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South Asia Regional Initiative for Energy Integration (SARI/EI)

Overview

South Asia has witnessed rapid macroeconomic growth over the past two decades, yet the energy sector continues to be affected by chronic problems of electricity supply shortage and poor quality of service. The energy sector challenges impinge on the economic future of the 1.5 billion people of the region. Long-term solutions require sustained increase in energy cooperation among countries in the region. A World Bank study estimates that South Asia requires investments of USD 1.7 trillion to USD 2.5 trillion, where one-third will have to be spent on electricity infrastructure development alone.¹ Regional inter-connections can bring down the cost of electricity and diversify the generation portfolios through regional resources by particularly addressing peak power deficits in utilities across the region. Already, India has established transmission links with Bangladesh, Bhutan, and Nepal through which power trading is under way. Opportunities for Cross-Border Electricity Trade (CBET) are amplified in the large and untapped hydropower resources identified in the region, especially in Bhutan, India, and Nepal, that can significantly address South Asia’s electricity requirements.

The signing of the Project Development Agreement (PDA) for developing hydropower projects between Nepal authorities and private developers from India in October 2014 has given a renewed thrust to CBET in the South Asia region. Consequently the Power Trade Agreement (PTA) signed by India and Nepal allowing exchange of electricity has amped up cooperation for electricity trade. In December 2014, SAARC nations signed the Inter-Governmental Framework Agreement (IGFA) for Energy Cooperation to mobilize stakeholders for regional and sub-regional projects in the area of power generation, transmission and power trade.

Easy and faster execution of related policies is necessary to harness CBET potentials in the region. Clear procedures have to be established for channelizing and the realizing CBET benefits by stakeholders including Power, Finance, Energy and Trade ministries and the larger civil society. CBET necessitates large investments in generation and transmission infrastructure. Hence there is a need for a comprehensive and macroeconomic perspective, not just a technical overview. This can be made possible by optimum utilization of available resources for creating a level playing field, assuring returns to investors and providing affordable electricity to consumers, thus making the region energy secure and self-sustainable.
**SARI/EI Phase IV**

The role of USAID’s South Asia Regional Initiative/Energy (SARI/E) over the past decade in advocating energy cooperation in South Asia has transited to the next phase of advancing regional energy integration and 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 being 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 cross-border electricity trade in the region, promote transmission systems interconnections and works toward establishing a regional market exchange for electricity. The program acts as a catalyst for enabling systemic conditions for regional integration through three task forces. Task forces help to create market mechanisms for transparent trade practices, access to clean energy, promote efficiency, conservation and renewable sources. The task forces are guided by a Project Steering Committee (PSC). The SARI/EI Secretariat executes the program in consultation with the PSC and the task forces.

IRADe, located in Delhi, is a non-profit and fully autonomous institute for advance research. IRADe’s multidisciplinary research and policy analysis aid action programs. It is a hub for a network of diverse stakeholders. Established in 2002, the institute is recognized as an R&D organization by the Department of Scientific and Industrial Research and Ministry of Science and Technology of the Government of India; the Ministry of Urban Development has accorded IRADe the status of center of excellence for urban development and climate change. Through the SARI/EI program, IRADe is pushing the envelope for sustainable energy access through 28 experts and members from South Asia.

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**SARI/EI Secretariat**

**Task Force-1**

Coordination of policies, legal and regulatory frameworks

Defining ground rules for allocation of cost and risks; and creating an enabling environment for investors both in generation and transmission

**Task Force-2**

Advancement of transmission system interconnections

Both technical and operational aspects of power system interconnections

**Task Force-3**

South Asia Regional Electricity Market (SAREM)

Exploring market-driven commercial practices in power trading (including long-term contractual instruments and short-term power trade in exchanges)
In the 18th SAARC summit held in December 2014, the biggest development has been in the area of energy. The framework agreement signed in the SAARC summit allows, in principle, to import/export power among South Asian countries in future. The prospects of power sector cooperation between India and Bangladesh with Bangladesh exploring the possibility of importing or exporting hydropower from Northeast India and the regional power trade, involving Pakistan and Afghanistan taking advantage of the CASA 1000, have more to offer to the region.

The three task forces are the key features of the SARI/EI program which will help move forward the agenda of regional energy cooperation and regional electricity market. To achieve this, the region needs expertise, capacity building and to learn from international best practices. To move forward and institutionalize the process, it is necessary to establish investor-friendly legal, regulatory and policy framework, evolve regional investment policy framework, create regional grid master plan, harmonize grid codes and operational procedures, develop regional electricity regulatory forum/association, explore alternate financial mechanisms, promote public and private sector investments, establish competitive regional electricity markets and regional dispute settlement mechanisms, etc.”

Quoted from 4th PSC Meeting Remarks, December 2014, Dhaka, Bangladesh

“SARI/EI efforts are critical to South Asia’s sustainable energy future. The region has witnessed per capita GDP growth rate of six percent. In order to sustain this rate of economic growth, it is imperative that the countries in the region have access to clean energy. However, existing power shortages and high reliance on fossil fuels in conjunction with rapidly increasing electricity demand are threatening to undermine the economic progress of these countries.

To enable cross-border electricity trade in South Asia, SARI/EI activities addresses policy, legal and regulatory issues for CBET in the region and promotes investment for transmission interconnectivity as well as support the establishment of regional electricity markets. While the region bears immense hydropower potential, it is yet to be tapped into. Investments in CBET are critical and the role of private players, including power markets and market intermediaries, in facilitating investment in power generation and transmission assets in the region is paramount.”

Quoted from South Asia Investor Workshop Valedictory Remarks, September 2014, New Delhi, India
SARI/EI Project Steering Committee 2013-14

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Mr. Sanjeeb Baral  
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Overview of SARI/EI Events in 2013-14

- Inaugural Conference, New Delhi, India October 2013
- 2nd Meeting of PSC, New Delhi, India January 2014
- 2nd Meeting of TF-1, Colombo, Sri Lanka February 2014
- 1st Meeting of TF-3, Mumbai, India April 2014
- 2nd Meeting of TF-2, Kathmandu, Nepal April 2014
- 3rd Meeting of TF-1, Thimphu, Bhutan April 2014
- Study Tour, International Power Markets (EU) June 2014
- South Asia Investor Workshop, New Delhi, India September 2014
The workshop, organized by IRADe in association with the Confederation of Indian Industry (CII), was an important platform for investors, developers, financial institutions, multilateral development banks and high-level officials from the region to explore challenges and investment opportunities to enhance CBET in South Asia. The workshop emphasized that promoting regional cooperation in CBET requires enhanced political consensus and formalization of ensuing processes. This will minimize the risks and attract more private sector investment. Also, harmonizing legal, regulatory and policy frameworks are important for enabling CBET. Further, cross-border generation and transmission interconnection projects are capital intensive hence transparency and reliability are critical to attract investments. A regional grid master plan for CBET and regional mechanisms for settlements will need to be put in place to generate confidence among stakeholders. A competitive regional power market in South Asia is essential for long-term sustainability.
South Asia Regional Inaugural Conference of SARI/EI on Cross-Border Electricity Trade
October 4-5, 2013, New Delhi, India

The South Asia Regional Inaugural Conference of SARI/EI on CBET was held on October 4-5, 2013, in New Delhi, India. The conference launched the SARI/EI program to gain acceptance for its goals among the South Asian countries. It showcased the ‘win-win’ benefits offered by bilateral and multilateral electricity trade, and initiated a concrete and constructive discussion on the vision and road map for the South Asia Electricity Market. The conference was inaugurated by Dr. Montek Singh Ahluwalia, then Deputy Chairman, Planning Commission, Government of India.
**STUDY TOUR**

*European Regional Power Markets*

*July 13-19, 2014, Amsterdam and Paris*

**IRADe** in association with the Indian Energy Exchange Limited (IEX) organized a visit to Amsterdam and Paris to facilitate knowledge transfer and build the capacity of task force and PSC members. The team studied legal and regulatory issues, institutional governance, operational and other aspects of the European Regional Power Market.

**Key learning:** Long-term bilateral contracts were used for setting up of bilateral CBET transmission infrastructure in European markets. Strong political will drove European Union’s (EU) road map for legal, regulatory and policy framework for CBET and creation of a single EU energy market for electricity and natural gas. The Agency for Cooperation of Energy Regulators (ACER) was set up to create the single market. Industry pushed market integration vis-a-vis market couplings, which were subsequently formalized by EU and established the European Network of Transmission System Operators for Electricity (ENTSO-E) with key legal mandates for coordinated, reliable and secure operations of the interconnected electricity transmission networks. Non-discriminatory open access to networks and to cross-border interconnectors was made completely market-based.
SARI/EI MEETINGS

PSC and the three SARI/EI Task Forces provide critical inputs for advancing CBET policies, regulations, infrastructure and creating a South Asian power market. The recommendations that emerge from these meetings guide SARI/EI/IRADe secretariat activities.

2nd PSC Meeting, SARI/EI
January 8, 2014, New Delhi, India

The members of the Project Steering Committee from various South Asian countries along with representatives from IRADe, USAID and USEA examined SARI/EI activities planned for 2013-2014 and deliberated on: extensive task force meetings, studies to help task forces to achieve their respective deliverables, study visits to developed regional energy markets (SAPP, GMS, etc.), workshop on development of infrastructure and investment trends for CBET and formation of Task Force-3.
TAS K FO RCE-1

2nd Meeting of Task Force-1 on ‘Coordination of Policy, Legal and Regulatory Framework’, February 19-20, 2014, Colombo, Sri Lanka

Key Findings and Recommendations: Taxes and duties between South Asian nations can impede CBET. There should be non-discriminatory open access for enhancing private sector participation and relevant regulatory regime is required for granting access. Members emphasized that for long-term sustainability the overall tariff must reflect true cost of generation and must be fixed by independent regulators. Subsidies may be required as South Asia comprises developing countries, but these have to be reasonable, viable and must be supported by adequate trading mechanism and power market rules; along with infrastructures it is necessary to regulate the trading of power. Mechanisms like Unscheduled Interchange (UI), on a regional basis, need to be developed for the purpose of regional grid discipline.
3rd Meeting of Task Force-1 on ‘Coordination of Policy, Legal and Regulatory Framework’, June 4-5, 2014, Thimphu, Bhutan

Key Findings and Recommendations: It was stressed that synergies among task forces are critical to ensure SARI/EI deliverables are achieved within its legal, regulatory and policy framework. The members advised the review of existing studies (such as by ADB and SAARC) and analysis of international best practices in harmonization of legal, regulatory and policy issues. Other areas of priority were the need to develop Risk Matrix for all modes of CBET and identifying new instruments like Inter-governmental Agreement, etc. for CBET and draw up term sheets. Members made a one-day site visit to Basochhu and Punatsangchhu-I (1200 MW installed capacity) hydropower plants that are under construction and supported by India and Bhutan. The plants are expected to start commercial operation by 2015 and 2019, respectively.
Key Findings and Recommendations: Members prioritized the need to build requisite transmission infrastructure for regional and bilateral power trade. A Regional Transmission Master Plan for regional power trade was hence suggested and such a plan needs to be coordinated with the Generation Expansion Plan for regional electricity trade. Thus harmonization of technical standards and grid codes among the South Asian nations is required. The trading potential of each country – over a typical day, week, month, or season, and annually over a 15-20-year period – needs to be assessed based on the commissioning schedules of new generating stations and their associated transmission systems as prepared by the respective countries. Task force members recommended a study on Trading Potential and Harmonization of Grid Codes, Operating Procedures and Standards for CBET.
Key Findings and Recommendations: The development of untapped hydropower potential in South Asia will ensure energy security and economic benefits to the region. Hence developing a Road Map of South Asia Regional Electricity Markets was advised. Power traders will play a key role in optimization of existing energy resources and bring vibrancy to the commercial outlook in the sector. Members pointed out that short-term bilateral contracts and energy exchange through power exchanges will continue to play a crucial role to fill the gap between seasonal and diurnal supply-demand pattern. To this end a study was formulated to Assess the Preparedness of Each South Asian Country for CBET and the associated commercial terms and conditions, principles and procedures, agreements, etc. for short-, medium- and long-term electricity trade. The study is expected to suggest a suitable model for a power exchange in South Asia for CBET.
Overview of Current and Proposed Studies

**Task Force-1 Studies**

**Study 1: Review of Electricity Laws, Regulations and Policies for South Asia**
To identify various provisions for Electricity Laws, Regulations and Policies that can impact CBET for recommending changes/amendments and developing regulatory guidelines for promoting CBET.

**Study 2: Investment-Friendly Policies/Guidelines for South Asia Power Sector**
To review various investment policies/guidelines/regulations prevailing in South Asian Countries (SAC) and its impact on the investment in CBET for developing Investment Policy Guidelines and Regional Investment Framework for promoting CBET Infrastructure Power Projects.

**Task Force-2 Studies**

**Study 1: Assessment of the Electricity Trading Potential of the South Asian Countries**
The main objective of this study/exercise is to identify the trading potential in SACs by reviewing existing long-term Demand-Supply projection scenarios of each country and reviewing the expected developments in the next 10-20 years, taking into account the CBET potential.

**Study 2: Harmonization of Grid Codes, Operating Procedures and Standards to Promote CBET in South Asia**
To review the Grid Codes of each South Asian nation covering procedures, codes and standards such as power system operating procedures, protection code, metering code, connection code, planning code, system security, demand estimation systems, outage planning, recovery procedures etc. to suggest necessary changes for promoting CBET.

**Task Force-3 Studies**

**Study 1: Assessment of Preparedness of Each South Asian Nation and Identification of Commercial Terms and Conditions/Principles/Aspects Required for Regional Electricity Market**
To assess the preparedness of each South Asian country for CBET, for selecting suitable models of power trading including a power exchange for the region and to recommend commercial terms and conditions, principles and procedures for short-term, medium-term and long-term CBET in the South Asian Regional Electricity Market.

**Study 2: Development of SA Power Market Rules and Pilot Market Design**
As agreed in the Roadmap for South Asia Regional Electricity Market, it was decided to develop South Asia Power Market Rules based on the exchange model and best practices from various international power exchanges. A pilot market based on those market rules will be designed.
## Status of Studies and Reports

### Task Force-1 Studies
(a) ‘Review of Electricity Laws, Regulations, Policies and Legal Structure of South Asian Countries’ was awarded to AF-Mercados (KPMG India).

(b) ‘Investment-Friendly Policies/Guidelines for South Asian Countries for Promoting Investment in South Asian Power Sector and in particular in CBET’ was formulated.

### Task Force-2 Studies
(a) ‘Assessment of the Electricity Trading Potential in the South Asia Region’ – the terms of reference (TOR) for the study was finalized and the request for proposal (RFP) floated.

(b) The TOR for ‘Harmonization of Grid Codes, Operating Procedures and Standards to Facilitate/Promote Cross-Border Electricity Trade in the South Asian Region’ was finalized.

### Task Force-3 Studies
The TOR and RFP for the ‘Assessment of Commercial Terms and Conditions for CBET and Suggested Model for Power Exchange in South Asian Region’ were finalized.

### Road Map of South Asia Regional Electricity Markets
Based on the outcome of the 1st meeting of Task Force-3 on ‘South Asia Regional Electricity Markets’ on April 29-30, 2014, in Mumbai, India, the Roadmap for the Evolution of South Asian Regional Electricity Markets was finalized in consultation with the task force members and USAID.

### Background Paper
IRADe published a background paper that highlights the current status, overall benefits, challenges and opportunities related to CBET in South Asia. Highlights include:
- The current status of regional energy integration, including past energy trade, projects in pipeline and those that are in various stages of planning.
- Review of existing literature, including academic literature covering developments in other parts of the world (such as Greater Mekong, European, North American and African CBET experiences), as well as South Asian studies (by ADB, SEC, World Bank and USAID).
- Issues in the development of a regional power market.

### Concept Paper on ‘Cross-Border Electricity Trade in South Asia: Investment, Challenges and Opportunities’
IRADe’s in-house efforts brought out critical analysis of the overall investment requirements, challenges and opportunities in CBET in South Asia. The highlights of the concept paper are:
- Power sector overview of South Asian countries and CBET
- Key drivers for investment in CBET
- South Asia investment climate
- Key investment challenges in CBET
- Key opportunities and investment requirements in each of the South Asian countries.
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