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# Session 2: BIMSTEC Grid Interconnection and Regional Energy Trade

Theme Presentation

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- Prevailing Electricity Trade in BIMSTEC Region
- Existing Cross Border Transmission Network
- Planned Transmission Capacity
- Grid Interconnection Development \_ Salient Strategic Pointers
- Opportunities and Challenges
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## Traded Electrical Energy Volume (MUs) amongst BIMSTEC Countries\_ Last 5 Years

Year	India - Bangladesh	Bhutan - India	India - Nepal	India- Myanmar	Total
14-15	3271	5109	997	-	9377
15-16	3654	5557	1469	-	10680
16-17	4419	5863	2021	3.23	12306
17-18	4808	5611	2388	5.07	12812
18-19	5690	4657	2798	6.67	13152
19-20 (8months)	5600	5856	1354	5.90	12816

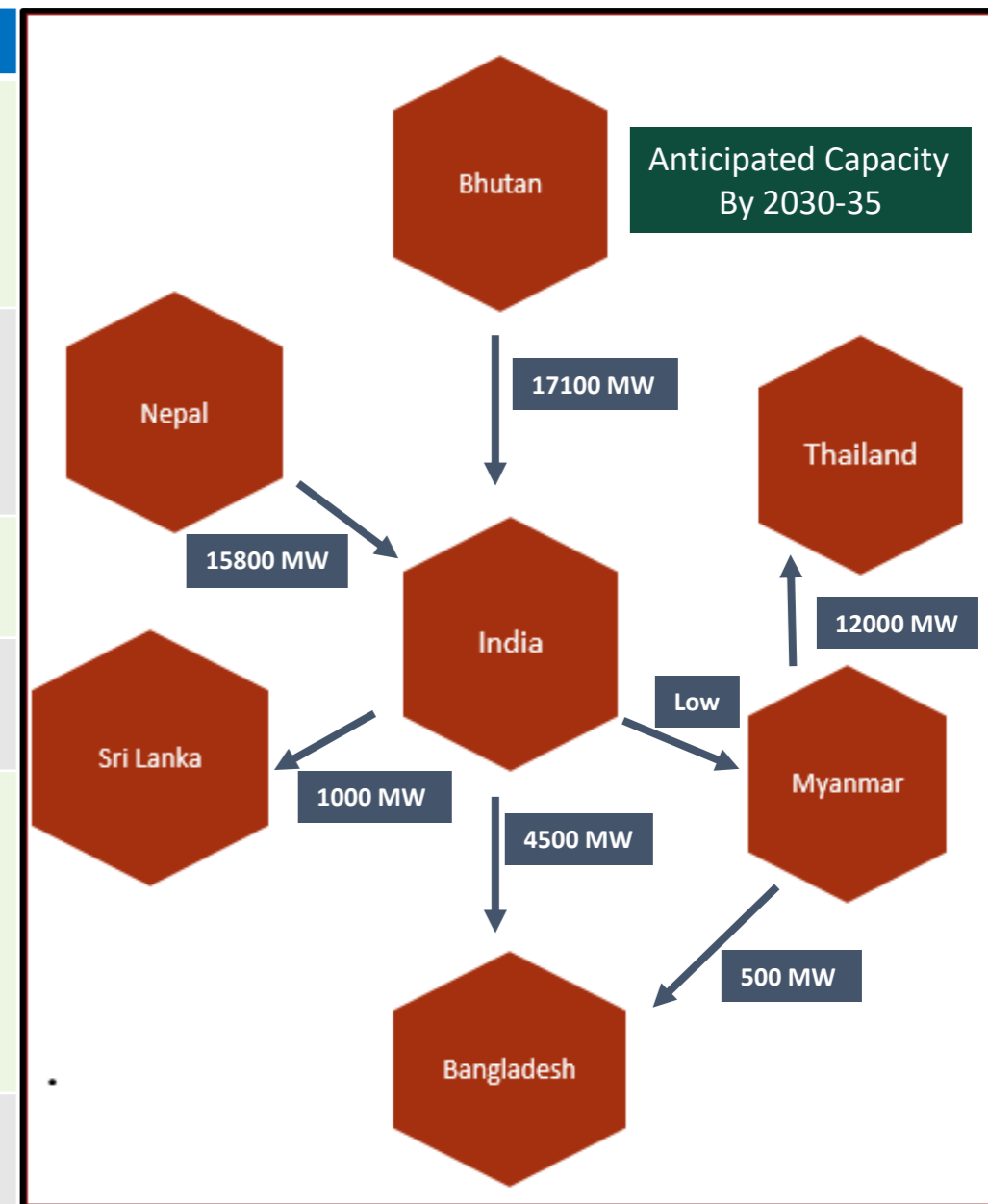
# Existing Cross Border Transmission Network\_BIMSTEC Region

Countries	Existing Power grid interconnection
<b>India – Nepal</b>	<p>Multiple Lines Presently Operating at 220 KV, 132 KV and lower voltages :</p> <ul style="list-style-type: none"> <li>400 KV D/c Dhalkebar-Muzzafarpur line (presently charged at 220 KV)</li> <li>132 KV lines: Kataiya – Duhabi, Raxaul-Parwanipur, Tanakpur – Mahendranagar, Kataiya-Kushaha, Gandak East – Gandak/ Surajpura (operating in Radial Mode)</li> </ul>
<b>India – Bangladesh</b>	<p>Primarily connected through an HVDC Back-to-Back link and there is an AC interconnection also presently operating at 132 KV :</p> <ul style="list-style-type: none"> <li>400 KV Bheramara – Baharampur HVDC (2x500 MW)</li> <li>400 KV Surjyamaninagar - South Comilla AC line (currently charged at 132 KV)</li> </ul>
<b>India – Bhutan</b>	<p>Multiple lines at 400 KV, 220 KV, 132 KV and lower voltages connected under synchronous mode. This includes:</p> <ul style="list-style-type: none"> <li>400 KV Tala HEP – Binaguri, Tala HEP – Malabase- Binaguri,</li> <li>400 KV Mangdechu HEP – Punatsamchu – Alipurduar,</li> <li>220 KV Chukha HEP - Birpara</li> <li>132 KV Geylephu – Salakati, Deothang - Rangia</li> </ul>
<b>India – Myanmar &amp; Thailand – Myanmar</b>	<p>Primarily Extension of network to supply to border areas of Myanmar :</p> <ul style="list-style-type: none"> <li>Manipur (India) – Tamu (Myanmar)</li> <li>Thailand – Tachileik (Myanmar), Thailand – Kayin State (Myanmar)</li> </ul>



# Planned Transmission Capacity\_BIMSTEC Region

Countries	Power grid interconnection planned for future
<b>India – Bhutan</b>	<ul style="list-style-type: none"> <li>Jigmeling – Alipurduar 400 KV D/c</li> <li>Alipurduar – Siliguri 400 KV D/c line and Kishanganj – Darbhanga 400 KV D/c line</li> </ul>
<b>India – Nepal</b>	<ul style="list-style-type: none"> <li>Upgradation of Dhalkebar-Muzzafarpur line to 400 KV</li> <li>400 KV New Butwal-Gorakhpur</li> <li>400 KV evacuation lines for new export oriented hydropower plants</li> </ul>
<b>India – Bangladesh</b>	<ul style="list-style-type: none"> <li>765 KV Bornagar (India NER) – Parbotipur (Bangladesh) – Katihar (India ER)</li> </ul>
<b>India – Sri Lanka</b>	<ul style="list-style-type: none"> <li>Undersea HVDC cable from Madurai in India to Sri Lanka, with a planned capacity up to 1000 MW</li> </ul>
<b>Thailand – Myanmar</b>	<p>Depends on the progress of the below generation projects:</p> <ul style="list-style-type: none"> <li>Mai Khot – Mae Chan – Chiang Rai (220 KV)</li> <li>Hutgyi – Phitsanulok 3 (500 KV)</li> <li>Ta Sang – Mae Moh 3 (500 KV)</li> <li>Mong Ton – Sai Noi 2 (500 KV DC)</li> </ul>
<b>Myanmar – Bangladesh</b>	<ul style="list-style-type: none"> <li>Myanmar – Cox’s Bazar</li> </ul>



## BIMSTEC Grid Interconnection MoU \_ Evolution and Objectives

### 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 4<sup>th</sup> BIMSTEC Summit held at Kathmandu, Nepal on 31<sup>st</sup> August 2018;
- ✓ The MoU has entered into force – on 7<sup>th</sup> 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;

### MoU Signed on 31.08.2018



#### MEMORANDUM OF UNDERSTANDING FOR ESTABLISHMENT OF THE BIMSTEC GRID INTERCONNECTION

##### PREAMBLE

The Governments of the People's Republic of Bangladesh, the Kingdom of Bhutan, the Republic of India, the Republic of the Union of Myanmar, Nepal, the Democratic Socialist Republic of Sri Lanka and the Kingdom of Thailand, the Member States of BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation), hereinafter referred to collectively as the "Parties" and individually as a "Party";

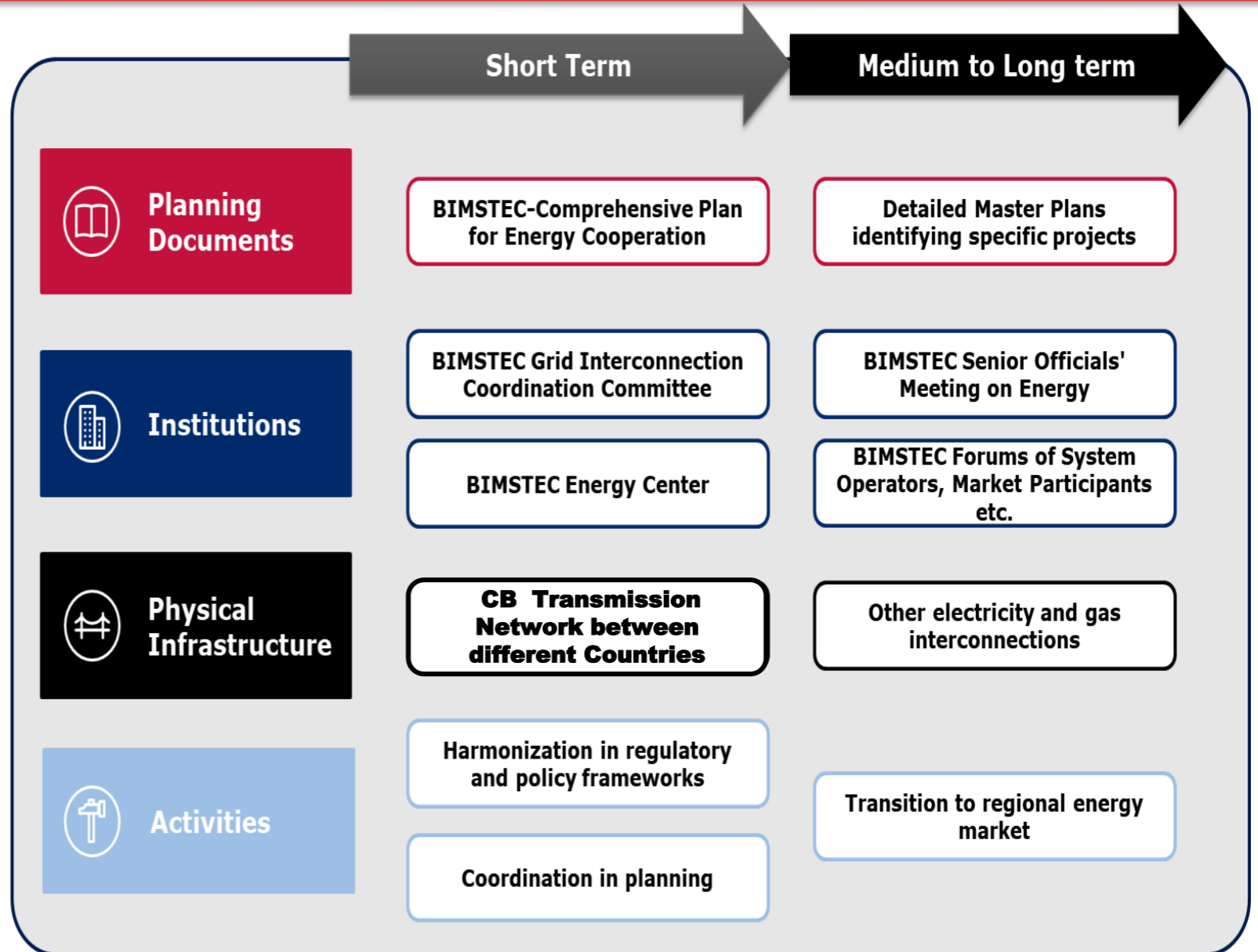
Recognizing the need of strengthening economic, commercial and technical collaborations in the region on energy cooperation programs, which will provide the opportunities and challenges to: (i) enhance the intra-regional coordination through an action plan for developing and utilizing various energy resources; (ii) coordinate and optimize the energy infrastructure investment including Grid Interconnections; (iii) encourage the new or renewable sources of energy projects; (iv) enhance energy security of the region (v) encourage for generating additional energy; (vi) encourage cross border energy trade, and (vii) establish the BIMSTEC Energy Center;

Affirming to enhance energy development in the region, the Parties, at the second BIMSTEC Ministerial Meeting, in Dhaka, December 1998, requested the respective Lead Countries of each sector to take further steps to form Sectoral Committees and Group of Experts to: (i) examine the different approaches of beneficial projects and to provide support for BIMSTEC members and (ii) to draw up proposals of cooperation for implementation;

# 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;





## 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.

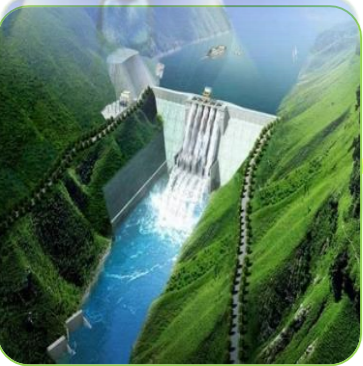


## Discussion Points

- 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 ?



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# Thank You

