven how far this instrument can reduce borrowing costs) and geothermal funds (for Geothermal Power Plant). Support that affects the burden of borrowing costs, among others, can also be obtained through access to the Green Fund\textsuperscript{16}. But for interest subsidies in the near future is still difficult to be realized. Figure 6 shows the simulation results of a 1 MW Solar powered financial model with an investment cost of USD 1.4 million and a debt to equity ratio of 70:30. If the lending rate is at 9\%, the break even price is USD 9.5 cents / kWh. Whereas if the lending rate is 8\% (down 100 basis points), the break even price decreases by USD 0.5 cents / kWh. A decrease of interest by 200 basis points ... lowered ... by USD 1 cent / kWh.

\begin{figure}[h]
\begin{center}
\begin{tabular}{|c|c|c|}
\hline
0.150 & 0.143 & 0.138 \\
\hline
0.140 & & \\
0.130 & & \\
0.120 & & \\
0.110 & & \\
0.100 & & \\
0.090 & & \\
0.080 & & \\
0.070 & & \\
\hline
\end{tabular}
\end{center}
\caption{Break even Price of Bioenergy PLT}
\end{figure}

Other incentives are those associated with access to cheap funding. This can be obtained through the provision of SJKU / BVGL (although it remains to be proven how far this instrument can reduce borrowing costs) and geothermal funds (for Geothermal Power Plant). Support that affects the burden of borrowing costs, among others, can also be obtained through access to the Green Fund\textsuperscript{16}. But for interest subsidies in the near future is still difficult to be realized. Figure 6 shows the simulation results of a 1 MW Solar powered financial model with an investment cost of USD 1.4 million and a debt to equity ratio of 70:30. If the lending rate is at 9\%, the break even price is USD 9.5 cents / kWh. Whereas if the lending rate is 8\% (down 100 basis points), the break even price decreases by USD 0.5 cents / kWh. The leftmost bar graph shows simulated results if the loan interest rate is at 7\% level. A 200 basis point in interest decrease (from 9\%) can lower the break even price by USD 1 cent per kWh.

\textsuperscript{16} The Green Fund will be channeled through PT SMI which conducts joint venture with JBIC. This is one of Indonesia's climate change financing initiatives that focuses on general infrastructure planning. There is also a focus for renewable energy financing. Four institutions in Indonesian government that have a role in budgeting and coordinating climate change financing are: DNPI, Ministry of Finance, Bappenas and Ministry of Environment & Forestry. Information on Climate Change Financing can be accessed at: http://www.fiskal.kemenkeu.go.id/pkppim/id/
The ease of Licensing and Non Licensing

The granting of licensing and non-licensing facility can also improve the financial feasibility of an EBT power plant. For example, Jeneponto Regency succeeded in attracting many investors to invest in a power plant with the facility of providing one-stop service for licensing. In addition, investors were also assisted (by the local government) in socialization to the community in the framework of land acquisition. The district government was active with acting as a communication bridge between developers and stakeholders, to reduce the risk of misunderstanding. Regional leadership, capable of delegation appropriately - becomes a catalyst for solving complex and sensitive issues related to licensing and non-licensing.

Another example is geothermal power plants that take a long time for project development -- up to 8 years. These development costs can be cut by reducing development time with improvement of coordination within the bureaucracy, preparation of document standards and acceleration of process of licensing.

Determination of Purchase Price of Electricity

The determination of the purchase price of electricity from each type of new and renewable energy source is regulated through Ministry of ESDM Regulation No. 50 of 2017 as described in the previous section. Although this electricity purchase price determination provides clarity for business actors, this decision puts the EBT generator in direct competition with non-renewable energy generator, particularly fossil energy, without internalization of external costs as discussed...
There is no window of opportunity for the EBT power industry to grow so that one day selling price of electricity can reach the parity without the need of support of massive fiscal incentives.

... the establishment of purchasing power companies from EBT plants ... the mechanism requires considerable fiscal support ... the need for approval from the DPR ... is difficult to realize in the near future.

in the previous section. In contrast to experience in India and Thailand\textsuperscript{17}, there is no window of opportunity for the EBT generating industry to grow with – the growing industry players, increasing competition, undergoing learning curve, increasing economies of scale - so that one day it can reach its selling price that it can compete with power plants with non-renewable energy, or reaching parity, without the need of massive fiscal incentive support.

**Establishment of Business Entities of Electricity Buyers and Subsidies**

Other forms of intervention contained in Perpres No.4 of 2016 jo Perpres No. 14 of 2017 is the establishment of business entities of buyers of electricity from EBT plants up to the electricity is then sold to PT PLN. PT PLN will still be able to buy at prices that will not increase national average BPP. On the other hand, EBT generators can sell at a financially feasible price. However, these mechanisms require substantial fiscal support, at least for state investment in the framework of the establishment of the enterprise. With the limitations of the current fiscal capacity and the need for approval from DPR, this option is difficult to realize in the near future.

The same is true of subsidy policy. Until now, the subsidy that can be approved by DPR is a directed subsidy to the most needy, namely the weak economic group. If the subsidy is aimed at the developer of the EBT generator, this can not be said to be a subsidy.

**Government Support In Accordance with Presidential Regulation No. 38 of 2015**

Government support can also be provided through the application of Perpres No. 38 of 2015 on KPBU for Infrastructure Provision. This support is in the form of the availability of Viability Gap Fund, Project Development Facility and Infrastructure Guarantee from PT PII. In relation to efforts to accelerate EBT investments in the power generation sector, Figure 1 shows there are two regulations at the level of Perpres that can be used as a basis for providing fiscal and non-fiscal incentives. The first is Perpres No. 4 of 2016 jo Perpres No. 14 of 2017 on the Acceleration of PIK, the second is Perpres No. 38 of 2015 on the KPBU in the provision of infrastructure. The comparison between the two is shown in Table 2.

\textsuperscript{17} Will be discussed in the next section "Lesson Learned from India and Thailand"
Table 2: Comparison Between PIK Regulation and Perpres 38

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Perpres PIK</th>
<th>Perpres KPBU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperation agreement</td>
<td>Power Purchase Agreement (PJBL) between PT PLN and PPL or subsidiaries</td>
<td>PJBL is a KPBU Cooperation Agreement between PT PLN as Responsible Party on Cooperation Project (PJPK) with Business Entity</td>
</tr>
<tr>
<td>Fiscal Incentives</td>
<td>Fiscal incentives (PPH, PPN, and import duties) are available for the EBT power generation sector</td>
<td>Fiscal incentives (PPH, PPN, and import duties) available for the EBT power generation sector of KPBU scheme</td>
</tr>
<tr>
<td></td>
<td>No VGF (Viability Gap Fund)</td>
<td>Can be given VGF (Viability Gap Fund)</td>
</tr>
<tr>
<td></td>
<td>PPL may be granted through a Business Feasibility Certificate (SJCU / BVGL). Subsidiaries are granted SJCU / BVGL guarantees</td>
<td>Business Entities may be granted Infrastructure Guarantee through Business Entity Infrastructure Guarantee (BUPI)</td>
</tr>
<tr>
<td></td>
<td>No PDF (Project Development Facility)</td>
<td>PT PLN as PJPK can get project preparation facility KPBU (Project Development Facility / PDF)</td>
</tr>
<tr>
<td>Non Fiscal Incentives</td>
<td>Can be given non-fiscal incentives support by Central Government and / or Local Government in accordance with their authority</td>
<td>Can be given non-fiscal incentives support by Central Government and / or Local Government in accordance with their authority</td>
</tr>
<tr>
<td>Business Entity Selection</td>
<td>Selection / Direct Selection. Direct appointment for PLTSa and PLTP</td>
<td>Competitive tender</td>
</tr>
</tbody>
</table>

The current KPBU scheme is still not widely used for the provision of power plant infrastructure. Until now, the application of Perpres 38 of 2015 in this sector is only at one power plant, namely coal-based coal-fired power plant (PLTU) in Batang, Central Java with a capacity of 2x1000 MW. Nevertheless, this scheme has a form of support in the form of VGF that can be utilized to overcome the problems where FiT can not be enacted. In this scheme PT PLN acts as the PJPK preparing and then transacting the EBT power plant project.
Lesson Learned from India and Thailand

India and Thailand are two of the countries that succeeded in accelerating EBT investments amid the challenges that exist in each of these countries. There are at least four similar things in both countries that support such success: (1) strong political support for the EBT sector; (2) available internalization mechanism of externalities; (3) fiscal and non-fiscal incentives to develop markets and reduce the price of EBT economy; and (4) access to financing of EBT.

Political Support

Prime Minister of India is a supporter of EBT, especially solar power. He uses his political power to encourage the development of EBT both at national and state levels. Each state has a targeted EBT mix in line with the national mix targets. In addition, there are several institutions and arrangements established to encourage the implementation of EBT:

- Solar Energy Corporation of India Ltd. (SECI) is a company established and regulated by the Ministry of New and Renewable Energy of India in 2011. SECI aims to facilitate the implementation of Jawaharlal Nehru National Solar Mission (JNNSM) which has ambitious targets to provide 20 GW of solar energy connected to power grids as well to reduce the cost of producing electricity from solar power. JNNSM is implemented through: (1) long-term policies; (2) large-scale procurement; (3) aggressive research and development; (4) production of critical materials, components and products in the country. The goal of JNNSM is to make India a global leader in solar power.

- Once the solar sector has grown, SECI shifts its focus on EBTs to power other than solar power.

- To develop large-scale markets, state Electricity Regulatory Commissions (SERC) in the states to apply Renewable Purchase Obligations (RPOs) in the form of percentage of electricity purchases from EBT to be performed by electric distribution companies (Distribution Companies / Discoms), open access consumers above 1 MW and captive customers above 5 MW. To meet these targets, entities subject to RPOs may: create an EBT generator for their own use, purchase from another EBT generator, or purchase Renewable Energy Certificates (RECs).

- REC is a green attribute of electricity generated from an EBT generator. REC can be traded separately from its electricity commodities, including through the stock exchange.
There are still many Indians who do not have access to electricity yet (about 215 million people).

Political support for EBT in Thailand is not too difficult because the primary energy price difference is not too far apart, especially when compared to gas as primary energy is dominant in power plants. In addition, EBT plants do not replace fossil generators, but to balance energy needs. The development of EBT in Thailand has passed through several phases. The era of 2002 - 2007 was the time EBT generators were heavily dependent on incentives and isolated, not connected to power lines. In 2007 - 2010, incentives were applied based on the type of technology and using the “adder”, a certain amount paid to the power plant over the tariff paid by the power company. This policy increases the interest of investing in EBT and leads to an increase in the amount of PPA. In 2010 - 2017, there was an excess of quotas of EBT and a lack of transmission capacity to channel the capacity. Incentive in the form of "adder" is then converted to Fixed Price FiT.

Incentives provided by the Government to build solar power plants do not always get community support, especially if there are other urgent needs such as protection against floods. Big portion of imported components on this technology is indirectly considered as "adder" provided by the Government and a subsidy for foreign companies. But today these difficulties have been mitigated by holding round table discussions with industry and banking sectors to identify potential problems before the Government launches a new policy. This is to anticipate the challenge and ensure that the policy can be implemented properly.

Thailand also has a mechanism to internalize the externalities of the Energy Conservation Fund, whose funds are derived from the Government's levies on revenue from petroleum products. The collected funds are used for the promotion of EBT and energy efficiency.

**Mechanism of Internalization of Externalities of Fossil Energy**

One of India's ways to meet INDC is to apply coal cess (carbon tax) to coal-fired power plants as a major contributor to CO2 emissions. Funds collected are called National Clean Energy Fund which is then used to provide incentives on EBT power generation projects.

The Thai government established the Energy Conservation Fund (ENCON) in 1992 to develop energy efficiency and EBT projects. The source of ENCON funds comes from the Government's
levy on revenue from petroleum products. ENCON's Objective Fund is to provide access to capital loans, develop the ESCOs (Energy Service Companies) market, boost private investment, and increase financial confidence in the Energy Efficiency and EBT sectors. In 2003, ENCON funded the Energy Efficiency Revolving Fund managed by the Department of Alternative Energy Development and Efficiency (DEDE) and was accessible by banks to provide financing to EBT or energy efficiency projects. In addition, in 2008 ESCO Fund was established to provide funding related instruments such as: equity, venture capital, leasing, partial credit guarantee, carbon credit trading, and technical assistance.

Fiscal and Non-Fiscal Incentives To Lower EBT's Economic Price

The economic cost of EBT plants in India and Thailand was initially high, but is purchased with appropriate FiT (or "adder" during the period before 2011 in Thailand). The amount FiT can be reduced by providing fiscal incentives in the form of income tax deduction, accelerated depreciation implementation, deduction of import duty and VAT for import of certain goods, including tax holiday.

Nevertheless, the decrease in FiT is driven more by the growth of the EBT power plant market and its supporting industries and the increasing economies of scale. For the reduction of FiT reverse action was applied so that the amount of FiT further declines. In India FiT for solar power continues to decline to date at USD 3.81 cents / kWh (INR 2.44 / kWh) due to the following factors:

- Falling price of solar panels (India not applying TKDN)
- Adoption of reverse auction that decreases FiT over time
- Economies of scale of projects and solar parks
- Lower the cost of EPC
- Guaranteed purchase from off taker
- The entry of big players (foreign) to this sector

The current challenges are land acquisition and the gap between the infrastructure capacity to evacuate with the planned capacity increase. For the latter there are plans to develop the Green Energy Corridor to evacuate electricity production from EBT plants to load centers.

In Thailand, the initial application of FiT is designed to Very Small Power Producers (VSPP) (<10 MW). In 2011 FiT was also applied to Small Power Producers (SPP) (<20 MW). All contracts...
In recent years, the development of the EBT sector has been growing rapidly in Thailand. The problem faced today is a lack of transmission and connection capacity to power electricity from EBT plants.

Concerns about the uncertainty of the intermittency of the EBT generator leads to the issuance of a policy in 2017 to support PPA with more than one hybrid source (EBT). A hybrid SPP (10 MW - 50 MW) may earn a 'firm' contract purchased continuously at any time during PPA. While VSPP (<10 MW) can only get PPA 'semi-firm' contract, which must provide 100% capacity during peak and maximum 65% at off-peak. Therefore, VSPP requires storage.

The issue of EBT costs is being resolved by reverse auction with a large penalty if the winning bidder does not fulfill his promise. The first reverse auction for FiT hybrid planned for October 6, 2017, will show whether investors are willing to accept the risk of such tariffs. But the price of FiT seems to be too low (5.4 cents / kWh) so that those who will join possibly companies associated with the Government hoping to benefit from other sources.

Board of Investment Thailand offers incentives for EBT in the form of:

- Investment promotion (announcement of BOI No. 2/2557): corporate income tax for service and public utilities company, 0% for 8 years
- Increased production efficiency (announcement of BOI No. 1/2557): reduction of corporate income tax on revenues from ongoing projects, amounting to 50% of total investment

In recent years, the development of the EBT sector has been going rapidly in Thailand. The problem faced today is the lack of transmission and connection capacity to power electricity from EBT plants. On the other hand, if the Government slows down the current EBT sector, the private sector will get into trouble. Another challenge in Thailand is the huge licensing problem.

Financing Access for EBT

The largest source of financing for solar rooftops in India comes from the Development Finance Institutions that indirectly finance most through commercial banks. In addition, private equity players and international pension funds are becoming interested in this sector. India's central bank seeks to develop a green bond market that will offer a yield of around 7% -8% in the national currency (Rupee). This figure attracts many investors to finance EBT through bonds.
In Thailand, financial institutions issued new funding products in response to government policy in EBT policy and energy efficiency since 2003. Among them are: National Innovation Agency, Bualuang Green Loan, Clean Energy Loan (CIMB), Top-up Loan for Energy Saving, K-Energy Saving Guarantee Program, KTB Green Loan, KTB Investment Loan for Private Sector, and KTB-Energy Saving. In addition, as described in the previous section, Thailand also has an Energy Conservation Fund whose funds are derived from the Government's levies on revenue from petroleum products. The collected funds are used for the promotion of EBT and energy efficiency. Various programs are funded by the Energy Conservation Fund, including on lending soft loan through commercial banks, tax incentives and investment grants.

Box 2: Development Potential of Rooftop Solar in Indonesia

**Development Potential of Rooftop Solar in Indonesia**

In addition to coal, Indonesia has a focus on developing renewable energy from geothermal and micro hydro in energy mix. At the same time, solar energy has a choice of strategy as an alternative energy source, where solar energy has enormous potential in Indonesia considering the location of Indonesia which lies on the equator. Realizing this potential, Indonesia has launched several schemes to accelerate the development of solar power, both on-grid and off-grid, such as:

1. The Solar PV 2025 National Scheme, which focuses on the development of 1.5 GW through 2025 with approximately 554 MWp off-grid capacity and in urban areas.
2. In 2010, PLN launched a national program for solar PV deployment
3. In 2013, the government issued a Feed-in Tariff policy for solar PV at a price of USD 0.30 / kWh.

However, the rate of execution of such schemes slows down. Given the development of solar power has achieved significant success in some countries, including countries in Southeast Asia, solar power should be a focus area of renewable energy development in Indonesia.

Until now, both the Government of Indonesia through the Ministry of ESDM and PLN is very focused on the development of renewable energy in a centralized manner. Meanwhile, based on global experience, there is a decentralized model approach to the dissemination and development of renewable energy.

For a decentralized model, such as solar rooftop, or an open access model to be successful, it is crucial that certain rules support this model. Indonesia currently has several rules that can support the model, among others:

1. For open access, power wheeling will become the main pre-requisite. In Indonesia alone, power wheeling regulation already exists but no implementation mechanism has been
determined by the government. Power wheeling regulations will make it easier for business actors to develop solar rooftop business plans.

2. Based on Regulation of Minister of ESDM No. 1 of 2017 on parallel operation of power plant with PT PLN power grid allows to perform capacity charge for captive power. Based on the regulation, there is a capacity charge regulated for all industrial and commercial customers who have a higher load than the threshold. It is important to make sure that this rule is adjustable to ensure the capability of power derived from solar rooftop.

The development of solar rooftop based on several parameters is as follows:

1. Promotion of renewable energy in the energy mix: with the existence of a clear national program, solar rooftop can help create the number of solar power usage installations.

2. Land: with modular form, decentralized development does not require large land and has no challenge in land tenure.

3. Distribution companies: Indonesia does not recognize unbundled services. The electricity supply is done entirely by PLN. However, the net metering model can be introduced and is a appropriate model to Indonesia's condition, which imposes a price limit on purchasing electricity from renewable energy. Another alternative is to impose a net billing, whereby net billing can provide a cheaper cost of purchase (compared to PLN's electricity production cost) if it is well prepared, both infrastructure and regulation.

4. Investors: the rooftop model provides a higher IRR than utility-scale solar PV with inflation-adjusted rates.

5. Financial: incentives are needed to increase the project's investmentability but do not require subsidies. Adequate infrastructure support by PLN is also needed to facilitate business actors to develop solar rooftop.

Overall, solar rooftop can be one of the alternative and attractive approaches for Indonesia to achieve energy mix targets at a more cost-effective cost. This approach, of course, requires technical support, commercial, funding, and risk mitigation programs as well as capacity building to all involved parties.
Development of Fiscal & Non-Fiscal Incentives

The fundamental challenge in the development of EBT in Indonesia is the relatively high cost compared to the allowed selling price (which is limited by 85% local BPP or 100% of the national average BPP, in accordance with Ministry ESDM Regulation No. 50 of 2017). Given the estimated selling price will not change in the short to medium term, here are three ways for incentives that can be used to support EBT:

- Increase the purchase price of EBT power plants in accordance with its current economy while offsetting its impact on PT PLN to be able to overcome the increase of electricity selling price and/or electricity subsidy.
- Reduce the cost of electricity production of EBT plants so that the selling price of electricity is in accordance with the current Government stipulations.
- Identify additional sources or alternatives that can increase revenues for an EBT power plant so that it becomes financially feasible.

The first way is not possible to do at this time. Therefore, the discussion in this section looks at the possibility of reducing the cost of generating EBT or increasing its revenue through fiscal and non-fiscal incentives. The previous section has exposed the potential of fiscal incentives in the form of tax incentives. The assumptions used in developing the above two ways are as follows:

- Policies involving new subsidies to EBT developers financed from the state budget, are currently possible. Therefore, new funding options, grants and soft loans have not been considered. However, more effective use of subsidized budget is still considered.
- Policies to internalize the cost of externalities of fossil fuel generation (e.g., carbon prices) are currently not possible because of their effect on the amount of basic electricity tariffs.
- The electricity sales levy policy which is then used to fund the purchase of electricity from an EBT generator is also unlikely at this time because of its impact on the electricity tariff.

The discussion undertaken in this section also refers to the experience of India and Thailand in developing incentive mechanisms. Potential incentives applied in these countries are identified, elaborated and sought for suitability of implementation in Indonesia. At the end of this section are shown incentive ratings based on the suitability of implementation and resulting impact. The types of incentives are limited to those that can be offered to power plants connected and export power to the PLN transmission system. Tax incentives are not developed in this section.
Reduce Costs

Solar Parks

Solar Park\textsuperscript{18} is a location developed to accommodate multiple individual solar plants with different owners. This location provides a general place and infrastructure at a cost divided among all the power stations in place. In addition to aiming to achieve the economies of scale, solar parks also provide the means to channel transfers from the central government to regional governments for the development of EBT projects.

\textit{Indian Experience}

India has had significant success in developing large scale solar power projects through government initiatives in building solar parks. The benefits of this central government grant also reduce costs through the sharing of facilities and faster land acquisition.

In Indian models, solar parks have a size of 500 MW or more provided by State Governments either through their own institutions or in partnership with national bodies established for this purpose\textsuperscript{19}. Central Government grants are available up to Rs1.2 million / MW (\textsim USD 0.184 / W) or 30\% of project costs to fund land acquisition and general infrastructure\textsuperscript{20}. The remaining funds come from fees imposed on project owners within the park and from the State Government. Current developers pay solar park fees around USD 0.06 / Watt (W) to USD 0.16 / W, varying by state and park. But these costs are reportedly increasing and some developers complain

\textsuperscript{18} While, in principle, wind parks can also be developed, this will require a much wider land. Estimate of National Renewable Energy Laboratory (NREL) in the United States is that a grid-scale PV project requires 3.2 hectares for the average of 1MW capacity (total area within the border fence). A 500 MW solar park, therefore, will require a land of about 16km\textsuperscript{2}. The approximate land area required for wind farms is very wide depending on the size and layout of the turbine among others. However, a reasonable estimate is 12-16 hectares for 1MW capacity (total area within the border fence). A 500 MW wind farm, therefore, will require an area of 70-80km\textsuperscript{2}.

\textsuperscript{19} Description of funding arrangements and eligibility requirements is available at: http://mnre.gov.in/file-manager/UserFiles/Scheme-for-enhancement-of-capacity-to-40GW-Solar-Parks.pdf (accessed on September 26, 2017)

\textsuperscript{20} Description of funding arrangements and eligibility requirements is available at: http://mnre.gov.in/file-manager/UserFiles/Scheme-for-enhancement-of-capacity-to-40GW-Solar-Parks.pdf (accessed 26 September 2017)
about inadequate infrastructure available, high up-front costs and lack of transparency in the process of pricing determination\textsuperscript{21}.

World Bank estimates - as part of a loan assessment to support the solar park program - the cost at the pilot solar park is USD 0.09 / W for land and shared infrastructure inside the park, including tax\textsuperscript{22}. Government grants are assumed to cover 30% of the cost of capital with the remainder and all operational costs are financed from the costs imposed on the developer. World Bank estimates, typically, the cost is around Rp0.4-0.5 million / MW (~ US $ 0.06-0.08 / W) or saving as much as USD 0.03 / W.

The Government of India also provides short-term incentives for EBT power plants, especially Solar PLT, which is conducted on the basis of competitive auctions and distributes electrical energy through interstate transmission channels. These incentives include the elimination of charges or losses on the use of interstate transmission\textsuperscript{23}.

\textit{Potential applications in Indonesia}

To apply the Indian model in Indonesia means the Provincial Government is responsible for developing the solar park with financial support from the Central Government in the form of transfers to the regions. Currently there has been APBN assistance from the Central Government for Local Government in the framework of developing small-scale EBT projects for rural electrification\textsuperscript{24}. However, if this transfer can be reallocated, the cost is sufficient to finance an expansive solar park policy.

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{24} Physical Special Allocation Fund (DAK) on rural energy sector / small-scale energy, in the year 2011 - 2017 is accumulatively around Rp. 3.1 trillion (source: presentation “Results of APBN Assessment Analysis for EBT Development”, PKAPBN BKF, Ministry of Finance, 29 September 2017)
\end{itemize}
\end{footnotesize}
Achieving targets in RUEN 6.5 GW of solar capacity by 2025 will imply a need to install an average of 800 MW of new solar capacity annually. The World Bank study cited above estimates a USD 46 million fee for a solar park capable of accommodating 500 MW. If the scale reaches 800 MW and assuming that 30% of this cost is funded from the Central Government grant it will require an annual budget of Rp 300 billion. By comparison, APBN expenditure for EBT infrastructure development by Directorate General of EBTKE of the Ministry of ESDM in 2016 reached Rp. 1.73 trillion. While the physical DAK assignment of rural energy / small-scale energy sector in 2016 is Rp. 677.5 billion. The allocation of some of these budgets can help the development of solar parks by the Regional Government.

Provincial Government is expected to establish a Business Service Agency (BLU) or BUMD to manage land acquisition, finance the procurement of the land and responsible for site preparation and management. In return, the BUMD will get the rental receipts paid by the developers located in the park including the appropriate margin and, if necessary, return it to the Provincial Government. This margin, in turn, provides incentives to the Provincial Government to support and facilitate the establishment of the next solar park.

Shared Transmission Infrastructure
In locations with multiple EBT projects under development, there is an advantage of sharing the transmission infrastructure. This will reduce the costs of the developers of these projects as well as avoid duplication of infrastructure, reduce the need for land acquisition and support higher voltage connections resulting in lower losses.

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25 It is also possible to access the designated Indonesian Asset Management Agency (LMAN) for land acquisition for strategic projects, especially those involving private partners.
26 This will require further review. With Presidential Regulation 38/2015, the Government obtained land for the KPBU project. The cost of land acquisition is financed by the state budget or region and is repaid by the business entity using the land. In this case, solar projects will be sold to PLN (PJPK) but use the land provided by the Regional BUMD. Therefore, it is not clear whether the initial cost will be funded by APBD or PLN and, consequently, who will be repaid for this.
Indian experience

In the Indian solar park model, the construction of a transmission connection is the responsibility of utility companies owned by the central or state government with Government grants available up to 30% of the cost of the transmission infrastructure. Further funding support is available under other schemes\(^{27}\) to support utility companies in building new infrastructure and to make solar power prices down.

More radical options are implemented elsewhere, such as establishing new entities to build and having shared transmission connections for EBT plants\(^{28}\). However this is difficult to achieve with the existing legal framework, which gives PT PLN a monopoly on transmission.

Potential applications in Indonesia

Currently, in Indonesia, EBT developers must bear the transmission infrastructure costs from their location boundaries to PT PLN's network. These costs are reimbursed through a separate component in the purchase price of PPA (Component E), which is additional in nature and not calculated against the price limit under BPP.

PT PLN can make arrangement on the transmission infrastructure provided by the newly developed project at the site and has accommodated the capacity also required by future EBT generators at the same location. The first developer does not have to worry because the higher initial cost is fully reimbursed through Component E of the sale price. In this case, PT PLN gains profit because the higher cost charges on the first project will be compensated more by lower cost in the subsequent projects.

However, in practice, PT PLN may have doubts to implement this. There is uncertainty over the timing of implementation and / or generating capacity of the next EBT to be built at the site. This raises the risk of too high transmission development costs compared to what is actually needed. On the other hand, the EBT developers may also be worried if the generators are the first project

\(^{27}\) For example, the Green Energy Corridor initiative is using soft loans to finance specific transmission links for renewable energy generation.

\(^{28}\) For example, in the UK, the regulator (Ofgem) coordinates the development of offshore wind transmission connections that are then auctioned competitively to private operators.
in the location, the actual cost will be much higher than the follow-up projects at the location because they also have to burden funding of the connections for all those projects.

In order to overcome this, the Minister of ESDM may approve PT PLN's plan to determine the capacity of the transmission connection by considering a rational estimate of future plans for the development of future EBT plants in a particular location. This will reduce the risk for PT PLN against criticism due to excessive cost allocation for transmission infrastructure.

Theoretically there is another way, where the Central Government directly finances part of the cost of shared transmission infrastructure for EBT projects, such as in India. However, no such mechanism is currently available in Indonesia.

Suspend the requirements of the domestic content level

The requirements of domestic content level (TKDN) for hydroelectric power and solar power (although not for winds) are stipulated in Regulation of the Minister of Industry No. 54 of 2012. For hydroelectric power plants with a capacity of up to 15 MW, the combined portion of local goods and services must be bigger than 70.76%, for hydroelectric power plants between 15 MW and 50 MW, the portion should be bigger than 51.60% and for solar projects sold to PT PLN must be bigger than 43.85%\(^{29}\). Based on ESDM Regulation No. 19 of 2016, failure to verify compliance with the requested requirements will be subject to sanctions for reduction of power rates (equal to the difference between the actual and minimum required content\(^{30}\)).

There have been various media reports showing that the requirements to meet the TKDN incur costs and reduce the viability of the EBT project and in particular, solar projects. Local production capacity is generally small scale which results in higher costs than imports other than unreliable quality\(^{31}\).

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\(^{29}\) The regulation also includes larger hydroelectric projects, solar systems, coal-fired power plants and gas.

\(^{30}\) For example, a solar project with a combined domestic goods and services of 40% will be subject to sanctions amounting to 3.85% reduction (minimum required share of 43.85% less than 40% actually achieved).

\(^{31}\) In the interview, solar power plant developers report total solar module production capacity in Indonesia of 825MW of which only 60MW (owned by Canadian Solar) is considered capable of delivering the required quality products.
Indian Experience

India’s experience shows that TKDN is largely ineffective in increasing domestic inputs but increasing costs. Initially, TKDN auctions and open auctions (using imported components) are held at a price or higher subsidy paid based on a TKDN auction. However, the number of TKDN auctions goes down to less than 10% of total auctions due to the difference in the price between Chinese imports and domestic production equipment, estimated at 10-15%\(^{32}\). By 2017, imports from China are expected to meet 84% of module requirements while domestic producers only 12%\(^{33}\). Domestic module manufacturing capacity utilization rate is estimated to be only 25% and most of this capacity is outdated and small in scale.

In response to the World Trade Organization (WTO) decision, all TKDN auctions will expire in December 2017\(^{34}\). The Indian government is exploring some form of incentives that will continue but will not be a preferential auction.

Potential applications in Indonesia

The purpose of TKDN is to promote the development of domestic production capacity. However, higher costs and quality of domestic products that are not yet fully reliable at present have the effect of inhibiting the accelerated investment of EBT development, and the limited development of markets that is supportive of increased production capacity.

To address this, it is recommended to loosen the TKDN requirements for EBT technology for several years... once the market is sufficiently developed, the requirements of TKDN can be re-applied.

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Such relaxation can be indirectly done by amending the Minister of ESDM Regulation No. 19 of 2016 on Purchase of Electricity from PLT Surya Photovoltaics by PT PLN with price reprieve due to failure to meet TKDN. Suspension may be associated with time (for example, over five years) or associated with achieving a specific benchmark (e.g., installed solar capacity increased to 5,000 MT).

**Increase Revenue**

*Viability Gap Fund*

Most of the new large-scale EBT plants will be developed by private investors. Indonesia has a Government support mechanism to enhance the financial feasibility of the KPBU project in the form of a Viability Gap Fund (VGF) managed by the Ministry of Finance to finance up to 49% of eligible project construction costs. As this is a mechanism already available and not a new mechanism, the EBT project that have access to it will not conflict with policies that avoid a new subsidy form.

To be eligible for VGF-based support, the project must be economically viable but financially unfeasible, and for that VGF is used to close the gap between cost and income. Eligible projects should have a total investment cost of Rp 100 billion or more\(^{35}\), funded on the principle of user pay, awarded through competitive bidding processes and developed based on BOT arrangements. The PJPK (in this case PT PLN) first requests the principal approval from the Minister of Finance, then approves the proposed (or 'cap') VGF amount and finally, after the tender, approval for VGF grant\(^{36}\). At each stage, the VGF Committee within the Ministry of Finance shall review and make recommendations to the Minister.

Under the current arrangement, there are two obstacles to the EBT generating project accessing VGF support. The first is a legal matter. Under Ministry ESDM Regulation No. 50 of 2017, EBT developers are selected through the Direct Selection procedure (similar to 'shopping procedure'...

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\(^{35}\) This is equivalent to about US $ 7.5 million. Most EBT plants with a capacity of 10MW or higher will meet these criteria.

in which two or more developers are invited to submit prices directly) except for the Municipal and Geothermal Waste project where the Direct Appointment procedure applies (where a sole developer is invited to negotiate price). Both of these mechanisms appear to be incompatible with competitive procurement procedures for KPBU based on Perpres 38/2015 requiring prequalification followed by tender\textsuperscript{37}. The second is a practical matter. The VGF granting mechanism that involves the committee will take up too much resources if it is only used to process some of the proposed small-scale projects for VGF support.

\textit{Indian Experience}

In India, VGF support for solar power is available in three stages, for 750MW, 2,000MW and, most recently, 5,000MW. With mechanisms applied for the 5,000 MW stage\textsuperscript{38}, SECI first makes contract with offtaker to obtain full capacity to be purchased at each round of tender at a reference price plus a margin. The reference price is set at Rs4.50 / kWh (USc6.85 / kWh) except in the state where auction has led the price to go below this level, in this case set at Rs4.00 / kWh (USc6.09 / kWh)\textsuperscript{39}. SECI then held a reverse auction to select the developer based on the lowest requested VGF support (at Rs10 million / MW or ~ US $ 0.15 / W\textsuperscript{40}). Selected developers go to PPA with SECI at a reference price.

\textit{Potential applications in Indonesia}

Similar models with India can be followed in Indonesia. First it is necessary to amend of Minister of ESDM Regulation No. 50 of 2017 thus enabling competitive bidding, while trying to maintain the current reference price. Large-scale EBT generators / utilities will then be obtained through a competitive tender procedure in accordance with Perpres 38/2015, which enables them to qualify as qualified KPBU for VGF support.

\begin{itemize}
\item First it is necessary to amend Minister of ESDM Regulation No. 50 of 2017 thereby enabling competitive bidding ....
\item The purchase price of electricity shall be determined in accordance with the provisions of Minister of ESDM Regulation No. 50 of 2017 ....
\item The VGF closes the gap between those prices and the financial feasibility of EBT plants.
\end{itemize}

\textsuperscript{37} Perpres 38/2015 permits Direct Appointment where only one eligible bidder or where the KPBU represents an extension of the existing facility or requires the use of technology or land which can only be provided by one entity.


\textsuperscript{40} The higher capitalization of RS12.5 million / MW (US $ 0.19 / W) applies to the DCR auction
In the tender, PLN then follows the Indian approach by imposing reverse auction for EBT
generating quota (where quotas are determined by existing VGF allocations) with bidders
selected on the basis of the lowest VGF demand. The purchase price of electricity shall be
determined in accordance with the provisions of the Minister of ESDM Regulation No. 50 of 2017
(ie, at a maximum of 100% of the national average BPP or 85% of regional BPPs). Since
applications for VGF support will be made for a small number of multi-project auctions, it is
possible to speed up the approval process.

Such a mechanism would make the purchase price of PLN to the EBT plant unchanged from the
Minister of ESDM Regulation 50/2017 because VGF closes the gap between the price and the
financial viability of the EBT generator. By using competitive bidding to allocate VGF support, it
is also possible to minimize the budget used.

The effectiveness of VGF support in encouraging EBT projects will depend on the availability of
funds. The draft of 2017 APBN allocates only Rp0.5 trillion (US $ 35 million) to VGF 41. However,
this is not the total allocation number of VGF in the APBN because it depends on the agreed
payment schedule. The 2017 APBN is allocated to the Water Supply System (SPAM) project in
accordance with the 2017 payment schedule.

The amount to be used to support EBT development is quite measurable. Suppose for a solar
power plant, the achievement of the RUEN target of 6.5 GW in 2025 requires VGF support
around USD 70 million or Rp 950 billion annually. Surely additional funds will be required to
incorporate other EBT technologies but an allocation of up to US $ 100 million per year should
be sufficient.

Qualification as a KPBU project under Presidential Regulation 38/2015 will also enable the EBT
generating project to access existing guarantees through PT PII. This will safeguard the

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41 See Box 1 at https://www.pwc.com/en/en/cpi/asset/indonesian-infrastructure-stable-foundations-for-
growth.pdf (accessed September 27, 2017)

42 The calculation of the VGF support assumption includes the difference between the price of US $ 7.4 /
kWh (national BPP average in 2016) and the average cost of US $ 8.5 / kWh (equivalent to US $ 0.85 / W
investment cost) for a total of 6.5GW installed over eight years.
Box 3: One-Roof Information Center

In addition to VGF funds, there are various funds and other support facilities that can be accessed by EBT plants. This includes the Availability Payment mechanism, the Business Feasibility Certificate (available for the project in FTP2), guarantee fund at PT Penjaminan Infrastruktur Indonesia (available for the appropriate KPBU Perpres 38/2015 and Perpres 78/2010) and the Geothermal Fund Facility managed by PT SMI. In this report, a detailed review of these funds and facilities has not been done in detail. However, there should be a one-stop information center designated to keep records of all funds and facilities accessible to the EBT with eligibility criteria, availability amount, application process and contact details. This will allow developers to quickly identify which facilities may be open to them and to investigate further. This is like the existence of the Joint Office for infrastructure projects in accordance with Perpres 38/2015.

Direct appointment for EBT generators 'firm'

Currently, PT PLN does not have an explicit quota for procurement of EBT plants due to cost implications. This concern, in relation to direct purchase costs, has been addressed by Ministry of ESDM Regulation No. 50/2017. However, PT PLN also still has concerns over large but intermittent (wind and solar) power plants connected to its network as it can increase operating costs and, worst of all, threaten the stability of the system.

Although such concerns may be excessive (there is no consensus in Indonesia or internationally on how much decent renewable energy penetration rates so that it does not need to redesign the network), the risk needs to be reduced. There may also be areas that have operational transmission challenges although overall grid penetration is still low. If these problems can be addressed, taking into account the direct costs required to overcome this, it will be possible to enforce quotas for EBT for PT PLN without jeopardizing its financial position.

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43 The Ministry of Finance may also issue a Business Viability Assurance Letter which appears to provide sufficient security to the creditor. However, the eligibility for these letters under Presidential Regulation 14/2017 is limited to power projects included in the 35GW Program.
Thailand experience

The new ‘firm’ and ‘semi firm’ Thailand firm F iT provisions can provide a model of how intermittent concerns can be addressed. In this setting, the EBT generator remains eligible for FiT. However, they are required to meet specific requirements regarding generator profiles.

During peak hours (09.00-22.00) the plant must reliably deliver 100% of their contract output. Failure to do so causes sanctions. Outside peak hours, the plant must reduce output to 65% of the contract rate. Output larger than this is sanctioned. This avoids concerns on high cost due to the need to replace the supply of electricity from intermittent generators at peak hours and on the other hand there is oversupply at off-peak. This scheme is explicitly aimed at promoting the development of combinations of biomass and solar power plants with battery storage. The battery can be charged at night (note to pack Bely: is not upside down, the battery should be charged during the day to be used at night) and then used to ensure reliable supplies during the day if the solar power plant is compromised.

Potential applications in Indonesia

With this option, the price under Regulation 50/2017 will remain in effect. However, the EBT plant will be able to get ‘firm’ commitment from PT PLN as in Thailand. To do so, PT PLN is obliged to make contract based on the price set out under Regulation 50/2017 (with a limit up to 100% of the national BPP average) without the need for further negotiation or competitive selection process (ie direct appointment rather than direct election). This will provide avenues for EBT plants that can offer robust inventories and incentives for EBT generators to explore options to improve output reliability. At the same time, it will reduce costs for PT PLN to manage the integration of EBT plants into the network.

Direct sales through Power Wheeling mechanism

The last incentive to be considered, with reference to the Indian example, is to enable direct sales by EBT generators to customers through PT PLN (wheeling) network. Such direct sales provide an opportunity for EBT generators to target customers who are willing to pay a premium for ‘clean’ energy.

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44 The company’s FiT applies to power plants from 10MW to 50MW and throughout the year. Semi-firm FiT applies to plants with a capacity of less than 10MW and only for six months of summer with the highest demand. Tariff descriptions are available at: http://www.epco.go.th/images/Infromation_service/NEWS/2017/06Jun/08Jun/PPT-NEPC-hybrid-englishUBM2.pdf (accessed 26 September 2017).

45 FiT is applicable to plants that use one or more eligible technologies. The output of all technologies combined with one meter is used.
would allow an EBT generator to target customers willing to pay a price that completely covers the cost of generation, either because the current PLN tariff exceeds the customer's BPP by a large margin or because this customer is willing to pay a premium for 'clean' energy.

Indian Experience

India offers several routes to the market for renewable energy generation. This includes a captive supply by using wheeling and open access where the plant sells to a third party based on the terms of negotiation and power wheeling through the network. Rules relating to cost implications and balancing arrangements vary from state to state and between state and national level. However, a common issue is that renewable energy generation, in the absence of exemption or discount, generally pays higher transmission costs per unit of energy sold than conventional plants. These costs are calculated on the basis of connected capacity, given that renewable energy generation has a lower capacity factor, making it effectively higher for renewable energy.

At the national level, these shortcomings are realized and ultimately solar generators get exceptions when using inter-state networks of transmission costs so that lost revenue is charged to other users. A number of countries also apply such exclusion schemes or discounts.

For inter-country transactions, wind and solar generators are required to balance scheduled and actual outputs at 15-minute intervals. Deviations from this will be subject to sanctions with increasing magnitude. Sanctions begin with a certain price and will increase to 130% of the fixed price if the deviation exceeds 35% of the agreed output. Fixed price is the price of PPA / PJBL or, if not available, the average cost of the conventional generation purchased by

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46 The market for AKA renewable energy companies is estimated to reach 3.4GW in the United States (as in 2015) and has also grown to Central and South America, the UK and to a lesser extent in a number of other areas. In Southeast Asia, there is one example (Heineken in Singapore which has a 2.2MW contract size). Most of the participating companies are multinational companies with two of the largest Google and Amazon. (See: http://www.wbcsd.org/Clusters/Climate-Energy/Resources/Corporate_Renewable_PPAs_Scaling_up_globally accessed 27 September 2017).

47 Open access allows the plant to claim a renewable energy certificate (REC) while a catch inventory with no boost. These records may be used by state distribution companies to demonstrate compliance with renewable purchasing obligations as an alternative to direct procurement of renewable energy. However, this is very limited because too much supply and preference by distribution companies for direct procurement meaning very low REKAT prices.

the state utility. Each country has similar balancing requirements for inter-country wheeling but the period in which deviations are calculated varies from 15 minutes applied at the national level up to one year.

The wheeling challenge in India is the adoption, by many states, of compensation for state utility companies due to the loss of customers with high margins (used to subsidize cross-cutting household and agricultural customers). This eliminates most of the financial savings that should be realized by customers who buy under open access arrangements.

As a result of these cost deficits, the share of open access sales in India is relatively low. In 2012, it is estimated that open access sales represent 15% of the total power plant. However, 13.5% represents sales of surplus output by captive generators. The rest is sales to third parties and sales through the Indian electricity stock exchange for one day ahead.

**Potential applications in Indonesia**

In Indonesia, power wheeling through transmission of PT PLN and distribution network is pursuant to Minister of ESDM Regulation No. 1 of 2015. However, no regulation has been issued regarding the technical or commercial requirements of such efforts. If no, the plant must negotiate terms and conditions with PT PLN. This makes the EBT generator looking to take advantage of the power wheeling opportunities in a very weak position, especially if it tries to supply customers with high margins that PLN wants to sustain.

Further constraints are, under the 2009 Electricity Law, public electricity supply can only be done by one license holder in each Business Region. In practice, this means that PT PLN holds a monopoly on electricity sales unless it voluntarily delivers this right or if an alternative supplier can point out that PT PLN can not provide a sufficiently reliable or adequate supply. To be able to conduct direct sales through power wheeling, PT PLN must recognize that a new business

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49 The methodology for calculating average cost is available at: http://www.cercind.gov.in/2015/orders/SO15.pdf (accessed September 27, 2017). The current fee used is Rp3.48 / kWh (USC5.30 / kWh).


51 A JICA-funded study makes recommendations on the 2016-raising legislation. However, this has not been developed.
... medium industrial and commercial customers ... with the assumption ... the effective rate is Rp. 1,372.41 / kWh (USD 10.2 cents / kWh) ... exceeds BPP (plus margin) of Rp. 161.28 / kWh (USD 1.2 cents / kWh).

... the potential savings for customers who directly purchase from the plant equals ... USD 1.2 cents / kWh for MV customers. If the savings are evenly shared with the EBT generator ... to rise USD 0.6 cents / kWh above the national average BPP... medium industrial and commercial customers ... with the assumption ... the effective rate is Rp. 1,372.41 / kWh (USD 10.2 cents / kWh) ... exceeds BPP (plus margin) of Rp. 161.28 / kWh (USD 1.2 cents / kWh).

area (e.g., industrial area) is not its business territory or this sale needs to be classified as a captive power plant. If this problem can be solved, then the next question is whether the sale to third parties is worth doing. In September 2017, medium and high-voltage commercial and industrial customers paid the tariff of Rp1,035.78 / kWh on off-peak hours and multiples (1.4 to 2 times) in peak hours. Assuming a multiple of 1.5 times and two-thirds of consumption in peak hours, the effective tariff is Rp1,372.41 / kWh (USD 10.2 cents / kWh). BPP audited for 2016 for medium voltage customers including a 7% PSO margin is Rp1,211.13 / kWh (USD 9.0 / kWh). This implies that the current average tariff for subscribers exceeds BPP (plus margin) of Rp161.28 / kWh (USD 1.2 cents / kWh).

It can be assumed that PT PLN will expect power-generating power plants to use power wheeling paying at least the same cost as BPP's transmission and distribution for the associated voltage levels plus the applicable public service obligation (PSO) limits, which are the missing benefits of PLN. Therefore, the savings potential for customers purchasing directly from the plant is equal to the difference between the current rate and the BPP plus the margin at the supply voltage level or USD 1.2 cents / kWh for the MV customer. If these savings are shared equally with EBT generators, that means consumers are willing to pay for an EBT generator with a national average BPP amount and half of savings from direct supply (at purchase cost and margin paid by customer). This provides an effective price that MV subscribers are willing to pay an EBT generator of USD 9.6 cents / kWh. This will be a USD 0.6 cents / kWh rise above the national average BPP.

For other regions, the price that direct electric buyer pays may be below the prevailing price in Regulation 50/2017. Customers in this area pay tariffs based on national average BPP while EBT generators are eligible to receive prices based on 85% of local BPP.

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52 The Electricity Law allows for the capture of self-consumption. However, it is unclear whether these requirements can be met through the deployment of powers and the extent to which joint ownership of generators and customers is necessary.

53 This assumes that direct customers do not want to pay a premium for clean energy. If yes, then the effective purchase price will be higher.
This calculation can be overly optimistic as an additional revenue potential for EBT generators from direct sales. This is because it does not take into account the costs for PT PLN for the imbalance between actual and scheduled output (as applicable in India) or the cost of reserve stock (as applied for locally generated captive generators).

**Comparison of Incentive Impacts on Solar PLT**

The table below illustrates the impact of the various incentives identified in this section against the difference between the price and cost for a utility-scale solar power plant. Similar calculations can be made for other technologies.

The example shown here is for a 1 MW solar power plant with an investment cost of USD 0.85 / Watt-peak (Wp) and a levelized rate of USD 8.5 cents / kWh. This compares to the national average BPP in 2016 of USD 7.4 / kWh at odds with USD 1.1 cents / kWh. The difference will be smaller for the plants located on the regional network with higher regional average BPP. However, given the large amount of solar power required to meet RUEN targets, most need to be installed on the Java-Bali and Sumatra grids where the benchmarks are the national average BPP. The impact calculations of each incentive are summarized in the table notes.

With assumption the required budget is available and that Minister of ESDM Regulation 50/2017 can be amended to allow procurement through competitive tendering then VGF support allows the difference between cost and price to be eliminated. While there are no other incentives in isolation that can close the difference, except when combined.

<table>
<thead>
<tr>
<th>Incentive</th>
<th>Price (USD cents / kWh)</th>
<th>Cost (USD cents / kWh)</th>
<th>Difference (USD cents / kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base case (Regulation 50/2017)</strong></td>
<td>7.4</td>
<td>8.5</td>
<td>(1.1)</td>
</tr>
<tr>
<td>Solar Park (a)</td>
<td>7.4</td>
<td>8.2</td>
<td>(0.8)</td>
</tr>
<tr>
<td>Shared Transmission Infrastructure (b)</td>
<td>7.4</td>
<td>Not yet calculated</td>
<td></td>
</tr>
<tr>
<td>Delaying TKDN Implementation (c)</td>
<td>7.4</td>
<td>8.0</td>
<td>(0.6)</td>
</tr>
<tr>
<td>Provide VGF Support (d)</td>
<td>8.5</td>
<td>8.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Direct Appointment of EBT Generators ‘firm’ (e)</td>
<td>7.4</td>
<td>8.5</td>
<td>(1.1)</td>
</tr>
<tr>
<td>Direct Sales Through Power Wheeling (f)</td>
<td>8.0</td>
<td>8.5</td>
<td>(0.5)</td>
</tr>
</tbody>
</table>

All estimates are indicative only and depend on the type of technology, capacity and location of the plant.
Notes:
(a) Applying the same savings as estimated for the solar park reference in India of USD 0.03 / W. However, these savings come from assumed access to Central Government grants for 30% of site costs, such as in India. From the available information, it is impossible to determine the extent to which the solar park program can also lower costs through faster land acquisition and sharing of facilities.
(b) The price represents 100% of the national average BPP by 2016. The prices for EBT generators are in areas where local BPP exceeds the national average will be higher.
(c) DCR impact on the cost of solar and hydro power in Indonesia is unknown. However, assuming the cost difference is similar to that in India and applying it to a combined share of 43.85%, the cost savings to relax the current DCR are about 4.5-6.5% of the project cost. For a solar reference project, it is equivalent to reducing the required tariff of USc0.4 / kWh to USc0.6 / kWh, bringing it to USc0.8 / kWh or below.
(d) Assume VGF funding is used to close the gap between cost and price by creating additional revenue sources. Effectiveness is limited by the budget available for VGF support.
(e) No direct price increases but an easier route to the market for an EBT generator is able to offer the firm's offerings.
(f) Estimates for illustrative MV customers, assuming network costs and PSO margins are paid by customers. No allowance is made for possible imbalance costs and other non-network charges applied by PLN. Detailed calculations explained below are description of relevant incentives.

Priority Rating
Here are the indicative priority ratings of the various incentive mechanisms discussed in this section. This is based on an assessment of the ease of implementation and the potential impact on the viability of the EBT project, with greater weight placed on the ease of implementation.

Based on these ratings, steps to expand VGF implementation to EBT through competitive quota auction with offers based on the lowest VGF support payments should be the highest priority. Other relatively simple incentives can be introduced although the impact, in addition to suspending DCR effectively, is relatively low. More complex changes such as introducing a solar park with budget support and direct sales should be considered a lower priority given the longer time needed to introduce it.
Table 4. Ranking of Incentive Priorities

<table>
<thead>
<tr>
<th>Incentive</th>
<th>Implementation (a)</th>
<th>Impact (b)</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Park</td>
<td>Moderate</td>
<td>Moderate</td>
<td>5</td>
</tr>
<tr>
<td>Shared Transmission Infrastructure</td>
<td>Very simple</td>
<td>Low</td>
<td>3</td>
</tr>
<tr>
<td>Suspension of TKDN Implementation</td>
<td>Simple</td>
<td>Moderate</td>
<td>2</td>
</tr>
<tr>
<td>VGF support</td>
<td>Simple</td>
<td>High</td>
<td>1</td>
</tr>
<tr>
<td>Direct Appointment for EBT Generators 'firm'</td>
<td>Simple</td>
<td>Very Low</td>
<td>4</td>
</tr>
<tr>
<td>Direct Sales to Consumers</td>
<td>Difficult</td>
<td>Moderate</td>
<td>6</td>
</tr>
</tbody>
</table>

Notes:

(a) The ease of implementation. Judged on whether a new legal instrument or an amendment to an existing instrument is required and whether this is a regulation or a higher level. The assessment does not take into account potential of institutional rejection.

(b) Impact on EBT viability. Derived from Table 3 above.
Policy Recommendations

Energy legislation has set specific primary energy mix target and reduced emissions of greenhouse gases generated in the electricity sector. But decisions made to date not very supportive of efforts to achieve these targets. It is therefore necessary to establish appropriate policies and regulations for future decisions to quickly reduce the gap between target and achievement.

The mandate of energy as a capital of development and fair energy is essentially in favor of the development of EBT plants. Even Presidential Decree on PIK Acceleration regulates the priority of the use of EBT in the context of efforts to reduce greenhouse gas emissions. But the facts on the ground show that the development of this sector is still not in line with the objective mandated by the legislation.

There are some institutional barriers that cause the above deviation:

1. There is no further regulation related to the development of a national EBT industry that is supportive of the emergence of efficient EBT plants and can compete with non-EBT plants.
2. Definition of Justice Economic policy for energy is still short-term so as not to take into account cross-generational costs as impact of negative externalities and the diminishing resources of unsustainable resources.
3. Regulations related to PT PLN's energy costs are currently short-term - pressing the lowest possible BPP rate - so that when fossil energy prices are low, the development of EBT plants becomes obstructed.

This threatens to derail a plan to reach the energy mix target and reduction of greenhouse gas emissions. There is not enough opportunity space for the EBT generating industry to grow so that it can generate costs competitive with current non-EBT generating plants such as those in India and Thailand. Moreover, the price difference between EBT energy and non-EBT energy is greater in Indonesia than in those two countries.

To overcome this obstacle, there are several things that need immediate action. The following is a policy recommendation that is divided into three sections. The first is related to the implementation of existing regulations. These recommendations can be done quickly and can be expected to get a quick win. Nevertheless, the impact - like some calculations in the previous section - is generally limited. The second is to complement the regulations based on the mandate of energy and electricity legislation. Implementation of this recommendation takes a longer time, but is expected to be completed in less than a year. While the third is to make changes to the implementing regulations not well in line with the energy paradigm as development capital and justice economic policy across generations. This recommendation is linked to political support.
for the development and sustainable use of energy. Its implementation takes time which varies, and depending on the political process required.

First group policy recommendations include:
1. To reintensify socialization of fiscal incentives in the form of: income tax facility, value added tax facility, import duty facility, and government borne tax facility; for the development of EBT plants. Socialization is done by involving simulations of the impact of these incentives on the types of EBT technology and EBT generating sites.
2. Create knowledge sharing forum among regional governments on the experience of providing licensing and non-licensing support in order to accelerate the development of EBT plants in the regions.
3. Support PT PLN to develop planning on the implementation of shared transmission infrastructure for planned EBT plants in selected locations. This plan is then accommodated in RUPTL.
4. Establish an information center on the availability and ways to obtain financing facilities related to climate change mitigation and sustainable development
5. Develop human resources in the banking sector and non-banking financing institutions to be able to evaluate the financing of EBT plants, including in the development of non recourse funding schemes
6. Reduce the risk of investing in EBT generators by: improving cross-sectoral coordination, aligning central and regional government policies, and accelerating the resolution of ongoing EBT generating projects
7. Simplify procedures and increase transparency in TKDN evaluation for EBT generating components

The second group’s policy recommendations include:
1. Immediately complete the completion of the National Electricity General Plan (RUKN) which can be a reference for local governments to make Regional Electricity General Plan (RUKD)
2. Provide assistance to regional governments to make General Plan for Regional Energy (RUED) and Regional Electrificity General Plan (RUKD)
3. Establish regulations for the implementation of EBT industry development that support the achievement of energy mix targets in the provision and utilization of energy, strengthening the national economy and labor absorption, as well as targets for reducing greenhouse gas emissions (sustainable development)
4. Create regulations that provide proper incentives for PT PLN to be able to run the Power Wheeling mechanism so that it opens up opportunities for EBT generators to be able to increase their revenues by making direct sales to customers who are willing to provide premium on ‘clean’ energy.
5. Establish implementing regulations to accelerate the implementation of the Rooftop Solar program and integrate it into PT PLN’s RUPTL
The third policy recommendation group includes:

1. To amend Minister of ESDM Regulation No. 50 of 2017 so as to accommodate the determination of Business Entity based on competitive auction as regulated in Perpres 38 of 2015 so that the selected Business Entity can get VGF support and Infrastructure Guarantee.

2. Identify candidate of EBT generating projects with medium and large capacity to be provided through the KPBU scheme in accordance with Perpres 38 of 2015 so that it is fit with the criteria for obtaining VGF.

3. To amend Minister of ESDM Regulation No. 50 of 2017 so as to accommodate direct appointment mechanisms of EBT generator with the scale of ‘firms’ that can provide supply guarantees that do not impede the stability of PT PLN’s transmission and distribution system.

4. To amend Minister of ESDM Regulation No. 50 of 2017 thus allowing Build-Operate-Own (BOO) contractual arrangements for EBT plants located on land owned by third parties (not owned by the Enterprise).

5. Reallocation of DAK budget related to rural energy / small-scale EBT generator and / or infrastructure budget of the Directorate General of EBTKE to support the procurement of land and infrastructure for the development of solar parks in the region.

6. Postponement of the imposition of sanction on non-fulfillment of TKDN requirements and changes related to provision of tax facilities related to TKDN. The implementation of this policy should be done specifically for the types of EBT technology.
Reference


http://www.seci.gov.in/content (diakses 26 September 2017)

http://www.wbcsd.org/Clusters/Climate-Energy/Resources/Corporate_Renewable_PPAs_Scaling_up_globally (diakses 28 September 2017)


Model Finansial yang digunakan dari METI: PLT Surya [The financial model used from METI: PLT Solar] (Andre S.), PLT Bioenergi dan PLT hidro.
## Annex

### Fiscal Incentive Matrix For New and Renewable Energy Sectors

<table>
<thead>
<tr>
<th>Income Tax Facilities</th>
<th>Income Tax Import Article 22</th>
<th>PPN facility</th>
<th>Import Duty Facility</th>
<th>Government-Borne Tax Facilities</th>
<th>Tax Holiday</th>
<th>Funding Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income deductions of 30% of total investments are charged for 6 years, 5% per annum respectively</td>
<td>automatic (without Free Certificate) is exempted from the collection of Income Tax 22 on the import of goods in the form of machinery and equipment required by employers in the field of utilization of Renewable Energy Source</td>
<td>Exemption of PPN imposition of the import of Strategic Taxable Goods in the form of Machinery as well as Goods and Materials for Development or Industrial Development in the Framework of Investment</td>
<td>PMK 176/PMK 0.11/2009 on the Exemption from Import Duty on the Import of Machinery as well as Goods and Materials for Development or Industrial Development in the Framework of Investment</td>
<td>Government-borne tax facility regulated by APBN Law</td>
<td>PMK 159/PMK 0.10/2015 satis PMK 103/PMK 0.10/2016: Maximum Corporate Tax Deduction 100%, minimum 10% of Income Tax owed; reduction of corporate tax max 50% with value of new investment plan less than 1T and minimum 500 billion period of 5 to 15 years (with ministerial discretion can be given max 20 years)</td>
<td>PMK 139/2011: procedures for granting PT PLN's business feasibility guarantee (Persero) for the construction of a power plant by using renewable energy, coal and gas carried out in cooperation with private power developers</td>
</tr>
<tr>
<td>Accelerated depreciation and amortization</td>
<td>PMK 154/PMK 0.03/2010 sad PMK 18/PMK 0.01/2016: the exemption of collection of PPN article 22 on the import of goods for geothermal business activities. Implemented by the Customs Directorate General whose procedure is regulated by the Director General of Customs and Excise and / or the Director General of Taxes</td>
<td>PMK 231/PMK 0.03/2001 sadi PMK 142/PMK 01/2015: not subject to PPN or PPN and PPN BM on the import of Taxable Goods exempted from import duty. Goods used for exploration and exploitation activities of upstream oil and gas and geothermal exploration and exploitation. With the note the item is not available domestically</td>
<td>PMK 154/PMK 0.11/2008 on the Exemption of Import Duty on the Import of Capital Goods in the Framework of Development and Development of Power Plant for Public Interest</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dividend tax to foreign tax subject of 10% or lower rate under the applicable Double Tax Avoidance Agreement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss compensation is longer than 5 years but not more than 10 years</td>
<td>PP 9 / 2016, PMK 89/PMK 0.10/2015: reduction in net income 30% of investment, accelerated depreciation / amortization, 10% dividend income to WPLN and loss compensation 5 to 10 years.</td>
<td></td>
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<td></td>
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</tbody>
</table>

Business Viability Guarantee Letter (BVGL) provided to private power developers, including the EBT generator included in the Phase 2 Development Fuel Development Acceleration (FTP - 2) list.