MINISTRY OF ENERGY AND MINERAL RESOURCES
DIRECTORATE GENERAL OF MINERAL AND COAL

“LOW RANK COAL UTILIZATION IN INDONESIA”

Presented by:
THAMRIN SIHITE
Director General of Mineral and Coal

CLEAN COAL DAY IN JAPAN 2012 INTERNATIONAL SYMPOSIUM
Tokyo, September 4-5, 2012
I. CURRENT CONDITION

II. POTENCY OF LOW LOW RANK COAL

III. LOW RANK COAL UTILIZATION

IV. INVESTMENT OPPORTUNITIES

V. CONCLUDING REMARKS
1. Resources allocation for coal production is imbalance. Largely coal comes from Kalimantan and the rest comes from Sumatera, particularly South Sumatera. On the contrary, the coal potential in Sumatra is more than the coal in Kalimantan.

2. Percentage of domestic coal demand is still relatively low, while coal export is rising continuously.

3. Not all Indonesian coal qualities can be consumed by domestic demand.

4. Coal is still main concerned as a commodity rather than as a source of energy.

5. Infrastructure limitations in several areas.
Implement priority fulfillment of mineral and coal for domestic needs

Provide certainty and transparency (Mining Law regulation supporting, sanction violations of the provisions, etc.)

Improving supervision on good mining practice

Increasing investment and state revenues from mining

Encourage the development of value-added products (i.e. processing, local content, local expenditure, upgrading brown coal, labor and CSR)

Maintain environmental sustainability through environmental management and monitoring, including the reclamation and post-mining
There are two major coal bearing formations by geological age namely Paleogene and Neogene. Both ages are present in Kalimantan, while in Sumatra mostly Neogene Formation.

Coal Resources

- Hypothetic: 33,554.03 million tons
- Inferred: 35,625.36 million tons
- Indicated: 27,058.79 million tons
- Measured: 24,100.42 million tons

Coal Reserves

- Probable: 17,757.14 million tons
- Proved: 10,260.32 million tons

Source: Geological Agency, 2011
INDONESIAN COAL DISTRIBUTIONS BASED ON CALORIFIC VALUE

Low – Medium Calorie result from Neogene Formation, while Medium – High Calorie result from Paleogene Formation. Very High Calorie result from Intrusion.

COAL RESERVES BASED ON CALORIFIC VALUE AND PROVINCES 2011
Most of Indonesia’s coal reserve is categorized as medium rank coal (5100 – 6100 kcal/kg, ADB). This type of coal should be prioritized to electricity, particularly PLN as the primary coal user since it is suitable to the needs of PLN’s coal ranged between 4000 – 5200 kcal/kg (GAR) or equivalent to 5100 – 6100 kcal/kg (ADB).
Domestic Consumption of Coal (2008-2012)

<table>
<thead>
<tr>
<th>Year</th>
<th>Other Industries</th>
<th>Briquette</th>
<th>Textile</th>
<th>Pulp &amp; Paper</th>
<th>Metallurgy</th>
<th>Cement</th>
<th>Power Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>9.60</td>
<td>0.06</td>
<td>5.12</td>
<td>1.54</td>
<td>2.56</td>
<td>8.32</td>
<td>41.47</td>
</tr>
<tr>
<td>2009</td>
<td>11.34</td>
<td>0.06</td>
<td>0.00</td>
<td>1.17</td>
<td>0.26</td>
<td>6.90</td>
<td>36.57</td>
</tr>
<tr>
<td>2010</td>
<td>24.12</td>
<td>0.00</td>
<td>1.20</td>
<td>1.74</td>
<td>0.34</td>
<td>6.31</td>
<td>34.41</td>
</tr>
<tr>
<td>2011</td>
<td>0.92</td>
<td>0.03</td>
<td>1.97</td>
<td>0.60</td>
<td>0.34</td>
<td>8.86</td>
<td>47.39</td>
</tr>
<tr>
<td>2012</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.07</td>
<td>0.11</td>
<td>23.10</td>
</tr>
</tbody>
</table>

Note: 2012 * = data semester I
LOW RANK COAL UTILIZATION (Indirect Use)

BROWN COAL UPGRADING AND CONVERSION TECHNOLOGY

- Upgraded Brown Coal (UBC) Technology
  - Demonstration plant, cap. 1000 ton/day, (kobe steel ltd. Jcoal, PT. Arutmin, and Tekmira), location Satui, South Kalimantan (completed).
  - The commercial plant, start construction in 2012.

- Other Upgrading Technologies
  - Binderless Coal Briquetting Technology (White Energy, Australia)
    Commercial plant, cap. 5 million tons/year, and 4 other plants will soon be built. (PT. Gunung Bayan, East Kalimantan);
  - Coal Upgrading Briquette Technology
    Commercial plant, status Reviewing Design (PT. Bhakti Energi Persada);

UP COMING:
- Coal Upgrading Technology:
  - Upgraded Brown Coal/UBC Plants, by Pendopo Energi Batubara PT., South Sumatera), start up in 2014;
  - Coal Upgrading Plant, by Delma Mining Corporation, PT., East Kalimantan;
- Coal Conversion Technology:
  - Coal Gasification Plant, by Delma Mining Corporation, PT., East Kalimantan.
CURRENT DEVELOPMENT OF CLEAN COAL TECHNOLOGY IN INDONESIA

CONVERSION TECHNOLOGY:

• **Gasification Technology**
  Pilot Plant, 2005 - now on (Mineral and Coal Research and Development Centre/tekMIRA, state electricity company/PLN, and other institutes), Location: Bandung and Palimanan West Java.

• **Liquefaction Technology (brown coal liquefaction technology)**
  • Lab scale, bench scale, 1990 – 1993 (tekMIRA), Location: Bandung;
  • Study and research leading to Pilot Plant Scale, 1994-2001 (tekMIRA, Agency of Sience and Technology Study and Application (BPPT), Oil and Gas Research and Development Centre/LEMIGAS, and NEDO Japan), Location: Bandung and Jakarta.
  • In 2005-2009, meeting and discussion on the possibility of SASOL technology application in Indonesia.

• **Coal Bed Methane Technology,**
  On going (Oil and Gas Research and Development Centre/LEMIGAS), Location: Jakarta;

• **Coal Water Fuel (CWF)/Coal Water Mixture (CWM)**
  Lab and bench scale, on going (tekMIRA), Location: Bandung West Java.
1. Coal Dryer Technology:

PLN Batubara is now constructing one coal dryer facility to be installed at PLTU Labuan site. The facility is expected to be able to increase coal quality up to 1000 kcal/Kg. PLN still needs more Coal Dryers. Also, in Rembang PP, STD (Steam Tuibe Dryer) is studied by TSK (Tsukishima Techno Machinery co. Ltd), Japan.

2. Coal Blending Facilities:

PLN is now under cooperation with a company to study the cost/benefit and prepare a plan of having the facility with production capacity of 10 million ton per year.

3. Gasification Coal Power Plant:

It is operated in east Kalimantan. Need more.

4. Slurry (Liquid Coal) / Coal Water Mixture:

It has been launched by JCF- JGC at Sinarmas Group Power Plant (Private Company), Karawang - Jakarta, 24 May 2012. PLN has nominated to use the slurry at 5 Power Plants i.e.: Belawan PP, Tanjung Priok PP, Tanjung Perak PP, Tambak Lorok PP, Tello PP.

5. SynGas:

SynGas products 2 commodities i.e.: Hot steam for oil lifting of PT PERTAMINA (State Oil co.) and Gas for PGN (State Gas co.) which directly pass through to PLN.
INVESTMENT OPPORTUNITIES

- Mining infrastructure developments (mainly in Kalimantan and Sumatra)
- New application of mining through bidding process in new areas of mining (IUP and IUPK)
- Development of mining and smelter (energy) as well as development of processing and refining (Added Value of Mineral)
- Cooperation in underground coal mining development
- Development of upstream-downstream mineral and coal based on industrial linkages
- Utilization of law rank coal (LRC)
  - Coal liquefaction
  - Coal gasification
  - Mine-mouth power plant

- MEMR proposed Coal liquefaction and gasification business in (South Kalimantan, East Kalimantan, Central Kalimantan, Jambi, Bengkulu, South Sumatra, West Sumatra, Riau, NAD) as a one of business sector to obtain income tax facilities in certain field and business.
- Incentive for underground mining development
OPPORTUNITIES OF COAL SECTOR IN JAVA CORRIDOR

"Boosting national industry and service"

Infrastructure:

1. Coal Generated Electricity
   • Development of Steam Power Plant 10,000 MW Stage I and II

10000 MW stage I
PLTU 10000 MW stage II
PLTA & PLTP 10000 WW stage II
OIL REFINERY
OPPORTUNITIES OF COAL SECTOR IN SUMATERA CORRIDOR

Added Value for Mineral and Coal Sector

- **Coal**: Developing petrochemical industry by constructing syngas pipeline; Coal Gasification and Coal Upgrading in Pendopo.
- **Mineral**: Constructing Processing Facility for gold and silver in South Tapanuli; constructing concentrate factory and mining infrastructure for Zinc and Lead in Dairi Regency

Necessary Key Infrastructure

1. **Infrastructure on Electricity related to mineral and coal**
   - Steam mine-mouth power plant in PLTU Banjarsari (Lahat, Sumsel); PLTU Sumsel di Muara Enim, PLTU Tj. Enim, PLTU Tarahan (Lampung Selatan) and PLTU Peranap (Indragiri Hulu, Riau).
   - Electricity installment for gold and silver processing in South Tapanuli, Sumut;

2. **Infrastructure on Coal**
   - Rail way and port
     - Construction of new railway Tj. Enim – Srengsem (Lampung)
     - Improving capacity of railway Tj. Enim – Lampung and Tj. Enim – Kertapati
     - Rail way Muara Enim – Tj. Carat
     - Construction of Tj. Carat Port (Lampung)
   - Construction of Kuala Tanjung Dock
OPPORTUNITIES OF COAL SECTOR IN KALIMANTAN CORRIDOR

Development Planning for Infrastructure, Transportation, Stockpiling, and Blending Kalimantan Corridor

Added Value of Coal
• Acceleration of Operation Production in Central Kalimantan
• Coal Processing in Tanjung Redep, Bulungan, and Batu Licin
• Development Planning of Coal Liquefaction in East Kalimantan

Infrastructure
1. Coal Infrastructure
• Railway Puntikahu - Bangkuang
• Road Expansion of Kelanis, Central Kalimantan
2. Electricity Infrastructure
• Construction of gas power plant (1x120MW)
• Construction of coal mine mouth power plant Tabalong (2x300MW)
• Coal Power Plant (2.160MW), Transmission (5.346 km), Sub-station (1.720MVA), Distribution JTM (10.810 km), Distribution JTR (9.907 km), Distribution Station (898MVA)
1. In accordance with the law on mineral and coal, the Government must control the level of production and increase domestic consumption. Considering the current condition, coal allocation for domestic uses should consider the location of coal resources.

2. Controlling coal production is necessary to maintain Kalimantan's high rank coal production and increase South Sumatra's low rank coal production. Infrastructure and transportation should be constructed to increase Sumatra's low rank coal production, and coal from this area is also suggested to be upgraded and converted into liquid.

3. Indonesia's Mining Sector is truly still a great opportunity for Indonesia's development. Foreign investment is one of the crucial factors for developing the mining industry. In this matter, there is a need to increase international cooperation to develop mining investment, technology, and manpower development. It is important to note that there are still many opportunities on mining development in Indonesia.
Arigato Gozaaimashita

www.djmbp.esdm.go.id