

# **SOUTH ASIA REGIONAL INITIATIVE FOR ENERGY INTEGRATION (SARI/EI)**

**A *USAID* Initiative to strengthen  
Energy Security in South Asia**



**March 2019**





They said ...



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)



R.K. Singh  
Hon'ble Minister of State (IC)  
(Power and New & Renewable Energy)

“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.

Power trade will enable sharing of competitive advantage and will bring prices down for everyone in the region. We have seen the benefits of power trade bilaterally and we must now extend it regionally. There is a huge journey ahead which we have to do together.”

“I applaud all our colleagues in the region for joining in this pursuit of regional grid integration. The United States is proud to partner with each country to ensure energy security, expand prosperity, and promote a rules-based order in South Asia.

I would like to thank USAID's implementing partner for this Initiative – Integrated Research and Action for Development – for its excellent work over the past six years. By bringing together policy makers, regulators, financial institutions, and other members of the private sector from different countries, our roadmap toward a regional electricity market will proceed forward with good momentum.”



Kenneth I. Juster  
United States  
Ambassador to India

# Introduction

The exponential growth story of South Asia region over the past two decades has been accentuated by the World Bank, declaring it the fastest growing region across the globe in 2015. Alongside this amplified growth, the challenge of energy security arose to sustain the pace of development. The South Asian countries are working in close cooperation with each other to counter the energy demand-supply deficit. The evolutionary requirement for this has led to the emergence of Cross Border Energy Trade (CBET) mechanism, and increased focus on tapping the vast potential of clean energy resources.

Both CBET and clean energy mechanisms promote resource optimization and competitive market dynamics, while providing returns to investors and affordable electricity supply to consumers. Additionally, the complementary geographic, economic and cultural aspects of these nations offer natural avenues of exchange of energy and electricity, not just within the region, but with the neighboring countries in South East Asia, thereby enhancing the overall outreach and benefits.

The **US Agency for International Development (USAID)** initiated the **South Asia Regional Initiative for Energy (SARI/E)** program in the year 2000, covering the eight countries in South Asia, viz. Afghanistan, Bangladesh, Bhutan, India, The Maldives, Nepal, Pakistan and Sri Lanka. In the first three phases, the program focused on increasing awareness

on regional energy markets, supporting transmission interconnections and building capacity. The program, aiming to promote energy security in South Asia, worked on three focus areas: Cross Border Energy Trade (CBET); Energy market formation; and Regional Clean Energy development. SARI/E played a key role in integrating and promoting the energy policy and technology linkages across the South Asian nations.

The fourth and current phase of the program, called SARI/EI, is aimed at advancing regional grid integration through cross border power trade, started in 2012, and is implemented by **Integrated Research and Action for Development (IRADe)**, the leading South Asian Think Tank.

SARI/EI program was recently extended to 2022 and is a key program under USAID's Asia EDGE (Enhancing Growth and Development through Energy) Initiative. The initiative aims to enhance the economic and energy security of Asian countries by promoting a more affordable and reliable energy system that is also more globally accessible. One of the key objectives under Asia EDGE is to accelerate the growth of the region's energy markets through regional energy trade and integration, which will unlock billions of dollars in the regional energy market through the development of power markets and regional exchanges.

Presently, only bilateral power trade is prevalent in the South Asia region. In its extended phase, SARI/EI will focus on moving the region to trilateral and multilateral power trade, and establishing the South Asia Regional Energy Market (SAREM).

## Key Developments and Current Power Trade in South Asia region

- Guidelines for Import / Export (Cross Border) of Electricity - 2018 issued by Ministry of Power, Government of India, in consultation with Ministry of External Affairs.
- Signing SAARC Framework Agreement for Energy Co-operation (Electricity).
- MoU on establishment of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) grid interconnection signed by member nations.
- India made provision for incorporating CBET in draft amendment of Electricity Act 2003.
- Cross Border Power Trade in South Asia region increased by 1500 MW since 2012.

**Integrated Research and Action for Development (IRADe)**, the leading South Asia Think Tank, is the implementing partner for phase IV (2012-22) of the SARI/EI program through a cooperative agreement with USAID. IRADe acts as the Secretariat, and works to provide technical inputs to build consensus among member countries as per the program objectives. Established in 2002, IRADe is a non-profit, fully autonomous institute for advancing multidisciplinary research and policy analysis to aid action programs.

# SARI/EI Structure & Function

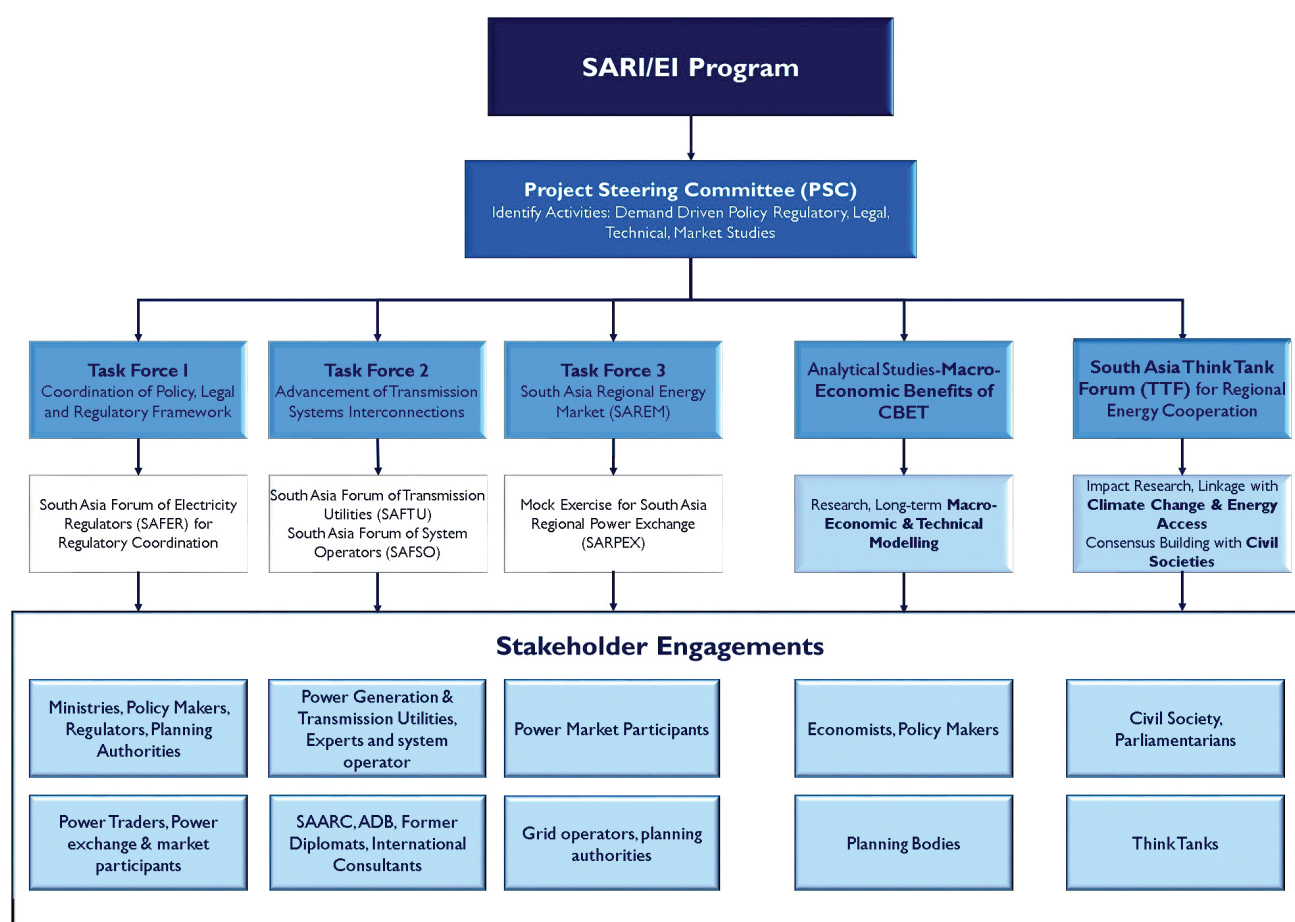
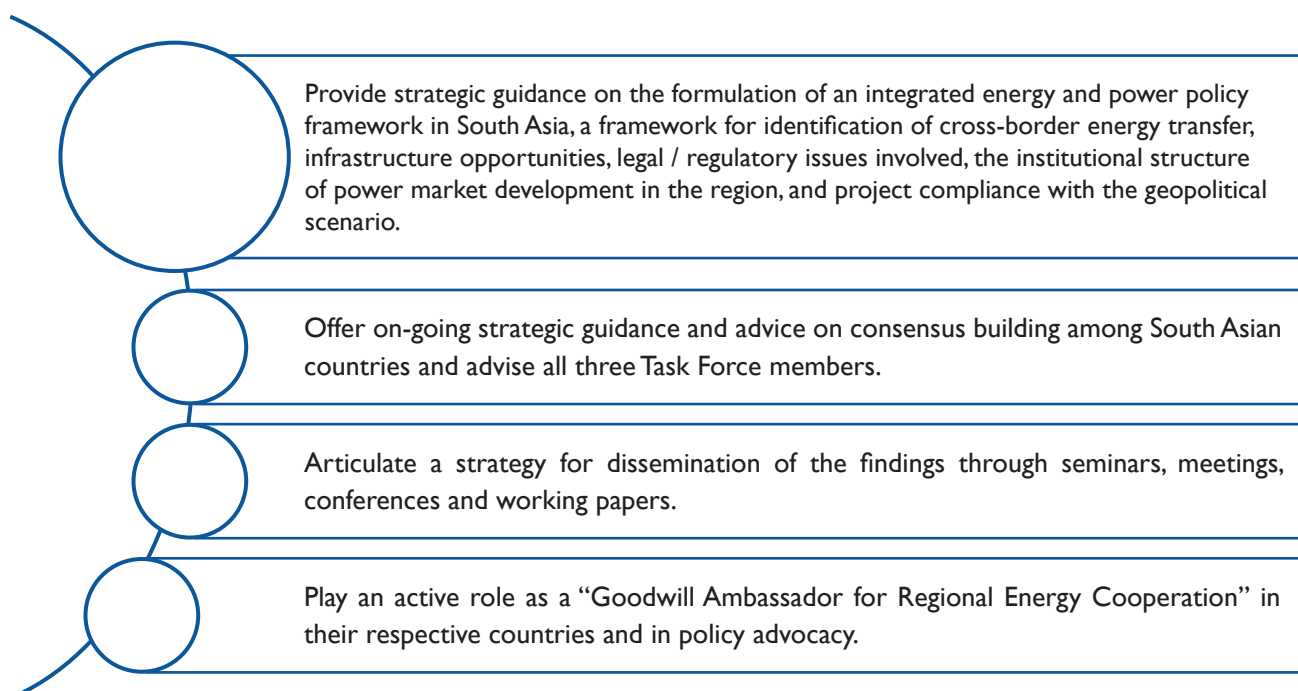


Figure 1: SARI/EI Program Structure

**Project Steering Committee (PSC)** is the apex body providing overall strategic directions to the SARI/EI program and has the following functions:





The three dedicated **Task Forces (TF)** will address various issues related to CBET and will provide practical and concrete recommendations for expanding CBET in the region during SARI/EI Phase IV (2012-2022). The brief details of each task forces are described below.

### Task Force 1 (TF1)

**“Harmonizing Policy, Legal and Regulatory Issues”** to create the enabling systemic conditions for a sustainable market for investment and implementation of CBET.

### Task Force 2 (TF2)

**“Advancing Transmission Systems Interconnections”** to create enabling, systemic conditions for a sustainable market for investment and implementation of sub-regional bilateral transmission interconnections in the eastern sub-region of South Asia.

### Task Force 3 (TF3)

**“Establishment of South Asia Regional Electricity Markets”** by creation of enabling and systemic conditions for a sustainable energy trading and exchange market in the eastern sub-region of South Asia.

## Peek into the Past: History and Prior Phases (2000-2012)

### Phase I (2001–2004)

The initial phase gave high emphasis on capacity building and information exchange.

1,500 participants on clean energy trade /efficiency, rural power supply, and regulatory issues;

Offered opportunities for exchanging information and building skills in analysis/ negotiation with a view to enhance the understanding of the energy sector and create a pool of aware stakeholders;

Planned pre-feasibility studies to identify opportunities for private sector investments in energy infrastructure; and Focused on the socio-economic aspects of regional energy cooperation, reaching stakeholders who can act as change agents—the media, public leaders, scholars, industrial energy consumers, and trade unions.

### Phase II (2004–2007)

In Phase II, SARI/EI laid the foundation for increased clean energy access and improved market structures to facilitate regional investment in energy trade.

It focused on improving policy, legal, and regulatory framework for cross-border energy trade.

It identified, assessed, and promoted four of the five cross-border energy trade and investment projects between India and its neighbouring countries.

The program also supported bilateral energy projects in Afghanistan to encourage power imports from Central Asia to Afghanistan and the long-term transit of energy to South Asia.

It spread awareness of best practices to promote environmentally sound and sustainable energy systems.

### Phase III (2007–2012)

The activities in the third phase focused on enhancing regional energy security through mutual Co-operation and was marked by several tangible accomplishments.

Cross-border energy trade has been significantly advanced by a series of technical assistance activities for the development of transmission infrastructure.

The regional energy market formation was supported through programs that helped energy planners and policymakers in understanding the key energy market trends, latest modelling techniques, and ways to hedge risk.

**Figure 2: Phase-wise historic activities of SARI/EI**

# Current Scenario Cross-Border Electricity Trade (CBET)

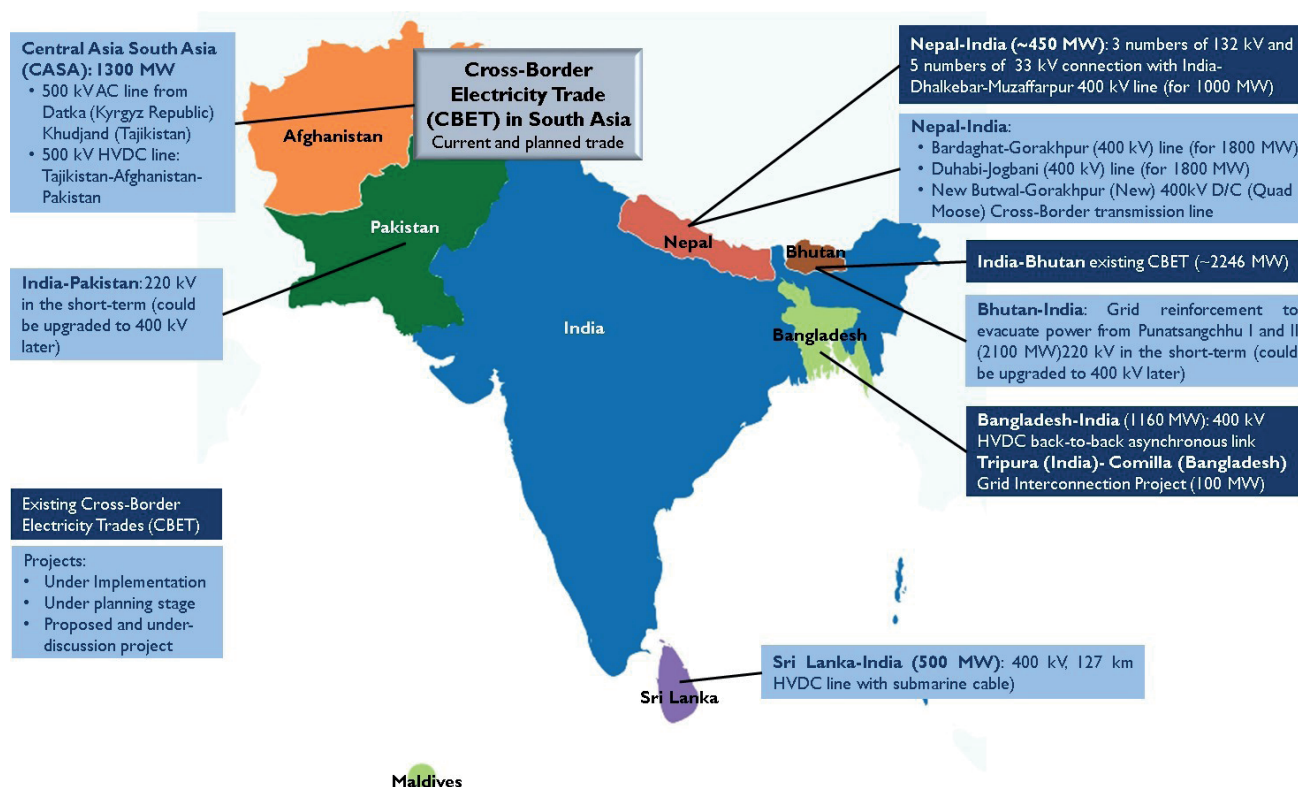


Figure 3: Current Scenario of Cross-Border Electricity Trade (CBET) in South Asia region

## SARI/EI Stakeholder Engagement (2012-18)

Over the past six years, SARI/EI organised 83 events and published 30 reports (refer Figure 4) as part of its stakeholder engagement and guidance mandate. These regular interventions during the last half decade has resulted in successfully engaging more than 2000 stakeholders across various institutions, including government, diplomats, international financial institutions (IFIs), and think tanks/research institutions.

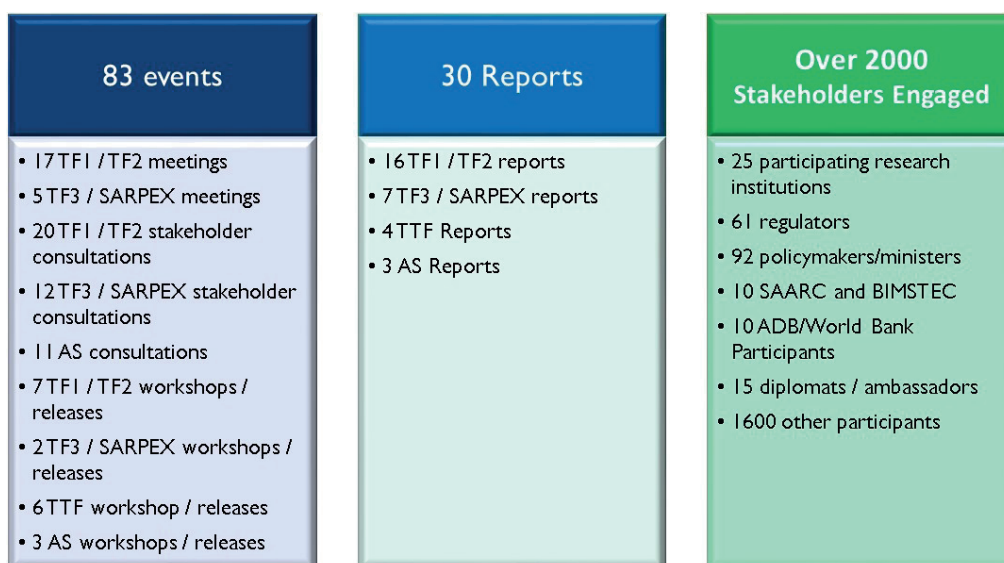


Figure 4: SARI/EI Stakeholder Engagement (2012-18)

AS: Analytical Studies

SARPEX: South Asia Regional Power Exchange

TF: Task Force

TTF: Think Tank Forum



## SARI/EI Achievements (2012-18)

The three task forces took up demand-driven studies with tangible outcomes such as Regional Regulatory Guidelines (RRG) for Promoting CBET in South Asia, Suggested Changes/Amendments in Electricity Laws, Regulation and Policies, Grid Code provision required for facilitating CBET, Model Power Purchase Agreements (PPAs) & Transmission Service Agreements (TSAs), Framework guidelines on Trading License and Market Design & Rules for South Asia Regional Power Exchange (SARPEX), Power Pricing Mechanism in South Asia, etc. (refer Figure 5)

In all, 29 members from South Asian countries worked together in a highly consultative and participatory manner over the last six years and have taken steps to advance CBET in the region. The SARI Secretariat also worked with South Asian Association for Regional Cooperation (SAARC), South Asia Forum of Infrastructure Regulation (SAFIR), and Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).

Key Outputs	Intended Results
Regional Regulatory Guidelines (RRG) for CBET	<ul style="list-style-type: none"> <li>• Harmonized regulatory framework for CBET</li> </ul>
Amendments in Electricity Laws, Policies	<ul style="list-style-type: none"> <li>• Remove legal, policy barriers for CBET</li> </ul>
Harmonization of Grid Codes and standards	<ul style="list-style-type: none"> <li>• Uniform technical standards, transmission planning; integrated South Asia power grid operation</li> </ul>
Macro Economic Benefits of CBET	<ul style="list-style-type: none"> <li>• Build consensus for accelerating CBET</li> </ul>
Gains from multilateral Electricity trade	<ul style="list-style-type: none"> <li>• Promote multilateral Cross Border Electricity Trade</li> </ul>
South Asia Power Exchange Mock Exercise	<ul style="list-style-type: none"> <li>• Demonstrate case for day-ahead power trade, market design and rules</li> </ul>
CBET Impact on livelihoods, gender (Nepal, Bhutan) Implementation of NDCs, Collaboration among SAARC think tanks	<ul style="list-style-type: none"> <li>• Support CBET expansion by demonstrating its multi-dimensional benefits</li> <li>• South Asia Think Tank Forum</li> </ul>
White Paper on South Asia Forum of Electricity Regulators (SAFER)	<ul style="list-style-type: none"> <li>• Institutionalization of Regulatory Forum, Working Group for Regulatory Harmonization</li> </ul>
Transmission Pricing and tariff mechanisms	<ul style="list-style-type: none"> <li>• Facilitate power trade and tariff harmonization</li> </ul>
Framework on non-discriminatory open access in transmission	<ul style="list-style-type: none"> <li>• Create condition for open access – essential to regional market development</li> </ul>
BIMSTEC Energy Outlook	<ul style="list-style-type: none"> <li>• Promote BIMSTEC Cross border power trade; linking South Asia with South East Asia power system</li> </ul>
Regional investment Framework and Policy Guidelines on Cross border power projects	<ul style="list-style-type: none"> <li>• Create conducive environment for investment in cross border power projects</li> </ul>

Figure 5: Key Outputs and Intended Results of SARI/EI Program (2012-2018)

The efforts of SARI/EI have paved the way for several transformational changes over the last six years. The BBIN region is better integrated with more interconnections developed between India and Bangladesh, as well as India and Nepal. Additionally, countries of South Asia and BIMSTEC countries in South East Asia are adopting changes in their National policies and regulations as well as in their planning process to facilitate CBET. Several key intra-country regional frameworks have also been adopted to support power trade in the region. Actual trade of power in the region has gone up significantly in last six years, which has also given co-benefits of Green House Gas (GHG) emission reductions at a regional level (refer Figure 6).

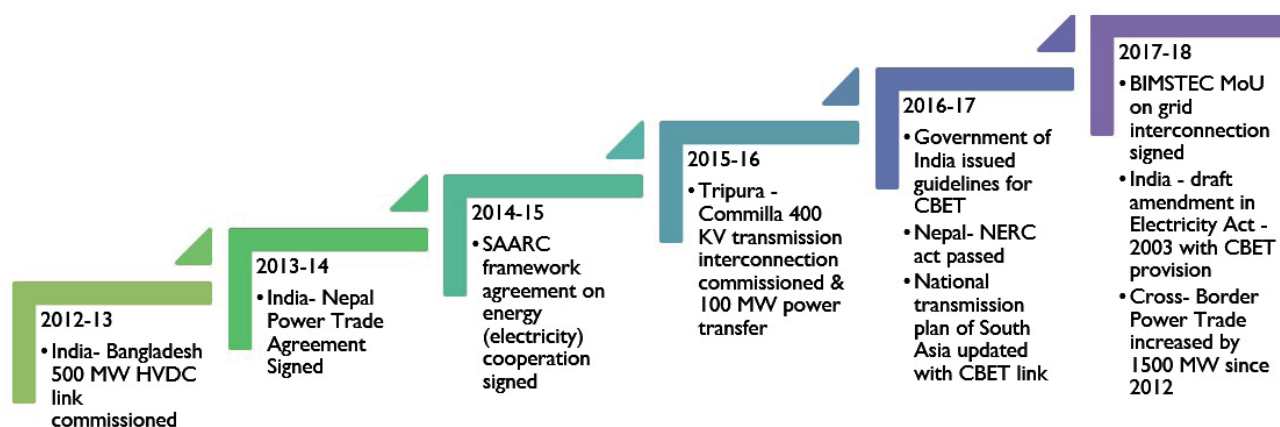


Figure 6: Key Impacts of SARI/EI Program (2012-18)

## Formation of SARPEX

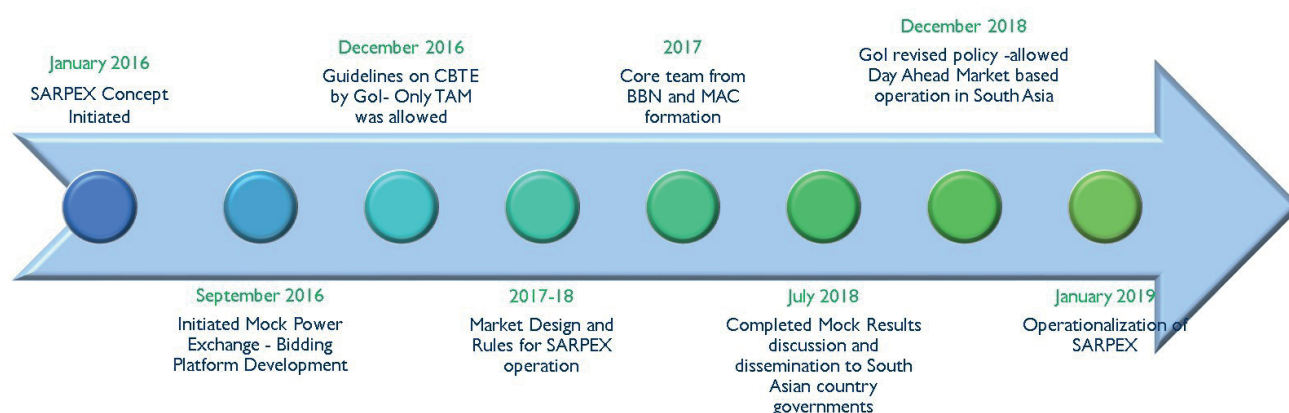


Figure 7: Timeline depicting formation of SARPEX

## Extension of SARI/EI Phase IV (2018-2022)

USAID extended the SARI/EI program, implemented by IRADE, for another four years, from 2018 to 2022. This was announced by the US Ambassador during the “SARI/EI Regional Conference on Enhancing Energy Cooperation (EC) and Integration in South Asia” held on August 30-31, 2018 at New Delhi, India. This allowed for continuation of the work undertaken as part of SARI/EI (Phase IV of SARI/E).

During this extended period, SARI/EI will work with energy experts, government departments and ministries, diplomats, regulators, think tanks, businesses, academicians, Regional Institutions (SAARC, BIMSTEC, SAFIR), Multilateral Development Banks (MDBs), Financial Institutions, Industry bodies, and other agencies to promote enhanced energy integration and Cross-Border Electricity Trade in South Asian Countries (SACs) and South East Asia (BIMSTEC region). The extended phase of SARI/EI project will focus on the following activities (refer Figure 8).



### **Harmonization of Policy, Legal and Regulatory Issues (TF1)**

- Focus on Institutionalizing regional regulatory institution to promote Cross Border Electricity Trade (CBET) including Trilateral and Multilateral Power Trade
- Focus on Developing Regional frameworks and guidelines for CBET including Multilateral Trade
- Develop a detailed roadmap for effective energy cooperation by identifying specific regulatory interventions needed.

### **Advancing transmission system interconnection (TF2)**

- Institutionalize regional institution or forum of transmission utilities and system operators to support coordinated generation and transmission planning and uniform system
- Promote coordinated Transmission Planning and Investments
- Developing Regional frameworks and guidelines for CBET including Multilateral Trade

### **Establishing South Asian Regional Electricity Market (TF3)**

- Focus on formation of South Asian Regional Energy Market (SAREM)
- Focus on operationalization of South Asian Regional Power Exchange (SARPEX) and facilitating participation of South Asian countries in Indian power exchange

### **Macro-analytical studies to support the potential of gas for regional energy**

- Assess potential of gas trade within the BBIN region
- Assess economic benefits of electricity trade between India and Myanmar
- Disseminate study results on India-Nepal, India-Bangladesh and BBIN Multilateral trade

### **Sharing of Knowledge and Capacity Building**

- Focus on sharing of knowledge and learning within South Asia on Renewables Energy Development
- Energy efficiency, integration of RE into the power system.
- Training and Workshops on new and advanced technologies (e.g. energy storage, EV, etc.)

### **Engage private sector to promote investments in energy infrastructure in South Asia**

- Promote investments in regional energy projects and infrastructure through a “South Asia Joint working Groups or Forums for Regional Investment Facilitation”
- Facilitate regional or cross-border projects

### **Highlight power trade benefits through SARI/EI Think Tank Forum (TTF)**

- Identify new partners (from South-Asia, Thailand and Myanmar) for Think Tank Forum
- Policy advocacy for public understanding of domestic and regional policy dynamics of CBET
- Integration with Climate Change and Sustainable Development
- Linking to electricity access for livelihoods and gender mainstreaming

*Figure 8: SARI/EI Program Strategy for 2018 - 2022*

In 2019, SARI/EI is focusing on institutionalization of bodies and mechanisms that can give a boost to CBET. SARI/EI intends to support these institutions to implement activities and conduct region-wide studies that focus on the policy, legal, technical, regulatory and market related aspects to enable greater regional energy integration. The process also focuses on ongoing engagement with top level officials across the board to ensure sustenance of momentum throughout the journey. Refer Figure 10 for the outlined activities.

In next four years, SARI/EI will focus on institutionalization of bodies and mechanisms that can facilitate give a boost to CBET, in particular, trilateral and multilateral trading. SARI/EI intends to support these institutions to implement activities and conduct region-wide studies that focus on the technical, regulatory and market related aspects to enable greater regional integration. The program in 2019 will focus on establishing these association or forums, developing white papers on the structures and institutional structure, undertaking analysis and studies that will support in SARI/EI's overall agenda, supporting partner countries in establishing processes or systems that will facilitate regional power trade, engage media and civil society to build consensus around power trade, and engage top-level officials across the board to ensure sustenance of momentum throughout the journey. Refer Figure 9 for the outlined activities in the next four years.



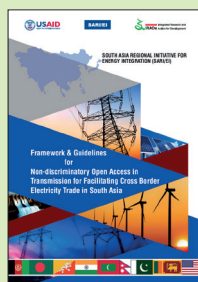
Figure 9: SARI/EI Activities Outlined for 2018 - 2022



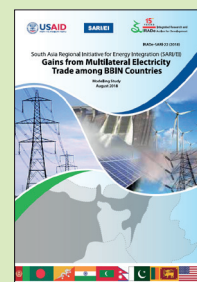
## Recently Published Reports (2018)



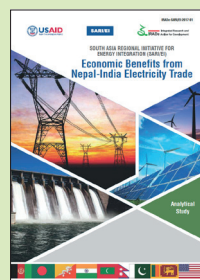
Enhancing Energy Cooperation and Integration in South Asia



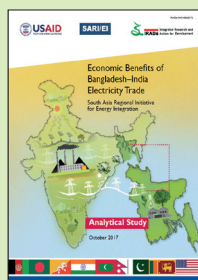
Framework & Guidelines for Non-discriminatory Open Access in Transmission for Facilitating Cross Border Electricity Trade in South Asia



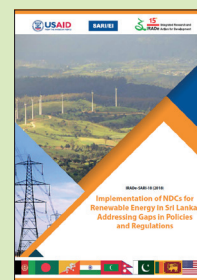
Gains from Multilateral Electricity Trade among BBIN Country



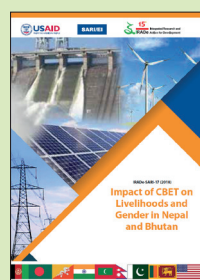
Economic Benefits of Nepal-India Electricity Trade



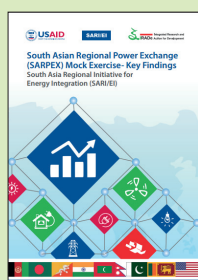
Economic Benefits of Bangladesh-India Electricity Trade



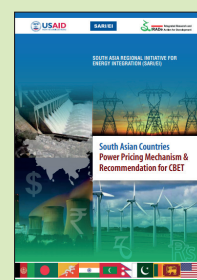
Implementation of NDCs for Renewable Energy in Sri Lanka: Addressing Gaps in Policies and Regulations



Impact of CBET on Livelihoods and Gender in Nepal and Bhutan



South Asian Regional Power Exchange (SARPEX) Mock Exercise-Key Findings



South Asian Countries Power Pricing Mechanism & Recommendation for CBET

## Key Reports published earlier (2012-18)

- Regional Regulatory Guidelines (RRGs) for Promoting Cross-Border Electricity Trade in South Asia
- Suggested Changes/ Amendments in Electricity Laws, Regulations and Policies of South Asian Countries for Promoting Cross Border Electricity Trade in South Asia Region
- Regional Investment Framework and Guidelines for Promoting Investment in Power Sector in South Asian Power Sector and in Cross Border Electricity Trade in South Asia Region
- Regional Energy/Electricity Regulatory Institutional Mechanism in South Asia: South Asia Forum of Electricity/Energy Regulators (SAFER)
- Model Framework for Trading Licence Regime and Guidelines for grant of trading licence to facilitate CBET in South Asia Region
- Model Framework for non-discriminatory Open Access regime in transmission and Guidelines for grant of Open Access to initiate power Trading and facilitate CBET in South Asian Countries.
- Harmonization of Grid Codes, Operating Procedures and Standards to Facilitate Cross-Border Electricity Trade in South Asia
- Assessment of Commercial Terms and Conditions for CBET and Suggested Model of Power Exchange in South Asian Region
- Assessment of the Trading Potential
- Model Power Purchase Agreement (PPA)
- Model Transmission Service Agreement (TSA)
- South Asian Regional Power Exchange - Market Design and Rules
- BIMSTEC Energy Outlook 2030
- Assessment of Socio-economic Impacts of CBET in Bangladesh
- Linking South Asia with Burma & Southeast Asia to Advance Cross Border Electricity Trade: A Political Economy Study
- Potential for Power Trade in Western Part of South Asia: Techno-Economic Rationale

# Key Engagements



SARI/EI Regional conference on Enhancing Energy Cooperation and Integration in South Asia  
30 -31 August 2018, New Delhi, India



6th SARI/EI Project Steering Committee Meeting  
08-09 March 2018  
Colombo, Sri Lanka



Regional Dialogue "Cross Border Energy Co-operation in Bay Of Bengal Region"  
19 January 2018, New Delhi, India



Report release workshop on "Economic Benefits of Bangladesh – India Power Trade"  
11 January 2018, New Delhi, India



SARI/EI participation, HAPUA-ASEAN-UNESCAP Workshop  
17-19 April 2017  
Jakarta Indonesia



SARPEX Capacity Building Workshop  
07-09 February 2017  
New Delhi, India

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