Session 2: BIMSTEC Grid Interconnection and Regional Energy Trade

Theme Presentation
By
Vinod Kumar Agrawal
Technical Director, IRADe

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• Prevailing Electricity Trade in BIMSTEC Region
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<thead>
<tr>
<th>Year</th>
<th>India - Bangladesh</th>
<th>Bhutan - India</th>
<th>India - Nepal</th>
<th>India-Myanmar</th>
<th>Total</th>
</tr>
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<tr>
<td>14-15</td>
<td>3271</td>
<td>5109</td>
<td>997</td>
<td>-</td>
<td>9377</td>
</tr>
<tr>
<td>15-16</td>
<td>3654</td>
<td>5557</td>
<td>1469</td>
<td>-</td>
<td>10680</td>
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<td>16-17</td>
<td>4419</td>
<td>5863</td>
<td>2021</td>
<td>3.23</td>
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<td>17-18</td>
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<td>18-19</td>
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<td>4657</td>
<td>2798</td>
<td>6.67</td>
<td>13152</td>
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<tr>
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<td>5600</td>
<td>5856</td>
<td>1354</td>
<td>5.90</td>
<td>12816</td>
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# Existing Cross Border Transmission Network_BIMSTEC Region

<table>
<thead>
<tr>
<th>Countries</th>
<th>Existing Power grid interconnection</th>
</tr>
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</table>
| **India – Nepal**          | Multiple Lines Presently Operating at 220 KV, 132 KV and lower voltages :  
                         | • 400 KV D/c Dhalkebar-Muzzafarpur line (presently charged at 220 KV)  
                         | • 132 KV lines: Kataiya – Duhabi, Raxaul-Parwanipur, Tanakpur – Mahendranagar, Kataiya-Kushaha, Gandak East – Gandak/ Surajpura (operating in Radial Mode)                                  |
| **India – Bangladesh**     | Primarily connected through an HVDC Back-to-Back link and there is an AC interconnection also presently operating at 132 KV :  
                         | • 400 KV Bheramara – Baharampur HVDC (2x500 MW)  
                         | • 400 KV Surjyamaninagar - South Comilla AC line (currently charged at 132 KV)                                                                                          |
| **India – Bhutan**         | Multiple lines at 400 KV, 220 KV, 132 KV and lower voltages connected under synchronous mode. This includes:  
                         | • 400 KV Tala HEP – Binaguri, Tala HEP – Malabase- Binaguri,  
                         | • 400 KV Mangdechu HEP – Punatsamchu – Alipurduar,  
                         | • 220 KV Chukha HEP - Birpara  
                         | • 132 KV Geylephu – Salakati, Deothang - Rangia                                                                                                                         |
| **India – Myanmar & Thailand – Myanmar** | Primarily Extension of network to supply to border areas of Myanmar :  
                         | • Manipur (India) – Tamu (Myanmar)  
                         | • Thailand – Tachileik (Myanmar), Thailand – Kayin State (Myanmar)                                                                                                        |
## Planned Transmission Capacity_BIMSTEC Region

<table>
<thead>
<tr>
<th>Countries</th>
<th>Power grid interconnection planned for future</th>
</tr>
</thead>
</table>
| **India – Bhutan**| ▪ Jigmeling – Alipurduar 400 KV D/c  
▪ Alipurduar – Siliguri 400 KV D/c line and Kishanganj – Darbhanga 400 KV D/c line                       |
| **India – Nepal** | ▪ Upgradation of Dhalkebar-Muzzafarpur line to 400 KV  
▪ 400 KV New Butwal-Gorakhpur  
▪ 400 KV evacuation lines for new export oriented hydropower plants                                     |
| **India – Bangladesh** | ▪ 765 KV Bornagar (India NER) – Parbotipur (Bangladesh) – Katihar (India ER)                               |
| **India – Sri Lanka** | ▪ Undersea HVDC cable from Madurai in India to Sri Lanka, with a planned capacity up to 1000 MW            |
| **Thailand – Myanmar** | Depends on the progress of the below generation projects:  
▪ Mai Khot – Mae Chan – Chiang Rai (220 KV)  
▪ Hutgyi – Phitsanulok 3 (500 KV)  
▪ Ta Sang – Mae Moh 3 (500 KV)  
▪ Mong Ton – Sai Noi 2 (500 KV DC) |
| **Myanmar – Bangladesh** | ▪ Myanmar – Cox’s Bazar                                                                                     |
**Evolution of BIMSTEC Grid Interconnection MoU:**

- Decision to commence BIMSTEC Grid Interconnection Master Plan Study – In 2nd BIMSTEC Energy Ministers Meeting held at Bangkok, Thailand on 5th March 2010;
- Signing of the MoU for establishment of BIMSTEC Grid Interconnection – in 4th BIMSTEC Summit held at Kathmandu, Nepal on 31st August 2018;
- The MoU has entered into force – on 7th April, 2019

**The Main Objectives under this MoU:**

- Coordinate and cooperate in the planning, development and operation of interconnected systems to optimise costs while maintaining satisfactory reliability and security;
- Fully recover the costs and share benefits equally, resulting from the reductions in investments on generation, transmission system and fuel costs;
- Provide reliable, secure and economic electricity supply to the parties;
- Develop transmission tariff framework for trading of electricity among the parties;
- Open up new avenues of cooperation to promote electricity trade;
Salient Strategic Pointers towards development of BIMSTEC Power Grid

Strategic Pointers

- Planning;
- Building up of Institutions;
- Bringing out Physical Infrastructure;
- Harmonisation of policies and Regulatory Framework;
- Development of markets and physical transactions;

Planning Documents

- BIMSTEC-Comprehensive Plan for Energy Cooperation
- Detailed Master Plans identifying specific projects

Institutions

- BIMSTEC Grid Interconnection Coordination Committee
- BIMSTEC Energy Center
- BIMSTEC Senior Officials' Meeting on Energy
- BIMSTEC Forums of System Operators, Market Participants etc.

Physical Infrastructure

- CB Transmission Network between different Countries
- Other electricity and gas interconnections

Activities

- Harmonization in regulatory and policy frameworks
- Transition to regional energy market
- Coordination in planning
Key Opportunities & Challenges towards development of BIMSTEC Power Grid

Key opportunities

 Utilize the benefits from generation and demand complementarity, resource complementarity and generation cost difference.

 Optimize on Capex by sharing reserve capacity and develop and utilize transmission network in most optimum manner.

 Develop / invest in clean energy generation irrespective of land / resource shortage within the country and fulfill towards NDC targets.

 Regional energy sustainability & support towards increased access to electricity, especially in border regions.

Key challenges

 Identifying and agreeing towards building the cross border links and arrival at the decision towards sharing of costs.

 Matching the new generation and transmission timeline and ensuring that any excessive expenditure towards stranded assets is averted/minimized.

 Allocation of transmission capacity of the intervening country for trilateral/multilateral agreements and congestion management.

 Harmonization of rules and regulations related to connectivity, open access and settlement of accounts.
Discussion Points

• What are the potential benefits of BIMSTEC Regional Power Grid and what kind of socio economic impact this transition can bring?

• What is the strategy and Roadmap towards taking up BIMSTEC Grid Interconnection Master Plan study?

• What are the real challenges in identifying Regional Cross Border Transmission Links and pooling of Resources?

• How the transmission capacity in the intervening country can be channelized under trilateral/multilateral trade?

• With Regional Grid Interconnections, what specific measures would be essential towards safety and security of the overall grid?