South Asia Regional Energy Partnership (SAREP) Discussion on Mitigation of Challenges and Attracting Investment for Cross Border Electricity Trade (CBET) Projects

SAARC Energy Centre’s Virtual Consultative Workshop: “Cross Border Electricity Trade in SAARC Region: Challenges and Investment Opportunities” 10.30 TO 13.30 HRs (IST) I Thursday, 11 November 2021

Presented by Rajiv Ratna Panda
Content

- USAID Support to Cross Border Electricity Trade (CBET) in South Asia
- CBET in South Asia and it’s Future Perspective
- Region Amidst of Climate induced Energy Transformation
- Nature of CBET Project – Uniqueness, Risks & Investment Challenges
- Attracting Investment in CBET Project & Risk Mitigation.
- Role of Market Design in Promoting Investment
- Conclusion
USAID Support to Cross Border Electricity Trade in South Asia
USAID Support to Cross Border Energy Trade (CBET) in South Asia

- Long History- USAID supporting Cross Border Energy Trade in South Asia (SA) over 2 Decades.
- SARI/EI Program initiated in the year 2000 promotes energy security through: CBET, Energy Markets formulation, Clean Energy Access
- Four Phases
  - Phase I (2000-03) – Awareness on regional power markets
  - Phase II (2004-06) & III (2007-12) - Investigations
  - Phase IV (2012-22) – Implementation
- Aims to promote regional grid integration through CBET

USAID’s new Regional Program-South Asia Regional Energy Partnership (SAREP)
5 year (2021 – 2026), $49 million initiative

SAREP focuses on fostering an integrated, self-reliant energy system in SA

- Improving the competitive landscape by building a regional market and diversifying energy sources drives down the cost of electricity and increases needed access to affordable, secure, and reliable energy services.
- Enabling private sector investment and mobilizing public and private capital drive inclusive economic growth.
- Fostering inclusiveness in the energy sector with respect to factors such as gender, youth, and geography increases resilience and facilitates regional sustainability.
South Asia Regional Energy Partnership (SAREP)

Technical Work Stream

Objective-1
- Enhanced Regional Energy Markets and Integration

Objective-2
- Increased deployment of Advanced Energy Solutions and Systems

Objective-3
- High Performing Modern Utilities

Objective-4
- Transparent, Best Value Procurement and Private Sector Investment
CBET in South Asia and it’s Future Perspective
CBET in South Asia and its Future Perspective

Bhutan-India ~2100 MW
India- Bangladesh ~1160 MW
Nepal-India ~ 500 MW

South Asia CBET* (~ MW)

2012 2015 2018 2020
1400 2126 3760

CBET Doubled | Potential Remains Large | Prospects for Inter-Regional Integration

Mitigation of Challenges and Attracting Investment for CBET Projects/SAARC Energy Centre Virtual Consultative Workshop: “Cross Border Electricity Trade in SAARC Region: Challenges and Investment Opportunities/Rajiv/SAREP/10.30 TO 13.30 Hrs | Thursday, 11 November 2021

Data Source-CERC, POSOCO

CBET in South Asia* BU's (TWh)

2020-21
11-11-2021

~ Maximum Peak Trade Data Source-CERC, POSOCO BU's-Billion Units

* BBIN & Trade with Neighbouring Region’s Countries i.e. Afghanistan’s CBET with Central Asian Countries and Iran, Pakistan’s CBET with Iran,India’s CBET with Myanmar

Data Source- Compile by Author from various Sources -CERC, POSOCO, NEPRA, Afghanistan Statistics, CBET-Cross Border Electricity Trade BU's-Billion Units

CBET- Cross Border Electricity Trade in South Asia
CBET in South Asia and its Future Perspective

Rapid expansion is envisaged, 43.8 GW Cross Border Grid Interconnection by 2036/2040

Transition of Cross Border Electricity Grid Integration
Bilateral-Trilateral-Multilateral-Regional Electricity Market Development

Bilateral Integration & Cross Border Electricity Trade (CBET)

Sub regional Integration & Sub-Regional Market

Integrated Regional Grid & Pan-Regional Market

Mitigation of Challenges and Attracting Investment for CBET Projects/SAARC Energy Centre Virtual Consultative Workshop: "Cross Border Electricity Trade in SAARC Region: Challenges and Investment Opportunities"/Raj/SAREP/10.30 TO 13.30 HRs / Thursday, 11 November 2021

Source: Conceptualized and Developed by the author

11-11-2021
South Asia – Amidst Climate Induced Energy Transformation
South Asia – Extremely Vulnerable to Adverse Impact of Climate Change

Global Climate Risk Index 2000 – 2019

10 Most Affected Countries (2000-2019)

<table>
<thead>
<tr>
<th>Country</th>
<th>CRI score</th>
<th>Fatalities per 100 000 inhabitants</th>
<th>Losses in million US$ PPP</th>
<th>Losses per unit GDP in %</th>
<th>Number of events (2000–2019)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puerto Rico</td>
<td>7.17</td>
<td>149.85</td>
<td>4.12</td>
<td>4 149.98</td>
<td>3.66</td>
</tr>
<tr>
<td>Myanmar</td>
<td>10.00</td>
<td>7 056.45</td>
<td>14.35</td>
<td>1 512.11</td>
<td>0.80</td>
</tr>
<tr>
<td>Haiti</td>
<td>13.67</td>
<td>274.05</td>
<td>2.78</td>
<td>392.54</td>
<td>2.30</td>
</tr>
<tr>
<td>Philippines</td>
<td>18.17</td>
<td>859.35</td>
<td>0.93</td>
<td>3 179.12</td>
<td>0.54</td>
</tr>
<tr>
<td>Mozambique</td>
<td>25.83</td>
<td>125.40</td>
<td>0.52</td>
<td>303.03</td>
<td>1.33</td>
</tr>
<tr>
<td>The Bahamas</td>
<td>27.67</td>
<td>5.35</td>
<td>1.56</td>
<td>426.88</td>
<td>3.81</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>28.33</td>
<td>572.50</td>
<td>0.38</td>
<td>1 860.04</td>
<td>0.41</td>
</tr>
<tr>
<td>Pakistan</td>
<td>29.00</td>
<td>502.45</td>
<td>0.30</td>
<td>3 771.91</td>
<td>0.52</td>
</tr>
<tr>
<td>Thailand</td>
<td>29.83</td>
<td>137.75</td>
<td>0.21</td>
<td>7 719.15</td>
<td>0.82</td>
</tr>
<tr>
<td>Nepal</td>
<td>31.33</td>
<td>217.15</td>
<td>0.82</td>
<td>233.06</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Three SA Countries: Bangladesh (7), Pakistan (8), Nepal (10) among the 10 most affected from 2000-2019 (Average)

Five SA Countries : Bangladesh (7), Pakistan (8), Nepal (10), India (20), Sri Lanka (23) within the initial 30 rankings out of 180
South Asia: Rising Emissions, Needs Energy Transformation for a Just Sustainable Future

Fossil Co2 Emission (Mt CO2/yr)

- Data Source: EDGAR - Emissions Database for Global Atmospheric Research, 2021 report

Fossil Co2 Emission by Sector

- Data Source: EDGAR - Emissions Database for Global Atmospheric Research, 2021 report

Sector Share in Fossil Co2 Emission (2020)

- Data Source: EDGAR - Emissions Database for Global Atmospheric Research, 2021 report

Transformational Action in Power followed by Transport Sector will be Crucial in South Asia

Greening Power Sector and Electrifying Transport

Mitigation of Challenges and Attracting Investment for CBET Projects/SAARC Energy Centre Virtual Consultative Workshop: “Cross Border Electricity Trade in SAARC Region: Challenges and Investment Opportunities/Rajiv/SAREP/10.30 TO 13.30 HRs | Thursday, 11 November 2021

11-11-2021
Key Initiatives and Recent Developments in South Asia

**Mujib Climate Prosperity Plan**
30% of energy from renewables by 2030

**Source:** Mujib Climate Prosperity Plan

**To remain Carbon Neutral**

**Bhutan**
One Sun, One World, One Grid (OSOWOG), Green Grids Initiative- One Sun One World

**Source:** Bhutan’s 2nd Nationally Determined Contribution

**Five nectar elements, ‘Panchamrit’**
Unprecedented contribution of India to Global climate action

- Non-fossil energy capacity to 500 GW by 2030
- 50% energy requirements from renewable energy by 2030
- Reduce the total projected carbon emissions by one billion tonnes from now till 2030.
- By 2030, India will reduce the carbon intensity of its economy by less than 45 percent.
- By the year 2070, India will achieve the target of Net Zero.

**Source:** National Statement by Prime Minister Shri Narendra Modi at COP26 Summit in Glasgow

**Net zero Emission by 2030**

**Maldives**

**Source:** Update of Nationally Determined Contribution of Maldives

**Net zero Emission by 2045**
(Illustrates Cross Border Energy Trade potential for emissions reductions outside of Nepal)

**Nepal**

**Source:** Nepal’s Long-term Strategy for Net-zero Emissions submitted to UNFCCC

**By 2030, 60 % of all energy will be generated from renewable energy resources (including hydropower)**

**Pakistan**

**Source:** Pakistan Updated Nationally Determined Contributions

**Carbon Neutrality by 2060**

**Sri Lanka**

**Source:** UPDATED NATIONALLY DETERMINED CONTRIBUTIONS

One Sun, One World, One Grid (OSOWOG) , Green Grids Initiative- One Sun One World
One Grid (GGI-OSOWOG) will deepen Regional Grid Integration
Nature of CBET Project

Uniqueness, Risks and Investment Challenges
Nature of CBET Project – Uniqueness and Risks

- Long Term
- Irreversible
- Multiple Jurisdiction

Risks:
- Political and Country Risk
- Financing Risks
- Off-taker Risk (Including payment Risk)
- Policy & Regulatory Risk
- Construction / operation Risk
- Expropriation and breach of Contract
- Dispute Resolution Risk
- Security Risk
- Pricing Risks
Investment Challenges Faced in Mobilising Finance for CBET Projects in SA Region

Political, Regional vs. National Interest, Energy Security

Time consuming Process of building Consensus

Matching Interest & Geopolitical Realities

Political Capital & Will, Cooperation

Energy Security & Energy Interdependence

Jurisdiction, Harmonisation, Competitive vs Cooperative Spirit

Different level & Jurisdiction of Policy, Regulatory, Market, Technical & Commercial (PRMT) Frameworks, Harmonisation

Development & Implementation of agreements, lack of clear PRTM framework

Power Market Development & Competition Variance in Power Sector

Financial/Commercial

Project Feasibility, Financing

Fair & Equitable Sharing of cost of cross border transmission

Lack of Dedicated Investment Facilities

Risks Amplification and viability

Trilateral, Multilateral, Regional Institutional Platforms

Moving from Bilateral, Building consensus on Trilateral takes time

Lack of Dedicated/Effective Decision Making Regional Institutional Platforms

Source: Developed, Modified, Adjusted by referring to the SAARC Energy Center-Video Conference Presentation by Rajiv Ratra Panda’s presentation https://www.saarcenergy.org/video-conference-on-roadmap-for-the-implementation-of-saarc-framework-agreement-on-energy-cooperation-electricity/
Attracting Investment in CBET Project & Risk Mitigation
Recent Decarbonisation Goals will require significant additional investment

South Asia’s Climate Smart Investment Opportunity
Investment Potential by Country and Sector 2018–2030

<table>
<thead>
<tr>
<th>Sector</th>
<th>Bangladesh</th>
<th>Bhutan</th>
<th>India</th>
<th>Maldives</th>
<th>Nepal</th>
<th>Sri Lanka</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable energy</td>
<td>$3.2 billion</td>
<td>$72 million</td>
<td>$403.7 billion</td>
<td>$55 million</td>
<td>$2.1 billion</td>
<td>$2.3 billion</td>
<td>$411.4 billion</td>
</tr>
<tr>
<td>Large hydro</td>
<td>-</td>
<td>$40.6 billion</td>
<td>$44 billion</td>
<td>-</td>
<td>$22.5 billion</td>
<td>$190 million</td>
<td>$107.3 billion</td>
</tr>
<tr>
<td>Green buildings</td>
<td>$118.8 billion</td>
<td>$390 million</td>
<td>$1.4 trillion</td>
<td>$200 million</td>
<td>$3.4 billion</td>
<td>$8.4 billion</td>
<td>$1.53 trillion</td>
</tr>
<tr>
<td>Transport infrastructure</td>
<td>$23.7 billion</td>
<td>$615 million</td>
<td>$250 million</td>
<td>$1.5 billion</td>
<td>$10 billion</td>
<td>$326 million</td>
<td>$286.1 billion</td>
</tr>
<tr>
<td>Transport electric vehicles</td>
<td>-</td>
<td>$322 million</td>
<td>$667 billion</td>
<td>-</td>
<td>$2.5 billion</td>
<td>-</td>
<td>$669.8 billion</td>
</tr>
<tr>
<td>Municipal solid waste</td>
<td>$4 billion</td>
<td>$11.5 million</td>
<td>$11 billion</td>
<td>$46 million</td>
<td>$83 million</td>
<td>$3.5 billion</td>
<td>$18.6 billion</td>
</tr>
<tr>
<td>Climate-smart urban water</td>
<td>$13 billion</td>
<td>$106 million</td>
<td>$128 billion</td>
<td>$86 million</td>
<td>$686 million</td>
<td>$2.7 billion</td>
<td>$144.6 billion</td>
</tr>
<tr>
<td>Climate-smart agriculture</td>
<td>$9.1 billion</td>
<td>$140 million</td>
<td>$194 million</td>
<td>$31 million</td>
<td>$4.8 billion</td>
<td>$964 million</td>
<td>$209 billion</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$171.8 billion</strong></td>
<td><strong>$42.3 billion</strong></td>
<td><strong>$3.1 trillion</strong></td>
<td><strong>$1.9 billion</strong></td>
<td><strong>$46.1 billion</strong></td>
<td><strong>$18.4 billion</strong></td>
<td><strong>$3.4 trillion</strong></td>
</tr>
</tbody>
</table>

Source: Climate Investment Opportunities in South Asia. An IFC Analysis

In increasing investment opportunity by country.
Attracting Investment in CBET Project & Risk Mitigation Needs an Ecosystem Approach

Mapping the Green CBET Projects for tapping into Climate Finance.

South Asia Regional Green Grid Integration Fund (SARGGIF)

Regulatory Power and Institutional Capacity

Managing Policy and Regulatory amidst Transformational Clean Energy Transition

Level playing field and rule of the market

Trust and Confidence

Adequate conducive legal framework

Balancing the interest of all stakeholders, Adequate and Reasonable Return on Investments

Regional Institution South Asia Forum on Energy Investment (SAFEI)

A combination of de-risking strategies, risk mitigation instruments, innovative financing instruments and regional forums can create the needed ecosystem
Role of Market Design in Promoting Investment
Role of Market Design in Promoting Investment

- CBET on Power Exchange has been initiated. (Nepal’s import & export through IEX)
- A Vibrant Regional Power Market (RPM) can provide alternative avenues for revenues.
- Transparent and Competitive Price Discovery.
- Regional Balancing and Ancillary Market can improve viability of Hydro.
- Innovative Market Products G-DAM, G-TAM, RTM, TAM, DAM, REC and it’s availability in RPM.


Source: Conceptualized and Developed by the author 11-11-2021
Conclusion

- Recognising Green CBET Projects for tapping into Climate Finance

- Creation of South Asia Regional Green Grid Integration Fund (SARGGIF)

- Prioritize Financing of Cross Border Transmission

- Regional Transmission Master Plan & Investment Plans

- Focus on Regional Market Development-Price Signals

- Develop Risk Mitigation Instruments, Customised Risk Insurances, Investment Protection

- Innovative Financing Instruments, Mechanism

- Mechanism/Principles for Sharing of Cost and Benefits
Thank You

“It always seems impossible until it’s done.”

- Nelson Mandela

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