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South Asia Regional Energy Partnership (SAREP) Presentation

on

Terms of Reference of the TF-2 Study on Regional Electricity Supply and Demand Scenario and Cross Border Electricity Trade (CBET) potential by 2043

**Session 4: Presentation and Deliberations on the draft Terms of Reference of the Study on
Regional Electricity Supply-Demand Scenario and CBET potential by 2043**

**11th Meeting of SAREP Task Force-2 on “Advancement of Transmission System Interconnections for Cross Border Electricity Trade”
15.30-15.45 Hrs. 16th February 2023, Karnali Hall, Kathmandu Marriott Hotel, Kathmandu, Nepal**

**Presented by
Rajiv Ratna Panda and Ajit Kumar**



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- 02** → Terms of Reference of the TF-2 study on Regional Electricity Supply and Demand Scenario and Cross Border Electricity Trade (CBET) Potential by 2040

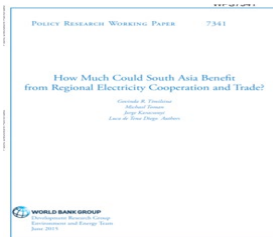
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Why to Study ? There are so many studies ?

Many studies on regional electricity supply and demand scenario and cross border electricity trade (CBET) potential ? Is it ? Major Regional Studies

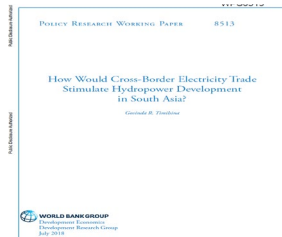
World Bank



How Much Could South Asia Benefit from Regional Electricity Cooperation & Trade?

- June 2015
- Policy Research Working Paper
- 2015-2040
- Demand-Supply projection
- CBET flows
- Most of data used 2011-2014 or before

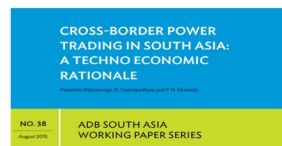
World Bank



How Would Cross-Border Electricity Trade Stimulate Hydropower Development in South Asia?

- July, 2018
- Policy Research Working Paper
- 2040 Period
- To a large extent relies on earlier study of 2015

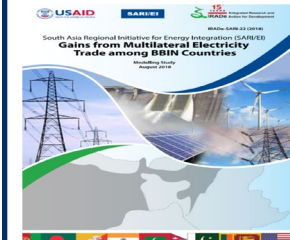
ADB



Cross-Border Power Trading in South Asia: A Techno Economic Rationale

- August, 2015
- ADB South Asia Working Paper Series
- Six Cases studies
- Annual joint benefit in 2016/17

USAID/SARI/EI



Gains from Multilateral Electricity Trade among BBIN Countries

- August, 2018
- 2015-2045
- Build on the Bilateral Model
- Regional Optimisation

NREL



Cross-Border Energy Trade between Nepal and India: Assessment of Trading Opportunities

Brendan McConnett, Amy Rose, David Huribut, David Palchak, and Jaquelin Cochran
National Renewable Energy Laboratory

South Asia Cross-Border Electricity Trade and Cooperation Study

- April, 2019
- CBET potential* for year 2022.

Last 8 Years

* From an operations perspective among India, Nepal, Bangladesh, and Bhutan by examining the technical & economic impacts of trade on both systems in the year 2022.

Why to Study ? Regional Electricity Supply and Demand Scenario and Cross Border Electricity Trade (CBET) potential by 2040 ?

- ❑ **Massive transformation** in energy and power sector is expected.
- ❑ A **different vision and outlook** are emerging at **policy level**.
- ❑ **RE, EV, Decarbonization, Net Zero targets ,energy efficiency, roof top, energy storage , hydrogen economy** has come up etc.
- ❑ **Load profile and nature of power system** is changing due to various factor including weather factors.
- ❑ **Changing Market Dynamics.**
- ❑ Can have **significant impact** on the **prospect/nature of CBET.**
- ❑ Most of the Regional Studies **base motivation relied upon on data and projection made in the country specific plans** in each country, nature/characteristic of power system of that time.

- ❑ **Earlier country specific plans under review in most country/come up new plans.**
 - ❑ **Bangladesh-** Draft New Integrated Power and Energy Master Plan (IEPMP), 2023
 - ❑ **India-** Draft National Electricity Plan (Generation), September, 2022
 - ❑ **India-** Draft National Electricity Plan (Transmission), 2022/23
 - ❑ **India-** Transmission System for Integration of over 500 GW RE Capacity by 2030, December, 2022
- ❑ **Sri Lanka-** CEB Long Term Generation Expansion Plan (2022-2041).
- ❑ Master plan/Projects in Bhutan and Nepal are under periodic and regular review.
- ❑ Transmission System Development Plan of Nepal,2018.
- ❑ Bhutan Sustainable Hydropower Development Policy 2021
- ❑ Emerging OSOWOG Interconnections.
- ❑ Pakistan- Indicative Generation Capacity Expansion Plan 2022-31 (IGCEP-2022),

A Renewed assessment of Cross Border Electricity Trade Potential is needed along with a long-term trajectory

Clean Energy Transformation Vision



Bangladesh

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

Source: Mujib Climate Prosperity Plan



Bhutan

To remain Carbon Neutral

Source: Bhutan's 2nd Nationally Determined Contribution



India

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



Maldives

Net zero Emission by 2030

Source: Update of Nationally Determined Contribution of Maldives

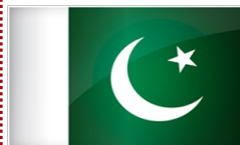


Nepal

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 UNFCCC



Pakistan

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

Source : Pakistan Updated Nationally Determined Contributions



Sri Lanka

Carbon Neutrality by 2060

Source : UPDATED NATIONALLY DETERMINED CONTRIBUTIONS

Source: SARC Energy Centre: Evaluation of Challenges and Assessing Investment for Cross Border Electricity Trade (CBET) Process Study, 11 November 2021

Key Initiatives and Recent Developments in South Asia: A Regional Approach will be an Economical, Cost Effective, Optimal and Sustainable over a long period of time



02

Terms of Reference of the TF-2 study on Regional Electricity Supply and Demand Scenario and Cross Border Electricity Trade (CBET) Potential by 2040



Terms of Reference of the TF-2 study on Regional Electricity Supply and Demand Scenario and Cross Border Electricity Trade (CBET) Potential by 2043

Objective :

To identify the Cross Border Electricity Trading potential in (MW, MWh.) of the South Asian (SA) Nations over a period of next 20 years (2023-2043).

Terms of Reference:

1. Collect, compile and conduct a thorough literature review survey of relevant regional studies conducted in the past , document the strength and limitation of these studies vis-à-vis of projections of regional electricity Demand-Supply (D-S) and CBET potential. Develop a comparative assessment of these studies, its findings and actual progress.
2. Review and analyse the latest existing long term D-S projection scenarios of SA countries - based on the country master plans available in each country, or carrying out comprehensive modelling exercise, if projections are not available.
3. To assess whether existing D-S projections have adequately been taken up and have explored the CBET potentials of each SA country from the trading perspectives and in the time horizon of next 20 years with a three-five year wise horizon.

Terms of Reference of the Study on Regional Electricity Supply and Demand Scenario and Cross Border Electricity Trade (CBET) Potential by 2043

Terms of Reference:

4. Review and analyse the latest development such as Renewable Energy, Electric Vehicle , Electrification of Transport, decarbonization measures, Net Zero targets ,energy efficiency, roof top solar, energy storage, green hydrogen economy in power sector, overall clean energy priorities/targets of each SA countries and expected developments/impacts in next 20 years for power demand and supply.
5. Factoring in the above analysis of 1-4 and its findings , develop regional electricity supply and demand scenarios and optimal CBET potential by 2043 across scenarios with a three–five year wise horizon over next 20 years by optimising overall system wide cost of regional SA power system.
6. The above shall also identify country wise and regional CBET potential over various seasons, monthly and annually for next 20 years (2023-2043) and associated transmission systems needs by optimising various diversities & complementarities among SA countries with CBET happening through bilateral, trilateral and multilateral mode.
7. Estimate the broad economic, environmental and social benefits of fully tapping the CBET potential by 2043 across scenarios.
8. Prepare a web/online simulation tool of the above study findings of all scenarios for better and easy dissemination.
9. Analysis to be updated once in every two-year including the web/online simulation tool.

Tentative Timeline



Terms of Reference of the Study on Regional Electricity Supply and Demand Scenario and Cross Border Electricity Trade (CBET) Potential by 2043

Tentative Time Line : Six Month

SL NO	Deliverable	TIME LINE
1	Consultant On board	May, 2023
2	Inception Report	May, 2023
3	Data collection	June, 2023
4	Draft Report	August, 2023
5	12th TF-2 Meeting and stakeholder Consultation on Meetings	September/October 2023
6	Fina Report and web/online simulation tool	October, 2023
	Report Release and Dissemination	November, 2023

Thank You



Contact: rpanda@sarep-southasia.org
rajivratnapanda@gmail.com
+91-9650598697



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Disclaimer

The data, information and assumptions (hereinafter ‘data-set’) used in this document are in good faith and from the source to the best of SAREP (the program) knowledge. The program does not represent or warrant that any data-set used will be error-free or provide specific results. The results and the findings are delivered on “as-is” and “as-available” data-set. All data-set provided are subject to change without notice and vary the outcomes, recommendations, and results. The program disclaims any responsibility for the accuracy or correctness of the data-set. The burden of fitness of the data-set lies completely with the user. In using the data-set data source, timelines, the users and the readers of the report further agree to indemnify, defend, and hold harmless the program and the entities involved for all liability of any nature.