

Conference Proceedings

“Enhancing Energy Cooperation & Integration in South Asia”

under

South Asia Regional Initiative for Energy Integration
Desire Hall, Hotel Le Méridien, New Delhi
30th – 31st August 2018



Report is prepared by:

SARI/EI Project Secretariat, IRADe

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Programme Schedule for Regional Conference on “Enhancing Energy Cooperation & Integration in South Asia”

Day- 1 (30th August, 2018)

Session-I: Inaugural

0945 – 1100 Hrs

- Welcome Address: Dr. Jyoti Parikh, Executive Director, IRADe
- Overview of SARI/EI programme: Mr. V K Kharbanda, Project Director, SARI/EI-IRADe
- Special Address: H.E. Kenneth I. Juster, US Ambassador to India
- Special Address: Mr. Ali Hader Altaf, Director of SAARC
- Keynote Address: Mr. R. K. Singh, Hon’ble Minister of Power, Govt. of India
- Vote of Thanks: Mark A White, Mission Director, USAID

Session-II: Policies/Regulations and Institutional Mechanisms for Promoting Energy Cooperation & Cross Border Electricity Trade in South Asia

1135 – 1300 Hrs

- Session Chair: Mr. Gireesh B. Pradhan, Former Chairperson of Central Electricity Regulatory Commission (CERC), India
- Session Co-Chair: Dr. Salim Mahmud, Chairman, Bangladesh Energy Regulatory Commission Tribunal
- Theme Context: Mr. Rajiv Ratna Panda, PC, SARI/EI
- Session Panelists:
 - Mr. Samdrup Thinely, CEO, Bhutan Electricity Authority
 - Mr. Mohammad Hossain, Director General, Power Cell, MPEMR, Govt of Bangladesh
 - Mr. Dinesh Kumar Ghimire, Joint secretary, MOE, Nepal

Session-III: Investments in Infrastructure for Cross Border Projects: Catalyzing Private Investments and Mitigating Risks

1400-1515 Hrs

- Session Chair: Mr. Ajay Shanker, Ex Secretary, GOI
- Session Panelists:
 - Mr. K Rajagopalan, CEO, Reliance
 - Mr. Troy Kofroth, MCC, Nepal
 - Mr. Sunil Poudel, Sr. Division Engineer, IBN, Nepal
 - Mr. Jiwan Acharya, Senior Energy Specialist, ADB

Session-IV: Coordinated Interconnection Transmission planning and Need for a Technical Institutional Mechanism in South Asia for Secure Reliable Grid interconnection

1530-1645 Hrs

- Session Chair: Mr. Pankaj Batra, Chairman, CEA, India
- Session Co-Chair: Mr. S K Soonee, Advisor, POSOCO
- Theme Context: Mr. Rajiv Ratna Panda, Program Coordinator, SARI/EI
- Session Panelists:
 - Ashok Pal, GM, PGCIL, India
 - Mr. Arun Kumar Saha, Chief Engineer, PGCB, Bangladesh
 - Mr. Karma Tshewang, Chief Engineer, Bhutan

Session-V: Electricity Trade in BBIN Region–Long-term Trading Volume and Uncertainties

1645-1800 Hrs

- Session Chair: Dr. Kirit Parikh, Chairman, IRADe
- Session Co-Chair: Dr. Swarnim Wagle, Former Vice Chairman, Planning Commission, Nepal
- Theme Context: Dr. Probal Ghosh, Head Modelling, IRADe and Mr. Vinay Saini, Sr. Research Analyst, IRADe
- Session Panelists:
 - Mr. S.K. Soonee, Advisor, POSOCO, India
 - Mr. Jiwan Acharya, Sr. Energy Specialist, ADB
 - Md Mahbubur Rahman, Chief Engineer, BPDB

Day- 2 (31st August, 2018)

Session VI: South Asian Regional Power Market–Market Instruments and Regional Power Exchange

- 0930-1100 Hrs**
- Session Chair: Dr. Kirit Parikh, Chairman, IRADe
 - Session Co-Chair: Mr. Sanjeev Mehra, MD & CEO, TPTCL
 - Theme Context: Mr. S. K. Ray, Technical Specialist & Mr. Gaurav Jain, Senior Research Analyst, SARI/EI, IRADe
 - Session Panelists:
 - Mr. Mohamad Hossain, Director General, Power Cell, Bangladesh
 - Mr. K.S Bandyopadhyay, General Manager- NTPC Vidyut Vyapar Nigam Limited (NVVNL)
 - Mr. Anil Raj Bhandary, Deputy Managing Director, Nepal Electricity Authority (NEA)
 - Mr. Rajesh K Mediratta – Director (Business Development), Indian Energy Exchange (IEX)

Session VII: Linking South Asia with South-East Asia and Synergizing Regional and Sub Regional Initiatives for Energy Cooperation

- 1100-1215 Hrs**
- Session Chair: Ms. Julia Kennedy, Director (A), USAID/India Clean Energy and Environment
 - Theme Context: Mr. Tushar Sud, Deloitte
 - Session Panelists:
 - Mr. Ali Haider Altaf, Director, SAARC
 - Dr. Sagar Prasai, Country Representative, Asia Foundation
 - Mr. Lei Lei Song, Regional Economic Advisor, South Asia Department, ADB
 - Mr. Myint Oo, Deputy Director General, MoPE, Myanmar
 - Dr. Mahendra P Lama, Professor, JNU, Delhi

Session VIII: Role of think tanks in Enabling a Conducive Environment and Consensus Building for CBET in South Asia

- 1215-1330 Hrs**
- Session Chair: Mr. Vikram Doraiswami, Joint Secretary (BM), Ministry of External Affairs, Government of India
 - Session Co-Chair: Dr. Jyoti Parikh, Executive Director, IRADe
 - Session Panelists
 - Mr. Rohit Magotra, Deputy Director, IRADe
 - Dr. Bishnu Pant, Executive Director, IIDS, Nepal
 - Dr. Sagar Prasai, Country Representative, Asia Foundation
 - Ms. Monali Zeya Hazra, Regional Energy Manager and Clean Energy Specialist, USAID, India
 - Mr. Lei Lei Song, Regional Economic Advisor, South Asia Department, ADB
 - Mr. Prabir Neogi, Chairman, Power Committee, FICCI, India

Session IX: Enhancing Energy Cooperation in Pan South Asia: Future Strategies & Way forward

- 1430-1545 Hrs**
- Session Chair: Dr. Jyoti Parikh, Executive Director, IRADe
 - Session Panelists:
 - Mr. Merrille Goonetilleke, Add. Secretary, Ministry of Power & Energy, Sri Lanka
 - Dr. Swarnim Wagle, Former Vice Chairman, Planning Commission, Nepal
 - Mr. Dinesh Kumar Ghimire, Joint Secretary, Nepal
 - Ms. Mandakini Kaul, Senior Regional Cooperation Officer, The World Bank

Session X: Valedictory Session–Shri Suresh Prabhu, Hon'ble Minister of Commerce and Industry, Government of India and Deputy Chief of Mission, U.S. Embassy, Mary Kay L. Carlson delivered the valedictory addresses.

- 1600-1700 Hrs**
- Session Speakers/Participants
 - Dr. Kirit Parikh, Chairman, IRADe
 - Ms. Ramana El Hamzaou, Deputy Mission Director, USAID
 - Mr. Desh Deepak Verma, Secretary General, Rajya Sabha
 - Mr. V. K. Kharbanda, PD, SARI/EI, IRADe



सत्यमेव जयते

प्रधान मंत्री
Prime Minister
MESSAGE

I am glad to learn that a Regional Conference on “Enhancing Energy Integration in South Asia” is being organized at New Delhi on 30-31 August under the auspices of Integrated Research and Action for Development (IRADe).

There is lots to gain from enhanced regional energy integration. By matching the sources of energy production and its demand centres, it will synergize the economies of the region. India has a special role to play in helping the region to realize this shared destiny of prosperity.

I hope that the regional conference will be an occasion for energy experts and policy makers to deliberate on enhancing the energy integration in the region. I convey my best wishes for the successful conclusion of the conference.

(Narendra Modi)

New Delhi
27 August, 2018

Dr. Kirit S. Parikh

Chairman

Integrated Research and Action for Development (IRADe)

C-80, Shivalik, Malviya Nagar

New Delhi- 110017

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FOREWORD

The USAID South Asia Regional Initiative for Energy Integration (SARI/EI) program advocates energy security through cross-border electricity trade (CBET), clean energy access and energy markets development in the South Asia region. The region has witnessed a per capita GDP growth rate of more than six percent in the recent past. In order to sustain this growth, provide opportunities for entrepreneurs, and continue to develop new job opportunities, it is imperative that the countries in the region have access to clean energy. However, existing power shortages and high reliance on fossil fuels, along with the rapidly increasing electricity demand are threatening to undermine economic progress.

The SARI/EI program promotes regional energy cooperation through cross-border electricity trade (CBET) by harmonizing policies, legislation and regulations; facilitating transmission interconnections and establishing a regional power market. Currently, the majority of the power trade in the South Asian Region (SAR) is between four countries i.e. Bangladesh, Bhutan, India and Nepal (BBIN) through bilateral trade. While these bilateral contracts have been critical in establishing power trade in the region, greater efficiencies can be achieved through power markets. Recently, Government of India issued the revised guidelines on cross-border power trade which will facilitate tripartite cross-border trade and pave the way for power markets in the region.

A Regional Conference on “Promoting Regional Energy Cooperation and Integration in South Asia” on August 30-31, 2018 in New Delhi was organized to discuss and deliberate the key challenges and way ahead for moving the region from bilateral power trading to multi-lateral trading. The participants, included representatives from the South Asian Government, think tanks, development agencies, etc. and the topics that were deliberated included harmonization of policies and regulations, coordinated transmission planning, market instruments, investments in infrastructure, role of think tanks, linking South Asia with South East Asia and Way Forward. These deliberations and ideas that were discussed by various regional stakeholders have been documented in this conference proceeding. The action items emerging out of this conference will be factored by USAID in designing the extended phase of SARI/EI.

I would like to take this opportunity to commend Integrated Research and Action for Development (IRADe) for organizing the conference and publishing this proceeding. I hope that the proceedings will be very useful to energy stakeholders from the different South Asian countries.

Thank you

Michael Satin
Director
Clean Energy & Environment Office
USAID/India

Preface

We are happy to present these proceedings of the regional conference on “Enhancing Energy Cooperation and Integration in South Asia”. IRADe achieved a major six-year milestone of successful completion of the stage-1 of the fourth phase of SARI/EI. During these six years, SARI/EI conducted more than 80 events, published more than thirty reports on various aspects of cross-border such as grid-code, market design, standard agreements, economic benefits etc. IRADe engaged more than 2000 stakeholders from South Asian countries through various event such as workshops, conferences, focus group meetings, capacity building programs and training programs.



During these last six years, SARI/EI collaborated with various national and regional institutions such as the Central Electricity Regulatory Commission(CERC), Central Electricity Authority(CEA), India; Power Cell, Bangladesh; Nepal Electricity Authority (NEA), Bay of Bengal Initiative for Multi Sectoral Technical and Economic Cooperation (BIMSTEC), Association of Southeast Asian Nations (ASEAN), SAARC Energy Centre etc. to disseminate the key findings and channelize the recommendations through these institutions.

SARI/EI, IRADe has initiated the work toward developing a regional institutional mechanism through SAFIR working group and SAARC council of experts of energy regulator. SARI/EI has also conducted a mock exercise to assess the feasibility and market design of South Asian Regional Power exchange (SARPEX)

Therefore, this conference was organized to showcase the work undertaken in the past six years of SARI/EI and highlight the success of various components of SARI/EI. Another objective of the event was to identify the key takeaways from the conference to design the Stage-2 of the fourth phase of SARI/EI.

This successful event had painstaking efforts behind it for shaping the sessions, getting appropriate speakers and most of all, bringing on the representatives from decision-making bodies, such as the Planning Commission, Ministry of External Affairs, Ministry of Power and representatives from senior management from the regulatory authorities, private sector, multilateral organisations of the South Asian region.

We are grateful to chairs, speakers, panelist, delegates and representatives from governments, ministries/ departments of power and energy, regulatory commissions, planning authorities, load dispatch centers, power exchanges, power generation companies, transmission and distribution utilities, trade and industry associations, civil societies, regional forums and network associations, public and private sector players, research and development organizations, financial institutions and multilateral organisations such as SAARC energy centre, ADB and the World Bank, energy professionals, researchers, and consultants affiliated to the power sector for being an integral part of the conference and for helping the program meet its objectives.

We felt that this conference succeeded in its objective of consensus building, knowledge sharing, exchange of best practices and sharing concerns of individuals.

Such a huge undertaking is possible only with the dedicated team efforts of IRADe team, and close cooperation with USAID. I am grateful to Ms. Monali Zeya Hazra, Regional Energy Manager and Clean Energy Specialist, USAID, India for standing by us throughout this project period. Professor Kirit Parikh has provided continuous guidance through out the project. I would also like to congratulate Mr. V. K. Kharbanda, Project Director; Mr. S. K. Ray, Technical Specialist, Rohit Magotra, Deputy Director, Probal Ghosh, Rajiv Panda, Gaurav Jain, Vinay Saini, Asha Kaushik, Anshuman Behera and many others. Our Finance and Admin office led by R. K. Tiwari and B. K. Sarkar and other team members for organizing this successful conference and ensuring successful completion of the first stage of SARI/EI phase-IV. This conference provide guidance for the future course of action.

Dr. Jyoti Parikh,

A handwritten signature in blue ink that reads "Jyoti K. Parikh".

Executive Director

Integrated Research and Action for Development (IRADe)

Executive Summary

Energy is one of the key factors driving socio-economic progress in developing countries. South Asian nations, namely Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka are moving in the direction to access clean, reliable, and affordable energy, especially electricity. Power shortages and the growing import of fossil fuel impose a heavy cost on energy insecurity. The energy endowments of South Asia (SA) are limited and dispersed across the region, with large, unexploited hydro-electric potential in some parts and growing dependence on fossil fuels in others. This presents an opportunity to develop these resources on a regional basis, so that the hydro resources of one country complements the thermal/renewable energy resources of another, for optimal utilization of resources in the Region. This would lead to reducing shortages in the Region in the most optimal way, in the quest for 24x7 supply to all consumers in the South Asia Region.

Against this backdrop, Integrated Research and Action for Development (IRADe), in cooperation with the US Agency for International Development (USAID), organized a conference on “Enhancing Energy Cooperation and Integration in South Asia” on August 30-31, 2018 in New Delhi, India, to disseminate the key findings of the South Asia Regional Initiative for Energy (SARI/EI) program and highlight the success of various components of the program. The program, which covers eight countries of the region -- Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka started in 2000. Since then, the program has consistently strived for the promotion of energy security in the South Asian nations by working in three focus areas: cross-border electricity trade (CBET); energy market formation; and regional clean energy development.

During the conference, Mr. Kenneth I. Juster, Hon’ble U.S. Ambassador to India, announced the extension of SARI/EI fourth phase implemented by IRADe, after evaluating the program and seeing its merit. He stated that SARI/EI would continue work toward promoting the integration of energy systems and enhancing CBET among the participating South Asian and South-East Asian countries during the extended four-year program period.

Prime Minister of India, Shri Narendra Modi, sent a message and best wishes for the successful conclusion of the Conference. Shri Suresh Prabhu, Minister of Commerce and Industry, Gol, sent a recorded video message for the participants from South Asian countries and mentioned that the Region has a shared destiny and hence we must work on shared ideas and work together to provide energy access and energy security to people of all South Asian nations.

Mr. R. K. Singh, Minister of State (IC), Power, Government of India (Gol), inaugurated the Conference. Dr. Jyoti Parikh, Executive Director, IRADe, delivered the welcome address. Mr. Juster delivered the special address; Mr. Ali Hader Altaf, Director of SAARC, delivered the special address. Mr. V.K. Kharbanda, Project Director, provided an overview of SARI/EI. Mark A White, Mission Director, USAID gave the vote of thanks. Senior representatives from South Asian governments, distinguished experts, and speakers shared insights with the delegates.

The two-day conference comprised an inaugural session and eight working sessions, followed by the valedictory session. The Sessions consisted of the following:

1. Policies/, Regulations and Institutional Mechanisms for promoting Energy Cooperation & Cross Border Electricity Trade in South Asia,
2. Investments in Infrastructure for Cross Border Projects: Catalyzing Private Investments and Mitigating risks
3. Coordinated interconnection transmission planning and need for a Technical Institutional Mechanism in South Asia for secure reliable Grid interconnection

4. Electricity Trade in BBIN region- Long term trading volume and uncertainties
5. South Asian Regional Power Market- Market Instruments and Regional Power Exchange
6. Linking South Asia with South-East Asia and Synergizing regional and Sub Regional Initiatives for Energy Cooperation
7. Role of think tanks in enabling conducive environment and consensus building for CBET in South Asia
8. Enhancing energy cooperation in pan South Asia: Future Strategies & Way forward

Based on extensive deliberations, the key takeaways are as follows:

- **Energy Cooperation:** It would help in transferring short-term and long-term surpluses of power in a country to help mitigate the energy deficit in another country, in the South Asian region. It will also be helpful for developing the clean energy (renewable energy and gas market) market.
- **Economic Growth and Policy Dialogue:** There is a need to extend the exercise of providing evidence through economic analysis done for India-Nepal-Bangladesh to other countries of Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) / South Asian countries. In this effort, we should engage with regional authorities and organize informal talks at the levels of foreign secretaries and power secretaries, regulators, generators, transmission utilities and power market players for the purpose of policy dialogue.
- **Think Tank Role:** The think tanks' role is important to advancing cross-border power trade. This will be helpful for sharing the best practices and for achieving the Intended Nationally Determined Contributions (INDC's) goal for reductions in greenhouse gas emissions.
- **Market-based Mechanism:** For efficiently reaping the true benefits of regional integration, market-based electricity trade needs to develop in South Asian region.
- **Inclusion of South-East Asian Countries:** SARI/EI should expand its work to South-East Asian neighboring countries, such as Myanmar and Thailand.
- **Integration of Renewable Energy:** By expanding the balancing area beyond a country's boundary and formation of a regional market, countries may move towards making ambitious plans for renewable energy integration and achieving their NDC's goal. The energy security from integrating energy resources in the regional basket and the wider geographical area provides an opportunity for reducing and managing the intermittency of renewable energy.
- **Developing Institutional Mechanism:** To achieve the policy and regulatory harmonization, SARI/EI is working with the South Asia Forum for Infrastructure Regulation (SAFIR) Working Group and SAARC Energy Regulator. To facilitate the regional transmission interconnections, SARI/EI is moving towards creation of the South Asian Forum of Transmission Utility (SAFTU). SARI/EI is also working toward creating a free and competitive market through developing institutions such as South Asian Regional Electricity Market (SAREM) and operationalization of South Asian Regional Power Exchange (SARPEX) etc. The Regional Investment forum will also be useful for reducing the high risk of cross-border projects.

Introduction

Access to reliable, affordable, and cleaner energy is a high priority to facilitate economic development and improve welfare of the population in the South Asia Region. South Asian Countries (SAC) have vast diversity of energy resources, which are still under development, particularly hydropower and renewable energy. With rapidly rising demand across the SAC and limited supply, there exists huge opportunities for the optimization of resources through an interconnected power system. Presently, around 2500 MW is being traded in the South Asia Region with the likelihood of electricity trade being doubled by the end of 2020. Increased energy cooperation among countries can bring economies of scale in investment, strengthen electricity sector financing capability, enhance competition, and improve sector efficiency. Regional energy cooperation offers an ideal platform for achieving sustainable growth through sharing of available natural energy resources in the region.

The USAID's South Asia Regional Initiative for Energy Integration (SARI/EI) program has been working in the region since 2000 to promote energy cooperation and a regional power market. The fourth and the current phase of the program, implemented by Integrated Research and Action for Development (IRADe), a leading think tank, was initiated in October 2012. The program aims to advance energy cooperation, regional energy integration and promote Cross Border Electricity Trade (CBET). Over the years, under the SARI/EI program, IRADe has published 30 reports and undertaken 84 events in the SAARC region engaging more than 2000 stakeholders.

The regional conference on "Enhancing Energy Cooperation and Integration in South Asia" is a celebration of the work undertaken thus far under the SARI/EI program and an opportunity to bring relevant stakeholders on a common platform to discuss, deliberate and inform the roadmap toward an integrated South Asia. The conference aims to provide the key takeaway for different South Asian governments, inform strategy of donor agencies and pave the future of regional grid integration.

Session I: Inaugural Session

- **Welcome Address:** Dr. Jyoti Parikh, Executive Director, IRADe
- **Overview of SARI/EI programme:** Mr. V K Kharbanda, Project Director, SARI/EI-IRADe
- **Special Address:** H.E. Kenneth I. Juster, US Ambassador to India
- **Special Address:** Mr. Ali Hader Altaf, Director of SAARC
- **Keynote Address:** Mr. R. K. Singh, Minister of Power, Govt. of India
- **Vote of Thanks:** Mark A White, Mission Director, USAID



The conference began with lighting the lamp by the Minister of Power Shri R K Singh, US Ambassador Kenneth Juster, Mr. Ali Haider Altaf, Director from SAARC, Mr. Mark White from the US Embassy, Dr. Jyoti Parikh, Executive Director, IRADe and Mr. V.K. Kharbanda, Project Director, SARI/EI.

Dr. Jyoti Parikh, Executive Director, IRADe, New Delhi

Dr. Parikh welcomed and greeted the dignitaries on the dais and the audience. In her remarks, she stressed the need for regional cooperation among the South Asian countries, even though each may seem short of energy, because of their different energy resource availability and demand patterns. Dr. Parikh highlighted the journey of South Asia Regional Initiative for Energy Integration (SARI/EI) over the last six years, and briefly explained the idea of Cross-Border Electricity Trade (CBET) and how SARI project of the USAID began at IRADe. She explained that the key components of SARI phase IV are: three task forces, modelling exercise for BBIN (Bangladesh, Bhutan, India, Nepal) countries, Think Tank Forum, and Mock Exercise of South Asian Regional Power Exchange.



She explained the comprehensive modelling exercise to capture macroeconomic, technical, environmental, and other benefits of power trade to the countries in the region. The study aimed to build consensus for cross-border electricity trade by quantifying its benefits. It showed how BBIN countries gain from electricity trade -- some in terms of lower capacity requirements and some in terms of additional export revenues from electricity trade. Compared to bilateral trade, multilateral trade in the BBIN region leads to more efficient use of fossil fuel resources and reduced cumulated emissions.

Dr. Parikh also dwelled on the Think Tank Forum (TTF), which was established for regional energy co-operation under SARI/EI as an outreach and dissemination forum to connect the civil society with policymakers, media, parliamentarians, foreign and administrative service officers, and citizens to help prioritize, fast track and push the agenda for CBET. The think tanks helped bring disparate stakeholders together, bridging communication gaps, mobilizing public opinion, as well as disseminating societal benefits of power trade through media engagement. The role of the think tanks is critical to sustaining enhanced discourse on CBET. SARI/EI is engaged with more than 20 think tanks across South Asia to reach out to politicians, bureaucrats, government representatives, civil society, citizen action groups, bilateral and multilateral development agencies and media for dissemination of SARI/EI work. Dr Parikh summarized the conclusions of the studies conducted by several regional think tanks.

Dr. Parikh said the existing power trade in the South Asian region is based on long and medium-term bilateral agreements. However, to capture the full benefits of daily complementarities, a Day-Ahead Market platform is essential. The sporadic demand-supply mismatch at the geographical level also calls for a market place where surpluses can be disposed of efficiently on a real-time basis to optimize resource allocation. To understand the actual realization of these complementarities in Day-Ahead Market, SARI-EI had conducted exercises, which provide empirical evidence that South Asian Regional Power Exchange (SARPEX) can bring major distributive benefits in terms of consumer and producer surplus for each country and price signals to the region.

She mentioned that over the last six years, SARI/EI had conducted more than 80 small and big events, meetings, regional conferences, and task force meetings engaging more than 2000 representatives from South Asian countries. She expressed her sincere gratitude to Prime Minister Shri Narendra Modi for sending an encouraging message while he was attending the BIMSTEC meeting for the same purpose. She thanked Minister of Power Mr. R.K. Singh, US ambassador Kenneth Juster and representatives from other South Asian countries for gracing this event. She also thanked the USAID and IRADe staff for their sincere and dedicated efforts and cooperation.

Mr. V. K. Kharbanda, Project Director, SARI/EI, IRADe

Mr. Kharbanda, Project Director, SARI/EI /IRADe presented an overview of South Asia Power Sector, the USAID's SARI/EI Program, key initiatives taken, the impact of the SARI/EI Program and the way forward. He mentioned that South Asia, having an installed capacity of 394 GW, is the third largest Power System in the world after China and the US. Furthermore, South Asia is blessed with diverse energy resources such as coal, oil, gas, bio-mass and particularly abundant natural hydro resource of 350 GW. He stated that per capita consumption, which is an indicator of standard of living, for South Asian Countries, is 576 per KWh—which is very meagre compared to the global average of more than 3100 per Kwh. In a developed economy like the US, it is 12984 per kwh. He emphasized that the optimal utilization of energy resources, meeting energy and peak shortages, poor per capita consumption and the economic development of all the South Asian Countries are some of the key drivers of promoting CBET in the region. He pointed out that in terms of economic benefit based on the existing power trade scenario between India and Bhutan, 40 per cent of Bhutan's revenue is through sale of hydro power to India while Bangladesh has also benefited in terms of reducing power cuts and having cheaper sources of supply.



The USAID initiated the SARI/E program in 2000 with the objective to bring awareness, capacity building, and development of clean energy and to promote Cross Border Electricity Trade (CBET) in the region. The current phase IV of the SARI/EI Program, effective from 2012-13, focuses on energy integration through three key development areas: a) Coordination of Policies/Regulations; b) Advancement of Transmission interconnection; and c) Regional power market. Under the SARI/EI Program, three intergovernmental task forces were constituted for the above key areas to help enhance CBET in the region.

Mr. Kharbanda shared the research studies/initiatives undertaken under the three task forces, such as publishing of Regional Regulatory Guidelines, changes/amendments in laws/policies/regulations, Report on South Asia Forum of Electricity Regulators, Harmonization of Grid Codes, Potential of Power Trade in Western Part of South Asia, Model PPA, TSA, feasibility study of having South Asia regional Power Exchange etc. The Key impact/highlights of current phase IV of SARI/EI Program include increase in trade of 1000 MW since 2012, signing of intergovernmental agreement on Energy Cooperation by SAARC member states, Power trade Agreement between India and Nepal, draft regulations on CBTE by Government of India and, Nepal Electricity Regulatory Act.

Looking forward, Mr. Kharbanda said it is important for the member states to implement treaties/agreements and, SARI/EI Task Force recommendations for creating i) association/forum of electricity regulators for cross cutting of regulations; ii) association/forum of transmission utilities/system operators for coordinated transmission planning and operation of power system; iii) facilitation forum for expediting investment in the region; iv) a transparent dispute resolution mechanism' and v) conducive policies/regulations to develop Hydro Power and renewable energy .. among others

H.E. Kenneth I. Juster, US Ambassador to India.

Mr. Juster began by noting the importance of regional trade. He mentioned that energy security is one of the key concerns in the South Asian region, which is one of the fastest growing regions in the world with the a collective growth rate of 6.9 per cent GDP in 2018. The region is home for nearly 1/4th of the world population. However, its per capita energy consumption is far lower than the global average.



He mentioned that rapid growth, expanding industrialization and increasing population will increase the demand of electricity and energy in the future. This will produce a growing dependence on energy import, primarily oil. Energy security thus presents critical challenges requiring each country to look beyond its borders. South Asian policy-makers and decision-makers recognize the importance of cross-border energy cooperation.

He pointed out that energy diplomacy is an integral part of Indian Prime Minister Narendra Modi's Look East policy. At the recent summit in Shanghai, the honorable prime minister mentioned that India's top priority remains connectivity of all type with its types with its neighbors. For India, regional connectivity provides a pathway for meeting the power demand of the North Eastern states.

Bangladesh saved annually \$500 million by importing power from India and is further expanding the power import from India in the next couple of months. It is keen to import power from Bhutan and Nepal as well. This will increase the competition and lower the cost of power in the region. Nepal is importing power from India to reduce its power deficit but once the Himalayan country manages to harness its hydro potential, it will be able to export its surplus power to the region and generate export revenue. Regional integration of South Asia can lead to a saving of \$100 billion over 25 years, according to a 2016 World Bank study.

Recognizing the benefits of regional or cross-border trade, countries in the region have signed the intergovernmental framework of energy cooperation among SAARC member states and bilateral Power Trade Agreements, which laid down the foundation of the power market in South Asia. Mr. Juster congratulated Minister RK Singh and the Indian government for taking a proactive step and preparing the draft guidelines and regulatory framework for Cross- Border Electricity Trade in India.

He mentioned that since 2000, USAID's SARI/EI program had strived to advance regional energy cooperation and energy security by promoting cross-border energy trade and supporting a regional energy market. He also highlighted the role of the three intergovernmental task forces, namely, Co-ordination of Policies, Legal and Regulatory Frameworks, Advancement of Transmission System Interconnections and Establishment of South Asia Regional Electricity Market. Mr. Juster highlighted some important achievements of SARI/EI and congratulated the program for increasing regional power trade by 1000 MW in the last six years, and for carrying out the first ever simulation of a regional power exchange exercise and developing a market design and rules for it.

He highlighted that through the SAFIR umbrella, SARI/EI brought Energy Regulators of the South Asian countries together for discussing the key issues of electricity trade and Think Tank Forum for building awareness and consensus for cross-border electricity trade in the region.

Mr. Juster announced that SARI/EI would continue for another four years, in order to achieve regional energy cooperation. He also highlighted the new initiative of the US government, namely Enhancing Development and Growth Through Energy (Asia EDGE). This initiative focuses on assisting countries to foster regional connectivity and market integration. The US Department of State also plans a regional connectivity conference for supporting the regional economic integration, infrastructure, and trade in the upcoming months.

Mr. Ali Haider Altaf, Director of SAARC

In his special address, Mr. Ali Haider Altaf, Director of SAARC, congratulated IRADe and thanked it for its laudable and timely initiatives and efforts to promote Cross-Border Electricity Trade in the region. He mentioned that SAARC is pursuing the goal of regional energy integration - and to promote the same, the SAARC Energy Minister has approved the concept paper on SAARC Energy Ring in 2009. Accordingly, SAARC has formed expert groups of Oil & Gas, Electricity, Renewable Energy, Technology, and Knowledge Sharing among others.



To carry forward the goal of enhancing energy-integration and self-reliance in the region, the SAARC Framework Agreement for Energy Cooperation was signed by the member countries at the 18th SAARC Summit held in Kathmandu in November 2014. Six countries have ratified it so far and after ratification from all the member countries, the South Asian region will have unrestricted Cross-Border Electricity Trade voluntarily.

The Forum of SAARC Energy Regulators started functioning in 2014 for knowledge sharing, the harmonizing legal, policy and regulatory framework, promoting Cross-Border Energy Trade and to recommend establishing the SAARC Council of Experts of Energy Regulators.

Taking it forward, the SAARC Council of Experts of Energy Regulators for Electricity was created for coordination on regulatory role, functioning, and capacity building of electricity regulator in view of Cross-Border Electricity Trade. Mr. Altaf thanked SARI/EI for taking the initiative in preparing the compendium of South Asia regulations of electricity in a short time.

Mr. R. K. Singh, Minister of Power, Govt. of India

Mr. R.K. Singh, Minister of Power, at the outset, welcomed all the panelists and distinguished guests at the event. He announced that India will be signing the BIMSTEC Grid Interconnection Agreement after all the participatory countries ratify the agreement for inter-country trading of power. Mr. Singh took a moment to congratulate IRADe and USAID for catalysing this initiative. He shared that USAID / US Govt. partnered with the Govt. of India in 2003-2004, during Mr. Singh's tenure at the Ministry of Home Affairs, for developing disaster management mechanisms for India. Mr. Singh appreciated the USAID/US Govt. for facilitating experts and conducting capacity-building training programs for the same. "Mankind is still in the process of learning, therefore, we should come together to share individual competitive advantages in the quest for development and ensure better and improved lifestyles of people around" he said. However, in the past, cooperation took a backseat and the government got derailed due to certain international competing political interests. Power is a critical input for progress, and prioritizing it is an essential ingredient for improving the lives of people. India is today the third largest producer of power in the world with 345 GW installed capacity this One Nation One Grid, makes making India the largest unified grid (having the same frequency) in the world. Mr. Singh



mentioned that presently the per capita consumption of India is approximately 1200 per Kwh. and to meet the global average of around 3000 per KWh, India needs to increase the generation capacity.

The total per capita energy consumption (including electricity) of India is 0.6 ToE/yr, whereas it is 2.5 ToE/yr in the advanced world economies, a gap that India needs to bridge. He mentioned that in April 2018 India made history with all the villages in the country being electrified. Moreover, since October 2017, 12 million households, out of 36 million, have been connected, which clearly suggests that India does not have surplus power as the country itself has to still meet the increasing supply demands despite being the third largest power producer globally. India's power demand is increasing at a rate of 6.5 percent per year, for which India is moving toward energy efficiency and renewable energy at policy level. The government launched a "Perform Achieve Trade (PAT) programme" by setting targets for industries to reduce their consumption which, in its first round, resulted in saving 867 million ToE in 478 industries across four sectors.

Mr. Singh opined that countries in the region should trade for competitive advantages viz-a viz per capita income of Bhutan which has increased by 40 percent because of hydropower trading with India. The current installed capacity of renewable energy in India is 71000 MW and this is being upgraded to 116,000 MW (approx.). "Hydropower will be the face of balancing power of future," he said, adding that said regional cooperation will help all the BBIN countries in their economic growth. The future growth of power will happen in SAARC countries, especially in India, since most of the investment is concentrated here. For instance, to establish the 71000 MW renewables within the country, an investment of \$42 billion was readily available. The Government of India aims to install 175 GW renewable power by 2022.

He concluded with a vision to meet targets and improve the livelihoods of people of South Asian countries through cross-border power trade and regional cooperation among SAARC countries.

Mark A White, Mission Director, USAID

Mr. Mark A White conveyed his sincere gratitude to the representatives of South Asian countries for gracing this occasion despite their busy schedule. He mentioned that the commitment to an integrated, stable, and prosperous South Asia could be achieved through energy integration in the region.

He mentioned the three key objectives of the conference – to celebrate the work undertaken in the past six years of SARI/EI, to highlight the success of various components of SARI/EI, and the key takeaways from the conference to design the implementation of the extended phase of SARI.



He conveyed that discussion and deliberation on issues such as regulations, power markets, economic impact, transmission interconnections, investment barriers etc. to promote cross-border power trade in the following two days would provide the information and experiences to crystallize some ideas and come up with a solution for making the region more integrated.

He thanked the eminent dignitaries including Minister R.K. Singh, Ambassador Juster, and SAARC Director Altaf Ali Haider, and acknowledged the contribution of the three SARI/EI task force representatives and the project steering committee. He also expressed his gratitude to implementing partner, Integrated Research and Action for Development (IRADe), for organizing the conference and looked forward to continuing the partnership in the coming years.

Session II: Policies/Regulations and Institutional Mechanisms for Promoting Energy Cooperation & Cross Border Electricity Trade in South Asia

- **Session Chair:** Mr. Gireesh B. Pradhan, Former Chairperson of Central Electricity Regulatory Commission (CERC), India
- **Session Co-Chair:** Dr. Salim Mahmud, Chairman, Bangladesh Energy Regulatory Commission Tribunal
- **Theme Context:** Mr. Rajiv Ratna Panda, PC, SARI/EI
- **Session Panelists:**
 - Mr. Samdrup Thinely, CEO, Bhutan Electricity Authority
 - Mr. Mohammad Hossain, Director General, Power Cell, MPEMR, Govt of Bangladesh
 - Mr. Dinesh Kumar Ghimire, Joint secretary, MOE, Nepal



Session Participants, L-R: Mr. Samdrup Thinely, Dr. Salim Mahmud, Mr. Gireesh B. Pradhan, Mr. Gireesh B. Pradhan, Mr. Mohammad Hossain

Mr. Gireesh B. Pradhan, Former Chairperson of Central Electricity Regulatory Commission (CERC), India

Mr. Gireesh B. Pradhan, Former Chairman, CERC, India highlighted the importance and challenges of addressing the energy poverty and energy access issue in South Asia in his opening remarks. For him, the crucial element in success of CBET are the regulations and unless the regulators of SA countries work together and put in place regulations which are harmonized and transparent, CBET potentials may not be fully realized. The process of regulatory harmonization needs strong and continued dialogues among regulators and issues can be resolved through discussion, he said. In this context, he mentioned the Technical Working group that has been created under SAFIR which SARI/EI program is supporting. He said that this viewed that, this Technical Working group could be a game changer for regulatory coordination and harmonization and can help in designing the much needed regulatory apparatus and framework needed for the kind of full-scale power trade that has been envisioned. He also cautioned that we should not create edifice and understand the realities of the region which is due to the severe lack an edifice of trust. We must address this lack of trust through dialogues and edifice cannot be built from the top and it must be from the bottom with baby steps for multilateral trade. He also an highlighted the importance of transmission planning and said there is a need for planners to work together and address Right of Way (ROW) problems and other issues. He said that a super regulator is not required as is it not practicable in SA the region.



Mr. Rajiv Ratna Panda, Project Coordinator, SARI/EI

To set the context of the discussion, a theme presentation was delivered by Mr. Rajiv Ratna Panda, PC, SARI/EI, IRADe, in which he covered: a) History of evolution of Energy Cooperation, CBET–key policy & regulatory development; b) key policy, regulatory challenges & risks for CBET) need for policy, regulatory coordination /harmonization; d) SARI/EI work on policy, regulatory aspects of CBET; and) International experiences on regional electricity regulatory agencies/associations/ forums. He said that in the absence of harmonized or coordinated regional policy as well as regulatory and legal framework, project risks in general tend to be high for large CBET project development and cross-border element greatly amplifies the risks due to additional geopolitical, economic and trade related risk/perceived risk factors. He said that in some cases, even projects that appear feasible, rational and economical in practice struggle to get it financed and built. He dwelled upon the key policy, regulatory challenges and risks for CBET and suggested an 11-point remedy for facilitating CBET both for initial stages of power system integration as well as for the transition stage and mature stages with higher levels of CBET in multilateral format. He pointed out that, while each country is sovereign by itself, there is a need to find appropriate ways and mechanisms to coordinate/harmonize the laws, rules, policies and regulations governing CBET to facilitate power trade, and stressed that a harmonized policy and regulatory framework for CBET brings consistency and predictability while minimizing perception of regulatory and policy risks.



Mr. Panda explained the Regional Regulatory Guidelines developed by SARI/EI as covering: a) Licensing for cross-border trading; b) Open access to transmission network (for competitive power market); c) Transmission pricing regime; d) Transmission planning; e) Imbalance settlement mechanism; f) Harmonization of codes; g) Dispute resolution; and h) Duties and tax regimes. Speaking on the international best practices on regional regulatory institutional mechanism, he covered the experience from Europe, Mekong, Southern Africa, and West Africa and more importantly the examples from the SA Region (India). In India, electricity is in the concurrent list and both Centre and State have power to legislate, regulate and govern. Therefore, there are statutory electricity regulators both at the state and the central level. The Forum of Regulators (FOR), which was constituted in pursuance of the provision under section 166 (2) of the Electricity Act, 2003, consists of Chairperson of CERC and State Electricity Regulatory Commissions (SERCs) and JERCs which helps in coordination and harmonization of regulation among state and central regulators. Briefly, FOR works on analysis of the tariff orders, harmonization of regulation in power sector, laying of standards of performance of licensees, information sharing among the members, research on issues relevant to power sector regulation, evolving measures for protection of interest of consumers and promotion of efficiency, economy and competition in power sector. Highlighting the SARI study recommendations the, he said, there is a need to create a Regional the Regulatory Institutional Mechanism such as the South Asia Forum of Energy/Electricity Regulators for coordination/harmonization and regulation governing CBET.

Mr. Samdrup Thinely, CEO, Bhutan Electricity Authority

Mr. Samdrup Thinely, CEO, Bhutan Electricity Authority, said that as we are expecting a manifold increase in cross border power trade, it is critical for the region to have harmonized regulatory framework governing cross border electricity trade. The focus in harmonizing regulation, however, should be limited to critical parameters related to Cross Border Electricity Trade (CBET). There is a need to recognize explicitly the export and import of electricity as a separate licensed business activity/entity. He said Open Access (OA) is key to a free and fair electricity market and CBET and was of the view that non-discriminatory OA in transmission also helps in the optimal utilization of resources, as it allows multiple power supply contracts by taking advantage of time load and seasonal difference. While there is a need for independent system operators a well-organized transmission plan stands at the forefront for successful implementation of OA. There is a need to establish a forum of electricity regulators in BBIN region to begin with and it can bring immense benefits to the region. The forum will provide a platform for frank discussion and exchange of views among regulators, on various key aspects such as harmonization of grid codes, imbalance settlement, transmission pricing etc. He felt that it will also provide an opportunity for information sharing, skills and knowledge enhancement and capacity building of SA regulators.



Mr. Dinesh Kumar Ghimire, Joint Secretary, Ministry of Energy, Water Resources and Irrigation (MWERI)

Mr. Dinesh Kumar Ghimire, Joint Secretary, Ministry of Energy, Water Resources and Irrigation (MWERI), highlighted the hydropower development of Nepal, bilateral energy cooperation in the field of hydro power and Nepal's perspective on the subject. On the CBET front, 5 MW power exchange started between India and Nepal in 1971,



progressing gradually to the current scenario where Nepal is doing CBET with 11 of cross-border transmission lines and importing around 450 MW electricity from India. The modality of power trading is in the river treaties, border town exchange program and commercial trading modalities. He said the Indo-Nepal power trade agreement and the SAARC Framework Agreement for Energy Cooperation provide the basis for exchanging electricity among South Asian countries. He shared that Nepal has recently enacted the Nepal Regulatory Commission Act and that the country is in the process of creating an independent electricity regulatory commission which will work on grid codes and regulatory standards, determine consumer and transmission tariff and facilitate CBET. The Ministry of Energy, Water Resources and Irrigation has come up with a white paper targeting power generation of 3000 MW in three years' time, 5000 MW in five years' time (which will help in electrifying 100 percent population in Nepal) and 15000 MW in 10 years' time, out of which 5000 MW will be for cross-border exports. On institutional mechanism, he said the MWERI is responsible for policy formation and coordination as well as various bilateral and multilateral engagements in energy cooperation. The Nepal Electricity Authority, a state owned utility, is carrying out the bilateral electricity trade/exchange with India and states of India and commercial power trading. Nepal, which has a federal structure, wish to learn from the neighboring countries how to formulate electricity regulation at the central, state and local levels in the power sector. He highlighted the various challenges which need to be internalized for CBET in South Asia. He said India has been very supportive of CBET and said there are some challenges on the CBTE guidelines/draft regulation which need to be addressed. There is a need to see electricity not as strategic commodity but as a commercial commodity and we need to translate the political commitment to action both in bilateral and multilateral power trade, he said. Project-specific practical action and problem-solving could help in faster implementation and that should be the approach, according to him. There is a growing need to correct the weaknesses in the existing laws, harmonize them, and move from bilateralism to multilateralism. Diversification of energy resources is also important for energy security through CBET in the SA region.

Mr. Mohammad Hossain, Director General, Power Cell, MPEMR, Govt of Bangladesh

Mr. Mohammad Hossain, Director General, Power Cell, MPEMR, Government of Bangladesh, talked about duality of export and import from the perspective of a SA country highlighting the load and seasonal variation of power system in the region. He noted that the SARI/EI program has now been extended for another four years but stressed on the need to move from the concept of initiatives to real implementation. It has been 17 years, and SARI/EI future program/activities must focus on implementation, he said. He also responded



to the questions that were highlighted in the theme presentation and shared various legal, regulatory and policy development in Bangladesh, such as changes in the electricity act which contains cross border power trade provisions and open access apart from power system master plan containing the import of 9000 MW power trade. He dwelled on how to move from bilateral to regional energy integration and said that the SAARC Framework Agreement on Energy Cooperation should be the basis to start with. India's role will be critical in the whole process, he added.

There was a detailed question-and-answer session covering issues such as policies/regulations and institutional modalities for power trade, India's massive renewable energy, dynamism of renewable energy, the coal-versus-renewable energy debate, commercial viability and tariff sustainability of hydropower projects vis-a-vis environmental issues, viabilities of the submarine link, complementariness of energy resources etc.

Dr. Salim Mahmud, Chairman, BERC Tribunal, Bangladesh

Dr. Salim Mahmud, Chairman, BERC Tribunal, Bangladesh, while co-chairing the session, made remarks on policies, regulations and institutional mechanisms for promoting Energy Cooperation & CBET in South Asia and touched upon the realities and geopolitics of the region from the past, including the Myanmar- India-Bangladesh gas pipeline and the lessons learned. He also responded to a question on dispute settlement mechanism for cross border power trade. He said that despite the difficulties in the SAARC process, the SAARC Arbitration Council, which is an intergovernmental agency, could be a forum for dispute resolution if made functional. Till the time it happens, or some alternate dispute settlement forum is created, he suggested disputes be addressed and resolved through commercial and contractual provisions and arbitrations provisions. Faced with similar- socio-economic challenges, South Asian countries should be able to build synergies among themselves to resolve issues in the best interest of the region. He spoke on the models of various Regional Regulatory Institutional Mechanism such as forum, association and super regulators format and said considering the current context and transitional phase of CBET, forum/association of regulators is possible, but not the super regulators format. However, going forward, a regional regulator will be essential. He also said there is a need to have an association of technical institutions. He concluded with the point that political consensus is key and there could be a paradigm shift from a zero sum game to a win-win case.



Session III: Investments in Infrastructure for Cross Border Projects: Catalyzing Private Investments and Mitigating Risks

- **Session Chair:** Mr. Ajay Shanker, Ex Secretary, GOI
- **Session Panelists:**
 - Mr. K Rajagopalan, CEO, Reliance
 - Mr. Troy Kofroth, MCC, Nepal
 - Mr. Sunil Poudel, Sr. Division Engineer, IBN, Nepal
 - Mr. Jiwan Acharya, Senior Energy Specialist, ADB



Session Participants, L-R: Mr. K Rajagopalan, Mr. Troy Kofroth, Mr. Ajay Shanker, Mr. Jiwan Acharya, Mr. Sunil Poudel

Mr. Ajay Shanker, Ex Secretary, GOI

In his opening remarks, Mr. Ajay Shanker said investment is critical, particularly for the development of hydro power projects which have a long gestation period and are associated with hydrological and geological risks, R&R risks etc. He mentioned that identification of risks and its mitigation are important for the project development. He pointed out that activities such as land acquisition, environmental clearances and R&R activities take substantial time. He gave the example of Ultra Mega Power projects (more than 4000 MW at one location) where the Government of India initiated the process through forming an SPV company for land acquisition, obtaining environmental clearances and R&R activities etc. It not only helped to cut short the time of implementation but also resulted in a very competitive tariff. He mentioned that hydro power development, despite the risks and challenges involved, is critical for load balancing.



Mr. V.K. Kharbanda, PD, SARI/EI/IRADe

Mr. Kharbanda presented the theme context on the 'Investment in Infrastructure Session' covering volume of investment required in the South Asia power sector, FDI in-flow in South Asian countries, various challenges and risks associated with the electricity sector, particularly with development of hydro power, and SARI/EI study recommendations to promote investment in the electricity sector. For the period 2015-2040, as per World Bank estimates, an investment of \$1390 billion would be required to enhance generation capacity to 750 GW, and \$ 29 billion will be required for transmission interconnection. In all the South Asian countries, FDI in terms of GDP was less than 2 percent, except for the Maldives. He shared the various challenges and risks associated with cross border power Projects.



In the initial stages, political commitment at the highest level, alignment of policies/regulation in the highly regulated electricity sector, and financial challenges covering financial closure etc. are critical for the success of CB Power Projects. Mechanisms of interconnection, form of power market, Open Access, transparent dispute resolution, payment security etc. are important at the transition stage/matured stage.

He shared that IRADe under the SARI/EI Program carried out a comprehensive study on Investment Framework and Guidelines covering review of investment policies/guidelines/framework prevailing in each South Asian country and gap analysis drawing International experience while framing the suggested investment framework and guidelines for South Asian countries. Key recommendations of the SARI/EI study on investment framework are:

- i) Designate or set up a CBET investment forum/association to facilitate investment;
- ii) Enactment of policies/laws for promoting investment in CBET;
- iii) Provision of transparent Regional Dispute Resolution Mechanism and legal safeguard for contract enforcement;
- iv) To develop guidelines for political risks;

- v) To provide single window clearance for necessary approvals;
- vi) Govt. to provide support for land acquisition, environment, R&R etc;
- vii) Risk minimization through Payment Security Mechanism, particularly to promote hydro projects;
- viii) Regulatory incentive or upfront tariff for the development of hydro power projects;
- ix) Policies to promote Public-Private Partnership
- x) Regional capital market for mobilizing long term debt.

He concluded that the role of the Government to fast-track development of hydro power projects and mobilizing investment in the infrastructure is critical to enhancing energy integration and Cross Border Electricity Trade in the region.

Mr. Jiwon Acharya, Senior Energy Specialist, ADB

He stressed on the importance of continuous dialogue between the member countries to promote energy cooperation and integration as well as to facilitate investment in the region. The Asian Development Bank (ADB) as a banker is playing this critical role in the region. He also shared that the ADB supported investment for the first 500 MW HVDC link between India-Bangladesh and also supported the second 500 MW HVDC link between the countries. The ADB is also exploring the



option to work with other funding agencies such as MCC. On development of hydro power projects, he said the challenges are familiar and it is now important to find solutions, in which the role of Government is particularly critical. He emphasized that it is important to have transparent land acquisition, environment, R&R policies, PPA to reduce the time from concept to implementation and commissioning of power projects, which would help to reduce the capital cost of the project, thereby ensuring more attractive tariff for the consumers. He gave the example of the Solar Park in India, where the government is acquiring land and clearances and inviting bids on a competitive tariff bidding route. He mentioned that the role of government is critical for development of hydro projects. He said that the ADB can also provide support for risk mitigation in energy projects.

Mr. K Rajagopalan, CEO, Reliance Power

He opined that investment in infrastructure is critical and shared from the perspective of the developer's point of view. He emphasized that consistency in policies, competitive tariff, equitable risks – risks to be shared equitably among the different stakeholders – transparent and fair process, skill to develop power projects, and bankable projects are some of the important concerns of developers. He was particularly concerned about risk sharing among the stakeholders. He said that if all the risks are to be borne by developers than there will be a premium



to be paid by developers to lenders which impact the cost of the project. He also mentioned that a proactive legal and regulatory institution mechanism is important for timely resolution of disputes.

Mr. Troy Kofroth, MCC, Nepal

He explained that the Millennium Challenge Corporation (MCC) is an innovative and independent U.S. foreign aid agency that is helping to promote economic growth and eliminate poverty by focusing on good policies, country ownership, and results. MCC provides time-limited grants promoting economic growth, reducing poverty, and strengthening institutions. These investments not only support stability and prosperity in partner countries but also enhance American interests. In terms of MCC requirement, it is important that all projects must be completed within a time period of five years without any and no time extension. The MCC conveys the message to its partners that time is of the essence and projects must be completed within the time frame. He briefed about the The MCC Nepal Project which has two components: a) Transmission project for improving availability and reliability; b) Building road network in Nepal for which the MCC is providing a grant of \$ 500 million. Furthermore, Government of Nepal is also contributing \$ 130 million for meeting project objectives. Construction of a 300 KM of HV transmission system will help Nepal to facilitate power trade with India.



Mr. Sunil Poudel, Senior Divisional Engineer

He highlighted that the country's stability and political commitment are important for the developers to invest. Furthermore, identification of various risks and their its mitigation are critical for the success of the project. He said the government has a critical role to play in land acquisition, environment clearance and R&R activities etc. Compensation can be used for providing education facilities, houses for the locals, better health facilities etc. He highlighted the two hydro power projects where IBN is facilitating: i) Arun III and ii) Upper Karnali (900 MW). He mentioned that land acquisition for Arun III has been completed whereas the process has started for Upper Karnali. GMR, the developer of Upper Karnali, is facilitating PPA with the Government of Bangladesh for sale of power. He mentioned that clear identification of risks, which can be borne by developer and government, is important for the success of the project.



Session IV: Need for Coordinated Interconnection Transmission Planning and for a Technical Institutional Mechanism in South Asia for Secure Reliable Grid Interconnection

- **Session Chair:** Mr. Pankaj Batra, Chairman, CEA, India
- **Session Co-Chair:** Mr. S K Soonee, Advisor, POSOCO
- **Theme Context:** Mr. Rajiv Ratna Panda, Program Coordinator, SARI/EI
- **Session Panelists:**
 - Mr. Ashok Pal, GM, PGCIL, India
 - Mr. Arun Kumar Saha, Chief Engineer, PGCB, Bangladesh
 - Mr. Karma Tshewang, Chief Engineer, Bhutan



Session Participants, L-R; Mr. Ashok Pal, Mr. Pankaj Batra, Mr. S K Soonee, Mr. Karma Tshewang, Mr. Arun Kumar Saha

Mr. Pankaj Batra, Chairman, CEA, India

In his opening remarks, Mr. Pankaj Batra, Chairman, Central Electricity Authority (CEA), highlighted the importance of Coordinated Interconnection Transmission Planning and System Operation from the perspective of CBET in South Asia in view of the limitation in storing electricity on a large scale though some breakthrough in storage technology may happen.



He highlighted the existing India-Bhutan, India-Nepal, India-Bangladesh interconnections and said these are win-win situations for all the countries due to diverse energy resources and demand patterns. He also highlighted the importance of grid integration of renewable energy and its associated challenges. India has surplus in-firm power and this can be exported to other countries and India can also be benefited by importing peaking power from hydro dominated countries such as Nepal and Bhutan.

He also highlighted the need to have common guidelines for operation of grid through grid code with common frequency, protection system, and scheduling process for integration operation in the south Asia power system. There is a need to have nodal agencies in each country for coordinated planning and operation.

Mr. Rajiv Ratna Panda, Program Coordinator, SARI/EI

To set the context of the discussion, Mr. Rajiv Ratna Panda, PC, SARI/EI, IRADe, delivered a theme presentation covering : a) Current and future Cross Border Transmission Interconnections; b) Current scenario of Coordinated System Planning & Operation (CSPO) in South Asia; c) SARI/EI work on harmonization of grid codes, operating procedures & standards for CBET; d) Stages/evolutionary nature for power system integration and power trade in South Asia; and e) International best practices on associations/forums of regional technical institutional mechanism for system planning, operation. Currently the total Maximum CBET trade in South Asia is 2450 MW which is happening through both HVDC and AC (both EHV, HV, LV) systems. This kind of multiple interconnection at various voltage levels calls for the need of CSPO. He said that significant Transmission System Interconnection (Both AC and DC) are planned and proposed a 43.2 GW additional Cross Border Transmission Interconnection. This capacity is required by 2036 for power trade in the region. It will involve large scale hydro power development in Bhutan and Nepal and renewable energy (175 GW by 2022) In India. In the medium term, by the end of 2022, 5890 MW power trade is expected to happen in South Asia. Power system integration can bring potential large technical, operational and economic power system benefits in the region.



Highlighting the importance of CSPO in South Asia, Mr. Panda said it will ensure safe, secure and reliable power system integration and expansion. More importantly, with large penetration of renewable (wind and solar) energy, changing energy mix, Deviation Settlement Mechanism (DSM), smart grid, electric vehicles and storage, there is a strong need for a more integrated and coordinated planning of power system in the region and balancing of regional power grids in South Asia. He highlighted the lessons from the region, including India's power system integration experience. India had different regional power systems with

different frequencies. Through coordinated planning and harmonization at legal, technical and regulatory levels, India successfully integrated the regional grids into One Grid One Frequency. He highlighted the scale and speed at which of integration took place, the Inter-Regional Transmission Capacity increased from 5.05 GW in 2005 to 78.05 GW 2016-17. For long term sustainability of CBET and development of a regional transmission master plan, he said the region needs to take into account the evolutionary nature for power system integration and power trade in South Asia. Speaking on the SARI/EI work on harmonization of grid codes, operating procedures and standards for CBET, he highlighted the Framework Grid Code Guidelines (FGCG) covering detailed guidelines on Cross Border Grid Codes on planning, connection (including metering & protection), operation and scheduling and dispatch. Speaking on system operation, he said, Independent System Operation is important for actual Integration of power grids as it helps in safe, secure, reliable integration which aids development of the power market and market operation. India followed a gradual and systematic approach towards an independent system Operator.

He spoke in detail about the need for a South Asia Technical Institutional Mechanism incorporating best international practices and shared the example of ENTSO-E of Europe, Southern African Power Pool, PJM-the regional transmission organization (RTO), and West Africa Power Pool. More importantly, he highlighted the example of the forum of load despatchers in India, which envisions being a catalyst in reliable, efficient and economic operation of the Indian bulk electric power supply system. It works on: 1) Promoting technological excellence and harmonization of practices; 2) promoting compliance to reliability standards; 3) facilitating development of ancillary services in power system; 4) promoting capacity building in power system/market operation; and 5) developing a Code of Ethics for Load Despatchers in India. He suggested that there is a need to Institutionalize the technical process to form South Asia Forum of Transmission Utilities (SAFTU) and South Asia Forum of System Operators (SAFSO) in the region.

Mr. Arun Kumar Saha, Chief Engineer, PGCB, Bangladesh

Mr. Arun Kumar Saha, Chief Engineer, PGCB, shared his experience of India-Bangladesh interconnection and highlighted on the need to go for HVDC system, instead of AC system, due to frequency difference and HVDC being more secure and safe. As for HVDC interconnection, the Bangladesh system will treat the interconnection as power plant system and it's easy from the system operation point of view. He highlighted the need to move toward more HVAC interconnection as we go along instead of HVDC interconnection which is expensive. He underlined the need to move towards synchronous interconnections and for that, he said, there is need to harmonize grid codes among South Asian countries. He said that we need a technical power system type of studies to come up with best possible connection which has been somehow less in focus so far. The USAID may consider conducting such kind of studies with the vision of creating a South Asia synchronous regional grid, he opined. He also talked about the need to have similar transmission pricing methodology for CBET during grid harmonization.



Mr. Karma Tshewang, Chief Engineer, Bhutan

Mr. Karma Tshewang, Chief Engineer, DHPS, MoEA, Bhutan shared the hydro power history of his country and its perspective. He said Bhutan has huge hydro potential of 35,000 MW considering the size of projects above 15 MW and it can be well above 45,000 MW if one takes small hydro projects into consideration. He said that Bhutan hydropower contributes 14 percent of GDP, and 25 percent of national revenues. He highlighted the various hydro projects that are under construction and said Magndechu (700 MW) will be commissioned soon. He said Bhutan, due to various factors, has decided that the Government will own the hydropower projects. He said Indian institutions such as the Ministry of Power, CEA, POSOCO etc. helped in the overall development of CBET hydro power trade but there is a need for a fundamental masterplan. He said it's time for implementation and all our talks must translate into action. He said that we need to rethink our situation and progress and that we can be leaders in CBET rather than followers.



Mr. Ashok Pal, GM, PGCIL, India

Mr. Ashok Pal, GM, PGCIL, India, shared his views on planning cross border transmission interconnection and highlighted various factors that affect the type and mode of interconnection in planning exercises. He said that India-Bangladesh transmission capacity will be increased to 1500 MW soon. India and Bhutan have synchronous interconnection and a lot of planning has been done for evacuation of power from various hydropower projects. He mentioned that the Nepal-India interconnection is operating on synchronous mode. He said that there is a Joint Technical Team which takes care of planning coordination but there are commercial issues about who will pay for the cost of interconnections. He said that we can have a body of planners of South Asian countries which will help in forming a regional power grid in South Asia.



Mr. S K Soonee, Advisor, POSOCO, India

Mr. S K Soonee, Advisor, POSOCO, India, shared his perspective and praised the excellent presentation by Mr. Panda for covering the subject in a holistic manner and flagging a few questions. He also highlighted the case study of India-Bangladesh interconnection and said HVDC interconnections is acting not only for power trade but also provides excellent ramp up/down and helps in managing grid operation in an efficient manner. There is a need to establish more connection and with more and more interconnection open access will come. He also highlighted the system operation coordination for cross border transactions. He said three elements which are a must are: 1) Scheduling; 2) Transfer capacity assessment and simplification of calculation; 3) transmission loss. There is a need to have a proper defence and protection plan as its absence can severely affect the whole energy integration process. We need to have various regulations for moving toward open access and market, he said, and there is a need for reciprocity in the whole process. The communication system for system operation and coordination should be improved, he said, and hoped there will be a One Frequency One SAARC Grid.



Session V- Electricity Trade in BBIN Region– Long-Term Trading Volume and Prospects

- **Session Chair:** Dr. Kirit Parikh, Chairman, IRADe
- **Session Co-Chair:** Dr. Swarnim Wagle, Former Vice Chairman, Planning Commission, Nepal
- **Theme Context:** Dr. Probal Ghosh, Head Modelling, IRADe and Mr. Vinay Saini, Sr. Research Analyst, IRADe
- **Panelists**
 - Mr. S.K. Soonee, Advisor, POSOCO, India
 - Mr. Jiwan Acharya, Sr. Energy Specialist, ADB
 - Md Mahbubur Rahman, Chief Engineer, BPDB



Report release "Gains from Multilateral Electricity Trade among BBIN Countries", L-R; Mr. Vinay Saini, Mr. Probal Ghosh, Md Mahbubur Rahman, Mr. S.K. Soonee, Dr. Kirit Parikh, Dr. Swarnim Wagle, Mr. Jiwan Acharya

Dr. Kirit Parikh, Chairman, IRADe

Dr. Kirit Parikh explained the importance and prospects of long-term electricity trade in the BBIN region. He shared with the audience the study "Gains from Multilateral Electricity Trade among BBIN Countries" that IRADe recently concluded. Dr. Parikh highlighted that each of the South Asian countries has its own resources and limitation, which needs to be considered while developing power development strategies as it has impacts on the economy and cost of each strategy varies. Different development strategies will have different impacts on the growth of the economy and the cost to the economy, and the demand for electricity, he explained. Therefore, an integrated assessment of all the technical and economic aspects is required, which is undertaken in bilateral and multilateral studies on CBET by IRADe. Dr. Parikh also stated that power sector investments have a long gestation period and hence we need to plan long-term and revise it from time to time.



Dr. Probal Ghosh, Head Modelling, IRADe

Dr. Probal Ghosh set the theme context for the session by giving an overview of the bilateral trade study IRADe has undertaken under the SARI/EI project of USAID. The first bilateral study "Economic Benefits from Nepal-India Electricity Trade" focuses on CBET between India and Nepal, whereas the second bilateral study "Economic Benefits of Bangladesh-India Electricity Trade" focuses on the same between India and Bangladesh. The approach for the bilateral studies is to assess technically feasible and economically viable electricity trade among the trading countries. Dr. Ghosh further explained the types, interaction and features of the technology models and macroeconomic models used in the studies.



The first study highlights the benefits of bilateral trade for Nepal in terms of higher hydro potential utilization, preference for environment-friendly run-of-river hydro power plants, increase in GDP and household consumption and higher share of industries in the GDP. For Bangladesh, the trade benefits it in terms of lower capacity requirements, less investment in capacity and infrastructure for imports, lower fuel bill for the economy, higher household consumption, and cumulated reduction in emissions from the power sector. India also gains from its bilateral trade with Nepal and Bangladesh. In the bilateral trade with Nepal, India gains in terms of reduced investment in power sector capacities, lower fossil fuel consumption, reduced CO₂ emissions and increase in cumulated consumption. Similarly, India also gains from bilateral trade with Bangladesh in terms of increase in GDP due to export earnings. Benefits to India from electricity, although not highly visible because of the large size of India's power system and its economy, are comparable in absolute terms to benefits to Nepal and Bangladesh.

Mr. Vinay Saini, Sr. Research Analyst, IRADe

Mr. Vinay Saini briefly explained the methodology and the power system models used for undertaking the multilateral electricity trade study "Gains from Multilateral Electricity Trade among the BBIN Countries." Following this Mr. Saini highlighted the key findings of multilateral electricity trade for the region and BBIN countries. He mentioned that the region gains in terms of higher regional electricity trades, Bangladesh gains access to Bhutan and Nepal power markets, regional trade leads to reduction in regional capacity requirements and lowers CO2 emissions for the region through multilateral trade. One of the key findings for Bangladesh is that with multilateral trade, Bangladesh can diversify its power import sources such as Bhutan, India and Nepal. For Nepal, multilateral trade helps in achieving higher hydro potential which is more than the bilateral trade. An interesting information for India derived from the study is that India will be net importer of electricity even in multilateral trade and has the potential to absorb electricity from both Bhutan and Nepal (after exporting to Bangladesh).



Mr. Jiwan Acharya, Sr. Energy Specialist, ADB

Mr. Jiwan Acharya congratulated IRADe for the multilateral study and felt the study findings will be useful to the stakeholders for taking forward multilateral trade in the BBIN region. He also stated that similar studies can also be undertaken for other regions as these kind of initiatives are helpful in highlighting the benefits of trade. On regional trade, Mr. Jiwan said regional trade should first promote clean energy. Secondly, the price of electricity trade should reflect the efforts undertaken to promote clean energy such as hydro and renewable based electricity. Finally, technological advancements, such as energy storage and electric vehicles, are happening very rapidly, which can completely change the dynamics of regional multilateral trade, he added.



Md Mahbubur Rahman, Chief Engineer, BPDB

Md. Mahbubur Rahman stated the present position of Bangladesh within the BBIN region on Cross Border Electricity Trade. He mentioned Bangladesh's power import target as per the Power System Master Plan (PSMP) 2016 and highlighted the various scenarios targets under it. At present, Bangladesh is importing around 660 MW power from India under four contracts. He mentioned Bangladesh's contract with Adani for supply of 1600 MW power from the IPP coal-based power plant near the Bangladesh border which will be operated under the Bangladesh Load Dispatch Centre. On 10th August, the Bangladesh signed MoU



with Nepal for cooperation in the power sector focusing on import of hydroelectricity from Nepal. Bangladesh will also import 500 MW from the 900 MW export-oriented Upper Karnali project in Nepal. Furthermore, the country is working with India and Bhutan on investing into hydro projects under trilateral agreements. He also highlighted the need of trilateral arrangements with India and other BBIN countries so that CBET could be more easy.

Mr. S.K. Soonee, Advisor, POSOCO, India

Mr. S K Soonee highlighted the importance of undertaking long-term studies. He mentioned the importance of seasonality and daily variations that can influence trading decisions. He shared that assumptions undertaken for planning systems may change over time. Hence, the power-system plans need to be revised from time to time, and, therefore, it needs to be a continuous process.



Dr. Swarnim Wagle, Former Vice Chairman, Planning Commission, Nepal

Dr. Swarnim Wagle praised the bilateral India-Nepal study findings, which was launched in Kathmandu last year. He stated that over the years the consensus for engaging with India on energy trade is emerging among the society. Since 2014, power engagements between the neighbors have been progressing and he cited the signing of PDA for two export oriented hydropower plants (Arun and Upper Karnali) to be developed in Nepal. Electricity trade in the South Asia region will be unique, he said, as many studies have shown that no country will be a major loser and all countries gain from electricity trade. He emphasized the trade scenario gains presented in the study comparing it with a no trade scenario, underlining the significant technological and economic gains for Nepal. Furthermore, comparing the trade scenario with delay trade scenario highlights the cost of inaction for the Nepalese economy. The current account deficit of Nepal on account of higher imports from India are expected to reduce once Nepal starts exporting electricity to India. He also stressed on the need for action as the hydro potential utilization reaches 34 GW with trade case and remains around 9 GW with no trade case. Nepal needs to identify sectors that can create jobs and energy is one of those sectors that contributes to both manufacturing and services sectors. The premium on clean energy use will be a key in future electricity trade, but a differentiation on price, branding and international recognition of clean energy from Bhutan and Nepal is needed, he said. Potential disruption from new technologies and technological advancements needs to be assessed by countries such as Bhutan and Nepal as hydro has a long gestation period. Dr. Wagle stressed on undertaking more engagements with the society on the outcomes of SARI studies so that civil society is more informed about the benefits of the trade.



Session VI- South Asian Regional Power Market Instruments and Regional Power Exchange

- **Session Chair:** Dr. Kirit Parikh, Chairman, IRADe
- **Session Co-Chair:** Mr. Sanjeev Mehra, MD & CEO, TPTCL
- **Theme Context:** Mr. S. K. Ray, Technical Specialist & Mr. Gaurav Jain, Senior Research Analyst, SARI/EI, IRADe
- **Panelists**
 - Mr. Mohamad Hossain, Director General, Power Cell, Bangladesh
 - Mr. K.S Bandyopadhyay, General Manager- NTPC Vidyut Vyapar Nigam Limited (NVVNL)
 - Mr. Anil Raj Bhandary, Deputy Managing Director, Nepal Electricity Authority (NEA)
 - Mr. Rajesh K Mediratta – Director (Business Development), Indian Energy Exchange (IEX)



The chair of the session Dr. Kirit Parikh started the session by welcoming all the Panelists and invited Mr. S. K. Ray and Mr. Gaurav Jain for setting up the context for the session discussion.

Mr. Gaurav Jain, Senior Research Analyst, SARI/EI, IRADe

Mr. Gaurav Jain briefly explained the existing market instruments available for Cross-Border Electricity Trade in the South Asian region. Following this, Mr. Jain highlighted the key findings of Task Force-3 on commercial terms and conditions in the region.

He mentioned that cross-border projects do have three major types of risks, namely commercial, financial and political and regulatory risk in infrastructure projects. To address these risks, standard commercial documents such as Power Purchase Agreement (PPA) and Transmission Service Agreement (TSA) play a significant role as these documents provide the clarity related to various commercial terms and conditions tariff, billing and payment, payment security mechanism, dispute resolution etc. Hence SARI/EI has developed the standard PPA and TSA for regional power trade so that all the relevant stakeholders may adopt and get more clarity on key commercial terms.



Mr. Jain conveyed that transmission pricing for CBET projects is a critical component and it is challenging to adopt a uniform methodology across South Asian countries given the differences in industry structure, market complexity, regulatory mechanism, etc. In the short term, South Asian countries need to adopt a segmented approach, viz. the transmission pricing for each CBET link on the path between generator/source and consumer/demand need to be separately determined. However, DSM should be applied in all CBET links as it is not only commercial mechanism is also needed for grid security mechanism. In the long run, a more robust mechanism which may be distance, direction and quantum sensitive and distribute the charge according to real time based usage may be adopted by all participating countries.

Mr. S. K. Ray, Technical Specialist, SARI/EI, IRADe

Mr. Ray mentioned that the main objective of the SARPEX mock exercise was to explore the feasibility of a Regional Power Exchange in South Asia, develop the draft market rules and design for the regional market as well as build the capacity of the participating nations in working on an exchange platform.

The SARPEX mock exercise showcased the Market Clearing Price (MCP) and Market Clearing Volume (MCV) and the associated social welfare for each country and region. On a DAM exchange, MCP and MCV are determined by the market dynamics of demand and supply, and the buyers' willingness to pay.



He mentioned that consumer and the producer surplus give a measure of the benefits to the participating nations. The additional surplus South Asian region may accrue about INR 10.10 billion through opening up of DAM for south Asian participants.

The findings showcase that a regional power exchange for BBIN countries, regardless of the operating mode, not only would help in the management of day-ahead demand and supply positions, but would also benefit the member countries in buying their marginal power requirements at a cost lower than their production cost or sell surplus power in a larger market.

He mentioned that two main reports named as "Power Market Design and Rules" and "Key Findings of SARPEX" have been prepared under SARPEX mock exercise and a web portal has been created for mimicking the regional power exchange (The link of the web portal is <http://mocksarpex.ga/>).

These reports cover the key recommendations for setting up and operating a Regional Power Exchange among India, Bangladesh, Bhutan, and Nepal. Key aspects covered in the report include: recommendation on operating modes, currency, timelines, transmission charges and losses, deviation settlement mechanism etc.

The SARPEX Mock Exercise-Key Findings report discusses the key results of the exercise for assessing the feasibility of a power exchange for India, Bangladesh, Bhutan and Nepal. The simulations were carried out for 71 days of FY16 and were based on the actual bid data extracted from IEX and bids submitted by neighboring countries. These were then extrapolated for the entire year. Impact on day ahead prices, volumes, consumer and producer surplus etc. were discussed in detail.

Mr. Ray concluded by stating that the region has already gained enough confidence on CBET and the mock exercise is clearly showcasing the win-win situation for all countries, hence the South Asian countries need to take a step forward and start the DAM based trading in the region.

Mr. Mohamad Hossain, Director General, Power Cell, Bangladesh

Mr. Hossain conveyed that the competitive power market in the South Asian region will create a win-win situation. He informed that Bangladesh's installed capacity is to the tune of 17,000 MW, however, more than 4,000-5,000 MW was installed, to meet only the peak demand, via diesel-based generators. The competitive BBIN market will provide an opportunity for Bangladesh to off-set this peak demand.

He emphasized that opening of Day Ahead Market (DAM) will provide the opportunity to optimal utilization of resources and creating a cost-competitive market in the South Asian region. He also conveyed that DAM should get started and various aspects related to this may be fine-tuned later on during the operation.

Mr. Hossain mentioned that he was an integral part of the SARPEX- Mock Exercise as a core team member and understands the nuances of this mock exercise and clearly sees the merits of DAM for each country in the South Asian region.



Mr. K.S Bandyopadhyay, General Manager- NTPC Vidyut Vyapar Nigam Limited (NJVNL)

Mr. Bandyopadhyay shared his experience of bilateral trade in the BBIN region. He conveyed that India's existing bilateral trade is about 13 BU (Exporting about 7 BU and importing 6 BU annually) which is going to increase at the level of about 17.5 BU by next year (export will be 11 BU and 6.5 BU import annually). Due to being centrally located, India does have unique position for CBET in the



region and does have five strong cross-border links with neighboring nations apart from various radial mode interconnections. He mentioned that BBIN countries gained enough confidence of bilateral trade after more than a decade.

Mr. Bandyopadhyay suggested the use of the USD as a bidding currency in the SARPEX case instead of INR, however more in-depth review needs to be done to conclude the same. He opined that by using USD currency conversion charges may get reduced (by using INR, the currency conversion will be twice). As the purpose of the market is to reduce the power procurement cost and economic benefit of the region, all the process should be streamlined and efforts should be made to avoid unnecessary processing costs wherever possible to achieve the final objective.

He conveyed that CBET links are capital intensive projects, hence full utilization of these links are necessary to protect investors and end-use consumer interests. BBIN countries' bilateral power trade experience will be useful for the implementation of SARPEX in the region as most of the processes and procedures are already in place, he added.

Mr. Anil Raj Bhandary, Deputy Managing Director, Nepal Electricity Authority

Mr. Bhandary has conveyed that CBET plays a very crucial role in Nepal's power sector meeting Nepal's electricity demand. He provided an example of a typical day when Nepal peak demand was in tune of 1300 MW, out of which 400 MW came from government generation station, 400 MW from Independent Power Producer (IPP) and 500 MW power was imported from India. It showed that about 30-40 percent of Nepal's demand was met by import from India during peak hours. During the off-peak hours, the demand slipped to 650 MW as the country doesn't have an industrial base load.



There are various types of agreements between India and Nepal for power trade such as river treaty, Power Trade Agreement, NEA agreements with private players such as the Power Trade Corporation (PTC), India and the NTPC Vidyut Vyapar Nigam Limited (NVTNL). Hence bilateral cross-border power trade is having a great significance in meeting Nepal's electricity demand and gaining enough confidence.

He informed that the 400 KV Dhalkaber –Muzaffarpur line (Cross-Border Link between India-Nepal) has been commissioned on 230 KV after initially being operated on 132 KV.

He appreciated the Indian government's efforts for Cross-Border Electricity Trade by preparing the guidelines for CBET. However, he also suggested that Nepal does have reservations on particular clauses related to equity participation and not allowing the Day Ahead Market in the draft CBET guidelines. He mentioned that the Nepal government believes that the Government of India will review these clauses based on the issues raised by neighboring countries and suitably modify and finalize the draft CBET guidelines.

Rajesh K Mediratta – Director (Business Development), IEX

Mr. Mediratta appreciated IRADe for producing the needful output during SARI/EI phase-4 such as harmonization of grid code, commercial terms and conditions of power trade, mock exercise of SARPEX etc. He mentioned that due to this mock exercise, South Asian stakeholders have developed a basic understanding of power exchange operation and associated benefits countries may accrue.

He highlighted the success story of the last 10 years of IEX operation and key learning. IEX has started its journey in the year 2008 with 2.2 BU and the volume has reached about 26 BU in 2017. This market trading volume is continuously improving as members are getting more confidence and the process is very streamlined. In a nutshell, power exchange is an IT enablement of the trading process in a transparent and competitive way.

He emphasized that so far power storage option has not reached its commercial viability, hence the power system balancing (Demand-Supply position) at any instant is required. Power exchange products are providing an option to utilities and consumers to balance their demand-supply situation near to real time basis and help in better management of the power system.

The South Asian region has gained the experience of long-term electricity trade over the last two decades. However, during the same time period, the other regions have moved at a better pace and the continent are doing the trade through the regional power market and DAM based trading is in operation in Nord Pool, South African Power Pool (SAPP), Greater Mekong Sub-region (GMS) etc.

He said we should learn from the other regional experiences. He cited the example of the South African Development Council (SADC) which was established in 1995 and decided to have African Power Pool SAPP. Accordingly, intergovernmental MoU followed by inter utility MoU were signed. Subsequently, agreement of market guideline and operating guidelines (Scheduling, dispatch) were developed. SAPP has started the DAM operation from 2006, though the countries are not that well connected. Despite a lot of challenges, SAPP has managed to start its DAM operation within 20 years of span.

Mr. Sanjeev Mehra, MD & CEO, TPTCL

Mr. Mehra mentioned that developing a competitive market is always beneficial and the kind of apprehension people have about opening up of Day-Ahead Market for regional power trade is very similar to what countries and entities were having while initiating the UI and DSM mechanism for CBET.

He mentioned that India is rapidly moving in the direction of green energy; however this power will be infirm in nature and to handle its intermittency, flexible hydro resources in Nepal and Bhutan may play a significant role. Through this regional cooperation, the whole region will get the significant economic and environmental benefit, he said.



He mentioned that South Asia is already late for reaping the benefits of this market mechanism and we need to begin it without any further delay. We may keep doing the small realignment and needful modification in the existing processes after getting started with Day Ahead Market (DAM), he said. European countries are getting a lot of environmental and economic benefits, he pointed out, as countries are achieving 100 percent green power generation with the help of balancing power provided by neighboring countries.

Dr. Kirit Parikh, Chairman, IRADe

Dr. Kirit Parikh emphasized that market creation should ultimately lead to the benefit for end-use consumer and power exchange is a truly competitive market. Price discovery through this platform is fair and robust based on the demand-supply matching algorithm, he said. He also provided the example of track-2 dialogue of India-Nepal power trade in the early stage of CBET when members shared their concerns on power pricing. The governments were willing to ensure that the price which has been offered is a fair price. This type of market product provides the certainty to the players that they are getting a fair price as this is a market-determined price (completely based on the Demand-Supply situation).



Session VII: Linking South Asia with South-East Asia and Synergizing Regional/Sub-regional Initiatives for Energy Cooperation

- **Session Chair:** Ms. Julia Kennedy, Director (A), USAID/India Clean Energy and Environment
- **Theme Context:** Mr. Tushar Sud, Deloitte
- **Panelists**
 - Mr. Ali Haider Altaf, Director, SAARC Dr. Sagar Prasai, Country Representative, Asia Foundation
 - Mr. Lei Lei Song, Regional Economic Advisor, South Asia Department, ADB
 - Mr. Myint Oo, Deputy Director General, MoPE, Myanmar
 - Dr. Mahendra P Lama, Professor, JNU, Delhi



Report launch of “ Linking South Asia to South East Asia to advance Cross Border Electricity Trade – A political economy study”, L-R; Mr. Myint Oo, Mr. Ali Haider Altaf, Ms. Julia Kennedy, Sarah Lanford, Mr. Lei Lei Song and Dr. Mahendra P Lama

Ms. Julia Kennedy, Director (A), USAID/India Clean Energy and Environment

The chair of the session, Ms Julia Kennedy, started the session by saying that regional grid integration is a win-win with benefits for all countries involved. It brings economies of scale, optimizes resource utilization, reduces environmental impacts and most importantly brings societal development. Energy cooperation on the Eastern grid of South Asia has significantly gone up over the past several years. As the cross-border power trade grows, there are opportunities to expand to South East Asia, particularly through Myanmar.



She also highlighted the political economy study of expanding power trade from South Asia to South East Asia through Burma by USAID's implementing partner, USEA. The study highlights the importance of Myanmar, a country straddling both South Asia and South East Asia, which has emerged as a potential energy supplier as well as a major energy consumer with significant impact on power trade on the eastern part of the Indian subcontinent.

She also touched upon the importance of regional institutions to promote regional connectivity, particularly focused on energy including SAARC (South Asian Association of Regional Cooperation) and sub-regional collaboration like BBIN in South Asia; initiatives like Greater Mekong Sub-region (GMS) and ASEAN (Association of South East Asia Nations) in South East Asia; and BIMSTEC (the Bay of Bengal Initiative for Multisectoral Technical and Economic Cooperation) covering both South Asia and South East Asia. The USAID has been deliberating on expanding the SARI/E program to include Myanmar and the panel discussion provides a great opportunity to listen to experts before deciding on what to do next, how to work with the ecosystems in South Asia and South East Asia and add value to the existing knowledge.

Mr. Tushar Sud, Deloitte

Mr. Tushar Sud, of Deloitte, made the context setting presentation where he discussed various multilateral institutions existing in South Asia and South East Asia and the opportunity and challenges that exist in linking the two regions. He mentioned that there are five multilateral groups that in the two regions - SAARC, BBIN, BIMSTEC, ASEAN and GMS. Of these five, SAARC and ASEAN are the two major groups and BIMSTEC is saddled between them. SAARC has the highest population share, BIMSTEC the highest share in global GDP among the five groups. However, ASEAN has a much higher trade share. The economies in SAARC and BIMSTEC are expected to grow fast in the future and hence there is a huge potential for trade. He said that the BIMSTEC group was progressing positively with a total of 2500 MW installed capacity of interconnection transmission lines and given the economic growth that is likely in the BIMSTEC countries, this transmission capacity is likely to double in the next five years. He emphasised that though most of the trade arrangements in the region were based on bilateral arrangement, trilateral arrangements are also being evaluated of late. He highlighted that South Asian economies, Myanmar and ASEAN countries are growing rapidly, but there is a huge gap between resources availability and



energy consumed. He mentioned that creating linkages can help optimise resources. In the other power pools in the world, like SAPP, GCC and GMS, shared reserve capacity is a prime criterion for creating power pools and shared development of resources. Another opportunity that he flagged was that most countries in the South Asia and South East Asia are oil dependent countries and hence substitution of oil by electricity will provide major economic benefits. He mentioned that India and Myanmar have very important roles to play in linking South Asia and South East Asia. India's importance comes from being the largest economy and sharing borders with other countries and its share in BBIN and SAARC trade and Myanmar's importance on account of it being a growing economy and being the link to ASEAN. He identified the requirement of a road map for harmonizing grid, sorting of regulatory matters, political, social and market dynamics as challenges to the development of trade in South Asia and South East Asia. He stressed the need for a robust institutional framework that builds upon knowledge and experiences of SAARC and ASEAN. Central planning done as in the case of ASEAN can be replicated for South Asia and South East Asia and the strengthening of regulatory framework are some other measures he suggested to promote trade linkages between South Asia and South East Asia.

Mr. Ali Haider Altaf, Director, SAARC

Mr. Ali Haider Altaf started his speech replying to the chair's question of "How do you think SAARC can leverage its experience in order to expand regional energy cooperation to South East Asia?" He explained, the leaders in SAARC truly feel that there are substantial opportunities for sub-regional energy trading between South Asia and Southeast Asia and have given a clear guideline to the secretariat to work and to link South Asia with Southeast Asia and other contiguous regions that is toward the west, for energy cooperation. He also added that the main opportunities for energy trading lies in the areas of electricity, mainly gas, energy pooling, power and gas pipelines and interconnection of electric power grids. Myanmar has an important potential role to play in the energy trading, given its substantial reserves of hydroelectric power capacity and natural gas plus its critical position as a pipeline location. According to him, the key challenge will be to develop both the physical and institutional infrastructures that can enable such trading to take place. He stated different kinds of barriers that exist in the cross sub-regional energy trading: technical barriers include grid codes and its synchronization, electric power and natural gas pipeline technology, potential difficulty in negotiations for trading arrangements which results in varying levels of economic development and different security concerns. Infrastructure and financial barriers also exist, like regulatory barriers and distorted energy pricing and subsidy regimes. Removing these barriers would have a strong positive effect on both the South Asian and Southeast Asian regions and also will have positive effects on cross sub regional trade and would generate substantial welfare gains to people of both the regions. Myanmar, in particular, stands to benefit from closer cooperation in this area and the rest of the region stands to gain a great deal from deepening of energy infrastructure in Myanmar. China and Myanmar are the two countries which have requested for the full-fledged membership of the SAARC and if it materializes that will benefit this potential. Mr. Altaf emphasized on having better coordination and synergies in west and Southeast Asia with the help of IGFA, which clearly indicates that SAARC should look outward and explore how they can engage in building connections in these regions. He also stated that SAARC has identified international best practices which includes harmonizing policy and regulatory frameworks essential to regional energy cooperation and with regards to licensing, tariff setting, wheeling, access to networks marketing, market monitoring and fulfilment of code standards and dispute resolutions. Keeping in view these ideas, the SAARC



secretariat formed a forum of SAARC energy regulators to strengthen cooperation in this vital area. The first meeting of the SAARC energy regulators agreed after thorough deliberations to adopt a plan of action to address the regulatory issues which we are facing. He also added that in light of SAARC's experience from IGFA, it can lend its expertise which we gain from our international partners and negotiations within the member states. He also stated that we can facilitate the cooperation which is foreseen and which is also given as a policy guideline to us by SAARC leaders. The SAARC Secretariat is also working toward the Sustainable Development Goal number seven, which is clean and sustainable energy for all. So that is also pushing our member states to ratify IGF as soon as possible. He praised the conference, saying it's easier to bring the technical people to an agreement rather than diplomats like him. He concluded stating the implementation of IGF was important for a brighter future for South Asia as a whole.

Mr. Lei Lei Song, Regional Economic Advisor, South Asia Department, ADB

The Session chair invited Mr. Lei Lei Song to make his speech by posing a question about the role ADB can play in linking South Asia and South East Asia given its key role in South Asia through SASEC and in South East Asia through GMS. He started his talk by praising Dr. Kirit Parikh and team for organising this conference at this time. After that, he highlighted the benefits of regional integration and how it will expand market and import resources and also increase efficiency and competitiveness in the South Asian region. He appreciated the way this conference showed the regional benefits in such a detailed



manner. He also appreciated the topic of the report, "Linking South Asia to South East Asia to advance Cross Border Electricity Trade" – A political economy study. He also highlighted cost of integration. He said that regional integration incurs cost and when trade happens there would be winners and losers. So we have to be very clear what the costs of integration brings and we have to put the institutions and mechanisms in their proper place to minimize and mitigate those costs, particularly for losers and it should be within national boundaries, he explained. He highlighted the linkages of integration between South Asia and Southeast Asia. At present, he said, the energy trade is quite minimal. The trade linkages between the regions have increased significantly since 1990. South East Asia's share of South Asia trade is nearly around 10 percent whereas South Asia's shares of South East Asians trade is probably only 5 percent, which is very small and the investment is also about that level. So the linkages between these two neighboring regions is very small and therefore the potential is very high. We are already seeing energy trade, he said, and the challenge is to increase integration between these two regions. He mentioned energy cooperation and brought two aspects into consideration, financing and coordination gaps. He said financing is a big challenge and the public sector definitely has to step in. And we don't have a regional mechanism to finance, he pointed out. ADB is a regional institution and it invests a lot in energy connectivity in South East Asia, particular, GMS region. In previous years, ADB has supported SASEC, SAARC and other regional institutions for finance, and particularly will continue to do so, he said. ADB itself was the product of regional cooperation half a century ago and its mission is to promote regional cooperation. Coordination gap is also an important aspect and these regions have very little coordination among themselves, like Pakistan and Afghanistan are always out of the picture. ADB has invested nearly US\$1 billion in energy connectivity in the past six years and identified to invest US\$ billion in regional projects for SASEC before 2020, he said. ADB also provides knowledge solutions and technical assistance to individual countries as well as regional bodies and also helps those institutions to strengthen their capacity and helps them to promote regional cooperation and bridge coordination gaps.

Mr. Myint Oo, Deputy Director General, MoPE, Myanmar

The session Chair asked Mr. Myint Oo, Deputy Director General, MoPE, Myanmar, to speak by asking for his thought on the issues and challenges in linking South Asia and South East Asia and what are the opportunities for Myanmar, which is the bridge between the two growing economic regions. Mr. Myint Oo started by first stating that 60 percent of Myanmar's population do not have access to electricity and that the Government of Myanmar wants to provide electricity for all by 2030. This, he said, was an opportunity for power trade. Highlighting the importance of hydro power, he said Myanmar's total hydro power capacity was 46000 MW and 60 percent of the country's current generation of 300 MW is hydro power based. Hydro power in Myanmar would be developed in phases, he said, spelling out the country's requirement of upgrading transmission lines for reliable and sustainable supply of power. He emphasised the strategic importance of Myanmar, calling it the gateway to South East Asia for South Asia, since Myanmar is a member of the BIMSTEC group as well as South East Asia groups like SASEC, ASEAN, GMS, ACMES and CLMV countries. He said Myanmar is engaged in government-to-government cooperation with its counterparts in India, Laos and Thailand for promoting cross border power trade. He also listed various challenges and opportunities for power trading in South Asia and South East Asia. In terms of challenges, he listed issues like the need for capacity expansion and diversification of energy sources, improvement in poor infrastructure which limits power trade, lack of harmonious policy framework for developing the regional power market, limited use of energy potential, limited finances in the public sector to undertake capital intensive projects and, finally, weak institutional and coordination capacity. In terms of opportunities, he identified economic growth and growth in installed hydro power capacity in Myanmar from its current 1100 GW capacity which it can use for exports to ASEAN, BIMSTEC and SASEC countries.



Dr. Mahendra P Lama, Professor, JNU, Delhi

The session Chair finally invited Dr. Mahendra P. Lama for his views on the role of India for establishing collaboration between South Asia and South East Asia. Dr Lama thanked the chair for providing him the opportunity to speak and started his speech by mentioning that 20 years back nobody was interested in energy trade. Energy became a part of the SAARC only in 1998 when it was consciously included as an item. He attributed this change to sensitisation and advocacy across South Asia. He mentioned that a second round of advocacy was now required on the lines of regionalism. He was of the opinion that in advocacy how technical analysis, political economy, strategic issues and diplomacy are put together and this is going to make a difference. He underlined critical factors like India's Look East policy, regional framework of SAARC, the idea of sub-regionalism which he thought had matured in South Asia and the idea of border lands instead of borders. He said that India had a critical role to play in connecting South Asia and South East Asia. India's actions would stimulate trade in a big way if it recognised its four roles: Producer, Exporter, Importer and Transit provider. Institutions like ADB also had critical roles owing to their first-hand experience in South Asia and South East Asia,



he said. Besides, the roles of new institutions in the region like AIIB are also important. As countries in South Asia are federal in nature, it's important to decide what kind of regionalism model needs to be promoted by ADB, India, SAARC and SASEC. He concluded by stating that cross border power trade plans of countries should factor in their renewable obligations under NDCs promised under the Paris Agreement.

Two questions were asked from the audience by Mr. Salim Mahmud, Chairman BERC Tribunal, and Mr. V. K. Kharbanda, Director SARI, IRADe. Mr. Mahmud mentioned that geopolitics and political economy play a key role in the success of Cross Border Electricity Trade while Mr. Kharbanda said that synergizing the functioning of SAARC and BIMSTEC would expedite trade in the region along with an inter-utility agreement.

Responding to the points raised in the audience, Dr. Lama said roles played by think tanks are important and need to be repeated again. India's Act East Policy could include Nepal, Bhutan, Bangladesh, the North East and Myanmar and this will sort out many big issues, he felt.

Session chair Ms Julia Kennedy concluded by saying that the opportunities and challenges to linking South Asia to South East Asia present the similar kind of opportunities as was with the SARI program for the past 20 years but on a larger scale. Concerns of political economy and geopolitics are important. The SARI program emphasizes on cooperation with country governments and development of think tank forums. The issues being raised are not only multilateral, bilateral institutions and governments to think through but also for civil society to contribute.

Session VIII: Role of think tanks in Enabling a Conducive Environment and Consensus Building for CBET in South Asia

- **Session Chair:** Mr. Vikram Doraiswami, Joint Secretary (BM), Ministry of External Affairs, Government of India
- **Session Co-Chair:** Dr. Jyoti Parikh, Executive Director, IRADe
- **Panelists**
 - Mr. Rohit Magotra, Deputy Director, IRADe
 - Dr. Bishnu Pant, Executive Director, IIDS, Nepal
 - Dr. Sagar Prasai, Country Representative, Asia Foundation
 - Ms. Monali Zeya Hazra, Regional Energy Manager and Clean Energy Specialist, USAID, India
 - Mr. Lei Lei Song, Regional Economic Advisor, South Asia Department, ADB
 - Mr. Prabir Neogi, Chairman, Power Committee, FICCI, India



SARI/TTF report launch, L-R; Mr. Prabir Neogi, Ms Monali Hazra, Mr. Vikram Doraiswami, Dr. Jyoti Parikh, Dr. Sagar Prasai, Dr. Bishnu Pant, Mr. Rohit Magotra and Mr. Lei Lei Song

Mr. Vikram Doraiswami, Joint Secretary, (BM), MEA, India, Dr. Jyoti Parikh, Executive Director, IRADe and the panel members launched three SARI/EI TTF reports:

- Assessment of Socio-Economic Benefits of the CBET in Bangladesh
- Impact of CBET on Gender and Livelihoods in Nepal and Bhutan
- Implementation of Nationally Determined Contributions (NDCs) for Renewable Energy in Sri Lanka: Addressing Gaps in Policies & Regulations

Mr. Vikram Doraiswami, Joint Secretary, (BM), Ministry of External Affairs, Govt. of India

Mr. Doraiswami welcomed the panelists and the delegates and said the session will provide an important opportunity to look through cross-cutting opportunities and look at the cross-boundary issues.



Dr. Jyoti Parikh, Executive Director, IRADe

Dr. Parikh, co-chair for the session, highlighted that think tanks are open to connect with the civic society, policy makers, and the common people and thus are very important in promoting CBET in the South Asian region.



Mr. Rohit Magotra, Deputy Director, IRADe

Mr. Rohit Magotra set up the context and briefed about the activities undertaken by SARI/EI Think Tank. South Asia Think Tank Forum for Regional Energy Co-operation was launched in September, 2016 as an outreach and dissemination forum. TTF has 20-plus think tanks across the region from countries including Bangladesh, Bhutan, India, Sri Lanka, Nepal and Pakistan.



He informed that a three-pronged strategy was employed for enabling energy co-operation and consensus building on CBET in South Asia. The first was through research studies to establish the narrative on the role of CBET in socio-economic development and examples of CBET in clean energy development. Three research studies were done by the TTF members. The first study, titled 'Assessment of socio-economic benefits of CBET in Bangladesh', was done by ICCCAD with a case study of Bhangapara village in Bangladesh, which showed that the access to electricity has given boost to the local economy of the village, resulted in increased ICT connectivity, improved academic performance, and better healthcare facilities. The second study, 'Impact of CBET on Livelihoods and Gender in Nepal and Bhutan', was done by CUTS International, India, capturing the cases of hydro power projects of Rahughat in Nepal and Tala in Bhutan. It gave pointers on how dams should be constructed, ground realities and policies associated with power trade and suggested ways to engage with people. The third study, 'Implementation of Nationally Determined Contributions (NDCs) for Renewable Energy in Sri Lanka:

Addressing Gaps in Policies & Regulations', was done by the Slycan Trust, Sri Lanka, and it examined gaps in policies and regulations for implementation of NDCs for Renewable Energy in the country and discussed the opportunities for developing the energy sector and enhancing renewable generation in Sri Lanka and provided links for promoting regional cooperation.

Through stakeholder engagement, TTF engaged with 240 stakeholders from across the region which included ministers, ambassadors, bureaucrats, policy makers, media, parliamentarians, civil society and citizens to help prioritize, fast-track and push the agenda for CBET. What CBET can bring to people was highlighted through media engagement, press briefs, opinion editorials and human stories published in local newspapers in different South Asian countries. Mr. Magotra cited the example of the Nepali translation of IRADe's modelling study on 'Economic benefits of Nepal India Power Trade'. The translated report provided evidence-based knowledge on the benefits of the CBET with India and associated costs for delaying the same.

He further said that greater energy cooperation between nations in South Asia is required, as an adequate energy supply can be all that is needed to pull a community out of extreme poverty. A more equal distribution of energy can contribute to greater equality in gender, health, nutrition and education in the world. Sharing the learnings of TTF, he said that quality of electricity is still a major concern for the villages and towns. In addition, there is need to prioritize distribution of electricity to the rural areas and towns. Energy access leads to multiple effects in socio-economic development and help achieve sustainable development Goal (SDG) 7 (access to affordable and clean energy) as well as other associated SDGs. Energy trade and cooperation can help achieve Clean Energy Targets Nationally Determined Contributions for the South Asia region. He concluded his presentation by raising questions for panel discussions – on the kind of role think tanks can play in promoting CBET, the type of strategies needed to sensitize the stakeholders and build awareness on the benefits of CBET in South Asia, and the ways required to engage with people for creating a conducive environment for CBET.

Mr. Doraiswami praised the excellent work done by SARI/EI -IRADe through Think Tank Forum.

Dr. Sagar Prasai, Country Representative, Asia Foundation

Dr. Prasai stated that the responsibility of producing knowledge and ideas related to issues like CBET is majorly on the shoulders of think tanks. Quality knowledge and ideas drive policy makers toward efficient decision making, he said.

He discussed areas where the think tanks need to improve, for becoming efficient knowledge providers. In order to build strong collaboration amongst the regional policy makers, decision makers and bureaucrats, it is important that the think tanks should have some evenness in the way they think and operate. The synchronization in their thinking will produce better ideas for the policy makers. Moreover, the think tanks should be relevant in the information/knowledge they produce.

Dr. Prasai suggested that think tanks should have strong communication across the borders, which is a must for propagating important information from a policy perspective among disparate stakeholders. They must be active on social media and should be updated with the happenings of regional energy cooperation. Dr. Prasai further discussed the positioning of think tanks, and said that sometimes they are more nationalistic which makes it difficult to communicate with them about an issue. He also highlighted on the need of improving the domestic investments on the think tanks.



Ms. Monali Zeya Hazra, Regional Energy Manager and Clean Energy Specialist, USAID, India

Ms. Monali Zeya Hazra briefed on the purpose of establishing the SARI/EI Think Tank Forum. She said technical stakeholders from the power sector are already at the consensus and are aware of the CBET benefits. To further boost the regional energy cooperation in South-Asia, it is important to bring on board and inform political stakeholders. The Think Tank Forum builds the political consensus, brings disparate stakeholders together and bridges the communication gaps, she said.



Ms. Hazra acknowledged that think tanks are credible organizations for promoting CBET in their own countries and for pushing their own policies and agenda. The SARI/EI TTF forum includes credible think tanks in each South Asian country having their own standing in terms of pushing the agenda of Cross Border Power Trade and who believe that CBET can bring societal benefits and address the energy security question in their respective countries.

She then appreciated the efforts put by the institute of Integrated Development Studies (IIDS), Nepal, in promoting CBET in that their country, releasing the SARI/EI report on 'Economic Benefits of Nepal India Power Trade' in Nepali language and organizing stakeholder consultations which brought civil society together and made them aware about the benefits of CBET.

Ms. Hazra highlighted the important role the media can play in public discourse and in creating political will for promoting CBET. Going forward, Ms Hazra said, the media should be made a part of the Think Tank panel and the network of Think Tank Forum should be broadened.

Dr. Bishnu Pant, Executive Director, IIDS, Nepal

Dr. Pant discussed the economic cooperation in South Asia and said that the general tendency of regional countries is to put the political agenda before the economic agenda, which is a major reason why they lagged behind the other regions of the world.



Dr. Pant said a negative perception is prevailing in the country about the India-Nepal power cooperation as some people think that a majority of the benefits from the Kosi Gandak projects (for which India Nepal signed a multilateral power contract in the 1950s and late 1950s) have been received by India. He hoped the successful implementation of the two new major projects (Arun III and Upper Karnali) being implemented by India in Nepal can give a new edge to power cooperation between the neighbors. Dr. Pant said that think tanks like IIDS have a great role to play in building stakeholder consensus and changing their mindsets.

He further informed that SARI/EI IRADe's report on 'Economic Benefits of Nepal India Power Trade', which was the first such analytical report released in Nepal, had a positive impact on the mindsets of people there. Such reports should be disseminated amongst all the important stakeholders to discuss the benefits of regional power cooperation in detail, he said. It is also important to reach out to the grass root level to explain to people what this India-Nepal power cooperation can bring.

Dr. Pant concluded saying think tanks can help the Government in exercising national policy reforms, including formulation of investment plans, can assist in harmonizing policies, legal and regulatory frameworks, and sensitize and advocate the agenda of Cross Border Energy Trade by being more relevant.

Mr. Prabir Neogi, Chairman, Power Committee, FICCI, India

Mr. Prabir Neogi provided the business context of CBET. He discussed that geopolitics often comes in the way of CBET and hence, political consensus needs to be built, provided we have a shared vision, and think tanks could work on shared policy initiatives of building sustainability, energy security and decarbonisation as part of the broader picture.



Mr. Neogi focused on the fact that for CBET, an ecosystem should be built for which strong coordination among regulators, policy makers and market participants is required and all of them have to move in tandem to have simultaneous steps in policy space under regulatory domain and within an institutional framework. The think tanks could help converge the thought process of building political, regulatory and institutional consensus.

Mr. Neogi said that for CBET to be effective, there has to be trading institutions and commercial arrangements, while design and enforcement of contracts would be of paramount importance. Think tanks can come and contribute by making the system conducive to cross-border electricity trade, he said. The role of markets in allowing cross-border electricity trade cannot be ignored, he said, and CBET would be effective if the power sector in each of the nation states is creditworthy. Power distribution particularly should be financially viable and able to recover its user charges and think tanks can play a contributory role in driving the process and providing inputs.

Mr. Neogi highlighted other roles that think tanks can play in promoting CBET such as building institutional capacity, in the markets and converging the thought process of nations across the South Asian region so that, eventually CBET can serve the broader spectrum of achieving energy security, decarbonisation and sustainable development.

Mr. Neogi reiterated that CBET must serve the bigger purpose of serving the unserved and the underserved and said that the electricity distribution system across the nation states must be equipped and enabled so that electricity reaches the weakest sections of the society.

Mr. Lei Lei Song, Regional Economic Advisor, South Asia Department, ADB

Mr. Song said that the key role of the think tanks should be to bridge the gap between the knowledge and the policy. He pointed out that think tanks are inference paddlers for promoting good policies. They can mobilize expertise and ideas for policy making, and to fulfil the same they should have good ideas, collation of actors to support the ideas, institutional capacity to nurture and promote the ideas and ability to seize a right moment.



Mr. Song said since India is at the central position of regional cooperation in South Asia, Indian think tanks should play a major role in promoting regional energy cooperation.

He said India could gain the most through regional energy cooperation in South Asia which is the least integrated region in the world. Mr. Song concluded stressing on the fact that India has to take some blame for the lack of integration in the region as it has been reluctant in opening its economy and working on the regional integration.

Responding to a question on how the role of government can be made effective for CBET, Mr. Vikram Doraiswami responded that to drive the policy makers, it is important to drive the discourse in the right direction and build a right case for it by doing quality and good advocacy using the media, using public discourse and influencing things in parliament. Also, coordination amongst the think tanks should be improved to bring the evenness in the way they think as they are required to produce right ideas for the policy makers.

Further Dr. Jyoti Parikh said that a multistakeholder and multidisciplinary approach is needed to answer policy questions. Think tanks can bring on board people from various disciplines and different areas like technical experts, financial experts, diplomats, civil society etc. to discuss issues comprehensively. The job of think tanks is also to create a vocabulary and a way to encourage the dialogues among different parties having totally different expertise and languages.

Dr. Parikh concluded saying that finally it should be remembered that, everything at the end has to be for the people and apprehensions of governments or society for new suggestions have to be addressed.

Session IX: Enhancing Regional Energy Cooperation & Integration: Future Strategies & Way Forward

- **Session Chair:** Dr. Jyoti Parikh, Executive Director, IRADe
- **Panelists:**
 - Mr. Merrille Goonetilleke, Add. Secretary, Ministry of Power & Energy, Sri Lanka
 - Dr. Swarnim Wagle, Former Vice Chairman, Planning Commission, Nepal
 - Mr. Dinesh Kumar Ghimire, Joint Secretary, Nepal
 - Ms. Mandakini Kaul, Senior Regional Cooperation Officer, The World Bank



Session participants, L-R: Mr. Merrille Goonetilleke, Mr. Dinesh Kumar Ghimire, Ms. Mandakini Kaul, Dr. Swarnim Wagle

Dr. Jyoti Parikh, Executive Director, IRADe

The Session Chair, Dr. Jyoti Parikh, welcomed the panelists and informed that the session will discuss mainly the future strategies and the way forward to promote energy security and trade of electricity in the South Asia region. She said the way forward can be different for different stakeholders and each session can be extended further in its own way.



Mr. Dinesh Kumar Ghimire, Joint Secretary, Nepal

Mr. Dinesh Kumar Ghimire discussed at length the opportunities present with Nepal for regional energy cooperation. Private hydro power projects came into existence in Nepal in 1992. Since then, through various initiatives, 4000 MW of hydro power projects are at different stages of development and within two to five years the installed capacity of hydro power projects will increase three to four folds. Also, the Government of Nepal has formulated a policy to generate 15000 MW over a span of 10 years, out of this 5000 MW will be exported. This is an opportunity from the policy perspective. These policies have been broken down to action plans with budgetary provision, said Mr. Ghimire.



He highlighted the seasonal complementarity arising from the electricity demand pattern of the neighboring countries and the abundant water resource available that have created an opportunity for the South Asian countries to cooperate in the development of various energy resources, particularly hydro power plants. Nepal's priority now is on utilizing the water resources for electricity generation and for economic development of the country. The political stability in the country, which has come after a long time of political transition, has created massive opportunities for developmental activities, which should be exploited to the most possible extent, he said.

Nepal has also come up with renewable energy development policies, especially solar energy. With a complementary source and an appropriate mix, Nepal has technically viable solar potential of 2100 MW. The country is planning to build solar projects in its Terai region where there is no hydro possibility. Regarding the cross-border transmission infrastructure, Nepal and India have jointly developed a cross border transmission master plan, which has identified eleven 400 KV inter connection points at six different locations from east to west in Nepal. One of these is the 400 KV Dhalkebar- line which is already operational. It has been charged to 220 kV now, and will be shortly upgraded to 400 kV, so there is a lot of opportunity to import power from India for the time being and after two years, Nepal will be able to export power.

Mr. Ghimire informed that the second cross border electricity transmission line (Butwal-Gorakhpur 400 kV Transmission line) has already been prioritized both by India and Nepal. The detailed feasibility study of this line has been completed and now negotiations on the implementation modality are on. As far as regional frameworks are concerned, he said the ground work has already been started for making CBET effective by signing a regional regulatory agreement on electricity in 2014 and also a power trade agreement with India in the same year. On August 10, 2018 Nepal also signed an MoU with Bangladesh for energy cooperation. These frameworks and bilateral agreements have created scope for the materialization of CBET.

Mr. Ghimire discussed the key learning points for the way forward. He said electricity should be considered as a tradable commodity. Political will should be translated into operational framework which should reflect in multi

and bilateral agreements to achieve cross border power trade. Gradually we should move to multilateral power trade like BBIN and beyond, he said. The real estates in the regional countries should try and gain confidence of the political leaders and work on building in-house consensus. The legal and regulatory framework of the countries must be aligned to meet the regional goal of Cross Border Energy Trade. He further said that a common South Asian grid template should be prepared which is a prerequisite for carrying out CBET. For this, South Asian forum of utilities can be formed and for building this forum there is a need to build bilateral coordination and gradually multilateral coordination.

He concluded by highlighting that many forums are exist in South Asia and South-East Asia, like BBIN, SAARC and BIMSTEC, and most of these forums are trying to conduct studies for promoting regional power trade and trying to implement interstate transactions, so there is a need to share and circulate the findings amongst these forums.

Mr. Merrille Goonetilleke, Additional Secretary, Ministry of Power & Energy, Sri Lanka

Mr. Merrille Goonetilleke pointed out that the materialization of the agreements and initiatives like Cross Border Energy Trade takes time in South Asia. He gave an example that a regional intergovernmental framework agreement was initiated around 2009 through SAARC. After five years of deliberations, the agreement was finalized in Colombo in 2014 through consecutive back-to-back meetings and it now only needs ratification. He also mentioned that 20 years back the regional energy cooperation was difficult to imagine in South Asia, but it is now a reality.



On getting a 500 MW link from India, he said Sri Lanka can get power without interruption as the Indian Grid is now fully interconnected. He felt that Sri Lanka has ample renewable energy potential but unfortunately this energy cannot be integrated to its grid due to the grid limitations and intermittency of renewable energy. Mr. Goonetilleke concluded by saying that Sri Lanka supports regional integration. However, initially, it can only go through India, but over the years it will pave the way for multilateral trading options.

Dr. Swarnim Wagle, Former Vice Chairman, National Planning Commission of Nepal

Dr. Swarnim Wagle highlighted that South Asia is one of the most politicized regions in the world in terms of penetration of politics within the country institutions and also in the intercountry relationship. In such a scenario, he said, the role of track-2 initiatives like think tanks assume more importance and is highly relevant to depoliticize the relations to tease out fundamental development merits and make solid economic case for regional cooperation. After this, according to him, the role of technical people who are not holding political baggage becomes important. He said that to bring results, progress should be made on the aforesaid areas in the beginning and the recent progress made in the India -Nepal and India-Bangladesh relations is an evidence of the same.



Mr. Wagle gave pointers for the way forward and said there is a need to disseminate the rich body of analytical evidence produced by institutions like IRADe. Multilateral cooperation like BBIN and BIMSTEC surpasses the bilateral advantages and is linked to larger points of depoliticization. He suggested partnership with credible think tanks and building on the existing work. The genuine gains from electricity trade should be highlighted and established, he said, suggesting collaboration amongst the think tanks and he felt the forums should have country-specific discussions. Involvement of media is important for spreading information and building public opinion for regional energy cooperation.

He stressed on the need for advancement in technical cooperation so that the idea for a South Asian forum for regulators, work on grid synchronization, scope for optimum energy dispatch and integrated masterplan for transmission lines can materialise. These are the issues which can be pursued irrespective of the political cycles that a country goes through. Dr. Wagle pointed out the long term investments and long gestation periods and sought ways to reduce risks and uncertainties. He drew attention to the potential of disruptive technologies which is looming large and the fact that a lot of gains depend on the massive amount of FDI being mobilized. This is the area where technical aspects of energy issues and economics should be merged and the role of bilateral and regional investment treaties becomes more important. Unfortunately, not much of the work is done on legal, economic and sectoral expertise of energy sector, he rued.

Dr. Wagle shed light on other issues of insuring market access, like the variations in peak demand, the power trade agreements, and power purchase agreements. These need to be analysed to find out what has worked best and what has not. The pricing of externalities is also an important issue which has not been discussed so far, he said.

He explained the need to advance mutual trust through early harvests/initiatives and cited the example of the Dhalkebar-Muzaffarpur transmission line that enabled Nepal to import 500 MW of electricity from India, thus ending crippling power cuts in the country. It also brought goodwill and more such projects should be built, he said.

In his conclusion, Mr. Wagle said the time to explore new forms of trade treaties has come. In South Asia, he said, still 20th century models of trade treaties are being used which only talk about goods and trading of merchandise. The new generation of treaties should involve trading of services, a chapter on investment protections and should go beyond and encompass other economic issues, as done in Europe in the form of EPAS, (economic partnership agreements), he argued. Going forward, it would help to embody energy trade in formal trade treaties.

Ms. Mandakini Kaul, Senior Regional Cooperation Officer, South Asia, The World Bank

Ms. Mandakini Kaul said that growing recognition of the benefits of economic integration has helped build up momentum among politicians and citizens for the regional integration in South Asia. This momentum is particularly strong in the Eastern sub-region or BBIN (Bangladesh, Bhutan, India, and Nepal) countries, as evident in the recent sub-regional agreements (e.g. Motor Vehicle Framework Agreement and renewed Protocol on Inland Water Transit and Trade). She said reimagining South Asia as an economic gateway between the east and west could make regional integration an aspiration for



all stakeholders. She said that for people or a country, to understand the direct benefits of regional integration, there is need to generate the demand within a country. This can be done through strategic communication and outreach activities, with an emphasis on evidence-based communication within countries. Ms. Kaul further said that the intermediate stages of integration in South Asia should also be acknowledged. Be it bilateral agreements, BBIN agreement or an agreement on the western front, all should be counted in the progress and should be taken forward as and when it can be. She said that we should try and identify things that may be done within the boundaries of a country, but also have a regional impact. We should try to understand and acknowledge, and bring out the evidence for these and place them before a wider audience.

Ms. Kaul concluded by sharing that the World Bank's South Asia Regional Integration program is centred on four engagement areas: Regional electricity market; Economic corridor development—currently transport connectivity, trade and investment policy, and local enterprise development but broadening to include financial systems and digital connectivity; Cooperative management of shared natural resources and disaster risks; and People-to-people connectivity.

Dr. Jyoti Parikh, Executive Director, IRADe

Dr. Parikh discussed the way forward for enhancing regional energy cooperation and integration in South Asia. She gave pointers for four different verticals: power system synchronization, economic growth and policy dialogue, role of think tanks, and Integration with BIMSTEC region. These are discussed below.

1. Power System Synchronization

- It is required to work on the coordination of regulations by creating a common platform/institution/association/forum/ or working group in the South Asia Region;
- Discussion on Regional Investment Facilitation, Regional Dispute Resolution Institutional Mechanism, Regional Transmission Planning and Operational aspects, Regional Hydro Power and Clean Energy development (including Renewable Energy and Gas);
- There should be focus on promotion of power market based CBET for short terms transactions also. We need to start with what is acceptable and meet the basic requirements of all the nations, develop model for sharing of revenues and transmission costs.

2. Economic Growth and Policy Dialogue

- There is need to provide evidence through an economic analysis of benefits at the state-level for Indian states bordering on CBET countries – Punjab, Tripura, Meghalaya, Assam, West Bengal, entire North East, Uttar Pradesh, Bihar and even Tamil Nadu;
- Extend economic analysis to the BIMSTEC Region;
- Get state governments and local authorities as party to trade and lobby with the Center;
- Engage with regional authorities and organize informal talks at the level of foreign secretaries, regulatory, generation and transmission players. This will help in bridging the gap;
- Bridge trust deficit among the key stakeholders within the SAARC region;

3. Think Tanks' Role

- Their role is critical as they can model power distribution policies - best practices for rural electrification;
- Linking NDCs to achieve the same at regional level;
- Develop co-operative framework for enabling SDG-7—Sustainable Energy Access for all;
- Bring Sub-Regional Alliance—Part of International Solar Alliance—to push renewable energy;

4. Integration with BIMSTEC Region

- it is important to get on board BIMSTEC countries like Myanmar and Thailand as the region can benefit from regional energy cooperation;
- Studies for assessing economic benefits of trade at country level in Myanmar, Sri Lanka and Thailand can also be carried out to build consensus on regional energy power trade.

Comments/Questions/Ideas emerged from open discussion

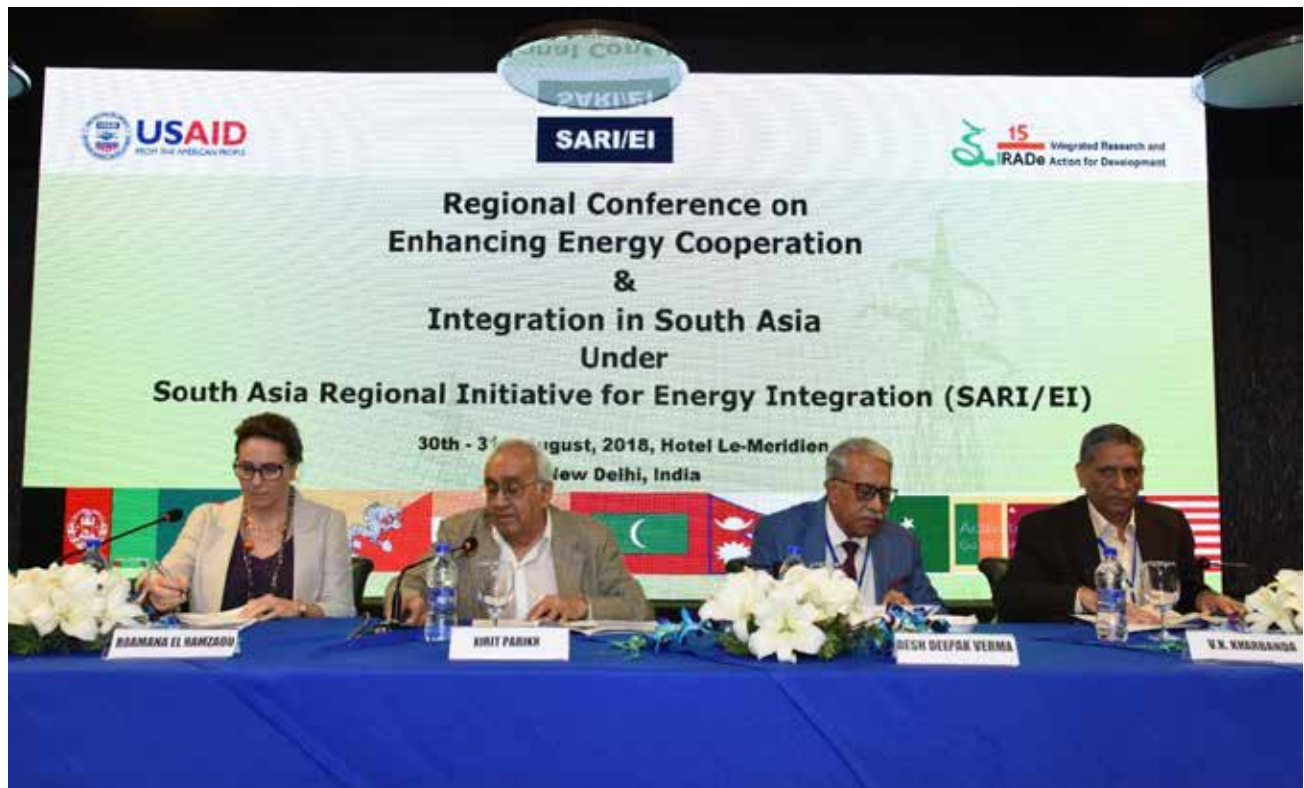
1. Outreach for regional energy cooperation has to be from the bottom to the top level, and the required institutional framework should be developed;
2. Knowledge management and transfer can provide a platform for effective policy making for the regional energy cooperation;
3. Pricing plays important role in electricity power trade. Intervention of the government is important to bring success to the regional energy cooperation;
4. We have to create a win-win situation for all the nations involved in the regional energy power trade. Economists should play a better role in working out the electricity tariffs.

The session chair concluded the session and thanked all the panelists and audience for their participation.

Session X: Valedictory Session

■ Session Speakers/Participants

- Dr. Kirit Parikh, Chairman, IRADe
- Ms. Ramana El Hamzaou, Deputy Mission Director, USAID
- Mr. Desh Deepak Verma, Secretary General, Rajya Sabha
- Mr. V. K. Kharbanda, PD, SARI/EI, IRADe



Session participants, L-R; Ms. Ramana El Hamzaou, Dr. Kirit Parikh, Mr. Desh Deepak Verma, Mr. V. K. Kharbanda

Dr Kirit Parikh, Chairman, IRADe

Dr Kirit Parikh, Chairman IRADe, in his introductory speech, pointed out that SARI has made enormous progress over the years. Currently, India exports 650 MW power to Bangladesh and 500 megawatts to Nepal. It imports 1500 MW from Bhutan.

Cross-Border Electricity Trade is a win-win for all in South Asia because of the complementarity of demand and resources. It provides more power to more people at a lower cost. It increases welfare and the benefits are clearly visible on the ground. It also benefits the world as CO2 emissions are reduced for the region as a whole, he said.



There are a number of barriers and obstacles to getting a fully integrated Cross-Border Energy Trade. There is trust deficit, though much progress has been made in this area. The Prime Minister of India is keen on cross-border cooperation and as a result, India's electricity trade with Bangladesh, Bhutan and Nepal has increased. The vast benefits to Nepal's economy and people that can result from Cross-Border Electricity Trade has yet to be effectively communicated to the people in Nepal.

He mentioned that many technical policy issues have been addressed through the three task forces over the last six years. They addressed issues concerning tariff, transmission charges, open access, dispute resolution mechanism, flexibility to absorb fluctuations in demand and supply, prevention of contagion and tripping, and regulation.

The analytical studies have explored, economically viable and technically feasible scope for India's electricity trade with Nepal and Bangladesh, and among India, Bhutan, Bangladesh and Nepal together. These have shown the win-win characteristic of Cross-Border Electricity Trade where all countries gain.

The SARPEX concept developed by IRADe and the associated mock exercise that was conducted demonstrated the benefits to all nations if a Day Ahead Market is introduced in the region. It also led to the capacity building of the core team members of Bangladesh, Bhutan and Nepal for participating in a power exchange based energy trading.

The think tank forum has got together some twenty think tanks in these countries to explore the benefits of such trade and to disseminate the findings to create consensus for such trade.

He also emphasized the need to further engage media and senior decision makers in these issues. Going forward, integrating Myanmar and BIMSTEC countries in Cross Border Energy Trade can bring further benefits to all, he said

Ms Ramana El Hamzaou, Deputy Mission Director, USAID

Ms Ramana El Hamzaou, Deputy Mission Director USAID, congratulated everyone for the success of the conference. She lauded the inclusion of policy makers, decision makers, experts, investors, developers, think tanks and regional institutions in development of the regional energy market. The tasks completed so far have to be taken forward and for this a proper outline needs to be prepared, she said.

She addressed the issue of investments required for the development of the regional projects. An amount of USD 1.7 to 2.5 trillion is required just to bridge the existing gap in institutional structures. This provides for an excellent opportunity for the private sector to engage in the market, she felt.

She emphasized the importance of Government support for private partnerships citing the example of India's model for solar energy development. In addition, the role of financial institutions is also critical. She suggested a similar approach may be adopted for establishing the power market across South Asia. She mentioned about the development in this field, which has taken place through bilateral trades, and that now a move is required to go from bilateral to multi-lateral trade. In this context, she expressed her optimism based on the tasks that have been completed and the momentum that has been generated.

Existing partners in each country need to create a vibrant power market in the region and the issues discussed in the conference should be worked on.

She thanked the Government of India for taking the lead in supporting CBET and the Nepal government for the various initiatives that they have taken in this regard. She thanked the governments of all other nations for their active involvement and the various activities that they have undertaken for promoting CBET. Lastly, she thanked IRADe for the excellent work that has been done and all the participants for sparing their valuable time to attend the conference and was hopeful of their continued engagement.



Mr. Desh Deepak Verma, Secretary General, Rajya Sabha

Mr. Desh Deepak Verma, Secretary General, Rajya Sabha, started by appreciating IRADe for its valuable works. He mentioned his earlier assignment as Chairman UPERC and said he was happy to come back to his earlier sector in this conference. He congratulated both IRADe and USAID for the pioneering work that is being done in this sector.

He mentioned that India has a central regulator as well as many state level regulators. To achieve harmonization between them was itself a challenging task and now that we are going ahead in CBET, many different nations will be involved, he said. The challenge would be enormous and the model regulations which have been developed are an important concept, he said.



The Cross Border Electricity Trade has the potential to create a win-win situation for all, he observed. CBET will provide opportunities for Indian generators to step into a new market. He cited many other benefits of CBET—like bridging the demand supply gap, reducing dependence on the fossil fuel imports, using regional complementarities etc. The per capita consumption of electricity, which is one of the parameters of economic progress, will grow and the hydro resources of the region have to be tapped for this purpose, he said.

He also mentioned that one benefit of CBET can be achieved by connecting the border areas to the grids of the neighboring countries in case they are remotely located from their national grid. This will also bring about savings in transmission and distribution costs along with improving energy access. He also mentioned that the support of IRADe and USAID will go a long way in achieving the targets of CBET.

In addition to the government-to-government dialogue, he felt the creation of a regional institutional framework is also required. They can look into the various aspects of the respective nation's power system and come out with a solution acceptable to all the countries. Most of the states want to have a cost plus approach and are not keen to be market driven.

He congratulated everyone for successfully holding the conference and appreciated the efforts made in the field of CBET.

Message from Mr. Suresh Prabhu Honorable Minister of Industry and commerce

Mr. Suresh Prabhu was invited for this session in the conference and he had also confirmed his joining the conference. Unfortunately, he had to go abroad and he sent a video message. The key points in his message are mentioned below.

Mr. Prabhu regretted the fact that he was unable to attend the conference. He mentioned that South Asia has a shared destiny and hence, he said, we must work on shared ideas and work together to provide energy access and energy security. He emphasized the importance of all the South Asian nations working together.

He assured that he will be very happy to work on the ideas that are generated from this conference and expressed his hope that we will be able to take it to its logical conclusion. He congratulated all the organizers, and in particular Dr Kirit Parikh, referring to him as his 'good friend'.



Vote of thanks by Mr. V.K. Kharbanda, PD, SARI/EI, IRADe

Mr. Kharbanda expressed his warm gratitude to all the speakers, dignitaries and participants for sparing their valuable time and attending the conference. He thanked Mr. R.K. Singh, Honorable Minister of power, and his Excellency Mr. Juster, the US ambassador to India, and others for sharing their perspective for enhancing CBET in the region. He also thanked Mr. Suresh Prabhu, Honorable Minister of Industry and Commerce, for his message.

He mentioned the issues covered in the last two days which included the possible ways forward to enhance CBET. He mentioned that when this program was initiated, CBET was a dream. Now we have electricity trade to the extent of 2500 MW taking place in the region which is expected to be doubled by 2020, he said, emphasizing on the role of SARI/EI in this process.

On behalf of IRADe he thanked all the Chairs, Co-Chairs, panelists and guests for their valuable inputs and interactions. He expressed gratitude to USAID for the opportunity given to IRADe to drive the SARI/EI program. He thanked Dr Kirit Parikh and Dr Jyoti Parikh, Chairman and Executive Director, IRADe for their valuable contribution and support. He thanked Ms. Monali Zeya Hazra, Regional Program Manager, USAID for her support and cooperation. He also thanked USAID Nepal and Bangladesh for their support and effort. He thanked the Policy and Strategy Committee (PSC) and the Task Force (TF) members for their support over the last six years.

He thanked all the members of the SARI/EI team for the work done over the last six years and also anchor Ms Subha Rajan and the hotel management for their support and cooperation.



ABOUT SARI/EI

Over the past decade, USAID's South Asia Regional Initiative/Energy (SARI/E) has been advocating energy cooperation in South Asia via regional energy integration and cross border electricity trade (CBET) in eight South Asian countries (Afghanistan, Bangladesh, Bhutan, India, Pakistan, Nepal, Sri Lanka and the Maldives). This fourth and the final phase, titled South Asia Regional Initiative for Energy Integration (SARI/EI), was launched in 2012 and is implemented in partnership with Integrated Research and Action for Development (IRADe) through a cooperative agreement with USAID. SARI/EI addresses policy, legal and regulatory issues related to (CBET) cross border electricity trade in the region, promotes transmission interconnections and works toward establishing a regional market for electricity.

ABOUT USAID

The United States Agency for International Development (USAID) is an independent government agency that provides economic, development, and humanitarian assistance around the world in support of the foreign policy goals of the United States. USAID's mission is to advance broad-based economic growth, democracy, and human progress in developing countries and emerging economies. To do so, it is partnering with governments and other actors, making innovative use of science, technology, and human capital to bring the most profound results to a greatest number of people.

ABOUT IRADe

IRADe is a fully autonomous advanced research institute, which aims to conduct research and policy analysis and connect various stakeholders including government, non-governmental organizations (NGOs), corporations, and academic and financial institutions. Its research covers many areas such as energy and power systems, urban development, climate change and environment, poverty alleviation and gender, food security and agriculture, as well as the policies that affect these areas.



For more information on the South Asia Regional Initiative for Energy Integration (SARI/EI) Program, please visit the project website:

www.sari-energy.org

