Roadmap for the implementation of SAARC Framework Agreement on Energy Cooperation (Electricity)

September 2020

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- Sambit Dash, PwC
ADB Support to promote CBET in South Asia
## ADB support to promote regional energy cooperation in South Asia

<table>
<thead>
<tr>
<th>Project</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAARC Regional Energy Trade (SRETS), 2005-2010</td>
<td>Regional trade and cooperation agreement, roadmap for harmonization of legal &amp; regulatory frameworks</td>
</tr>
<tr>
<td>Study on South Asia Regional Power Exchange (SARPES), 2011-2013</td>
<td>Alternative financing mechanisms for regional projects, institutional roles</td>
</tr>
<tr>
<td>Study of the SASEC Electricity Transmission Master Plan (SETMAPS), 2014-17</td>
<td>Green-field interconnection possibilities within SAARC region till 2020, draft market rules for regional power trade and exchange, recommendations for regulatory framework compatibility</td>
</tr>
</tbody>
</table>

- **Objective**: Develop the regional cross-border electricity transmission plan
- **Objective**: Also considered the regional generation plan (conventional and RE) and evacuation requirements

### Contents

- **ADB has financed several regional and interconnection projects in South Asia, e.g. the Dagachhu and Nikachhu hydropower projects in Bhutan, India-Bangladesh interconnections, etc.**
- **ADB is also providing support to the SAARC Council of Experts of Energy Regulators (CEERE) on various regulatory coordination issues related to implementation of the SAARC Framework Agreement**
ADB Regional TA to support SASEC member nations in enhancing power trade in the region

Key Objective: Enhancing regional cooperation in energy sector among the member nations in accordance with the SASEC vision and SASEC operational plan

### Activities to be carried out under the TA

<table>
<thead>
<tr>
<th>Regional Project assessments</th>
<th>Developing a regional master plan</th>
<th>Capacity Building through knowledge sharing workshops</th>
<th>Support CEERE in conducting studies for operationalisation of SAARC Framework Agreement</th>
<th>Regional Framework for Energy Cooperation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility, costing, safeguards, project benefits</td>
<td>Update the master plan prepared under SETMAPS</td>
<td></td>
<td>Enable members to participate in regional power market</td>
<td></td>
</tr>
</tbody>
</table>

### Progress achieved under the TA

- Work towards signing of Regional Power Trade Framework Agreement for increased regional cooperation among SASEC nations
- Assessment of project development options and preliminary viability analysis of various regional flagship projects
- Knowledge sharing on “Best practices on Cross-border Electricity Trade and Regulatory Cooperation” in the 3rd and 4th CEERE workshop in Colombo
**ADB support to facilitating CBET through SASEC Power Trade Working Group (SPTWG)**

### Objective

Facilitating increased cross border power trade among member countries through development of regional projects and suggest measures to overcome challenges w.r.t multi country power trading

### To work in coordination and complement the activities of other groups e.g. SAARC Energy Centre/ SAFIR etc

### Key Responsibilities

<table>
<thead>
<tr>
<th>Assist in mobilizing funds for priority projects</th>
<th>Facilitate discussions among planning agencies, regulators and utilities</th>
<th>Capacity Building &amp; Knowledge Management</th>
<th>Maintain and update SASEC priority projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Discussions on project development options</td>
<td>- Support in identifying issues with respect to regulatory/policy/commercial, etc.</td>
<td>- Oversee studies and share best practices on policy, regulatory, technical and commercial/financial aspects</td>
<td>- Review progress and support in identifying key issues/challenges</td>
</tr>
</tbody>
</table>
Opportunities to leverage complementarities in SAARC power sector through regional cooperation

<table>
<thead>
<tr>
<th>Countries</th>
<th>Installed Capacity (MW)</th>
<th>Peak Demand (MW)</th>
<th>Per Capita Electricity Consumption (kWh)</th>
<th>Power Import (MW)</th>
<th>Power Export (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>520</td>
<td>600</td>
<td>149</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>21,000</td>
<td>14,500</td>
<td>336</td>
<td>1,160</td>
<td>-</td>
</tr>
<tr>
<td>Bhutan</td>
<td>2,326</td>
<td>400</td>
<td>2,976</td>
<td>-</td>
<td>~2,300</td>
</tr>
<tr>
<td>India</td>
<td>3,63,000</td>
<td>1,78,000</td>
<td>1,208</td>
<td>~2,300</td>
<td>~1,660</td>
</tr>
<tr>
<td>Maldives</td>
<td>400</td>
<td>-</td>
<td>725</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nepal</td>
<td>1,177</td>
<td>1,320</td>
<td>190</td>
<td>~500-520</td>
<td>-</td>
</tr>
<tr>
<td>Pakistan</td>
<td>36,010</td>
<td>25,000</td>
<td>435</td>
<td>1,000</td>
<td>-</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>4,103</td>
<td>2,616</td>
<td>658</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

- Wide variety of generation sources across the sub-region
- Dominance of single energy source for power generation in most of the member countries
- Cost of generation and supply widely varies across the SA nations with countries like Nepal & Bhutan having access to cheap hydro power and India having access to abundant renewable energy
- Member nations have time (peak/offpeak) and seasonal complementarities which may be leveraged through regional cooperation
- Scope for channelizing revenue from power export for socio-economic development
- Scope for reducing carbon footprint (increasing RE penetration) - opportunity to support fluctuation from RE with traditional sources

Need for a regional framework agreement to develop energy resources, meeting electricity demand and enhanced economic benefits for the SAARC region
SAARC Framework Agreement for Energy Co-operation (Electricity)

**Objective:** Enable cross-border trade of electricity on voluntary basis subject to the laws, rules and regulations of the respective Member States

**Salient Features of the SAARC Framework Agreement**

- Non-discriminatory access to transmission grids for the purpose of CBET
- International coordination in transmission interconnection planning, system operations, and energy accounting
- Promotion of information sharing between Member States
- Encouraging member states to undertake power sector reforms in their respective jurisdictions, to promote competition
- Member states to develop structure functions and institutional mechanisms to resolve regulatory issues

- SAARC Framework Agreement has been ratified by all member states except Pakistan
- Multilateral/trilateral trade is yet to be established among SAARC member nations

SAARC Framework Agreement for Energy Cooperation (Electricity) was first signed in 2014 at the 18th SAARC Meeting. The member nations are Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.
Barrier and Challenges for implementation of framework agreement for CBET

**Technical Challenges**
- Limited competitive pricing regime for cross border trade
- No uniform transmission pricing framework

**Commercial Challenges**
- Lack of harmonisation of technical regulation
- Transmission Access & Planning

**System Operations**
- Lack of common operational guidelines
- Congestion Management
- Energy Accounting, settlement etc

**Institutional Challenges**
- Multiple decision making layers
- Lack of Member Nation Focal Point integrated in organisation structure of SAARC

**Challenges for Regional Power Exchange**
- Lack of clear roadmap for unified SAARC Power Exchange
- Lack of Open Access Regulation across Member States
Technical Challenges
## Technical Challenges

### SAARC Framework Agreement

<table>
<thead>
<tr>
<th>Article 7 Planning of Cross-border interconnections:</th>
<th>Current Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable the transmission planning agencies of the Governments to plan the cross-border grid interconnections through mutual agreements between the concerned states</td>
<td>• Currently only Bilateral transmission arrangements exist</td>
</tr>
<tr>
<td>Article 8: Build, Operate and Maintain:</td>
<td>• There is lack of regional transmission planning and project implementation to optimize investments on a regional level</td>
</tr>
<tr>
<td>Enable the respective transmission agencies to build, own, operate and maintain the associated transmission system of cross-border interconnection falling within respective national boundaries</td>
<td>• National institutions drives development of inter-connections</td>
</tr>
<tr>
<td></td>
<td>• Cross border inter-connections planned on a case-to-case basis</td>
</tr>
</tbody>
</table>

### Challenges

- No guidelines available in transmission planning for trilateral/multi country power trade
- No guidelines or clarity for cross country investment
- Absence of a regional transmission master plan
## Technical Challenges

### SAARC Framework Agreement

<table>
<thead>
<tr>
<th>Article 10: Electricity Grid Protection System</th>
<th>Current Status</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable joint development of coordinated network protection systems incidental to the cross-border interconnection</td>
<td>No common grid code or network regulation. Each country guided by its national electricity laws/policies</td>
<td>Absence of harmonisation may lead to difficulties in system operation with proposed significant increase in power trade</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Article 12: Transmission Access</th>
<th></th>
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</tr>
</thead>
</table>
| Enable non discriminatory access to the respective transmission grids as per the applicable laws, rules, regulations and applicable inter-governmental bilateral trade agreements. | • Apart from India, open access framework is not operationalized in other SAC  
• No open access required for power export for IND-NEP and IND-BAN as Nepal, Bangladesh are buyers.  
• Bhutan has dedicated transmission lines for export of power | Lack of open access regulation in SA countries will hinder access of transmission and distribution infrastructure to facilitate CBET |
Technical Framework for regional cooperation in GMS region

GMS program was started in 1992 with assistance of ADB

RPTCC established as per Article 4 of the IGA signed in 2002

RPTOA, drafted by the RPTCC was approved in 2005

Working Groups established under RPTCC for project and market development aspects

Key Achievements till Date

- Roadmap on transmission pricing methodologies
- Technical assistance to countries on regulatory issues, i.e. transmission company, system operation, wheeling charges, etc.
- GMS performance standards adopted as a reference document in June 2016
- Regional transmission regulations adopted as reference document in Dec 2017
- Work in progress
  - Standard regional metering and communication arrangements
  - GMS Grid Code
  - Regional master plan and FS for priority interconnectors
Existing Issues/Challenges among SAARC nations  3/3
Addressing technical Challenges-Way forward

1. Harmonisation of Regulatory framework and grid networks
   - Recognition of Cross Border Trade in each country's laws and regulations
   - Introducing clarity in regulations for promoting cross country investments for the much needed infrastructure
   - Formulation of Common Grid Code covering connection arrangements, operating parameters and scheduling/dispatching code etc. initially starting with partial adoption by member states and subsequently modification of national grid codes and move towards a full adoption

2. Open Access
   - Introduction of open access in the legislative framework of nations where it does not exist
   - Treatment of open access for cross border power trade
   - Define features and eligibility criteria for connectivity and open access (types of open access, tenure and priority of open access)
   - Fixation of Open access charges
   - Procedure for grant of connectivity of open access including details of nodal agencies, processing timelines etc
   - Establishing the operational and commercial mechanisms

3. Creation of Regional Transmission Infrastructure Plan
   - Formulation of a coordinated Regional Planning for the development of infrastructure under various project development regimes
   - Development of a regional coordination mechanism of planners for synergistic development of national vis-à-vis regional specific infrastructure
   - Development of National Transmission Plan to include details of CBET transmission infrastructure
Commercial Challenges
Existing Issues/Challenges among SAARC nations

Commercial Challenges

SAARC Framework Agreement

Article 3 Scope
Member States may enable Buying and Selling Entities to negotiate the terms, conditions, payment security mechanism and tenure of electricity trade under the Government regulatory mechanisms of the concerned states.

Article 9: Transmission Service Agreements
Member nations may facilitate entities to enter into TSA with transmission service Provider.

Current Status

- For projects developed under Inter-Governmental Agreement, the tariff is determined through G to G negotiations
- Gradual evolution from G-G to commercial CBET (~30% of the power trade)
- Transmission pricing currently governed by bilateral TSA.
- Transmission pricing involving Indian & interconnected grid is done as per CERC regulations

Issues/Challenges

- Along with the prevalent G2G model for power sale, there is need for more commercial focus and competitive price discovery
- Need of standard framework for Transmission Charges/ Pricing
- Need for development of model/standard TSA
- Need for framing uniform guiding principles on transmission cost sharing/transit fee arrangement
Existing Issues/Challenges among SAARC nations 3/3
Addressing Commercial Challenges-Way forward

1. Competitive Pricing Discovery

- Gradual transition from G-G bilateral arrangements to more competitive market driven arrangements
- Promotion of power trade through exchanges to improve price discovery and improve transparency

2. Common Norms for transmission pricing, payment security, and other commercial terms

- Setting up principles and mechanism for determination of economically efficient transmission pricing mechanism and gradually introduce concept of local specific pricing
- Evolution of an appropriate transit fee mechanism with a possible start using cost plus principles

International Example: GMS

- Presently transmission methodology varies across countries; in case of using third country network wheeling charge for that country as well as system loss to be recovered through end tariff. RPTCC under GMS Secretariat presently working on common CBET transmission pricing methodology

- Methodologies agreed to enhance present postal stamp method prevalent in some countries of Greater Mekong Region for transmission pricing are
  - Differentiation of charge by time of year to reflect hydrological variations
  - Differentiation of charges by capacity and energy,
  - Introduction of charges to generators and consumers

- Electricity Tariff for power export and wheeling charge is determined as per bilateral PPAs. Cost plus model is used for determination of tariff
System Operation Challenges
### Existing Issues/Challenges among SAARC nations

#### System Operation Challenges

**SAARC Framework Agreement**

**Article 11 System Operation and Settlement Mechanism**

Member States shall enable the national grid operators to jointly develop coordinated procedures for the secure and reliable operation of the interconnected grids and to prepare scheduling, dispatch, energy accounting and settlement procedures for cross border trade.

**Current Status (As-Is)**

- **Schedule and Dispatch**
  - The National System Operators (NSO) are involved in each transaction for scheduling & despatch related activities

- **Energy Accounting & Settlement**
  - Actual energy data is used for billing of variable charges (fuel cost of generation) in all SAC except India. In India, billing of variable charges is based on Scheduled Energy

- **Congestion Management**
  - In many SACs, congestion in transmission system is typically managed either by generation or load control. There is no specific provision detailed for congestion management in respective Grid Codes

**Challenges**

- Different procedures and timelines of different NSOs may create issues in cross border transaction of power

- Lack of common procedure in energy accounting and settlement may lead to lack of transparency

- In the absence of a regional commercial mechanism for Congestion planning in advance, many times curtailment in transaction take place in CBET
Existing Issues/Challenges among SAARC nations
Addressing System operation Challenges-Way forward

Scheduling & Dispatch
- Formulation of common grid code to standardize operation and scheduling with pre defined timelines

Energy Accounting
- In case of multiple transmission interconnection points, it is envisaged that scheduling would be carried out separately for each transmission link through a defined procedure
- A separate commercial mechanism for imbalance settlement may be established

Congestion Management
- Feasibility of implementing a commercial mechanism may be explored wherein, users causing congestion pay penalty and users relieving congestion receive incentive at predetermined rate

International Example: South African Power Pool
- Operating guidelines for SAPP issued in 2012. The areas covered are:
  - System control: Generation/ voltage/ time & freq. control, equipment
  - System security: Active/ reactive supply, relay coordination, connection & operation of IPPs
  - Emergency operation protocol: Over/ under generation, load surge, load shedding, system restoration,
  - Operating personnel: Responsibility, training
  - Operations planning: Normal, short/ long term emergency
  - Telecommunications: Facility, controller
Institutional Challenges
Institutional Challenges amongst SAARC Nations
Current Status and Challenges

<table>
<thead>
<tr>
<th>SAARC Framework Agreement</th>
<th>Current Status</th>
</tr>
</thead>
</table>

**Article 15: Regulatory Mechanisms**
Member States shall develop the structure, functions and institutional mechanisms to resolve regulatory issues related to electricity exchange and trade

**Article 16: Dispute Settlement**
Dispute arising out of interpretation and/or implementation of this Agreement shall be resolved amicably among the Member States. If unresolved, the Member States may choose to refer the dispute to the SAARC Arbitration Council

- Institutional structure of SAARC includes 7 layered organs
- SAARC Summits is the apex body governing the decision making
- Council of ministers from member states formulate and ratify the policies, regulations etc.
- Third layer is Standing Committee of Foreign secretaries responsible for approvals and overall monitoring and coordination
- The last 4 layers are responsible for implementation, monitoring and evaluation with allocation in a vertically hierarchical order

**Challenges**

- Multiple layer operations and governance system prolonging the decision making and implementation process
- Absence of Nodal Points from each member nation embedded in the organisational structure of SAARC
## Institutional Challenges amongst SAARC Nations

As-is Situation of the SAARC Institutional Structure

<table>
<thead>
<tr>
<th>Order</th>
<th>Principal Organ</th>
<th>Key Features</th>
<th>Roles and Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SAARC Summits</td>
<td>▪ Meetings of the Heads of State or Government of Member States&lt;br&gt;▪ Held biennially hosted by a Member State in alphabetical order</td>
<td>▪ Declaration consisting of decisions and directives&lt;br&gt;▪ Approval of reports of the Council of Ministers</td>
</tr>
<tr>
<td>2</td>
<td>Council of Ministers</td>
<td>▪ Comprises Ministers of Foreign/External Affairs of the Member States&lt;br&gt;▪ CoM meetings conducted before the Summit and between two Summits&lt;br&gt;▪ CoM reports submitted to meeting of Heads of State or Government</td>
<td>▪ Formulation of policies of the Association&lt;br&gt;▪ Review of progress of cooperation under SAARC&lt;br&gt;▪ Establishment of additional mechanism under SAARC</td>
</tr>
<tr>
<td>3</td>
<td>Standing Committees</td>
<td>▪ Comprises of the Foreign Secretaries of the SAARC Member States&lt;br&gt;▪ Standing Committee can meet ad hoc basis&lt;br&gt;▪ Conducted during Summit for CoM is convened in between two Summits</td>
<td>▪ Overall monitoring and coordination of programme&lt;br&gt;▪ Approval of projects and programmes and mobilize resources&lt;br&gt;▪ Determination of inter-sectoral priorities</td>
</tr>
<tr>
<td>4</td>
<td>Programming Committees</td>
<td>▪ Comprising of the Heads of SAARC Divisions of Member States&lt;br&gt;▪ Meets prior to the meetings of the Standing Committee</td>
<td>▪ Considers the Calendar of Activities&lt;br&gt;▪ Administrative and Financial Matters of the Secretariat</td>
</tr>
<tr>
<td>5</td>
<td>Technical Committees</td>
<td>▪ Comprises of 6 Technical Committees for SAARC activities&lt;br&gt;▪ Work on their respective areas to provide support to SAARC activities</td>
<td>▪ Implementation, coordination and monitoring of programmes&lt;br&gt;▪ Formulation of programmes and preparation of projects</td>
</tr>
<tr>
<td>6</td>
<td>Working Groups</td>
<td>▪ Carry out the directives emanating from SAARC higher bodies&lt;br&gt;▪ Comprises of 4 Working Groups</td>
<td>▪ Formulate and over see programmes and activities&lt;br&gt;▪ Coordinate, monitor and evaluate programmes</td>
</tr>
<tr>
<td>7</td>
<td>Action Committees</td>
<td>▪ Comprising of Member States concerned with the implementation of projects involving more than 2 but not all Members</td>
<td>▪ Support in the implementation of project as a support to WG</td>
</tr>
</tbody>
</table>
Benchmarking with Other Regional Body from Asia

CAREC has relatively flatter and shorter hierarchy with only 4 layers of decision making bodies or organs which can facilitate expeditious resolutions and approvals

**Ministerial Conference**
- Provide overall strategic guidance to the process of economic cooperation in the Central Asia Region
- Decide on new regional initiatives (involving two or more nations)

**Senior Officials Meeting**
- Effective implementation of the policy decision made by Ministerial Level Conference (MLC) by reviewing and articulating issues
- Making relevant recommendations and assessing issues

**Sectoral Coordination Committee**
- Set-up on an ad-hoc basis as determined by the MLC to coordinate sector wide issues, activities including plans for sector development.
- Works in close coordinate with National Focal Point

**Working Groups**
- Project specific working groups to facilitate the preparation, implementation, monitoring and progress

**Focal Point**
- Member nation designated point of contact responsible for coordination amongst concerned govt. agencies and other parties

**Way Forward**
- Learnings can be taken from other international cases to simplify and flatten the hierarchy to expedite the decision making process
- Introduction of an additional external body viz. the nodal focal point from all the member nations which can act as single contact point for all coordination, monitoring, oversight and decision making purposes for pertinent project nations
- Structured institutional mechanisms/committees/forums at the level of regulators, planning authorities etc
Challenges in Regional Power Exchange
## Regional Power Market Challenges amongst SAARC Nations

### Existing Cross Border Power Trade between member nations

#### Existing Bilateral Trade

<table>
<thead>
<tr>
<th>Source</th>
<th>Type</th>
<th>Trader</th>
<th>Tenure</th>
</tr>
</thead>
<tbody>
<tr>
<td>India → Bangladesh</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1160 MW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>250 MW NTPC</td>
<td>G-G</td>
<td>NVVNL</td>
<td>25 years</td>
</tr>
<tr>
<td>250 MW Market</td>
<td>Comml</td>
<td>PTC</td>
<td>3 years</td>
</tr>
<tr>
<td>160 MW Tripura</td>
<td>G-G</td>
<td>NVVNL</td>
<td>5 years</td>
</tr>
<tr>
<td>500 MW Market</td>
<td>Comml</td>
<td>NVVNL Semcorp</td>
<td>15 years</td>
</tr>
<tr>
<td>40 MW Market</td>
<td>Comml</td>
<td>PTC</td>
<td>2 years</td>
</tr>
<tr>
<td>Bhutan → India</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2260 MW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1020 MW Tala</td>
<td>G-G</td>
<td>PTC</td>
<td></td>
</tr>
<tr>
<td>336 MW Chhukha</td>
<td>G-G</td>
<td>PTC</td>
<td></td>
</tr>
<tr>
<td>60 MW Kurichhu</td>
<td>G-G</td>
<td>PTC</td>
<td></td>
</tr>
<tr>
<td>126 MW Dagachhu</td>
<td>Comml</td>
<td>TPTCL</td>
<td>25 years</td>
</tr>
<tr>
<td>720 MW Mangdechhu</td>
<td>G-G</td>
<td>PTC</td>
<td>35 years</td>
</tr>
<tr>
<td>India → Nepal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(500-520 MW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>237 MW India</td>
<td>G-G</td>
<td>-</td>
<td>Long Term Contract</td>
</tr>
<tr>
<td>80-120 MW Market</td>
<td>Comml</td>
<td>PTC/NVVN</td>
<td>-</td>
</tr>
<tr>
<td>160 MW Market</td>
<td>Comml</td>
<td>NVVN</td>
<td>Renewed every year</td>
</tr>
<tr>
<td>Afghanistan → Pakistan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(CASA - Project-1000 MW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Type</td>
<td>Trader</td>
<td>Tenure</td>
</tr>
<tr>
<td>Afghanistan → Pakistan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1000 MW)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASA Project</td>
<td>CASA</td>
<td>Bilateral</td>
<td>Yet to commence</td>
</tr>
</tbody>
</table>

#### Emerging Trilateral Trade

**900 MW Upper Karnali HPP**

The Cabinet Committee on Public Purchase (CCPP) in Bangladesh has approved a proposal for importing about **500 MW electricity from the proposed 900 MW Upper Karnali Hydroelectricity Project** being developed by GMR in Nepal.

**1125 MW Dorjilung Project**

Bhutan, Bangladesh and India intend to propose **1125 MW Dorjilung project** as a trilateral project. The DPR of the project has been approved by RGoB. Transmission interconnectivity options between Bhutan and Bangladesh through India is being currently explored.

**Bangladesh PSMP 2016**

Bangladesh proposes to import >5 GW of hydropower from Bhutan, Nepal and Myanmar.
Regional Power Market Challenges amongst SAARC Nations...(1/2)
Current State of Affairs to Progress towards Regional Power Market

<table>
<thead>
<tr>
<th>SAARC Framework Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Article 15: Regulatory Mechanisms</strong></td>
</tr>
<tr>
<td>Member States shall develop the structure, functions and institutional mechanisms to resolve regulatory issues related to electricity exchange and trade</td>
</tr>
</tbody>
</table>

| **Article 16: System Operation and Settlement Mechanism** |
| Member States shall enable the national grid operators to jointly develop coordinated procedures for the secure and reliable operation of the inter-connected grids and to prepare scheduling, dispatch, energy accounting and settlement procedures for cross border trade. |

<table>
<thead>
<tr>
<th>Current Status (As-Is)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase – I (Bilateral Power Trade)</strong></td>
</tr>
<tr>
<td>This phase aims at establishing bilateral trade connections between member nations. Currently most of the CBET ties amongst SAARC nations is in Phase-I</td>
</tr>
</tbody>
</table>

| **Phase-II (Trilateral Power Trade)** |
| This phase is gradual progress towards Trilateral/Quadrilateral connections to establish trilateral market setup in the region. SA region is slowly transitioning towards trilateral trade with joint initiatives e.g. GMR Upper Karnali Project, Dorjilung Hydro Power Project |

<table>
<thead>
<tr>
<th>Potential Status (To-Be)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase – III (Sub Regional Power Market)</strong></td>
</tr>
<tr>
<td>The subsequent phase post trilateral market ties would be development of sub regional grids &amp; sub-regional power markets which would lead to formation of clustered market within regions sharing common operating and technical standards</td>
</tr>
</tbody>
</table>

| **Phase – IV (Harmonized Regional Power Market)** |
| Final phase is unification of sub-regional power markets or sub-regional clusters and formation of an integrated grid and common market pool with harmonised grid standards |
Regional Power Market Challenges amongst SAARC Nations...(2/2)
Current State of Affairs to Progress towards Regional Power Market

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Way Ahead</th>
<th>Regional Power Market Potential</th>
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</table>
| Lack of clear roadmap for governing the transition of CBET from Bilateral to Trilateral/Multilateral | • Development of a comprehensive roadmap for the phase wise transition of the bilateral trade to trilateral and conclusively multilateral trade system  
• Development of a robust strategy for inclusion of nearly all the member nations to the PXs platform  
• Development of planning for the adoption of open access regime by all member nations | Option: Regional Power Exchange PXs offers a platform for multilateral Cross Border Electricity Trade facilitating an opportunity to leverage the generation of generation assets across SAARC Region  
Value Proposition: Considering the electricity demand has diversity on seasonal, monthly, weekly and even daily level, PXs can play a transformational role to provide electricity at a fair, transparent and neutral platform with competitive price discovery  
Regional Driver: Progressive regional power market initiatives to drive regional power market growth viz. Bangladesh having green power (hydro) power import from Bhutan-Nepal, trilateral power agreements (Bhutan-India-Nepal) etc.  
Progress: In the SAARC region, India is currently playing a catalytic role by taking preliminary steps towards the development of Regional Power Exchange. Introduction RTM market and establishing rules and regulations allowing participation of other SA nations. |
Potential Options of the Cross Border Trade of Electricity (CBTE) in SAARC Region

Option 1: Extend operations of established Power Exchanges in India
- Create separate bid area for each SAARC Member nation or include member nations in nearby existing bid area depending upon technical feasibility
- To begin with, include member nations having existing grid connectivity;
- Subsequently add other members as and when they get connected with Indian grid

Option 2: Set-up Regional Power Exchange
- Creation of a Regional Power exchange viz. Regional PXs where South Asian Nations can participate
- Regional PXs can receive bids from member nations and, depending upon technical feasibility, it can receive either separate direct bids from Indian sellers and buyers or only uncleared buy bids and sell bids from Indian PXs

Proactive Initiatives to facilitate CBTE

MoP Guidelines for Import/Export (Cross Border) of Electricity (2018)
- Import/export of electricity between India and neighboring countries possible through bilateral agreement, bidding route or mutual agreement route.
- Import/Export through bilateral agreement between two countries, the Government of India may designate an Entity for import/export of power
- Disputes involving multiple Entities of separate countries can be settled through the International Arbitration Centre

CEA Draft Conduct of Business Rules of Designated Authority for CBTE (2019)
- Indian entities trading in DAM in PXs will not require any approval from designated authority
- Approval from designated authority not necessary if import/export is taking place under the Inter Govt. Agreement signed by India and neighboring country for specific projects

CERC Cross Border Trade of Electricity Regulations, 2019
- Sale and purchase of power between India and neighbouring countries allowed under bilateral agreement, bidding route or mutual agreement
- Electricity trading licensee of India may trade in Indian PXs on behalf of entity of the SA nation by obtaining approval from MoP designated agency
Conclusion and Way forward

Transitioning from Bilateral to Trilateral and conclusively to Multilateral CBET in South Asian Region

Deepening CBET leads to Clean Energy Transition and Sustainability, Climate Change Mitigation

Focus on power market development including ancillary services (establishment of regional PX)

De-risking CBET infrastructure Projects, Enhancing Bankability of Projects, Investment Mobilisation

Need to strengthen the process of Policy and Regulatory Harmonisation and Institutional Capacity
Thank you