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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

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- ❑ 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

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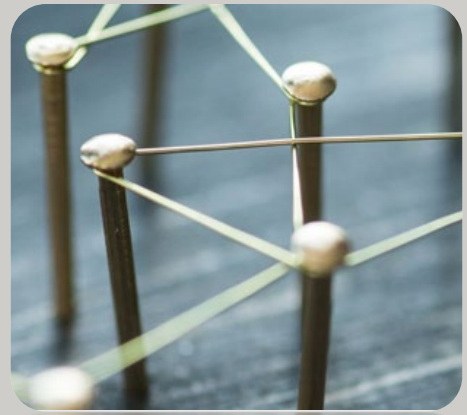
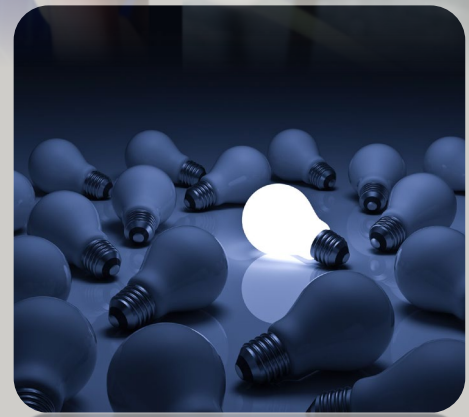
USAID Support to Cross Border Electricity Trade in South Asia





USAID Support to Cross Border Energy Trade (CBET) in South Asia

SARI/EI

- 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

SAREP

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

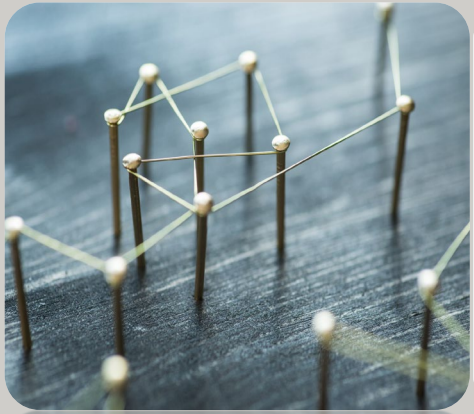
Objective-3

- High Performing Modern Utilities

Objective-4

- Transparent , Best Value Procurement and Private Sector Investment

CBET in South Asia and it's Future Perspective

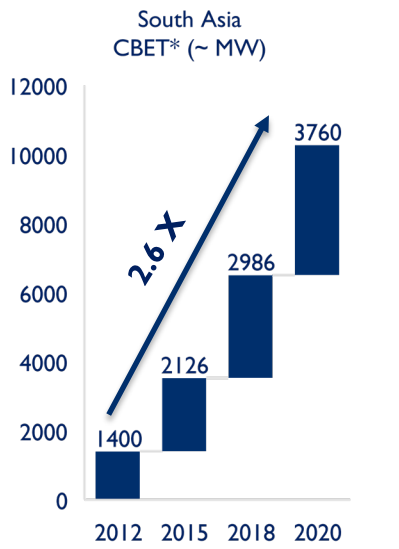


CBET in South Asia and it's Future Perspective

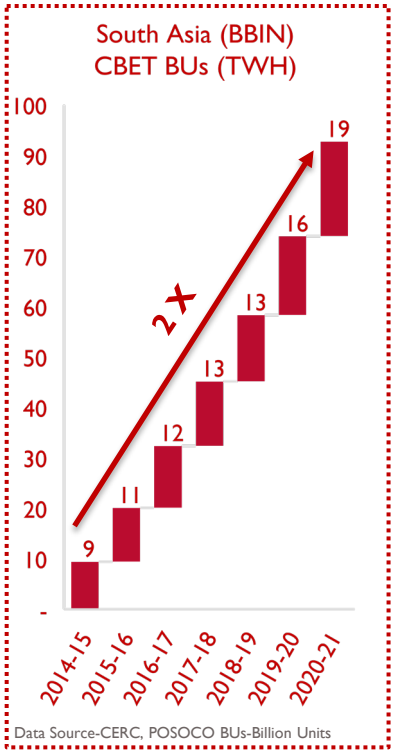
Bhutan-India ~2100 MW

India- Bangladesh ~1160 MW

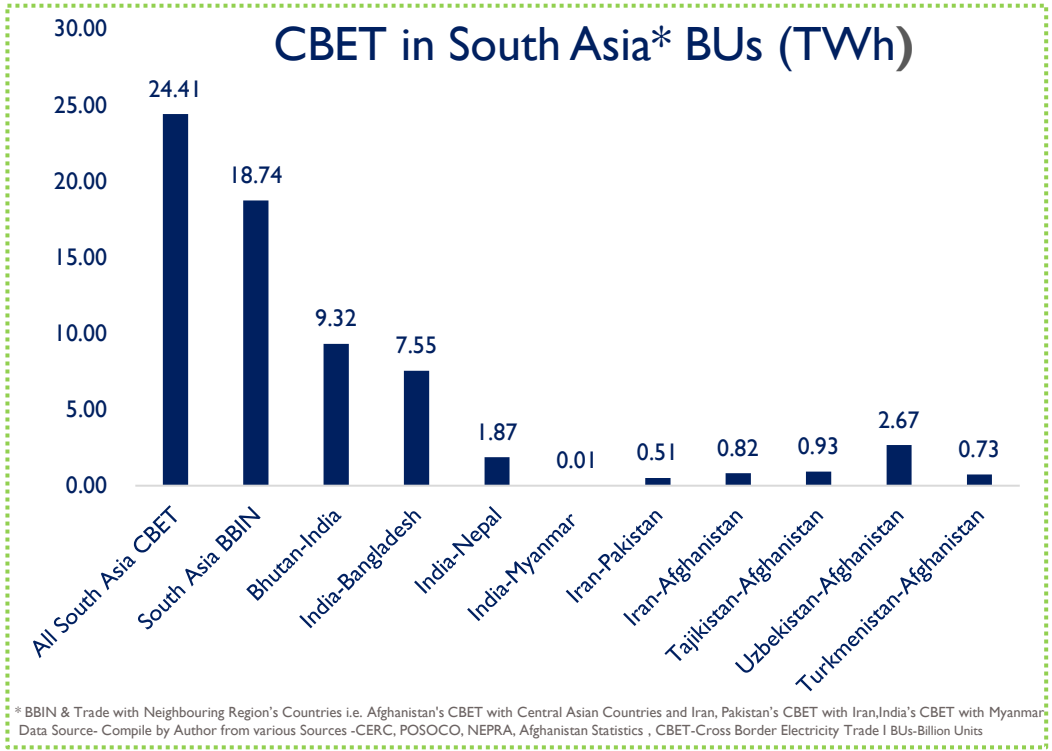
Nepal-India ~ 500 MW



* ~ Maximum Peak Trade Data Source-CERC, POSOCO BUs-Billion Units



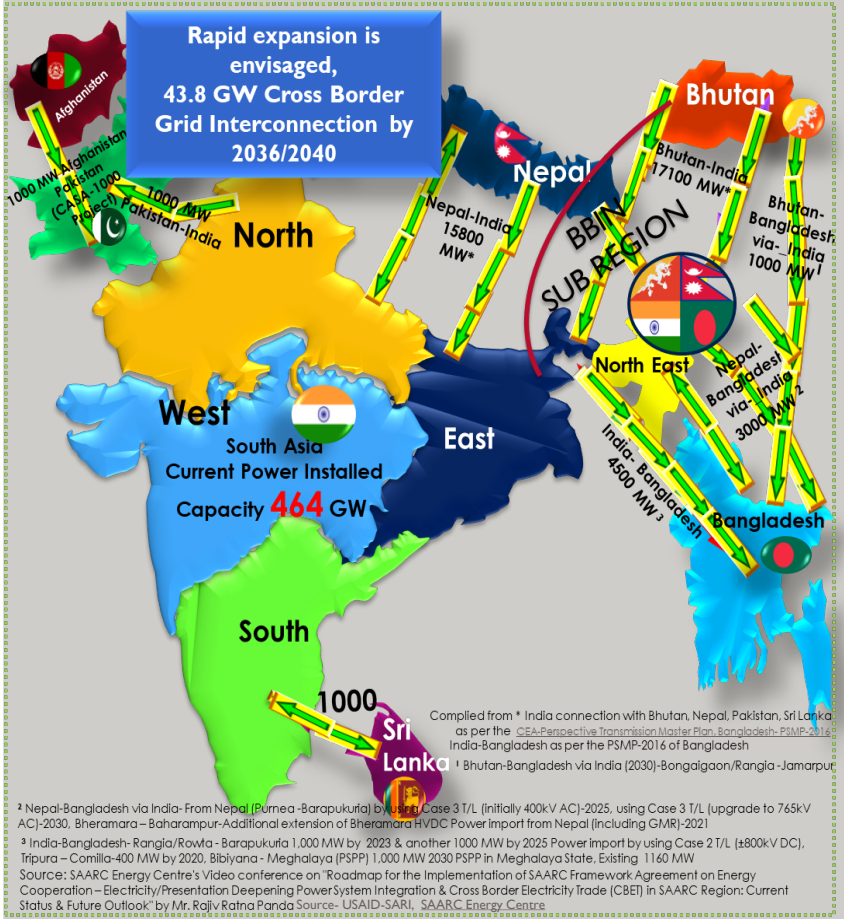
Data Source-CERC, POSOCO BUs-Billion Units

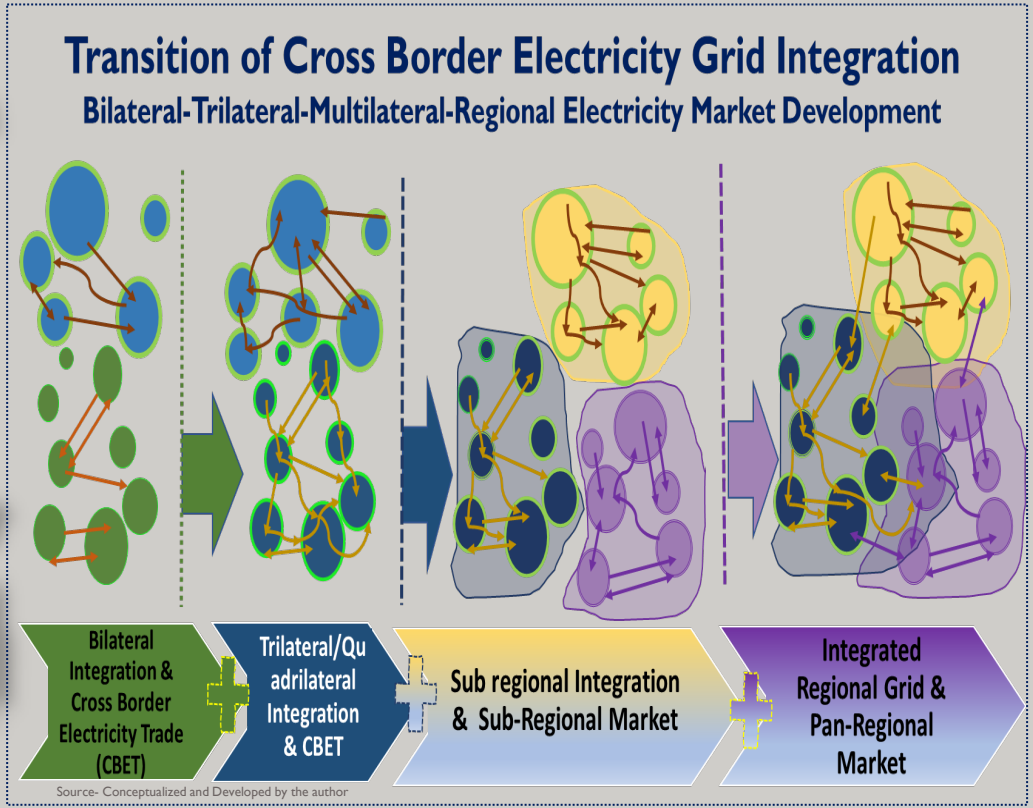


* BBIN & Trade with Neighbouring Region's Countries i.e. Afghanistan's CBET with Central Asian Countries and Iran, Pakistan's CBET with Iran,India's CBET with Myanmar
Data Source- Compile by Author from various Sources -CERC, POSOCO, NEPRA, Afghanistan Statistics , CBET-Cross Border Electricity Trade I BUs-Billion Units

CBET Doubled I Potential Remains Large I Prospects for Inter–Regional Integration

CBET in South Asia and it's Future Perspective





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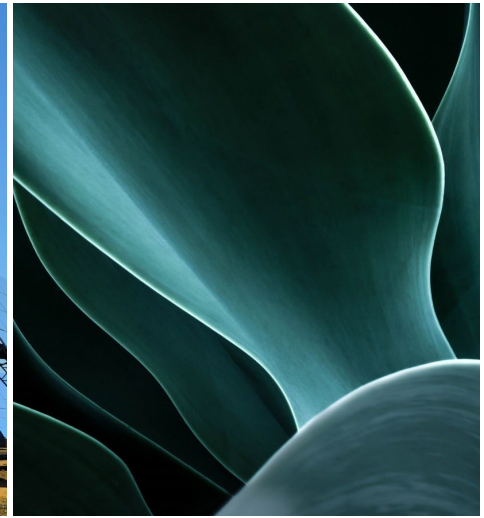
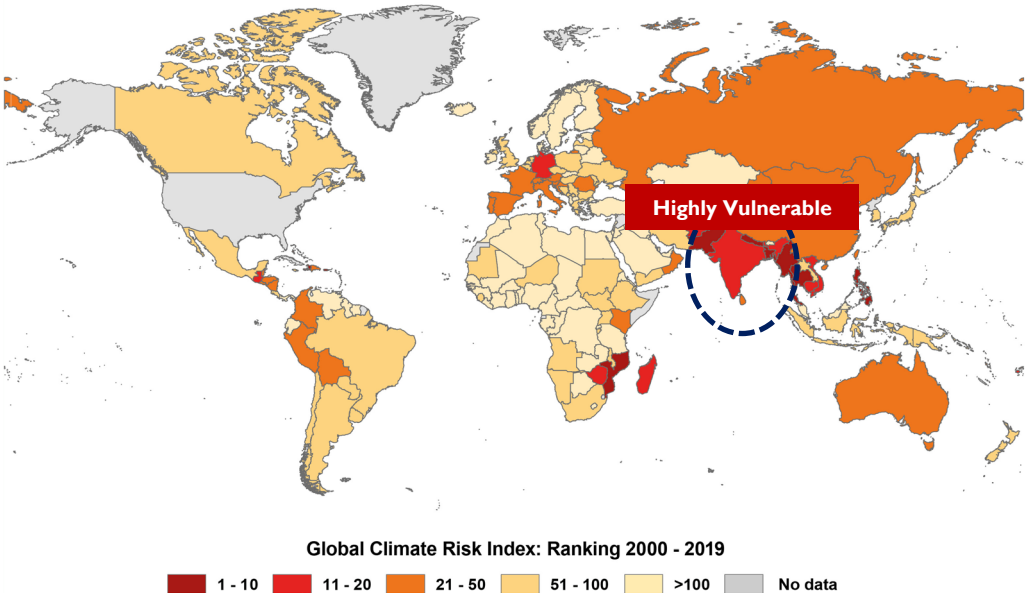


South Asia – Amidst Climate Induced Energy Transformation

South Asia – Extremely Vulnerable to Adverse Impact of Climate Change

Global Climate Risk Index 2000 – 2019



Source : Global Climate Risk Index 2021

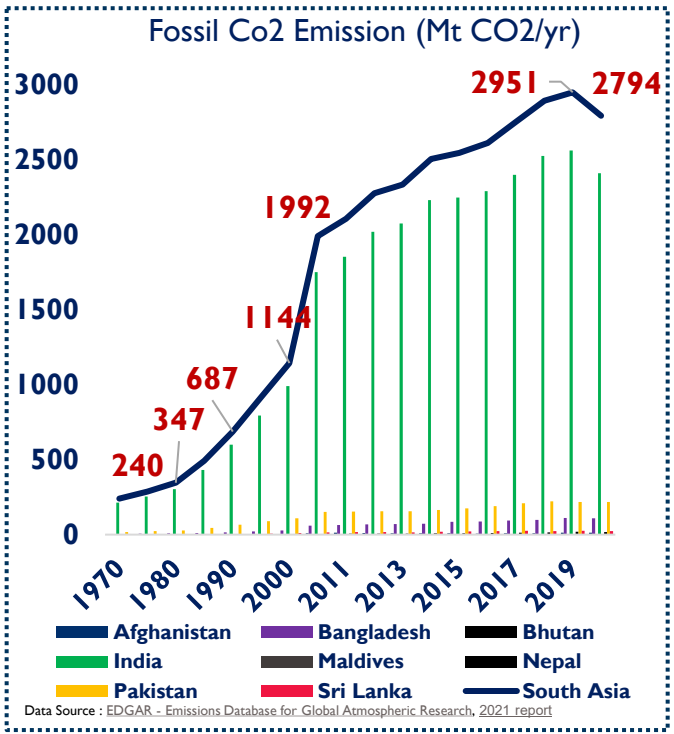
10 Most Affected Countries (2000-2019)

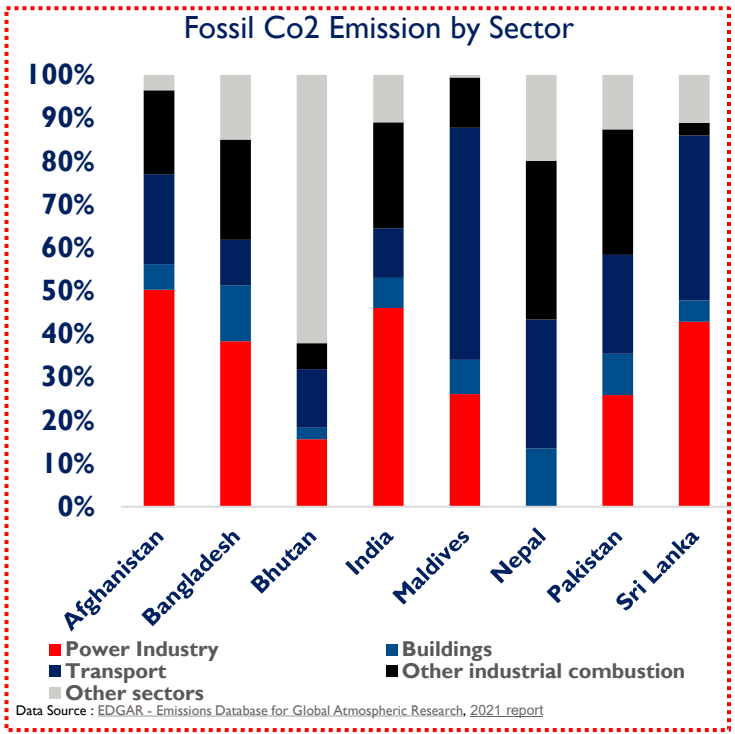
Country	CRI score	Fatalities	Fatalities per 100 000 inhabitants	Losses in million US$ PPP	Losses per unit GDP in %	Number of events (2000–2019)
Puerto Rico	7.17	149.85	4.12	4 149.98	3.66	24
Myanmar	10.00	7 056.45	14.35	1 512.11	0.80	57
Haiti	13.67	274.05	2.78	392.54	2.30	80
Philippines	18.17	859.35	0.93	3 179.12	0.54	317
Mozambique	25.83	125.40	0.52	303.03	1.33	57
The Bahamas	27.67	5.35	1.56	426.88	3.81	13
Bangladesh	28.33	572.50	0.38	1 860.04	0.41	185
Pakistan	29.00	502.45	0.30	3 771.91	0.52	173
Thailand	29.83	137.75	0.21	7 719.15	0.82	146
Nepal	31.33	217.15	0.82	233.06	0.39	191

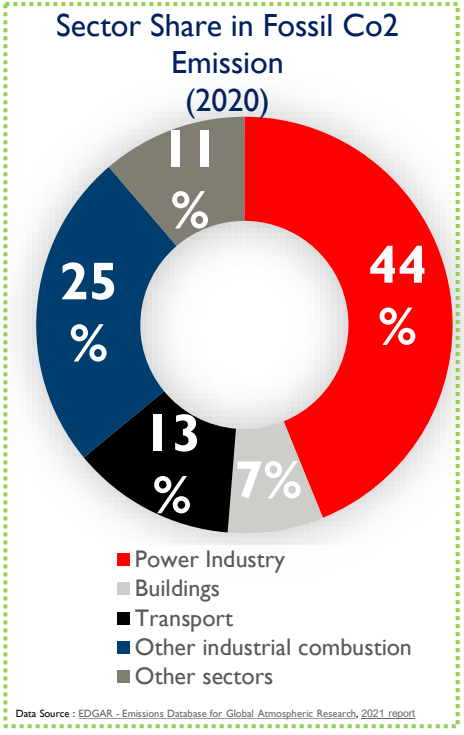
Source : Global Climate Risk Index 2021

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







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

Greening Power Sector and Electrifying Transport

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

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

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)

Source -Nepal's Long-term Strategy for Net-zero Emissions submitted to UNFCC

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

Source : Pakistan Updated Nationally Determined Contributions

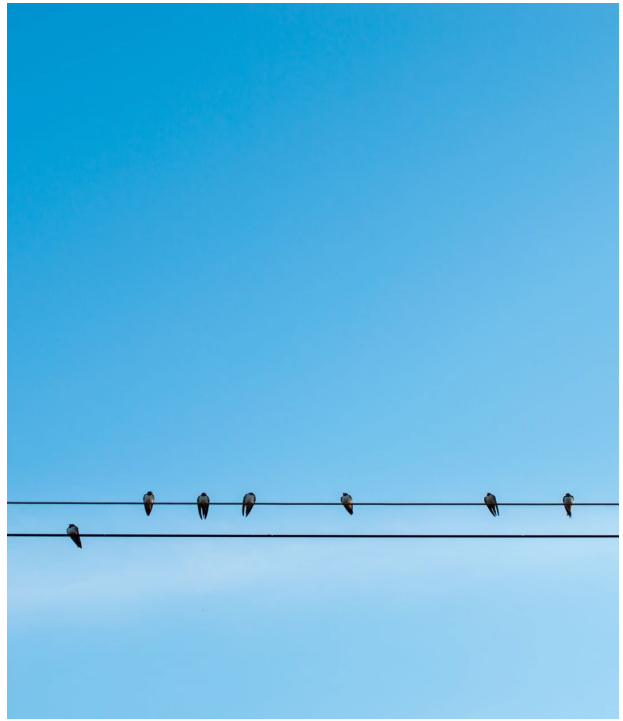
Carbon Neutrality by 2060

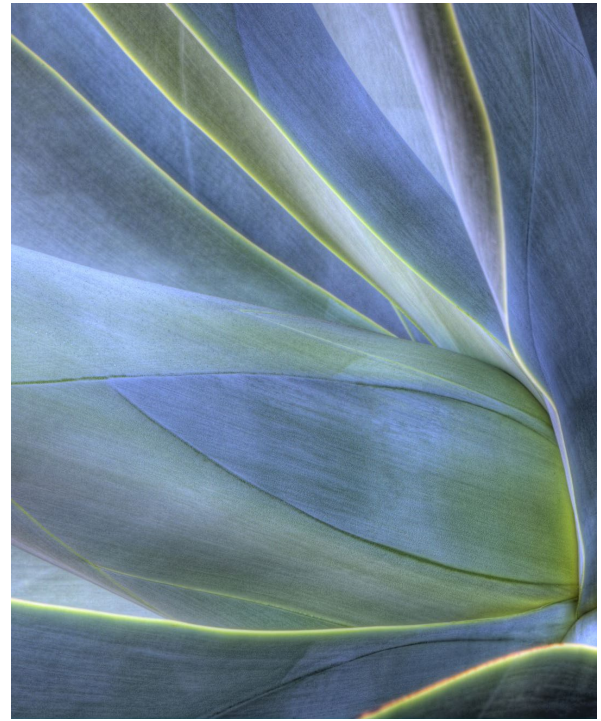
Source : UPDATED NATIONALLY DETERMINED CONTRIBUTIONS

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

Political and Country Risk

Financing Risks

Off-taker Risk (Including payment Risk)

Irreversible

Policy & Regulatory Risk

Construction / operation Risk

Expropriation and breach of Contract

Multiple Jurisdiction

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*
- *Political Capital & Will, Cooperation*
- *Matching Interest & Geopolitical Realties*
- *Energy Security & Energy Interdependence*

Jurisdiction, Harmonisation , Competitive vs Cooperative Sprit

- *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 Ratna Panda's presentation https://www.saarcenergy.org/video-conference-on-roadmap-for-the-implementation-of-saarc-framework-agreement-on-energy-cooperation-electricity/

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Attracting Investment in CBET Project & Risk Mitigation

South Asia's Climate Smart Investment Opportunity

Investment Potential by Country and Sector 2018–2030

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

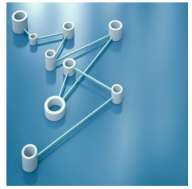
INCREASING INVESTMENT OPPORTUNITY BY COUNTRY

Source: Climate Investment Opportunities in South Asia An IFC Analysis

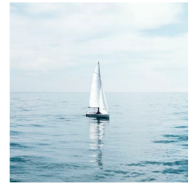
Recent Decarbonisation Goals will require significant additional investment

Attracting Investment in CBET Project & Risk Mitigation Needs an Ecosystem Approach

Mapping the Green CBET Projects for tapping in to 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

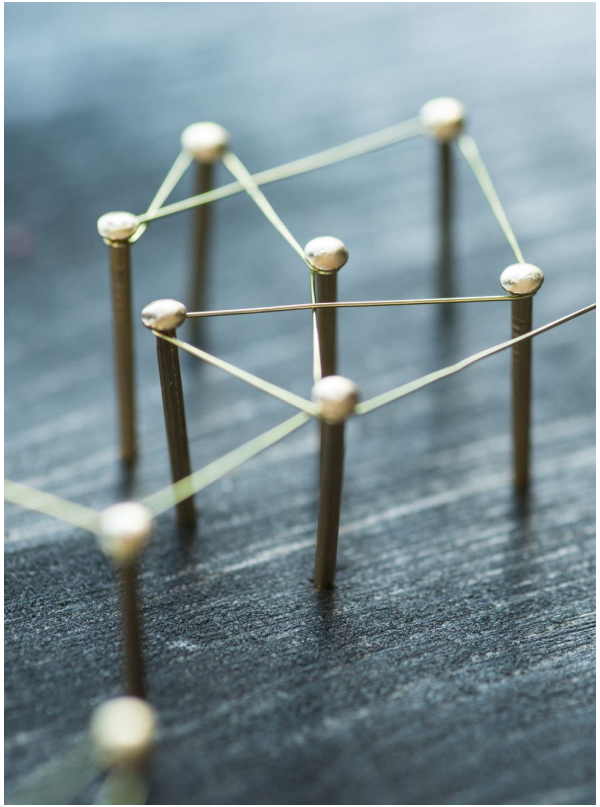
Balancing the interest of all stakeholders, Adequate and Reasonable Return on Investments

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

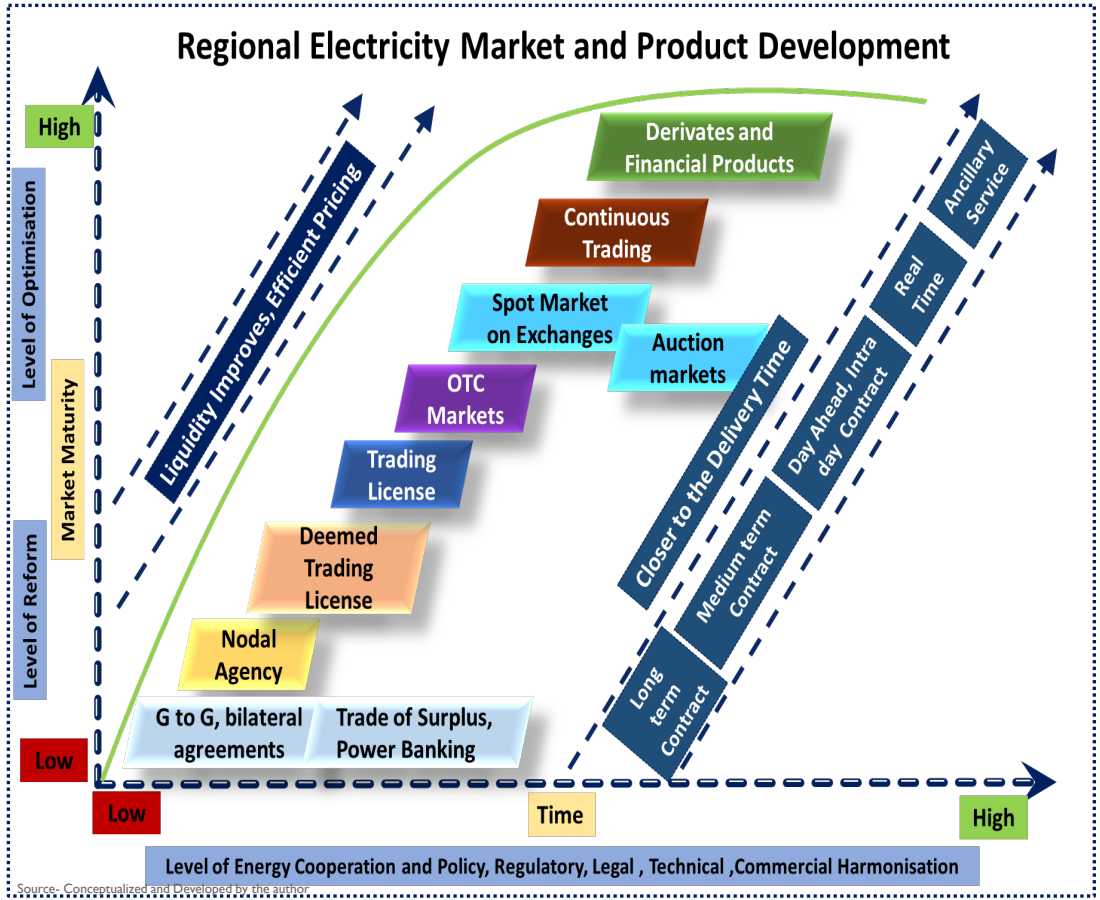
Role of Market Design in Promoting Investment



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.**

DAM-Day Ahead Market, G-DAM-Green -Day Ahead Market, G-TAM-Green Term Ahead Market, RTM-Real Time Market, REC-Renewable Energy Certificates, TAM- Term Ahead Market



Source- Conceptualized and Developed by the author

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