Energy Policymaking in Bangladesh: Need for Global Awareness

Institution of Engineers
Dhaka, Bangladesh

11 September 2007

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Energy Policymaking

• Provide for the current and future energy needs
• Security of energy supply
• Exploration and proper utilization of domestic energy resources
• Attract domestic and international investors
Oil and Gas

- Long term experience in Bangladesh on oil and gas fired generation
- Gas-fired generation capacity = 85%
- Oil-fired generation capacity = 8%

Hydroelectric Power

- Kaptai Hydroelectric Power
  - 230 MW
  - 100 MW

5% of total installed capacity of 4547 MW
Coal-fired Electricity Generation

Coal

Known Coal Deposits in Bangladesh

- Barapukuria 390 Million tonnes – Producing (2% of generation)
- Khalaspir 685 Million tonnes - Dev. Under Consideration
- Phulbari 572 Million tonnes - Dev. Under Consideration
- Dighipara 600 Million tonnes - Under further appraisal
- Jamalganj 1053 Million tonnes - Too deep for mining
**Depth of Coal Deposits in Bangladesh**

Barapukuria 390 Million tonnes (118-509 metres) Deep Shaft

Khalaspir 685 Million tonnes – (257-483 metres) Future

Phulbari 572 Million tonnes – (150-240 metres) Open Pit?

Dighipara 600 Million tonnes – (328-407 metres) Future

Jamalganj 1053 Million tonnes – (640-1158 metres) Too Deep?

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**Phulbari Coal Transportation for Export**

![Phulbari Coal Transportation for Export](image.png)
Impacts of the Phulbari Project

- Relocating around 50,000 people of about 100 villages and a part of Phulbari town.
- 500 million tonnes of coal is located at varying depths between 150 metres and 240 metres.
- Net income to the government is about US $200 million including six percent royalty if AEC produces 15 million tonnes of coal per year.

Top Ten Hard Coal Producers in the World 2006

<table>
<thead>
<tr>
<th>Country</th>
<th>Hard Coal</th>
<th>World Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. China</td>
<td>2,226</td>
<td>47.2%</td>
</tr>
<tr>
<td>2. USA</td>
<td>951</td>
<td>20.2%</td>
</tr>
<tr>
<td>3. India</td>
<td>398</td>
<td>8.4%</td>
</tr>
<tr>
<td>4. Australia</td>
<td>301</td>
<td>6.4%</td>
</tr>
<tr>
<td>5. South Africa</td>
<td>240</td>
<td>5.1%</td>
</tr>
<tr>
<td>6. Russia</td>
<td>222</td>
<td>4.7%</td>
</tr>
<tr>
<td>7. Indonesia</td>
<td>140</td>
<td>2.9%</td>
</tr>
<tr>
<td>8. Poland</td>
<td>98</td>
<td>2.1%</td>
</tr>
<tr>
<td>9. Kazakhstan</td>
<td>79</td>
<td>1.7%</td>
</tr>
<tr>
<td>10. Colombia</td>
<td>61</td>
<td>1.3%</td>
</tr>
<tr>
<td>World</td>
<td>4716</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: World Coal Institute
### Proven Reserves World 2006

(million tons)

<table>
<thead>
<tr>
<th>Country</th>
<th>Reserves</th>
<th>World Share</th>
<th>Hard/Lignite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. USA</td>
<td>246,643</td>
<td>27.1%</td>
<td>45/55</td>
</tr>
<tr>
<td>2. Russia</td>
<td>157,010</td>
<td>17.3%</td>
<td>30/70</td>
</tr>
<tr>
<td>3. China</td>
<td>114,500</td>
<td>12.6%</td>
<td>55/45</td>
</tr>
<tr>
<td>4. India</td>
<td>92,445</td>
<td>10.2%</td>
<td>97/3</td>
</tr>
<tr>
<td>5. Australia</td>
<td>78,500</td>
<td>8.6%</td>
<td>0/50</td>
</tr>
<tr>
<td>6. South Africa</td>
<td>48,750</td>
<td>5.4%</td>
<td>100/0</td>
</tr>
<tr>
<td>7. Ukraine</td>
<td>34,153</td>
<td>3.8%</td>
<td>47/53</td>
</tr>
<tr>
<td>8. Kazakhstan</td>
<td>31,279</td>
<td>3.4%</td>
<td>90/10</td>
</tr>
<tr>
<td><strong>World</strong></td>
<td><strong>909,064</strong></td>
<td><strong>100%</strong></td>
<td><strong>53/47</strong></td>
</tr>
</tbody>
</table>


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### Types of Coal Deposits

**Surface deposits**

Coal deposits shallow enough (up to 300 feet) to be extracted by removing the layer of earth, i.e., overburden.

**Underground deposits**

Coal deposits located deep in the ground that can be accessed only by drilling tunnels and shafts to the seams.
Factors determining the viability of a resource

- Thickness, nature and coverage of the overburden. (Overburden ratios of up to 15:1 are considered economical.)

- Ease of removal and management of overburden.

- Ease of reaching seam in the ground, i.e., access roads, drilling shafts, etc.

Surface mine in Wyoming. Seam is 60 feet thick of coal, bituminous as well as lignite
Seams of ultra-low sulfur coal up to 100-feet-thick are removed with shovels and haul trucks at Peabody’s Powder River Basin mines, which are among the nation’s largest and most productive. These operations provide more than half of Peabody’s annual production.
Lignite (brown coal) is mined from a pit in the state of North Rhine-Westphalia, in western Germany.

Source: Encyclopedia Brittanca
Impacts/Issues of Coal Mining

- Environmental
- Safety/Health
- Land Use
- Habitat, Vegetation, Wildlife
- Social and Economic
Coal Transportation

Short Distances: conveyor belts, trucks (up to 10 miles)
Long Distances: railways, barges, coal slurry pipeline
Continental: Ocean Vessels –
   Handymax Class (40-60,000DWT),
   Panamax Class (60-80,000DWT) and
   Cape Class (80,000 DWT and over) vessels

Conveyor Belt
Opportunities and Challenges

- Energy in northeastern part of Bangladesh where there is no gas
- Opportunity to develop power plants, steel mills and related industries
- Domestic investment not available (US $1.2 billion needed to develop Phulbari)
- Overseas investors would like to export coal to get quick returns
- Government gets a small royalty (6%) and taxes which in the long run could be insignificant because natural resource will be depleted
Economics of Nuclear Power

- Infrastructure to procure, manage and dispose of nuclear fuel is highly advanced
- Need for highly trained manpower
- Nuclear proliferation issue
- Fuel security concerns
- Fuel price uncertain
Global Awareness

What can we learn from others?

In-country manpower development

- Atomic Energy Commission and Atomic Energy Center were established in the 60’s
- There is some experience in gas and oil
- No experience in mining, transportation, and mitigation of the impacts of coal
Surface Mining Control and Reclamation Act in 1977 (USA)

- The Act specifies that all mining sites be restored to their original topography
- Requires mine operators to submit land restoration and acid mine drainage mitigation plans before a permit is granted for mining operations.
- Implement a funding mechanism for helping to restore abandoned mines, for e.g., by additional tax on current coal production.

Thank you for your attention

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