



# South Asia Regional Initiative for Energy Integration

(SARI/EI)

## Background, Prospects, and Retrospect

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Thimphu, India

**SARI/EI**



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## SARI/EI Regional Activities



**Import Electricity From Central Asia to South Asia (CA-SA)**

- Regional-level activities include:**
- Regional Center of Excellence (COE) for Lighting (RCL)
  - Regional CoE for Micro Hydro
  - Reg. COE for Women In Energy - WISER

- AFGHANISTAN**
- Import Electricity to Afghanistan
  - Capacity Building for Afghans
  - CASA

- PAKISTAN**
- CASA Advisory Services

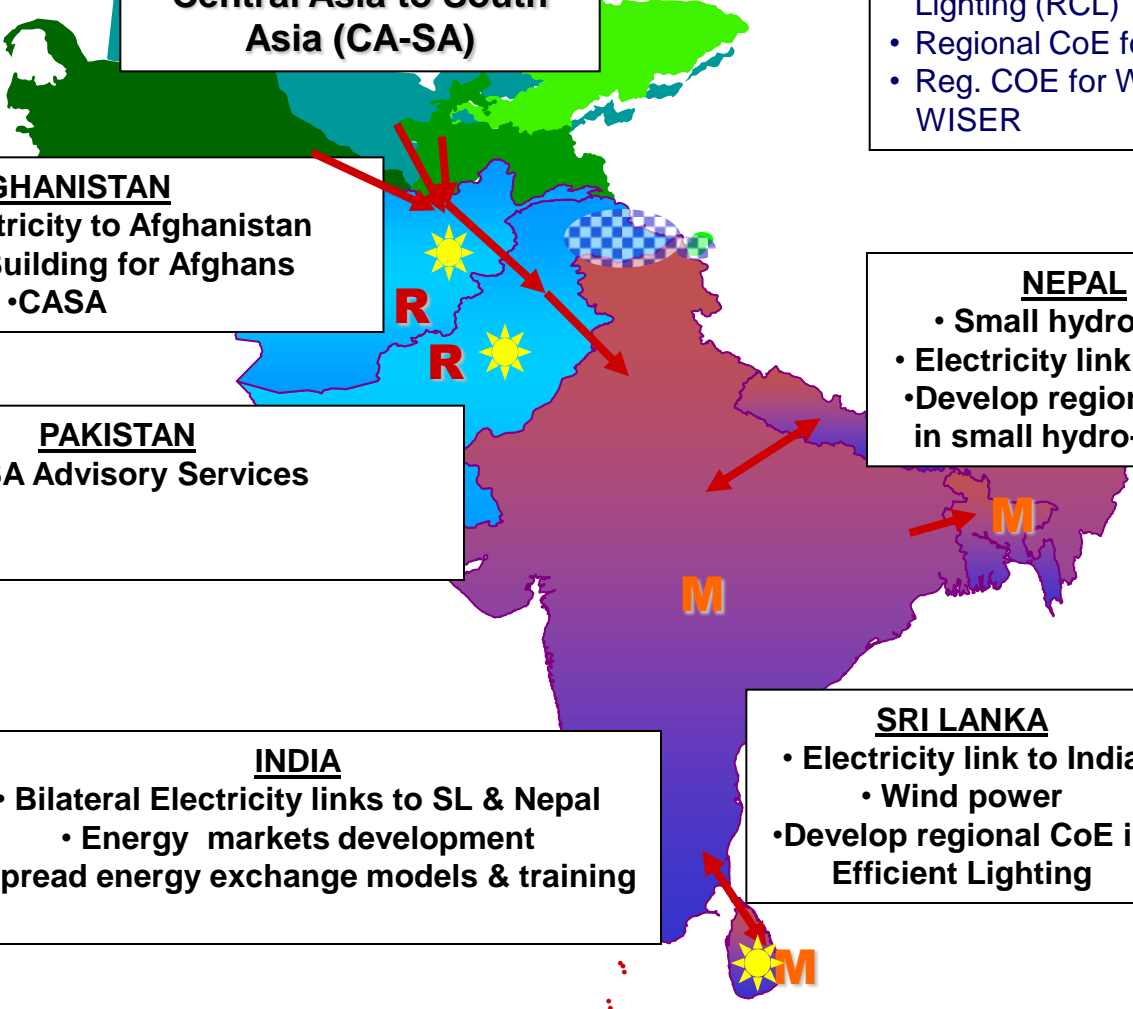
- NEPAL**
- Small hydro fund
  - Electricity link to India
  - Develop regional CoE in small hydro-power

- BANGLADESH**
- Electricity link to India

- INDIA**
- Bilateral Electricity links to SL & Nepal
  - Energy markets development
  - Spread energy exchange models & training

- SRI LANKA**
- Electricity link to India
  - Wind power
  - Develop regional CoE in Efficient Lighting

- M** = replicating models
- = wind & solar work
- = cross-border trade
- R** = rural electrification





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## SARI/E Participating Countries



SARI/E I Objective FY 2008 – 2011  
**PROMOTE ENERGY SECURITY**

### SARI/E Activity Areas

- 1. Cross Border Energy Trade**  
infrastructure interconnections
- 2. Energy Markets Formulation**  
precursor and full mechanisms for transparent trade practices
- 3. Clean Energy Access** efficiency, conservation, and renewable sources
- 4. Afghanistan Power Sector Capacity Building**



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## Twelve Key Cross Border Infrastructure Activities in the last Phase

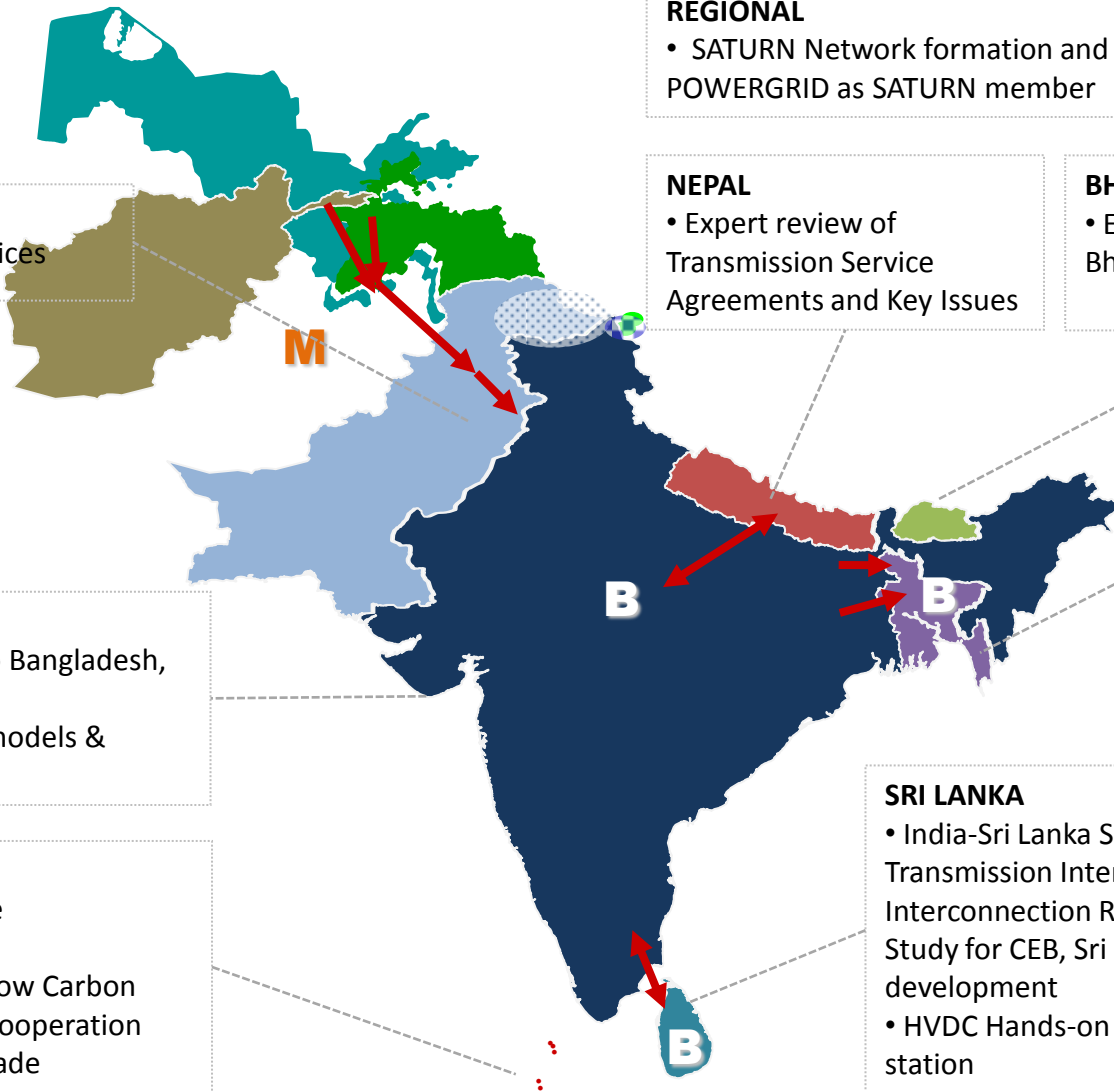


**B** = Bilateral trade  
**M** = Multi-lateral trade

**PAKISTAN**  
• CASA 1000 Advisory Services

**INDIA**  
• Bilateral Electricity links to Bangladesh, Sri Lanka and Nepal  
• Spread energy exchange models & training

**MALDIVES**  
• Maldives Submarine Cable Interconnection Study  
• Workshop on Advancing Low Carbon Growth Through Regional Cooperation and Cross-Border Energy Trade



**REGIONAL**  
• SATURN Network formation and Induction of POWERGRID as SATURN member

**NEPAL**  
• Expert review of Transmission Service Agreements and Key Issues

**BHUTAN**  
• Executive Exchange to Bhutan Power Corp.

**BANGLADESH**  
• HVDC training at PGCIL sub-station  
• Senior Level Exchange Program to Indian Energy Exchange, PTC and CERC

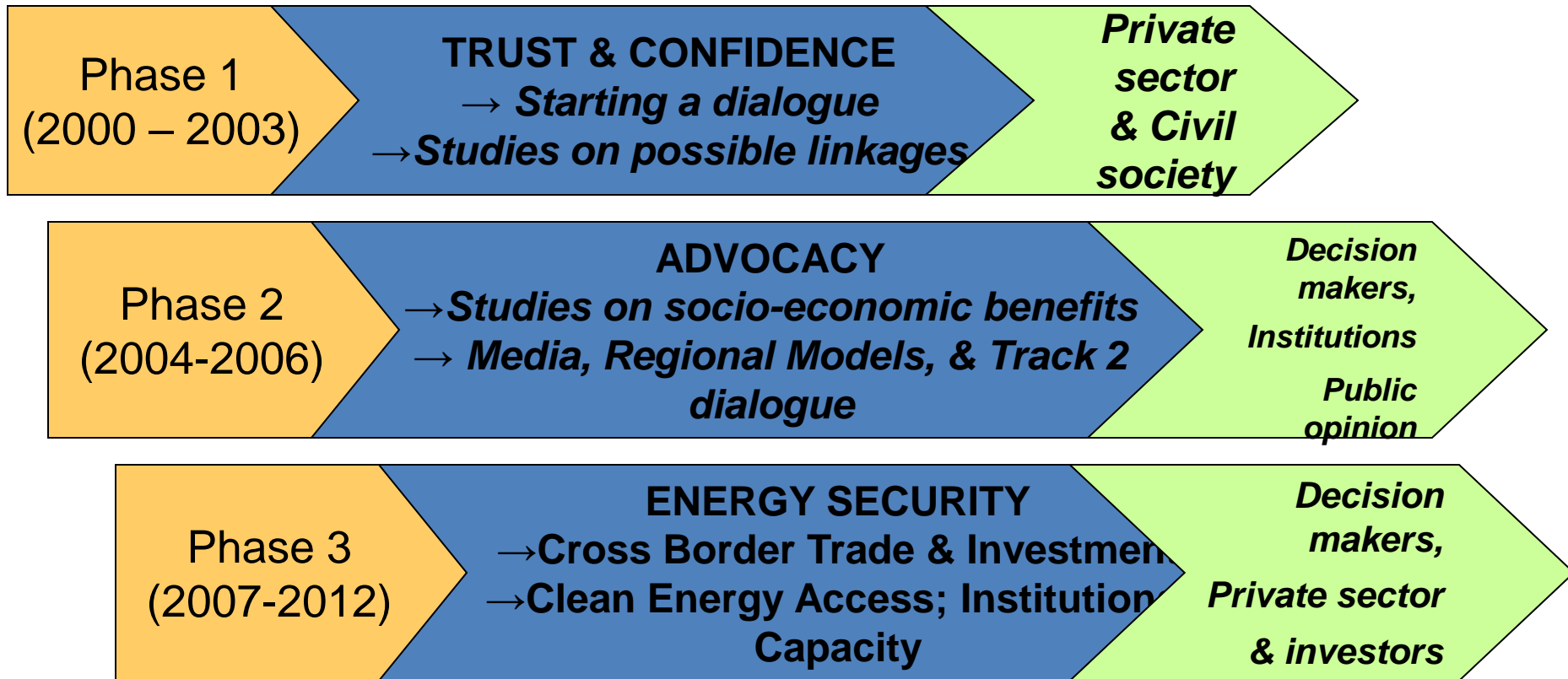
**SRI LANKA**  
• India-Sri Lanka Submarine Power Transmission Interconnection- Interconnection Reliability and Stability Study for CEB, Sri Lanka Wind power development  
• HVDC Hands-on training at PGCIL sub-station



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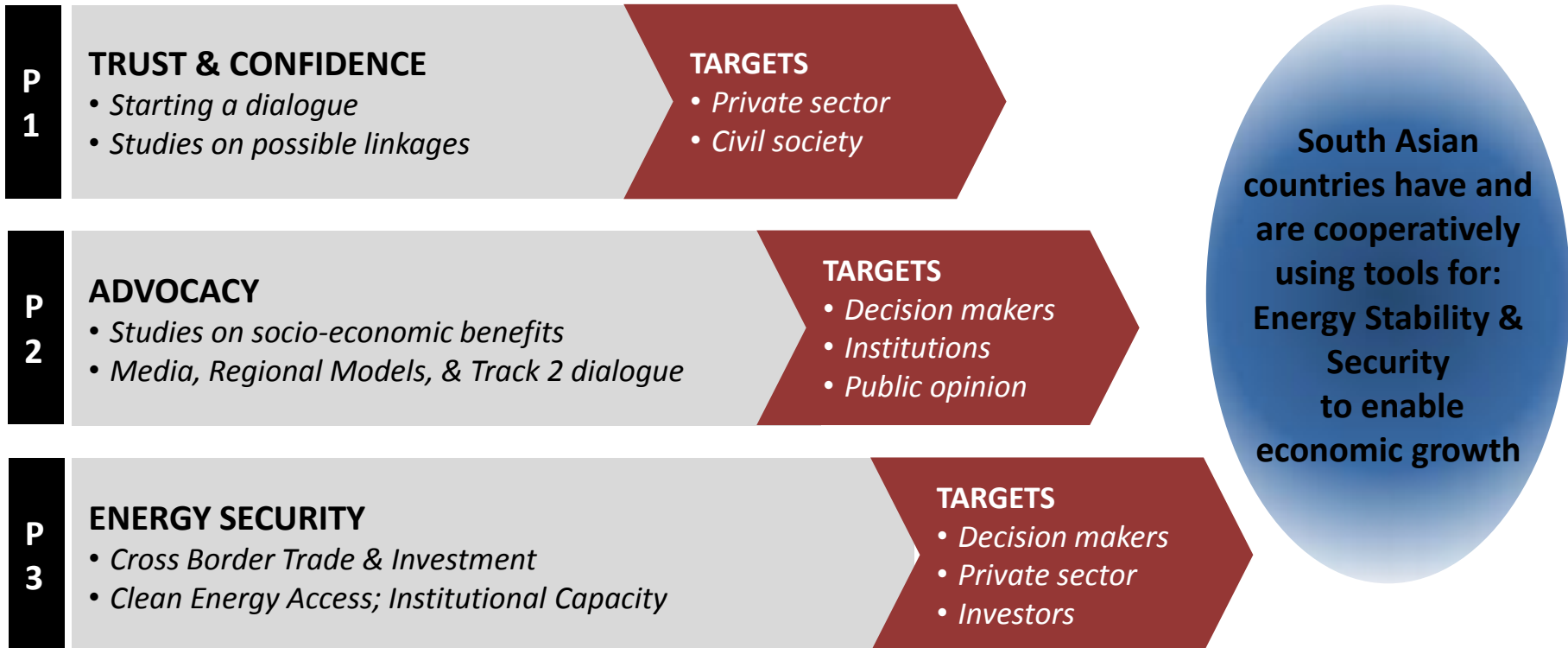
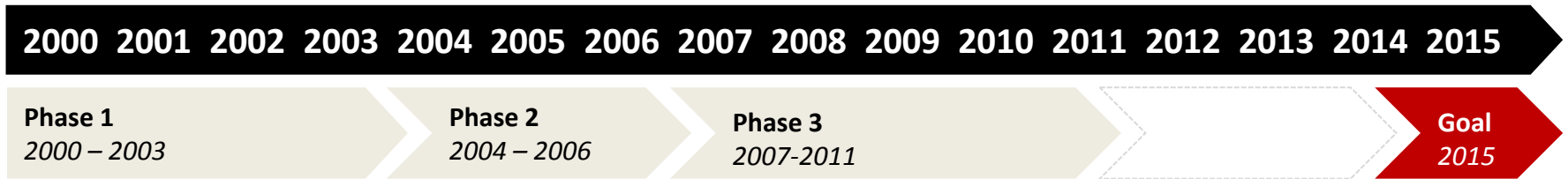
## Earlier Phases of SARI/EI

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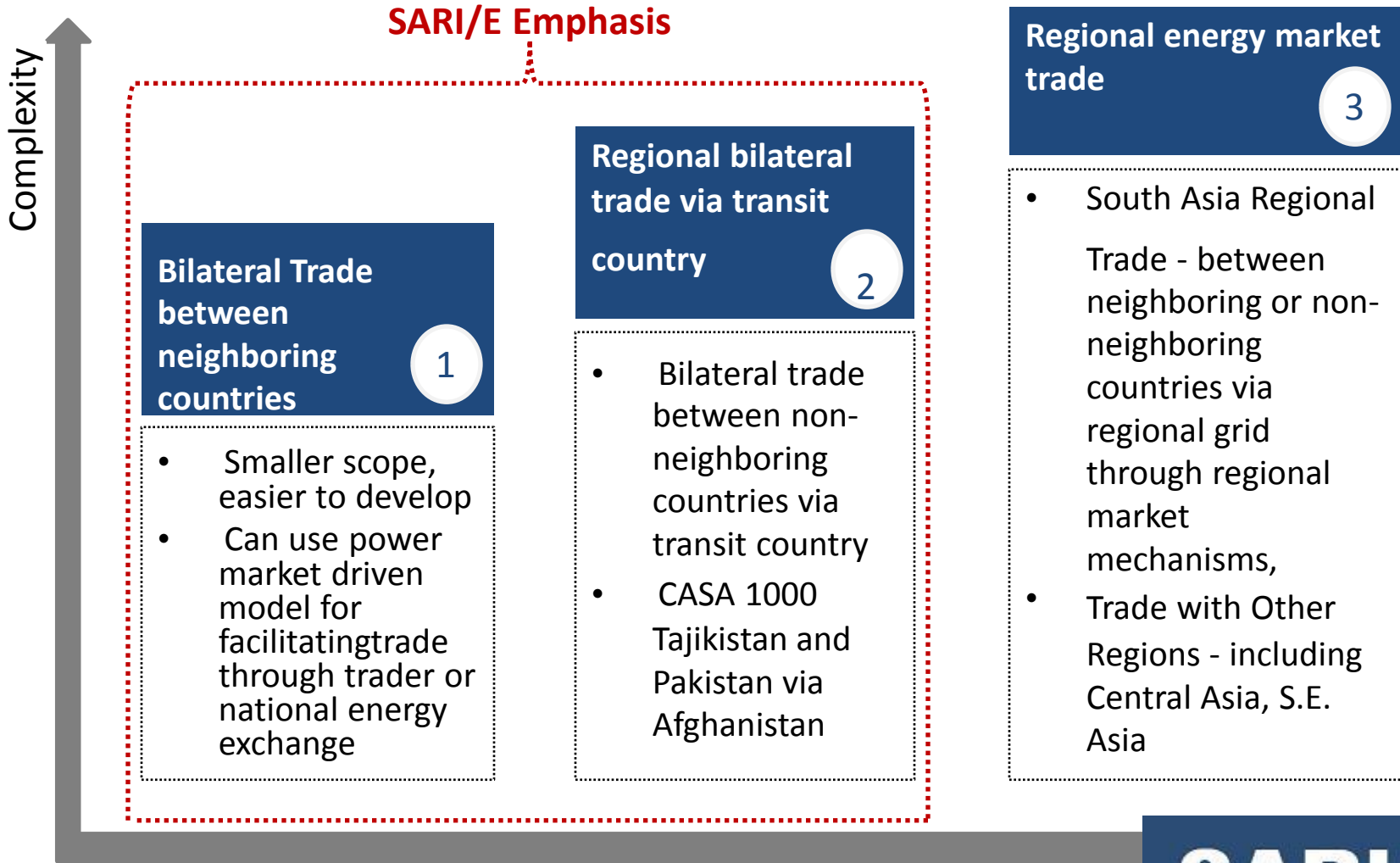
# SARI/Energy Reauthorization

FY12 – FY15





## We see three emerging interconnection business models under development...





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***....But number of “key ingredients” need to exist for energy trade***

- **The development of adequate transmission and generation infrastructure**
- **Establishment of protocols to ensure reliability and efficient scheduling**
- **Fair transmission pricing**
- **Developing long-term PPA**
- **Developing effective congestion management systems**
- **Open access and specification of transmission rights**
- **Settlement rights, allocation of risks and dispute resolution**
- **Timely and fair interconnection of new generation and demand resources**
- **Development of market structures that support efficient and mutually beneficial cross-border energy trade**

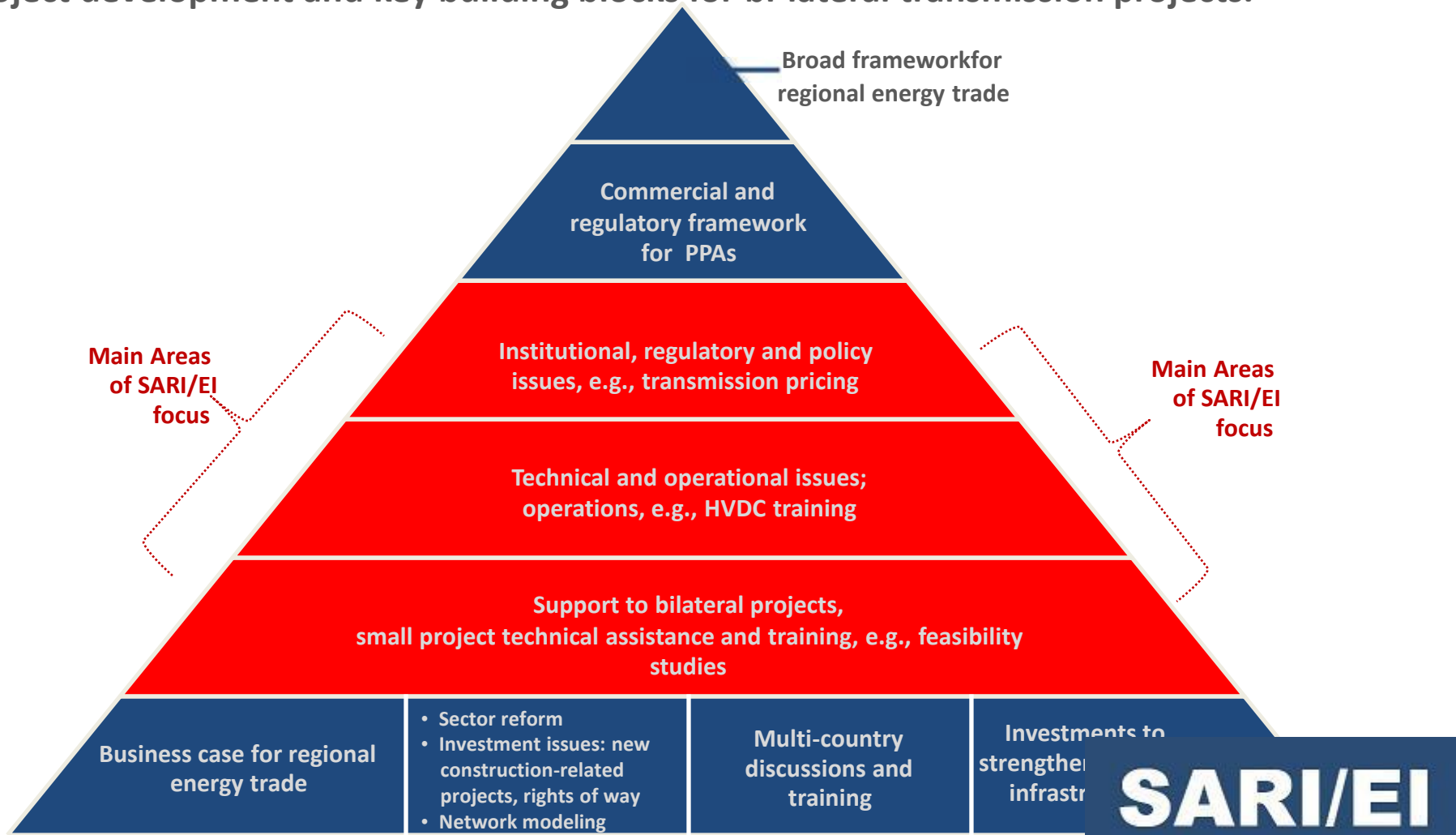




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# Our technical assistance framework stresses support to project stakeholders

Our program focuses on targeted assistance to key topics areas that supports project development and key building blocks for bi-lateral transmission projects.





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## SARI/EI Phase IV

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1. There are 2 Distinct Sub-Regions in South Asia

“SARI-East”

Bangladesh + Bhutan + India + Nepal + Sri Lanka

“SARI-West”

Afghanistan + Pakistan

and

2. The concept of a Regional Energy Grid across South Asia is being superseded by what we’ll call a “Virtual Energy Grid”



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## SARI/EI Phase IV

**SARI/EI**

- Commenced in Oct 2012 and will run till Sep 2017
- IRADe, a regional organization, is the implementing partner
- SARI/EI will try to facilitate the formation of Electricity Regulatory Assn. of South Asia
- Possibilities of collaboration between SARI/EI and SAARC Energy Center are being explored



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Our approach is customized to the needs of  
each country

- Early phases of SARI/E concentrated on a “top down” process focusing on bringing parties together and identifying a decision making frameworks for developing projects.
- Current SARI/E program focus is on a demand driven “bottom up” development paradigm specific for cross-border project development.
- The new phase has been renamed as South Asia Regional Initiative for Energy Integration (SARI/EI)
- IRADe, a regional institution has been selected as the implementing partner for this phase of the program
- SARI/EI will support a multi-stakeholder platform to convene, deliberate and provide recommendations in the following three areas:
  - Harmonization of policy, legal and regulatory issues*
  - Advancement of transmission systems interconnections, and;*
  - Establishment of South Asia regional electricity*

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Project Steering Committee

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- Project Steering Committee (PSC) is the apex body of the program and provides overall strategic directions.
- PSC members consist of
  - Senior level officials from the country governments
  - Representative of regional institutions like SAARC Energy Center
  - Representative of multilateral donor like ADB
  - Independent Energy Experts/Diplomats
- PSC held its first meeting in New Delhi on March 12, 2013
- In the meeting, the PSC members imparted a sense of direction to the program. They provided their inputs to the Terms of References of the Task Forces and agreed to build consensus about regional energy integration and cross-border energy trade in the region.



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## Task Forces

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- TF Activities form the heart of the program.
- TFs will act as the platforms for structured, concerted, and demand-driven discussion
- TF1 already formed, 1<sup>st</sup> meeting held in Dhaka last month
- TF1 and TF2 consist of representatives of country governments and power utilities
- Process to form Task Force 3 will be initiated soon



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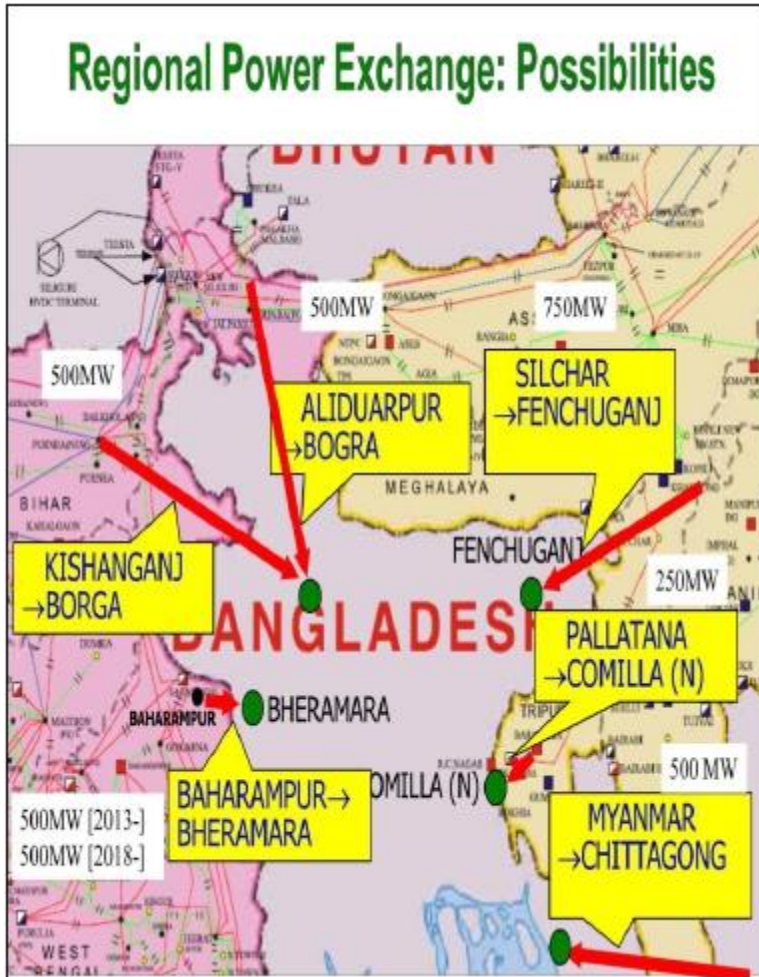
## Task Forces *(contd....)*

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- Needs for technical analysis, research, and studies will evolve during the course of the discussion in the TF meetings
- Those needs would be properly addressed by demand-driven research and analysis
- TF members will be helped to make informed recommendations



## Project



## Background

- Bangladesh: Generation capacity addition of 39000MW needed to meet demand by 2030
- Power System Master Plan (PSMP) recognizes cross border electricity trade as key to meeting future requirements
- Limited resources for electricity generation

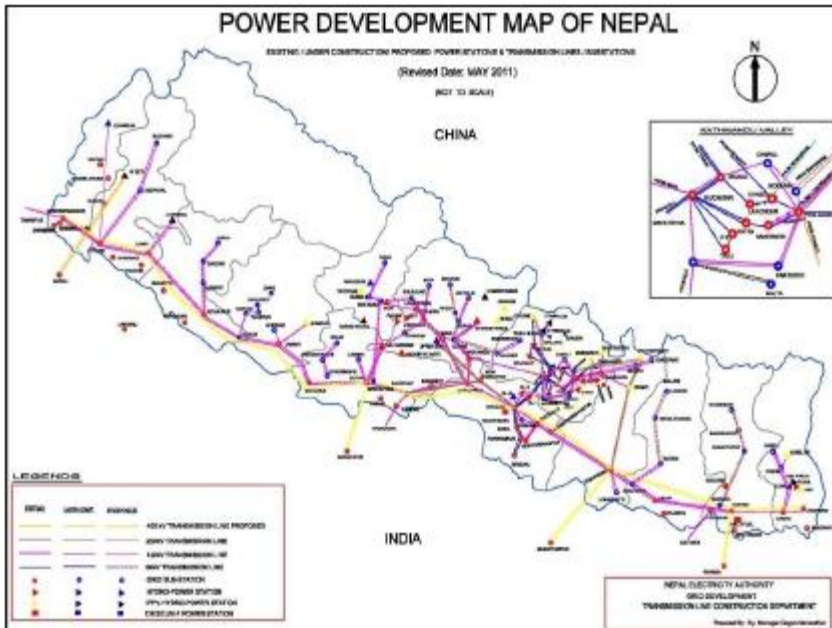
## Our Approach

- Study of current power situation and load forecast for future
- Identification of possible interconnections with neighboring countries within the SARI Region.
- Capacity building and creating awareness of the respective Country's Transmission





## Project



## Background

- Nepal: Demand for electricity will reach 2000MW in 2020
- Dependable supply is 340MW in dry season and 600MW in wet season. Large power shortage in dry season
- High dependence on hydro resources
- New generation projects constrained by limited evacuation capacity

## Our Approach

- Held technical workshops and consultations for Nepal Electricity Authority (NEA) to draft Implementation and Transmission Service Agreements (ITSA) for the upcoming Nepal-India Interconnection
- Facilitate interconnections between Nepal and India



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## Support to Central Asia – South Asia Transmission Interconnection (CASA 1000)



### Background

- Pakistan faces power deficit of 4,000MW to 5,000MW
- 65% of generation mix is thermal with 31% contributed by oil based generation
- High T&D losses and power sector debt of Rs. 300 billion
- Non-viability of generation projects crowding out existing and new IPPs

### Our Approach

- Review of electricity demand forecast study of NTDC
- Review of NTDC/PEPCO studies to assess upper and lower bounds of Power Purchase Price (PPP)
- Assess whether CASA 1000 project is in line with least cost expansion plan of Pakistan
- Assessment of marginal cost of generation system 'with' and 'without' CASA1000

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## Project



## Background

- Sri Lanka: Maximum demand of 1868 MW growing at 10% annually
- New generation avenues needed to meet future load growth
- Scope of further harnessing the hydro potential limited due to socio-environmental concerns
- Resources for thermal generation very limited

## Our Approach

- Review of existing studies to identify complimentary nature of load profile between India and Sri Lanka
- Identification of potential interconnections
- Identification of relevant technical issues affecting interconnection feasibility
- Estimation of cost-benefit of interconnections

Thank You!

