THE REPORT

Video Conference on “Roadmap for the implementation of SAARC Framework Agreement on Energy Cooperation (Electricity)”

22nd September, 2020
Organized by
SAARC Energy Centre Islamabad

September 22, 2020

SAARC Energy Centre
697, Street 43, Sector E-11/4 (NPF),
Islamabad, Pakistan
www.saarcenergy.org
Introduction

1. SAARC Energy Centre (SEC), Islamabad successfully conducted a video conference on “Roadmap for the implementation of SAARC Framework Agreement on Energy Cooperation (Electricity)” on Tuesday, 22nd September 2020. The agenda of this event is available at Annexure-I.

2. SAARC Framework Agreement on Energy Cooperation (Electricity) – shall be referred to as Framework Agreement here onwards – signed in 2014, was a landmark moment to move closer to the realisation of SAARC Energy Ring, as envisioned by SAARC Leaders in 2004. Through this agreement, the SAARC member states recognised the importance of electricity trade, realised the benefits of such trade and were convinced of the need to increase economic cooperation. The objective of this agreement is to enable cross-border electricity trade (CBET) on voluntary basis subject to the laws, rules and regulations of the SAARC member states. The salient features of this agreement include the following:
   a. Non-discriminatory access to transmission grids
   b. International coordination in transmission interconnection planning, system operations, and energy accounting
   c. Promotion of information sharing between Member States
   d. Encouraging member states to undertake power sector reforms in their respective jurisdictions, to promote competition
   e. Member States shall towards exempting the cross-border electricity trade from export/import duties/levies

3. Focus of this video conference was to share the information on ongoing efforts for the implementation of the Framework Agreement to the participants and sensitise the
policy/decision makers on the importance and benefits of this agreement. The topics of discussion were: Overview of power sector in South Asia and current status of CBET; Importance of the Framework Agreement and its salient features; Challenges – technical, commercial, system operation and institutional – for implementation of the Framework Agreement; Outlook of CBET, emerging trends and way forward; efforts of SEC, ADB and SARI/EI in promoting the cause of the Framework Agreement.

**Participation**

4. The webinar was attended by 76 professionals representing public sector organizations, academia, private sector, and other stakeholders within and outside SAARC region. The speakers from SEC, ADB, India and Pakistan shared their knowledge pertaining to importance of the Framework Agreement, steps taken by member states for its implementation and the challenges faced along the way. The participants list is available at Annexure-II.

**Description**

5. SEC Programme Coordinator, Mr. Ahmad Talha, Research Fellow (Technology Transfer) started the video conference with welcome remarks. Subsequently, he invited Dr. Shoaib Ahmad, Deputy Director (Coord.), to deliver opening remarks on behalf of Director SEC. After the Opening Remarks, the Program Coordinator read out the agenda of the video conference which comprised of presentations by the resource persons. Each presentation was followed by a brief Q & A session. The Program Coordinator read out conclusions, which were gathered during the video conference. At the end, Dr. Shoaib Ahmad, Deputy Director (Coord.), delivered the closing remarks, on behalf of Director SEC, whereby offered remarks of appreciation to all the participants and presenters.

**Technical Proceedings**

6. Six resource persons from SEC, ADB, India and Pakistan shared their knowledge in the video conference. All the presentations delivered during the webinar are available at SEC’s website. Details of the resource persons are available at Annexure-III and their presentations at Annexure-IV. A brief information on the content of the delivered presentations is as follows:

**Presentation 1 – Draft Roadmap for SAARC Framework Agreement and Role of SEC**

*Mr. Ahmad Talha, Research Fellow (Technology Transfer), SAARC Energy Centre (SEC), Pakistan.*

7. Mr. Ahmad Talha – currently working as Research Fellow (Technology Transfer) – has about 7 years of working experience in the power sector. He has been responsible for designing electrical and protection systems for high voltage substations; electrical balance of plant design for power plants; electrical distribution network for oil and gas fields. He holds a Master’s degree in Sustainable Transportation and Electrical Power Systems – a joint degree programme by University of Oviedo, Spain; Sapienza University of Rome, Italy; University of
Nottingham, UK. He has also authored four research papers for reputable international conferences.

8. Mr. Ahmad started his presentation with a brief introduction to SEC. He apprised the participants on the background of the Framework Agreement and energy integration in the SAARC region as envisioned by SAARC leaders through SAARC Energy Ring. He also shared the draft roadmap, prepared by SEC, for implementation of the Framework Agreement and the pre-requisites for this roadmap. The interventions, suggested by SEC to facilitate implementation of the Framework Agreement were also a part of his presentation. In the end, he shared a summary of the studies, completed so far by SEC, related to different articles of the Framework Agreement.

Presentation 2 – Roadmap for the Implementation of SAARC Framework Agreement on Energy Cooperation (Electricity)

Mr. Jiwan Acharya, Principal Energy Specialist, ADB
Mr. Subhrajit Datta Ray, Director Energy, Utilities & Resource practice, PwC Pvt. Ltd., India
Mr. Sambit Kumar Dash, Associate Director Energy, Utilities & Resource practice, PwC Pvt. Ltd., India

9. Mr. Jiwan Acharya is working in Energy Division of South Asia Department of Asian Development Bank (ADB) as Principal Energy Specialist. He currently focuses on developing and implementing energy efficiency, renewable energy and other broader energy sector projects in India and Nepal. He is also serving as focal person for Regional Cooperation and Integration for Energy in South Asia. He is a key member of ADB's Energy Sector Group and Climate Change Team and was responsible for overseeing ADB's several key initiatives including Energy for All, and Low Carbon Technology Transfer, among others.

10. Mr. Subhrajit Datta Ray is a Director with the Energy, Utilities & Resource practice of PricewaterhouseCoopers Pvt. Ltd., India. He brings over 14 years of experience in power sector engagements in South Asia, South East Asia and Central Asia, across areas such as power sector policy and regulatory, cross border power trade, institutional strengthening and capacity development, bid advisory support and sector planning. He also advised Council of Experts of Energy Regulators (Electricity) (CEERE) in conducting knowledge sharing sessions on case studies in regulatory evolution in various other regions globally.

11. Mr. Sambit Kumar Dash is an Associate Director with the Energy, Utilities & Resource practice of PricewaterhouseCoopers Pvt. Ltd., India. He brings in over 11 years of experience in power sector engagements across South Asia and South East Asia, in areas related to cross border/regional projects. Mr. Sambit has extensively worked with multilaterals in promotion of regional cooperation in SASEC and Greater Mekong Sub Region (GMS). He has assisted ADB in strengthening the power sector’s key frameworks and systems to enhance Bhutan’s hydropower development. Mr. Sambit is presently advising ADB in developing an Energy
Framework Agreement for South Asian countries to enhance cooperation among the member nations.

12. Mr. Jiwan started the presentation by highlighting ADB’s effort to promote cross border electricity trade in South Asia. He shared the highlights of some of the important studies conducted by ADB to promote CBET in South Asia from 2005 - 2017. He also talked about the support extended by ADB to SAARC Council of Experts of Energy Regulators (CEERE) regarding implementation of the Framework Agreement. He concluded his part of the presentation by sharing information related to ADB’s technical assistance to SASEC member nations in promoting power trade in the region and the progress achieved so far under this assistance programme.

13. Mr. Subhrajit carried the discussion forward by presenting an overview of the power sector in South Asia, the benefits offered by regional cooperation and the need for a regional framework agreement. He emphasized the need for energy cooperation in South Asia in the light of sustainable development goals. He discussed the salient features of the Framework Agreement in detail. He talked about the impact of this agreement on bilateral CBET agreements in particular and on the power sector in the SAARC region in general. Technical challenges, namely harmonisation of technical regulations and open access to transmission systems, in implementation of the Framework Agreement and ways to overcome these challenges were also discussed.

14. Mr. Sambit covered the barriers related to commercial, system operation and institutional aspects of the Framework Agreement. He also presented challenges in establishment of a regional power exchange. On commercial front, he apprised that CBET needed to move from bilateral to multilateral trade and commercial form of CBET, with the involvement of private sector, should be encouraged to realise competitive price discovery. Talking about system operation challenges, Mr. Sambit talked about formulation of common grid code, common procedure for energy accounting and mechanism for congestion management. He concluded by presenting way ahead for regional power market and aspects that need to be catered to implement the Framework Agreement in its true spirit.

**Presentation 3 – Deepening Power System Integration & Cross Border Electricity Trade in SAARC Region: Current Status & Future Outlook**

*Mr. Rajiv Ratna Panda, South Asia Regional Initiative for Energy Integration (SARI/EI), India.*

15. Mr. Rajiv Ratna Panda is an energy expert, management, research, public policy, and strategy professional with multi-regional energy system expertise & experience. He currently works as Head-Technical, USAID’s South Asia Regional Initiative for Energy Integration (SARI/EI) at Integrated Research and Action for Development (IRADe). He provides technical inputs/advice as well as the policy, regulatory, legal and market inputs/advice for enhancing
CBET, power system integration, transmission system and grid integration, regional power market design & development and energy security in South Asia & BIMSTEC region. He was instrumental in developing regional regulatory guidelines for CBET, conceptualizing the development of regional regulatory/ technical institutional mechanism for deepening energy cooperation in the SA & BIMSTEC region.

16. In his presentation, he started the discussion with economic outlook of the SAARC region and status of cross border electricity trade in South Asia. He highlighted some of the challenges faced by the SAARC Member States in the areas of energy access and clean energy development. Discussion on current status and future outlook of CBET were the focal areas of his presentation. He talked in detail about the benefits offered by four key emerging trends – transition from bilateral to trilateral CBET, renewable energy based CBET, commercial form of CBET and regional power market development – with regards to future of CBET in the SAARC region. He emphasised on the importance of political will, implementation mechanism, open access to transmission systems, harmonisation of grid codes and regional coordination forums to realise regional power market. He concluded his presentation with a brief on action plan for implementation of the Framework Agreement and sharing the studies, related to various articles of the Framework Agreement, carried out by SARI/EI.

Presentation 4 – Competitive Wholesale Power Market (CTBCM) of Pakistan

Mr. Abrar Hussain, Central Power Purchasing Agency (CPPA-G), Pakistan.

17. Mr. Abrar Hussain is an electrical engineer who has worked both in private and public sectors of Pakistan and well versed in legal, regulatory, planning and technical aspects of both developing and developed countries. He has diversified experience of market development, power sector planning and power projects. He is leading market development activity in CPPA-G and working with MRC international consultants. He has exposure of both North American Pool markets and European Exchange Power Markets. Under his guidance, Pakistani electricity market has expected COD on March 2022.

18. Mr. Abrar began his presentation with a history of power sector reforms and electricity market development in Pakistan. He shared the electricity market design features from around the globe. He covered in detail the steps taken by different Pakistani institutions as well as legal, policy and regulatory framework improvements undertaken to develop competitive electricity market in Pakistan. He talked about the market model being developed in Pakistan and its salient features. In the end, he apprised the participants about the implementation plan and monitoring framework of electricity market in Pakistan.
Wrap up and Conclusion

*Mr. Ahmad Talha, Research Fellow (Technology Transfer), SAARC Energy Centre*

19. Mr. Ahmad Talha thanked everyone for attending the video conference. He informed the participants that there is great potential for energy trade between SAARC countries. Following are the main conclusions derived from the discussion:

   a. Ratification of SAARC Framework Agreement by all member states is crucial.
   
   b. Focus should now be on the implementation of SAARC Framework Agreement. Steps must be taken by individual member states to develop complimentary regulatory frameworks and harmonised grid codes/standards that facilitate regional electricity trade. Appropriate regional forums can facilitate the dialogue in this regard.
   
   c. Strengthening CBET ties will help in ensuring sustainable development, transition towards clean and green energy and meeting the climate change mitigation goals.

Closing of Webinar

*Dr. Shoaib Ahmad, Deputy Director (Coord), SAARC Energy Centre*

20. Dr. Shoaib Ahmad, on behalf of the Director SEC, thanked all the resource persons for delivering excellent presentations and their excellent response to the queries raised by the participants. He informed all the participants that the presentations and recording of the video conference proceedings will be available on *SEC’s website*. He requested the participants to submit suggestions/comments for any further improvement of these video conferences and suggest new topics to SEC. He closed the video conference with a thank you note to everyone attending the Video Conference.
Annexures
Video Conference Agenda

Video Conference on
“Roadmap for the implementation of SAARC Framework Agreement on Energy Cooperation (Electricity)”
Tuesday, 22 September 2020

<table>
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<tr>
<th>Time</th>
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<td>1100 – 1105</td>
<td>Introduction</td>
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<td>1105 – 1110</td>
<td>Opening Remarks</td>
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<td>1110 – 1125</td>
<td>Draft Roadmap and Activities Conducted by SEC</td>
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<td>Mr. Ahmad Talha, Research Fellow (Technology Transfer), SEC.</td>
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<tr>
<td>1125 – 1225</td>
<td>Roadmap for the Implementation of SAARC Framework Agreement on Energy Cooperation (Electricity)</td>
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<td></td>
<td>Mr. Jiwan Acharya, Principal Energy Specialist, Asian Development Bank</td>
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<td>Mr. Subhrajit Datta Ray (Director) and Mr. Sambit Kumar Dash (Associate Director), Power &amp; Utilities, PricewaterhouseCoopers Private Limited, India.</td>
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<td>1225 – 1245</td>
<td>Q &amp; A</td>
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<td>1245 – 1315</td>
<td>Deepening Power System Integration &amp; Cross Border Electricity Trade in SAARC Region: Current Status &amp; Future Outlook</td>
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<td>Mr. Rajiv Ratna Panda, Head Technical, South Asia Regional Initiative for Energy Integration (SARI/EL IRADe).</td>
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<tr>
<td>1315 – 1330</td>
<td>Q &amp; A</td>
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<tr>
<td>1330 – 1400</td>
<td>Competitive Wholesale Electricity Market in Pakistan</td>
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<td>Mr. Abrar Hussain, Team Lead Market Design &amp; Development, Central Power Purchasing Agency (CPPA-G), Pakistan.</td>
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<td>1400 – 1415</td>
<td>Q &amp; A</td>
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<td>1415 – 1420</td>
<td>Conclusion and Recommendations</td>
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<td>1420 – 1430</td>
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Information for the participants:

1. All times mentioned in the agenda are according to Pakistan Standard Time (PKT). The participants from other Member States may attend this video conference by following their own national time. The time conversion for all Member States is provided below for reference:

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2. The participants can ask questions by typing questions under Questions tab or clicking the Raise Hand option in the Attendees pane of the main window of GoToWebinar application. You may send in your questions at any time during the presentations; we will collect these and address them during the Q&A session at the end of each presentation.

3. All participants can also submit comments/views and/or observations on this event to SAARC Energy Centre through email to Mr. Ahmad Talha, Research Fellow (Technology Transfer) (rftt@saarcenergy.org).
# List of Participants

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*Note: The table is a list of participants with their first name, last name, and email address.*
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<td>Narottam</td>
<td>Das</td>
<td><a href="mailto:n.das@cqu.edu.au">n.das@cqu.edu.au</a></td>
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<td>51.</td>
<td>Bhaskar</td>
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<td>Huma</td>
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<td><a href="mailto:soniahuma2005@gmail.com">soniahuma2005@gmail.com</a></td>
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<tr>
<td>Sr. No.</td>
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<td>Saarthak</td>
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<td>Mirza Sadaqat</td>
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<tr>
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<td>Thinley</td>
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<td>Ali</td>
<td><a href="mailto:engr.majidali.baig@gmail.com">engr.majidali.baig@gmail.com</a></td>
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</tr>
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<td>Rafee Ullah</td>
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<td><a href="mailto:rafeeullah.1@outlook.com">rafeeullah.1@outlook.com</a></td>
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<td>74.</td>
<td>Md. Nur</td>
<td>Mozahid</td>
<td><a href="mailto:mozahid.aep@sau.ac.bd">mozahid.aep@sau.ac.bd</a></td>
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<td>75.</td>
<td>Ahmad</td>
<td>Talha</td>
<td><a href="mailto:ahmadtalha@live.com.pk">ahmadtalha@live.com.pk</a></td>
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<td>76.</td>
<td>Muhammad Tanveer</td>
<td>Ramzan</td>
<td><a href="mailto:tanveerramzan018@gmail.com">tanveerramzan018@gmail.com</a></td>
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</table>
List of Presenters/Resource Persons

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name</th>
<th>Designation</th>
<th>Organization</th>
<th>Email address</th>
</tr>
</thead>
<tbody>
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<td>Principal Energy Specialist</td>
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<td><a href="mailto:jacharya@adb.org">jacharya@adb.org</a></td>
</tr>
<tr>
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</tr>
</tbody>
</table>
Presentations Delivered During the Video Conference

1. “Draft Roadmap and Activities Conducted by SEC” by Mr. Ahmad Talha, Research Fellow (Technology Transfer), SAARC Energy Centre.
Brief Introduction to SAARC Energy Centre (SEC)

SAARC Energy Centre

- Establishment: 2006
- Initiate, promote and facilitate cooperation in energy sector of the SAARC Member States for benefit of all
- SAARC Member States; supervised by a Governing Board comprising all the Member States
- Professional staff selected from the SAARC Member States
- Expert services through outsourcing

22/09/2020
SEC Mandate

→ Initiate, coordinate and facilitate regional, joint and collective activities on energy in the SAARC region
→ Provide technical inputs
→ Help in the integration of regional energy strategies by providing relevant information and expertise
→ Be a catalyst for the economic growth and development of the South Asia region

Background of SAARC Framework Agreement on Energy Cooperation
SAARC Vision on Energy

Domestic energy development and bilateral cooperation alone will not solve power crisis of South Asia.
Engagements have to be multi-lateral

SAARC Energy Ring

→ SAARC Energy Ring: Envisioned by the SAARC Leaders at the 12th SAARC Summit in 2004.
→ Four Inter-governmental Expert Groups engaged to pursue the concept:
  ➢ Oil and Gas
  ➢ Electricity
  ➢ Renewable Energy
  ➢ Technology Transfer (including Coal & Energy Efficiency)
SAARC Energy Ring: Power Grid

- Kyrgyzstan-Tajikistan-Afghanistan-Pakistan
- Tajikistan-Afghanistan
- Uzbekistan-Afghanistan
- Turkmenistan-Afghanistan
- Iran-Afghanistan
- Iran-Pakistan

- Pakistan-India-Nepal
- India-Pakistan

- Nepal-India-Bhutan-Bangladesh

SAARC Energy Ring: Gas Grid

- Turkmenistan-Afghanistan-Pakistan-India
- Iran-Pakistan-India
- Qatar-Pakistan-India

- Myanmar-Bangladesh-India

Pipelines from the west can further be extended to Nepal and Bangladesh.
Major Pre-Requisites for SAARC Energy Ring

- Enabling Environment: Harmonization of Regulatory Regimes
- Power Interconnections/Transmission Lines, Pipelines, Regional Energy Generation
- Establishment and Operation of Regional Power/Gas Market

SAARC Framework Agreement for Energy Cooperation (Electricity)

→ Signed in November 2014 at the 18th SAARC Summit:
  - Unrestricted cross-border trade
  - Commercial negotiation of PPAs
  - Non-discriminatory open access
  - Private sector trading
  - Participation in power exchanges
SAARC Framework Agreement for Energy Cooperation (Electricity)

→ Through this agreement, SAARC Member States have
  ➢ **Recognized** the importance of electricity in promoting economic growth and improving the quality of life
  ➢ **Realized** the common benefits of cross border electricity exchanges and trade among the Member States leading to optimal utilization of regional electricity generating resources, enhanced grid security, and electricity trade arising from diversity in peak demand and seasonal variations
  ➢ **Convinced** of the need to increase economic cooperation and create new opportunities in electricity sector

Draft Roadmap and Relevant Activities of SEC

22/09/2020
SAARC Council of Experts of Energy Regulators (Electricity)

→ The Second Meeting of SAARC Energy Regulators in 2016 recommended the formation of SAARC Council of Experts of Energy Regulators (CEERE) with the help of ADB.

→ Overall aim of the CEERE is to provide enabling regulatory environment for materializing SAARC Energy Ring through implementation of SAARC Framework Agreement on Energy Cooperation (Electricity)

→ As its active member, SEC developed and presented roadmap for CEERE and suggested potential interventions for successful implementation of SAARC Framework Agreement.

Critical Pre-requisites for Agreement Implementation

A. Ratification of Framework Agreement by the Member States
   • Ratification by all the Member States is critical.

B. Enabling Environment for Cross Border Electricity Trade
   • Identification of areas where interventions are required
   • Referring to the best regional and international practices

C. Capacity Building
   • Need assessment
   • Explore training opportunities
   • Manage financial resources
   • Organize training options

Agreement Ratification  Enabling Environment  Capacity Building
### Potential Interventions for Enabling Requirements

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<tr>
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<th>Intervention Title</th>
<th>SFA Reference</th>
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<tbody>
<tr>
<td>2.</td>
<td>Study to define &amp; adopt minimum set of data/information for operating CBET infrastructure</td>
<td>Article 5: Data Updating and Sharing</td>
</tr>
<tr>
<td>3.</td>
<td>Workshops for knowledge sharing on unbundling/modernization of Electricity sector</td>
<td>Article 6: Promoting Competition</td>
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<tr>
<td>4.</td>
<td>Establishing SAARC Power Planners Group for integrated operation of CBET Interconnections.</td>
<td>Article 7: Planning of Cross-border Interconnections</td>
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<td>5.</td>
<td>Study on gaps in relevant laws &amp; regulations to build, own, operate &amp; maintain the cross-border transmission &amp; interconnections.</td>
<td>Article 8: Build, Operate and Maintain the Associated Transmission Systems</td>
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### Potential Interventions for Enabling Requirements

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<tr>
<td>6.</td>
<td>Establishing SAARC System Protection Professionals Group for coordinated network protection system to ensure reliably operate interconnected system.</td>
<td>Article 10: Electricity Grid Protection System</td>
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<td>7.</td>
<td>Study on Gaps in Laws &amp; Regulations pertaining to entering into service agreements with the transmission providers for the purpose of CBET.</td>
<td>Article 9: Transmission Service Agreements</td>
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<td>9.</td>
<td>Workshops for knowledge sharing on mechanism and SOPs for open transmission access.</td>
<td>Article 12: Transmission Access</td>
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### Potential Interventions for Enabling Requirements

<table>
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<tr>
<td>10.</td>
<td>Workshops for knowledge sharing on regional competitive power market in SAARC member states.</td>
<td>Article 13: Facilitating Buying and Selling</td>
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<td>11.</td>
<td>An official blog space for each Member State at online Knowledge Sharing Platform on Regional Power Trade. Organizing executive exchange opportunities for SAARC experts and professionals.</td>
<td>Training of Professionals from Afghanistan conducted in 2019</td>
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<td>12.</td>
<td>Adopting structure, functions and institutional mechanisms for regulatory regime related to electricity exchange and trade.</td>
<td>Article 15: Regulatory Mechanism</td>
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<td>13.</td>
<td>Study to develop and adopt a Dispute Settlement Mechanism for resolving disputes on interpretation and/or implementation of framework agreement.</td>
<td>Article 16: Dispute Settlement</td>
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</table>

### Studies Conducted by SEC

- Action Paper on Gaps in Laws, Regulations, Export/Import Duties, etc. with respect to CBET and Exchange of Electricity between Buying & Selling Entities
- Template for Dispute Settlement Mechanism between Member States
- Minimum Set of Standardized Technical Data Required for Regional Power Interconnections and Regional Power Trading
### Summary of Intervention # 1 (Link)

<table>
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<tbody>
<tr>
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<td>SFA Reference</td>
<td>Article 4: Duties and Taxes</td>
</tr>
<tr>
<td>2.</td>
<td>Intervention Title</td>
<td>Study/Action Paper on Assessing the Gaps in Laws, Regulations, Export/Import Duties, etc. with respect to Cross Border Electricity Trade (CBET) and Exchange of Electricity between Buying and Selling Entities</td>
</tr>
</tbody>
</table>
| 3. | Objectives    | - Identify, collect and study the current, relevant documents  
- Study and determine the gaps with respect to initiation of CBET  
- Suggest critical exemptions for consideration by the relevant governments |
| 4. | Deliverables  | - Set of existing Laws, Regulations, Export/Import Duties, etc. on CBET  
- Recommendations for the exemption |

### Summary of Intervention # 2 (Link)

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<td>1.</td>
<td>SFA Reference</td>
<td>Article 5: Data Updating and Sharing</td>
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<tr>
<td>2.</td>
<td>Intervention Title</td>
<td>Research study for defining and making consensus on minimum set of technical data and information on the electricity sector along with their updating frequency, within the perspectives such as Transmission Planning, Planning of Cross Border Interconnections, Protection Systems, System Operation an Settlement Mechanisms</td>
</tr>
</tbody>
</table>
| 3. | Objectives    | - Identify, collect & study best regional/international practices  
- Develop a minimum set of technical data to be shared by the Member States, on a periodical basis  
- Share, discuss and seek consensus of the defined set of technical data among the Member States |
| 4. | Deliverables  | A set of technical data to be shared by the Member States for enabling CBET                                                             |
## Summary of Intervention # 13 (Link)

<table>
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<td>Article 16: Dispute Settlement</td>
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<tr>
<td>2.</td>
<td>Intervention Title</td>
<td>Developing, Sharing and Seeking Approval by the Member States of a template for Dispute Settlement Mechanism’ for amicably resolving any dispute arising out of interpretation and/or implementation of framework agreement</td>
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<tr>
<td>3.</td>
<td>Objectives</td>
<td>Facilitating the Member States aiming at smooth implementation of framework agreement.</td>
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<tr>
<td>4.</td>
<td>Deliverables</td>
<td>A template for Dispute Settlement Mechanism</td>
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</tbody>
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**THANK YOU FOR YOUR ATTENTION**

22/09/2020
“Roadmap for the Implementation of SAARC Framework Agreement on Energy Cooperation (Electricity)” by Mr. Jiwan Acharya¹, Mr. Subhrajit Datta Ray², Mr. Sambit Kumar Dash³

¹Principal Energy Specialist, South Asia Energy Division, ADB.
²Director, Power & Utilities, PricewaterhouseCoopers Private Limited (PwC), India
³Associate Director, Power & Utilities, PricewaterhouseCoopers Private Limited (PwC), India

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2. Technical Challenges ............................................... 11
3. Commercial Challenges .......................................... 16
4. System Operation Challenges .................................... 19
5. Institutional Challenges .......................................... 22
6. Challenges in Regional Power Exchange ................. 26
7. Conclusion ............................................................ 31
ADB Support to promote CBET in South Asia

ADB support to promote regional energy cooperation in South Asia

Objective

SAARC Regional Energy Trade (BRETS), 2005-2010
Regional trade and cooperation agreement, roadmap for harmonization of legal & regulatory frameworks

Study on South Asia Regional Power Exchange (SARPES), 2011-2013
Alternative financing mechanisms for regional projects, institutional roles

Study of the SASEC Electricity Transmission Master Plan (SETMAPS), 2014-17
Green-field interconnection possibilities within SAARC region till 2020, draft market rules for regional power trade and exchange, recommendations for regulatory framework compatibility

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**

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

**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**

- **Assist in mobilizing funds for priority projects**
  - Discussions on project development options
  - Scouting potential funding sources
- **Facilitate discussions among planning agencies, regulators and utilities**
  - Support in identifying issues with respect to regulatory/policy/commercial, etc.
- **Capacity Building & Knowledge Management**
  - Oversee studies and share best practices on policy, regulatory, technical and commercial/financial aspects
- **Maintain and update SASEC priority projects**
  - Review progress and support in identifying key issues/challenges
South Asian Power Sector Overview

Opportunities to leverage complementarities in SAARC power sector through regional cooperation

### SAARC Power Sector Scenario

<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>
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<tr>
<td>Afghanistan</td>
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<td>600</td>
<td>149</td>
<td>-</td>
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<td>14,500</td>
<td>336</td>
<td>1,160</td>
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<td>2,976</td>
<td>-</td>
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<td>India</td>
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<td>1,78,000</td>
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<td>~1,660</td>
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<td>1,320</td>
<td>190</td>
<td>~500-520</td>
<td>-</td>
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<td>Pakistan</td>
<td>36,010</td>
<td>25,000</td>
<td>435</td>
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<td>Sri Lanka</td>
<td>4,103</td>
<td>2,616</td>
<td>638</td>
<td>-</td>
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</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)

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.

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

Barrier and Challenges for implementation of framework agreement for CBET

- Limited competitive pricing regime for cross border trade
- No uniform transmission pricing framework
- Multiple decision making layers
- Lack of Member Nation Focal Point integrated in organisation structure of SAARC

Technical Challenges
- Lack of harmonisation of technical regulation
- Transmission Access & Planning

Commercial Challenges

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

Institutional Challenges
- Challenges for Regional Power Exchange
- Lack of clear roadmap for unified SAARC Power Exchange
- Lack of Open Access Regulation across Member States
## Existing Issues/Challenges among SAARC nations  1/3

### 1 Technical Challenges

<table>
<thead>
<tr>
<th><strong>SAARC Framework Agreement</strong></th>
<th><strong>Current Status</strong></th>
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<tbody>
<tr>
<td><strong>Article 7 Planning of Cross-border interconnections:</strong> 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><strong>Article 8: Build, Operate and Maintain:</strong> 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>• There is lack of regional transmission planning and project implementation to optimize investments on a regional level</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Challenges</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>No guidelines available in transmission planning for trilateral/multi country power trade</td>
</tr>
<tr>
<td>No guidelines or clarity for cross country investment</td>
</tr>
<tr>
<td>Absence of a regional transmission master plan</td>
</tr>
</tbody>
</table>
### Existing Issues/Challenges among SAARC nations 2/3

#### Technical Challenges

<table>
<thead>
<tr>
<th><strong>SAARC Framework Agreement</strong></th>
<th><strong>Current Status</strong></th>
<th><strong>Challenges</strong></th>
</tr>
</thead>
</table>
| **Article 10: Electricity Grid Protection System**  
Enable joint development of coordinated network protection systems incidental to the cross-border interconnection | No common grid code or network regulation. Each country guided by its national electricity laws/policies | **Absence of harmonisation may lead to difficulties in system operation with proposed significant increase in power trade** |
| **Article 12: Transmission Access**  
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

**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 2 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 6: Transmission Service Agreements**
  Member nations may facilitate entities to enter into TSA with transmission service Providers

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

3 System Operation Challenges

<table>
<thead>
<tr>
<th>SAARC Framework Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article 11 System Operation and Settlement Mechanism</td>
</tr>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Status (As-Is)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule and Dispatch</td>
</tr>
<tr>
<td>• The National System Operators (NSOs) are involved in each transaction for scheduling &amp; dispatch related activities</td>
</tr>
<tr>
<td>Energy Accounting &amp; Settlement</td>
</tr>
<tr>
<td>• 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</td>
</tr>
<tr>
<td>Congestion Management</td>
</tr>
<tr>
<td>• 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</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Different procedures and timelines of different NSOs may create issues in cross border transaction of power</td>
</tr>
<tr>
<td>• Lack of common procedure in energy accounting and settlement may lead to lack of transparency</td>
</tr>
<tr>
<td>• In the absence of a regional commercial mechanism for congestion planning in advance, many times curtailment in transaction take place in CBET</td>
</tr>
</tbody>
</table>
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

SAARC Framework Agreement

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

Current Status

- 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>
</table>
| 1     | SAARC Summits  | • Meetings of the Heads of State or Government of Member States  
- Held hierarchically by a Member State in alphabetical order | • Declaration consisting of decisions and directives  
• Approval of reports of the Council of Ministers |
| 2     | Council of Ministers | • Comprises Ministers of Foreign/External Affairs of the Member States  
- CoM meetings conducted before the Summit and between two Summits  
- CoM reports submitted to meeting of Heads of State or Government | • Formulation of policies of the Association  
• Review of progress of cooperation under SAARC  
• Establishment of additional mechanism under SAARC |
| 3     | Standing Committees | • Comprises of the Foreign Secretaries of the SAARC Member States  
- Standing Committee can meet ad hoc basis  
- Conducted during Summit for CoM is convened in between two Summits | • Overall monitoring and coordination of programme  
• Approval of projects and programmes and mobilize resources  
• Determination of inter-sectoral priorities |
| 4     | Programming Committees | • Comprising of the Heads of SAARC Divisions of Member States  
- Meets prior to the meetings of the Standing Committee | • Considers the Calendar of Activities  
• Administrative and Financial Matters of the Secretariat |
| 5     | Technical Committees | • Comprises of 6 Technical Committees for SAARC activities  
- Work on their respective areas to provide support to SAARC activities | • Implementation, coordination and monitoring of programmes  
• Formulation of programmes and preparation of projects |
| 6     | Working Groups | • Carry out the directive emanating from SAARC higher bodies  
- Comprises of 4 Working Groups | • Formulate and oversee programmes and activities  
• Coordination, monitor and evaluate programmes |
| 7     | Action Committees | • Comprising of Member States concerned with the implementation of projects involving more than 2 but not all Members | • Support in the implementation of project as a support to WG |
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.

<table>
<thead>
<tr>
<th>Body</th>
<th>Scope of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministerial Conference</td>
<td>• Provide overall strategic guidance to the process of economic cooperation in the Central Asia region &lt;br&gt; • Decide on new regional initiatives (involving two or more nations)</td>
</tr>
<tr>
<td>Senior Officials Meeting</td>
<td>• Effective implementation of the policy decision made by Ministerial Level Conference (MLC) by reviewing and articulating issues &lt;br&gt; • Making relevant recommendations and assessing issues</td>
</tr>
<tr>
<td>Sectoral Coordination Committee</td>
<td>• Set-up on an ad-hoc basis as determined by the MLC to coordinate sector-wide issues, activities including plans for sector development. &lt;br&gt; • Work in close coordination with National Focal Point</td>
</tr>
<tr>
<td>Working Groups</td>
<td>• Project specific working groups to facilitate the preparation, implementation, monitoring and progress</td>
</tr>
<tr>
<td>Fiscal Point</td>
<td>• Member nation designated point of contact responsible for coordination amongst concerned govt. agencies and other parties</td>
</tr>
</tbody>
</table>

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>250 MW NTPC</td>
<td>G-G</td>
<td>NVPN</td>
<td>15 years</td>
</tr>
<tr>
<td>136 MW Market</td>
<td>G-G</td>
<td>NVPN</td>
<td>5 years</td>
</tr>
<tr>
<td>199 MW Tribhara</td>
<td>G-G</td>
<td>NVPN</td>
<td>5 years</td>
</tr>
<tr>
<td>295 MW Market</td>
<td>G-G</td>
<td>NVPN</td>
<td>5 years</td>
</tr>
<tr>
<td>200 MW Market</td>
<td>G-G</td>
<td>NVPN</td>
<td>15 years</td>
</tr>
<tr>
<td>200 MW Market</td>
<td>G-G</td>
<td>NVPN</td>
<td>15 years</td>
</tr>
<tr>
<td>40 MW Market</td>
<td>G-G</td>
<td>NVPN</td>
<td>2 years</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 900 MW electricity from the proposed 900 MW Upper Karnali Hydroelectricity Project being developed by GMR in Nepal.

#### 1125 MW Darjiling Project
Bhutan, Bangladesh and India intend to propose 1125 MW Darjiling project as a trilateral project. The DPR of the project has been approved by RGoI. Transmission interconnection 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

#### SAARC Framework Agreement
- 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: System Operation and Settlement Mechanism
  Member States shall enable the national grid operators to joint 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.

#### Current Status (As-Is)

**Phase-I (Bilateral Power Trade)**
This phase aims at establishing bilateral trade connections between member nations. Currently, most of the bilateral ties amongst SAARC nations are in Phase-I.

**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, Darjiling Hydro Power Project.

#### Potential Status (To-Be)

**Phase-III (Sub Regional Power Market)**
The subsequent phase post bilateral market ties would be development of sub regional grids & sub-regional power markets which would lead to formation of clustered market within regions sharing common operating and technical standards.

**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 harmonized grid standards.
Regional Power Market Challenges amongst SAARC Nations...(2/2)
Current State of Affairs to Progress towards Regional Power Market

### Challenges
- Lack of clear roadmap for governing the transition of CBET from Bilateral to Trilateral/Multilateral
- Lack of strategy for the progress of the Regional Power Exchange with involvement of more than four member nations i.e. beyond BBN
- Lack of Open Access Regulation across Member Nations

### Way Ahead
- 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

### Regional Power Market Potential

<table>
<thead>
<tr>
<th>Option</th>
<th>Value Proposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1: Extend operations of established Power Exchanges in India</td>
<td>Provincial Power Exchange (PPE) offers a platform for multilateral Cross Border Electricity Trade facilitating an opportunity to leverage the generation of power assets across SAARC Region</td>
</tr>
<tr>
<td>Option 2: Set-up Regional Power Exchange</td>
<td>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 prices across</td>
</tr>
<tr>
<td>Regional Driver</td>
<td>Progressive regional power markets 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</td>
</tr>
<tr>
<td>Progress</td>
<td>In the SAARC region, India is currently playing a catalytic role by taking preliminary steps towards the development of Regional Power Exchanges. Introduction of RTS market and establishing rules and regulations allowing participation of other SA nations</td>
</tr>
</tbody>
</table>

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 login with, include member nations having existing grid connectivity
- Subsequently add other member nations 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 other direct bids from Indian sellers and buyers or only undisclosed buy bids and sell bids from Indian PXs

### Proactive Initiatives to facilitate CBTE
- MoP Guidelines for Import/Export (Cross Border) of Electricity (2019)
  - 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

  - Indian entities trading 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 neighboring countries allowed under bilateral agreement, bidding route or mutual agreement
  - Electricity trading, increase of India may trade in Indian PXs or the 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
Annexure-IV

South Asia Regional Initiative for Energy Integration

Presentation on

Deepening Power System Integration & Cross Border Electricity Trade in SAARC Region: Current Status & Future Outlook

Presented by

Rajiv Ratna Panda
(Technical-Head, SARI/EI, IRADe)

SAARC Energy Centre’s Video Conference on “Roadmap for the Implementation of SAARC Framework Agreement on Energy Cooperation—Electricity (SAARC FAEC(E))”
Tuesday, 22 September, 2020 from 11.30-15.00 hrs (IST).

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01. Marco Economic Growth & Economic Integration
02. Overview of South Asian Power Sector
03. Current & Future Scenario of Cross-border Electricity Trade (CBET)
04. Future Outlook for CBET
05. Enablers for accelerating CBET & Development Regional Power Market
06. SARI/EI Initiatives- Providing Actionability to articles of SAARC FAEC(E)*
07. Road Map & Action Plan

* SAARC FAEC(E): SAARC Framework Agreement for Energy Cooperation (Electricity)
Marco-Economic Growth & Economic Integration of South Asia

South Asian Economic Growth Story: Dynamic & Vibrant

Real GDP Growth Annual Percent Change

Source: World Economic Outlook (April, 2020)

South Asia: Fastest growing region in the world in recent past & expected to remain so in future
Annexure-IV

South Asia: Yet Least Integrated

Intra-regional Trade Share (%)
(Intra-regional trade to total trade of the region)

<table>
<thead>
<tr>
<th>Region</th>
<th>Intra-regional Trade Share (%) 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>European</td>
<td>68.9</td>
</tr>
<tr>
<td>Asia &amp; the Pacific</td>
<td>57.36</td>
</tr>
<tr>
<td>ASEAN+3</td>
<td>46.17</td>
</tr>
<tr>
<td>East Asia</td>
<td>34.61</td>
</tr>
<tr>
<td>North America</td>
<td>23.56</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>23.37</td>
</tr>
<tr>
<td>ASEAN</td>
<td>23.34</td>
</tr>
<tr>
<td>Africa</td>
<td>15.88</td>
</tr>
<tr>
<td>Middle East</td>
<td>14.33</td>
</tr>
<tr>
<td>Latin America &amp; Caribbean</td>
<td>14.26</td>
</tr>
<tr>
<td>Central Asia</td>
<td>7.87</td>
</tr>
<tr>
<td>South Asia</td>
<td>5.59</td>
</tr>
</tbody>
</table>


Overview of South Asian Power System
Cross Border Electricity Trade in South Asia: Current Status and Future Scenario
Cross Border Electricity Trade in South Asia:
Future Outlook

Cross Border Electricity Trade (CBET) in South Asia: Future Outlook

CBET Outlook 1
Transitioning from Bilateral to Trilateral CBET

CBET Outlook 2
Renewable Energy based CBET

CBET Outlook 3
Commercial form of CBET

CBET Outlook 4
Regional Power Market Development & Market Integration
CBET Outlook -1
Transitioning from Bilateral to Trilateral CBET

Power system Integration evolution across the Globe

Establishing Bilateral connections, bilateral market
Moving towards Trilateral/Quadrilateral Connection, Trilateral Market
Developing Sub regional Grids & Sub-Regional Power Market
Fully Interconnecting sub regional Grids & Creating Common Grid and Unified Market

SA CBET Outlook-1:-Moving from Bilateral to Trilateral
Gradual Transition to Trilateral Cross Border Power Trade

- 404 MW Nyera Amari HPP is envisaged as a trilateral project-sale to both India & Bangladesh. (DPR under preparation)
- $2 billion, 1125 MW Dorjilung Project (The DPR of the project approved by RGGoB)
- Bangladesh will import 500 MW of electricity from 900 MW Upper Kamal (GMR) in Nepal @ 7.72 cents/unit for 25 years##
  (Price Negotiation is Concluded, Discussion on transmission is under discussion)

CBET Outlook-2
Renewable Energy based CBET
Annexure-IV

South Asia-Significant Environment/Climate Change Challenge

SAARC Countries-fossil_CO2_by_sector_in Mt CO2/yr (2018)

- Afghanistan: 3.4
- Bangladesh: 59.8
- Bhutan: 0.3
- India: 1212.9
- Maldives: 0.1
- Nepal: 0.3
- Pakistan: 44.4
- Sri Lanka: 8.2

South Asia: Vulnerable to adverse impacts of climate change, de-carbonising the power sector is crucial.

South Asia-Large Renewable Energy Potential

South Asia Hydro Power Potential in GW (%)
- Afghanistan: 59 (17%)
- Bangladesh: 25 (7%)
- Bhutan: 50 (9%)
- India: 35 (10%)
- Nepal: 83 (24%)
- Pakistan: 150 (43%)

350 GW Hydro Potential

South Asia Hydro Power Potential (GW) & % tapped so far

South Asia: Large Renewable Energy Resource within the Region-Potential for clean energy transition, sustainability & energy security.

Large Solar & Wind Potential

- Solar Power Potential: ~933 GW (~3% developed)
- Wind Power Potential: ~967 GW (~4% developed)
Annexure-IV

South Asia: Cross Border Electricity Trade From Renewable Energy Zones

Bangladesh Importing from Renewable Energy Zones (Tamil Nadu State (Solar & wind export), India & Nepal (Hydro Power Export)

- Importing 1 GW of Wind Power From Tamil Nadu (India)
- Importing 1 GW of Solar Power From Tamil Nadu (India)
- Importing 1 GW of Hydro Power From Nepal

Sri Lanka Importing from Renewable Energy Zones (Tamil Nadu State (Solar and wind export), India)

- Importing 1 GW of Wind Power From Tamil Nadu (India)
- Importing 1 GW of Solar Power From Tamil Nadu (India)

South Asia: GW scale RE based trilateral CBET offers cost saving, clean energy transition - leads to enhance energy affordability & sustainability

One Sun One World One Grid' (OSOWOG)-A grand Vision
One Sun One World One Grid’ (OSOWOG)-A grand Vision

India-Idea Announced in October 2018
The “Sun Never Sets”, globally, at any given point of time.
Building a global ecosystem of interconnected RE, seamlessly shared for mutual benefits & global sustainability
Large Scale regional & trans-region cross border transmission interconnection

OSOWOG- Potential for regional & trans-region transmission interconnection, global sustainability

Phase III (Global interconnection)
Phase II MESASEA grid interconnected with African power pools
Phase I-Middle East-South Asia-South East Asia (MESASEA) interconnection

CBET Outlook -3
Commercial form of CBET
Annexure-IV

South Asia: Commercial form of Cross Border Electricity Trade

<table>
<thead>
<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Trader</th>
<th>Tenure Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhutan-India</td>
<td>G-G</td>
<td>1020 MW Tala</td>
<td>PTC</td>
<td>35</td>
</tr>
<tr>
<td>(~2262 MW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G-G-2136</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comml-126</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>336 MW Chukha</td>
<td>G-G</td>
<td>336 MW Chukha</td>
<td>PTC</td>
<td>6</td>
</tr>
<tr>
<td>60 MW Kurichhu</td>
<td>G-G</td>
<td>60 MW Kurichhu</td>
<td>PTC</td>
<td>13</td>
</tr>
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<td>720 MW Mangdechhu</td>
<td>G-G</td>
<td>720 MW Mangdechhu</td>
<td>PTC</td>
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<td>126 MW Dagachhu</td>
<td>Commercial</td>
<td>126 MW Dagachhu</td>
<td>TPICL</td>
<td>25</td>
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<tr>
<td>India - Bangladesh</td>
<td>G-G</td>
<td>250 MW NTPC</td>
<td>NVVNL</td>
<td>25</td>
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<tr>
<td>(~1160 MW)</td>
<td></td>
<td></td>
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<tr>
<td>G-G-410</td>
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<tr>
<td>Comml-790</td>
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<tr>
<td>160 MW Tripura</td>
<td>G-G</td>
<td>160 MW Tripura</td>
<td>NVVNL</td>
<td>5</td>
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<td>PTC</td>
<td>3</td>
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<td>NVVNL/Sembcorp</td>
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<td>India-Nepal</td>
<td>G-G</td>
<td>237 MW India</td>
<td>PTC/NVVNI</td>
<td>Long Term</td>
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<td>(~587 MW)</td>
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<td>G-G-237</td>
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<tr>
<td>Comml-350</td>
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<td>80-150 MW Market</td>
<td>Commercial</td>
<td>80-150 MW Market</td>
<td>PTC/NVVNI</td>
<td>—</td>
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<tr>
<td>160 MW Market</td>
<td>Commercial</td>
<td>160 MW Market</td>
<td>NVVNI</td>
<td>Renewed Every year</td>
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</table>

South Asia: Commercial form of CBET leads to the business case, help in fostering private sector engagement & investment

CBET Outlook -4

Regional Power Market Development & Market Integration
Annexure-IV

Regional Power Market & Power Exchange (PX)-Transitioning to Market form of CBET in SA

Demand Diversity- Daily, weekly, Monthly, Seasonal
PXs- Fair, Transparent, Neutral Market Place-
Competitive price discovery

PXs offers a platform for trilateral/multilateral CBET
SARI-Study on Gains from BBIM Multilateral electricity Trade (Capex reduces by USD 17 billion due to regional trade)

SARI/EI-Study-SARPEx- Pilot Market Exercise- DAM in PX Platform. Bangladesh, Nepal, Bhutan in PXs, the quantum of MCV increased in the range of 5-7% (2015-16).

New power market initiatives in India also offers an opportunity to leapfrog in Cross Border Front.

SA Regional Power Market -Benefits of Regional Grid Balancing & RE Grid Integration

Rapid Renewable Energy Expansion in the horizon in SA

175 GW by 2022
450 GW² by 2030

Bangladesh
7.9 Gw² by 2041

Sri Lanka
50% Generation⁴ from RE by 2030

Pakistan
16 Gw² by 2040

Hydro Power through CBET for optimised grid balancing

CBET as a tool for flexibility, managing RE intermittency

Opportunity-Developing Regional Power Market (Trading of balancing services, Ancillary Market)

Successful 9 PM, 9 Minute-A generation flexibility of ~ 400 MW was achieved from hydropower plants in Bhutan³

One Sun One World One Grid⁵ (OSOWOG)- A grand Vision

New power market initiatives in India also offers an opportunity to leapfrog

In 2016, 80% of Denmark’s wind generation⁴ was balanced through CBET through the utilization of Norway’s hydro resources
Enablers for accelerating CBET & Development of Regional Power Market

- Political
  - Regional Outlook/Vision
  - Political Consensus
  - Intergovernmental agreement(s)
  - Implementation Mechanism
  - Power Market Reform

- Regulatory
  - Permissibility to use intermediary transmission network under open access
  - Rules for identification of transmission capabilities & congestion
  - Rules for measurement of imbalance and settlements
  - A conducive & friendly ecosystem for investors

- Technical and Commercial
  - Harmonisation of grid codes & standards, Grid Connectivity
  - Transmission pricing & transit charge
  - Co-ordinated Regional Transmission Grid Planning
  - Settlement & payment mechanism
  - Dispute resolution mechanism

- Institutional
  - Institutional arrangements
  - Regional Coordination Forums are desirable
  - Will foster long term sustainability
SARI/EI Initiatives - Providing Actionability to articles of SAARC FAEC (E)

Article 12: Transmission Access:
(Member States shall, for the purpose of electricity trade, ensure non-discriminatory access to the respective transmission grids as per the applicable laws, rules, regulations and applicable inter-governmental bilateral trade agreements.)

Framework & Guidelines for Non-discriminatory Open Access in Transmission for Facilitating Cross Border Electricity Trade in SA

Article 13: Facilitating Buying & Selling Entities:
(Member States shall enable buying and selling entities to engage in cross-border electricity trading subject to the laws and regulations of the concerned Member States.)

Model Framework for Trading Licence Regime and Guidelines for grant of trading licence to facilitate CBET in SA Region

Article 7: Planning of Cross-Border Interconnections,
Article 10: Electricity Grid Protection System & Article 11: System Operation & Settlement Mechanism

Harmonisation of Grid codes, Operating Procedures and Standards to facilitate/promote CBET in SA Region: Framework Grid Code Guidelines

Report Suggested a detailed Model Regional Open Access Framework & Guidelines (on 7 key areas)
Implementation Roadmap - Regional Level Action & Country specific Action Plan

Report Suggested detailed Model framework & Guidelines (on 7 key areas) for trading license regime in South Asia
Implementation Roadmap - Regional Level Action & Country specific Action Plan

Suggested Regional Technical Institutional Mechanism.
Annexure-IV

**SARI/EI Published Studies: An effort to Provide Actionability to articles of SAARC FAEC(E)**

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

- Regional Regulatory Guidelines (RRGs) for Promoting CBET in SA Region
- Suggested Changes/Amendments in Electricity Laws, Regulations and Policies of SA Countries for Promoting CBET in the SA Region
- Model set of electricity regulations for implementation of the SAARC Framework Agreement for Energy (Electricity) Cooperation & for advancing CBET in SAARC countries
- Regional Energy/Electricity Regulatory Institutional Mechanism in SA: South Asia Forum of Electricity/Energy Regulators (SAFER)

**SARI/EI Ongoing Studies: An effort to Provide Actionability to articles of SAARC FAEC(E)**

**Article 7 Planning of Cross-border interconnections**

- Coordinated Regional Generation & Transmission Master Plan (CRGTMTP)
- Model Regional Framework for Trilateral & Multilateral Power Trade (MRFTMPT)
- South Asia Energy Knowledge Resource Database (SAEKRD)

**Article 2 Objective**

- Member States may enable cross-border trade of electricity on voluntary basis subject to laws, rules and regulations of the respective Member States and based on bilateral/trilateral/mutual agreements between the concerned states.

**Article 5 Data updating and sharing**

- Member States may share and update technical data and information on the electricity sector in an agreed template.
10 Point Roadmap & Action Plan for Deepening CBET in SAARC Region

01 Focus on Implementation of articles of various inter-governmental agreements (bilateral, trilateral, multilateral)
02 Strengthening & facilitating the process of Policy & Regulatory Harmonisation/Coordination
03 Focusing on Complementary Regulatory framework development for CBET in each SA countries
04 Transitioning to Regional System Planning - Generation and Transmission Master Plan
05 Instrument/Tools for De-Risking CBET Projects; enhancing bankability, Investment mobilisation
06 Focusing on power market development including ancillary service market
07 Institutionalizing the Process of CBET-SAFER, SAFTI, SAFSO, SAFEM, SAFEI
08 Valuing CBET for Clean Energy Transition, Decarbonisation & Sustainability, CC Mitigation
09 Strengthening Institutional Capacity, Technical Assistance & Training
10 Annual Review of SAARC FAEC(E) implementation and Annual status Report

Annexure-IV

Thank You

Contact: raijrunnapanda@irade.org
raijsunnapanda@gmail.com
https://sari-energy.org/
https://www.irade.org/

It always seems impossible until it's done.
3. “Competitive Wholesale Electricity Market in Pakistan” by Mr. Abrar Hussain
Team Lead Market Design & Development, Central Power Purchasing Agency (CPPA-G), Pakistan

PRESENTATION
ON COMPETITIVE WHOLESALE POWER MARKET (CTBCM) OF PAKISTAN

CENTRAL POWER PURCHASING AGENCY (CPPA)
SEP 22, 2020

Scheme of Presentation

<table>
<thead>
<tr>
<th>Part</th>
<th>Title</th>
<th>Duration</th>
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<tbody>
<tr>
<td>Part-1</td>
<td>History of Competitive Market Development</td>
<td>5 Minutes</td>
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<tr>
<td>Part-2</td>
<td>International Perspective</td>
<td>5 Minutes</td>
</tr>
<tr>
<td>Part-3</td>
<td>Stages of Market Development</td>
<td>3 Minutes</td>
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<tr>
<td>Part-4</td>
<td>Competitive Market Design</td>
<td>15 Minutes</td>
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<tr>
<td>Part-5</td>
<td>Implementation Plan</td>
<td>2 Minutes</td>
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Part-1
History of Competitive Market Development

Power Sector Reforms (Historical Perspective)

1992
- WAPDA Strategic Plan
  - Enhance capital formation
  - Improve efficiency and rationalize prices, and
  - Move towards full competition by providing the greatest possible role for the private sector through privatization

1994
- First Power Policy
  - Enabled Private Participation in Generation
  - Offered generous incentives
  - Several deals and capacity additions

1997
- NEPRA Act
  - Enactment of NEPRA Act
  - Formation of Independent Regulator (NEPRA) to oversee the restructuring process

1998
- Unbundling of WAPDA
  - Thermal Power Generation Companies
  - Perform Supply Business
  - Perform distribution, construction, expansion, maintenance operation of the distribution system

PEPCO
- Transition Management Company
  - Oversee the corporatization & privatization
  - Formed Business Plan for Restructuring process

GENCOs (4)
- LESCO
- GEPCO
- FESCO
- IESCO
- MEPCO
- PESCO
- HESCO
- QESCO
- TESCO
- SEPCO

DISCOs (10)
- Transmission Network Operator
- System Operator
- Planner
- Power Procure
- Power Market Development

NTDC

www.cppa.gov.pk
Historical on Market Development in Pakistan

- Legal formation of CPPA. However, functioned as Department of NTDC from 2009 to 2015.

- NTDG was granted Transmission License to perform five functions:
  1. TNO
  2. SO
  3. Planner
  4. Metering Service Provider
  5. Contract Registrar/PEX Administrator

- Per licensing requirement, NTDG was mandated to develop the wholesale market (CTBCM) by 2008

- ECC’s Decision April 2015
  - CPPA through consultation prepare CTBCM Model and Plan by June 2017
  - The CTBCM is for wholesale market
  - Will be approved by NEPRA
  - Commercial Operations date: June 2020

- CPPA Operationalized
  - CPPA formed Market Development Department

- The model and plan submitted to NEPRA for review
  - Request for ECC in amending timelines
  - New NEPRA Act Amendments
  - MO’s Authorization
  - Comments
  - Partnerships

- NEPRA Approved CTBCM Model

---

Market Development History

- Mar 2018
  - Submitted CTBCM to NEPRA for approval after evaluation of special committee
  - CTBCM Plan by NEPRA

- Sep 2020
  - After approval of CTBCM Plan by NEPRA
  - 1.5 years extension granted by ECC

- March 2021
  - CTBCM COD

- 2016-2017
  - Numerous Consultation being done for making the model

- 2015
  - Special committee including MoE (PD), MoF, CPPA & NEPRA constituted to evaluate the proposed model

- 2017
  - ECC Decision Point 9 (To Prepare CTBCM)

- 2018
  - Apr 2017
    - Special committee including MoE (PD), MoF, CPPA & NEPRA constituted to evaluate the proposed model

- 2019
  - Dec 2019
    - CTBCM Model approved by NEPRA

- 2020

- 2022
Part-2
International Perspective
Annexure-IV

Market Transition is a ‘Big Undertaking’

Framework Alignment:
Legal, Policy & Regulatory

Institutional Work:
- Roles Alignment
- People capacity
- Processes automation
- Technology deployer

Pakistan’s Electricity Market Framework

Markets Transition
- Vertically Integrated
- Single Buyer
- Single Buyer Plus
- Competitive Wholesale & Retail

Legal
- Constitution
- NEPRA Act 2018
- Electricity Act 1910

Policy
- Power Policy 2015
- RE Policy 2019
- Power Policy 2013, NEP

Regulatory
- Rules
- Regulations
- Codes and Guidelines

NTDC
- Transmission Network Operator (TNO)
- Metering Service Provider

NTDC System Operator
- System Balancing
- Expansion Planning and Forecasting
- Operational Planning & Forecasting

Market Operator
- Billing and Settlement
- Market & Product Development
- Contract Registration

Other Service Providers
- IAA
- SPT

DISCOs
- Distribution Network Operator (DNO)
- Base Supplier
- Metering Service Provider

Market Participants
- Generators
- Traders
- Competitive Suppliers
- BPCs

Competition = Liberalization

Competition requires liberalization (private participation) to achieve desired results!
Part-3
Stages of Market Development

Players in the Market

Consumers

1. Regulated Tariff Consumers
   (all consumers)

2. Eligible Consumers
   (large consumers with choice)

Suppliers

1. DISCOs as Supplier
   (can sell at regulated tariff only*)

2. Competitive Supplier
   (can sell to only eligible consumers at non-regulated prices)

*DISCOs are deemed last resort suppliers for a period of five years under NFRA Act
Annexure-IV

Single-Buyer Model and Wholesale Competitive Market

Current Structure: Single Buyer Model

1st Stage: Wholesale (CTBCM) Mar 2022

26.6 Mln Consumers, 84% share in energy sales

2000+ Eligible Consumers, 16% share in energy sales

Approved Structure: Competitive Wholesale Market Model

Competitive Wholesale and Retail Markets

1st Stage: Wholesale (CTBCM) Mar 2022

26.6 Mln Consumers, 84% share in energy sales

2000+ Eligible Consumers, 16% share in energy sales

Approved Structure: Competitive Wholesale Market Model

2nd Stage: Retail

All Consumers have choice
Part-4
Competitive Market Design
Trading in Competitive Wholesale Market

1. The CTBCM is constructed around bilateral contracts.

2. The System Operator will establish marginal prices for trading including settlement of imbalances.

3. DISCOs will procure power through competitive bidding organized by Independent Auctioneer (IAA) resulting in reduced purchase price for DISCOs.

4. Eligible Consumers will be free to procure power from Competitive Suppliers.

4 Major Design Parameters

- **Products Traded in the Market and System Reliability:** Two main products, Energy and Capacity, Energy traded to supply consumption and Firm Capacity Traded to ensure medium and long-term security of supply

- **Pricing Mechanism:** Cost-based pool model with single market clearing price based on marginal cost principle

- **Power Procurement:** 100% capacity obligations, procurement for regulated consumers is subject to IGCEP and Procurement Plan, Eligible Consumers free to contract bilaterally on their own terms and conditions

- **Market Architecture:** Bilateral Contracts complimented with balancing mechanisms for capacity and energy
CTBCM Main Features

CTBCM is wholesale competitive electricity market where electricity will be traded in bulk quantities on competitive prices.

Main Features:

- Establishment of an **independent and impartial** Market Operator
- **Dispatch Operations** improved through strengthening of System Operator
- Tool based **Security Constrained Economic Dispatch**
- **Generation adequacy** ensured through **Capacity Obligations**
- **New Capacity** for DISCOs procured through centralized auction by Independent Auction Administrator (IAA)
- Introduction of **Credit Covers** to cover non-payment risks in the market
- **Government Support** for **low performing DISCOs**
- **Balancing Mechanisms** introduced to trade imbalances on market prices

---

CTBCM Main Features

- Rules and Regulations established for **Market Participants** and **Service Providers**
- **Legacy PPAs/EPAs** will be commercially allocated to the DISCOs and will be legally administered by the Special Purpose Trader (SPT)
- Introduction of **flexibilities** in new contracts
- **Contract Registrar** to check validity of contracts and verify capacity obligations of the market participants
- **New Commercial Code** to govern the operations of MO
- **Existing Commercial Code amended** to govern the operations of SPT as per new market design
- **Amendments** in certain sub-codes of **Grid Code** to reflect the market design i.e. SDC, Metering, DRC and Planning
- **Strengthening of Institutions** i.e. MO, SO, IAA, DISCOs
- **Institutionalization** of data to enhance transparency
Capacity Obligations

- **Capacity Obligations** are introduced to ensure **Security of Supply and Generation Adequacy** in the system.

- Market **participants representing Demand** will have the obligation to **contract in advance** sufficient capacity (contribution to system peak and system reserves) to serve its load.

- Each market participant will be **accountable** for its **demand projections**.

- These capacity obligations is a contribution to ensure **medium and long term security** of supply.

- Obligations for each demand participant will be **calculated in advance** by MO based on an approved criteria.

- Capacity Obligations will be **verified** by the **Contract Registrar** function of the MO.

Future Procurement: Price Discovery through Competitive Auction

- All future procurements for regulated customers will be subject to competitive procurements (to the extent feasible).

- The **competitive process will be subject to NEPRA’s regulations and oversight**.

- The IAA will consolidate requirements from all DISCOs and will run competitive auctions as per process approved by NEPRA.

- After successful completion of the bidding process, the IAA will nominate successful bidders which will then be required to approve their tariffs from NEPRA.

- After approval of such tariffs, NEPRA will be bound to pass through these costs to end-customer tariffs of the DISCOs.
Part-5
CTBCM Implementation Plan and Monitoring
Implementation & Monitoring

CCoE

Market Implementation & Monitoring Group (MIMG) Board

Market Implementation Support Committee (MISC) of CPPA Board

Working Groups of Power Sector Entities

Thanks