SAARC Dissemination Workshop on the Study for Development of Potential Regional Hydro Power Plant in South Asia

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KATHMANDU, NEPAL
9-10 May 2016
The Country: The People’s Republic of Bangladesh

Capital: Dhaka

Area: 147,570 Sq. Km.

Population: 152 Million

Per Capita Income: US$ 1314

GDP Growth Rate: Around 7%
ENERGY SCENARIO IN BANGLADESH
Present Structure of Power Sector

Apex Institution
Power Division, Ministry of Power, Energy & Mineral Resources (MPEMR)

Regulator
- Bangladesh Energy Regulatory Commission (BERC)
- Sustainable & Renewable Energy Development Authority (SREDA)

Licensing Authority
- Office of the Electrical Adviser & Chief Electric Inspector

Generation
- Bangladesh Power Development Board (BPDB)
- Ashuganj Power Station Company Ltd. (APSCL)
- Electricity Generation Company of Bangladesh (EGCB)
- Rural Power Company Ltd. (RPCL)
- North West Power Generation Company Ltd. (NWPGCL)
Present Structure of Power Sector

Generation (contd.)
- Coal Power Generation Company Bangladesh Ltd.
- Bangladesh India Friendship Power Company Ltd.
- Independent Power Producers (IPPs)

Transmission
- Power Grid Company of Bangladesh Ltd. (PGCB)

Distribution
- Bangladesh Power Development Board (BPDB)
- Dhaka Power Distribution Company (DPDC)
- Dhaka Electric Supply Company Ltd (DESCO)
- West Zone Power Distribution Company (WZPDC)
- Bangladesh Rural Electrification Board (BREB) through Rural Cooperatives
<table>
<thead>
<tr>
<th><strong>Bangladesh Power Sector: At a Glance</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Installed Generation Capacity</strong> : 12,339 MW</td>
</tr>
<tr>
<td><strong>Import from India</strong> : 600 MW</td>
</tr>
<tr>
<td><strong>Present Avg. Generation</strong> : 7,000 MW</td>
</tr>
<tr>
<td><strong>Max. Generation</strong> : 8,348 MW</td>
</tr>
<tr>
<td><strong>Total Consumer</strong> : 20.04 Million</td>
</tr>
<tr>
<td><strong>Transmission Line</strong> : 9,789 km</td>
</tr>
<tr>
<td><strong>Distribution Line</strong> : 3,72,000 km</td>
</tr>
<tr>
<td><strong>Per Capita Generation</strong> : 371 kWh/annum</td>
</tr>
<tr>
<td><strong>Access to Electricity</strong> : 76%</td>
</tr>
<tr>
<td><strong>Share of Public Generation</strong> : 54%</td>
</tr>
<tr>
<td><strong>Share of Private Generation</strong> : 42%</td>
</tr>
<tr>
<td><strong>Import</strong> : 4%</td>
</tr>
</tbody>
</table>
Fuel Mix

Electricity Generation by Fuel Type

- Gas: 64.4%
- HFO: 18%
- HSD: 7%
- Renewable Energy: 3.6%
- Imported: 5%
- Coal: 2%
- Imported: 5%

[Graph showing the distribution of fuel types for electricity generation]
RENEWABLE ENERGY PROGRAM IN BANGLADESH
Bangladesh adopted a Renewable Energy Policy in the year 2009

Target of Renewable Energy Policy

- 10% (2000 MW) of total electricity generation will be from RE by 2020

- 10% (4000 MW) of total electricity generation from RE by 2030
<table>
<thead>
<tr>
<th>Type</th>
<th>MW</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar</td>
<td>192</td>
<td>45%</td>
</tr>
<tr>
<td>Wind</td>
<td>2</td>
<td>0.50%</td>
</tr>
<tr>
<td>Biomass to electricity</td>
<td>1</td>
<td>0.50%</td>
</tr>
<tr>
<td>Biogas</td>
<td>5</td>
<td>1%</td>
</tr>
<tr>
<td>Hydro</td>
<td>230</td>
<td>53%</td>
</tr>
<tr>
<td>Total</td>
<td>430</td>
<td>100%</td>
</tr>
</tbody>
</table>
Ongoing Activities on RE

- Solar Home System
- Solar Irrigation
- Solar Mini Grid
- Solar Parks
- Solar Rooftops
- Solar Water Heating System
- Solar Pump for Drinking Water
- Biomass & Biogas
- Municipal Waste to Energy
### Year wise Target for RE Development

(Figure in MW)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Solar</td>
<td>253</td>
<td>421.75</td>
<td>237</td>
<td>195</td>
<td>203</td>
<td>208</td>
<td>1739.8</td>
</tr>
<tr>
<td>Wind</td>
<td>20</td>
<td>250</td>
<td>350</td>
<td>350</td>
<td>200</td>
<td>200</td>
<td>1370</td>
</tr>
<tr>
<td>Biomass</td>
<td>16</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>47</td>
</tr>
<tr>
<td>Biogas (biogas to electricity)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Hydro (mini/micro)</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>292</strong></td>
<td><strong>680.75</strong></td>
<td><strong>594</strong></td>
<td><strong>552</strong></td>
<td><strong>410</strong></td>
<td><strong>415</strong></td>
<td><strong>3167.8</strong></td>
</tr>
</tbody>
</table>
Prospect of Hydro in Bangladesh

- Today, hydropower makes up the largest share of electricity generated from renewable energy.
- The only hydroelectric power plant in Bangladesh was established at Kaptai with present installed capacity of 230 MW.
 Bangladesh Power Development Board (BPDB) identified two other sites at Sangu (140 MW) and Matamuhuri (75 MW) for large hydropower plants.

 Further exploitation of hydropower appears to be limited due to flat terrain of Bangladesh. Several studies have identified a few sites having potential ranging from 10 kW to 5 MW.
A Study was carried out on Prospective Hydroelectricity Generation in Southeast Bangladesh in October 2014

Types of Hydropower plants studied:
- Run-of-River Type Plant
- Impoundment Type Plant
## Summary of Study
### Run-of-River Type Plant

<table>
<thead>
<tr>
<th>River</th>
<th>Maximum Power Output (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sangu</td>
<td>103</td>
</tr>
<tr>
<td>Matamuhuri</td>
<td>8</td>
</tr>
<tr>
<td>Bakkhali</td>
<td>1</td>
</tr>
</tbody>
</table>
## Prospect of Hydro in Bangladesh

### Summary of Study

**Impoundment Type Plant**

<table>
<thead>
<tr>
<th>River</th>
<th>Maximum Power Output (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sangu</td>
<td>58</td>
</tr>
<tr>
<td>Matamuhuri</td>
<td>21</td>
</tr>
<tr>
<td>Banshkhali Eco-park</td>
<td>0.05</td>
</tr>
</tbody>
</table>
Regional Co-operation

Regional Power Trade

- 500 MW electricity is being imported from Bahrampur, India through 400 KV double circuit line & HVDC sub-station and 100 MW from Palatana, Tripura
- Import of an additional 500 MW from India are under implementation;
- Discussion going on for import from Nepal
- Further dialogue going on for regional trade between Bangladesh-Nepal and Bangladesh–Bhutan
## Bilateral Co-operation

<table>
<thead>
<tr>
<th>Countries</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh-India</td>
<td>Rampal, Khulna : 1320 MW</td>
</tr>
<tr>
<td>JV with Singapore</td>
<td>Matarbari : 1200 MW</td>
</tr>
<tr>
<td>JV with Malaysia</td>
<td>Moheshkhali : 1200 MW</td>
</tr>
<tr>
<td>JV with China</td>
<td>Moheshkhali : 1200 MW</td>
</tr>
<tr>
<td>JV with Korea</td>
<td>Moheshkhali : 1200 MW</td>
</tr>
</tbody>
</table>

- Discussion is going on for hydro power projects between Bangladesh-India-Nepal and Bangladesh-India-Bhutan.
Possibilities: Bangladesh-India Grid Interconnections

- 765 KV Bongaigaon (NER/India)-Jamalpur/Barapukuria (Bangladesh)-Purnea, Bihar (ER/India)

- Establishment of 500/1000 MW HVDC back-to-back station (in phases) at Jamalpur/Barapukuria.

- Power from Bhutan through Bongaigaon and power from Nepal through Purnea can be tapped.

- Interconnection between Silchar (Assam, India) with Fenchugonj (Bangladesh)
Regional Power Exchange: Possibilities

- **Muzaffarnagar of India → BARAPUKURIA**
  - 500MW [2013-]
  - 500MW [2017-]
- **BAHARAMPUR → BHERAMARA**
- **RANGIA/ROWTA → BARAPUKURIA**
- **SILCHAR → FENCHUGANJ**
  - 2000MW
- **BAHARAMPUR → BHERAMARA**
- **TRIPURA → COMILLA**
  - 100 MW
- **MYANMAR → Cox’s Bazar**
  - 500 MW
High Capacity Multi-Terminal HVDC Bipole Line NER(India) – Bangladesh - NR (India)
Recommendations

- Development of a regional power grid
- Strengthening of bilateral initiatives among regional countries
- Power trading among the neighboring countries
- Joint investment in regional hydro power projects
- Sharing of views through regional workshops/seminars/visits
Thank You