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

Theme Presentation
Plenary Session on
REGIONAL INTEGRATION AND ENERGY COOPERATION: SUCCESS THROUGH SYNERGY

6th SAARC CCI Business Leaders Conclave

16th - 18th March, 2018
Hotel Hyat, Kathmandu, Nepal

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Overview of South Asia Power Sector

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Overview of South Asia Power Sector

Pakistan
- Mid sized power system
- Gas and Oil dependent
- Proposed interconnection with Central Asia & Afghanistan

Afghanistan
- Small power system
- Proposed interconnection with Central Asia and Pakistan

Nepal
- Small power system
- Under utilized hydro potential
- Net importer now but potential to export in future

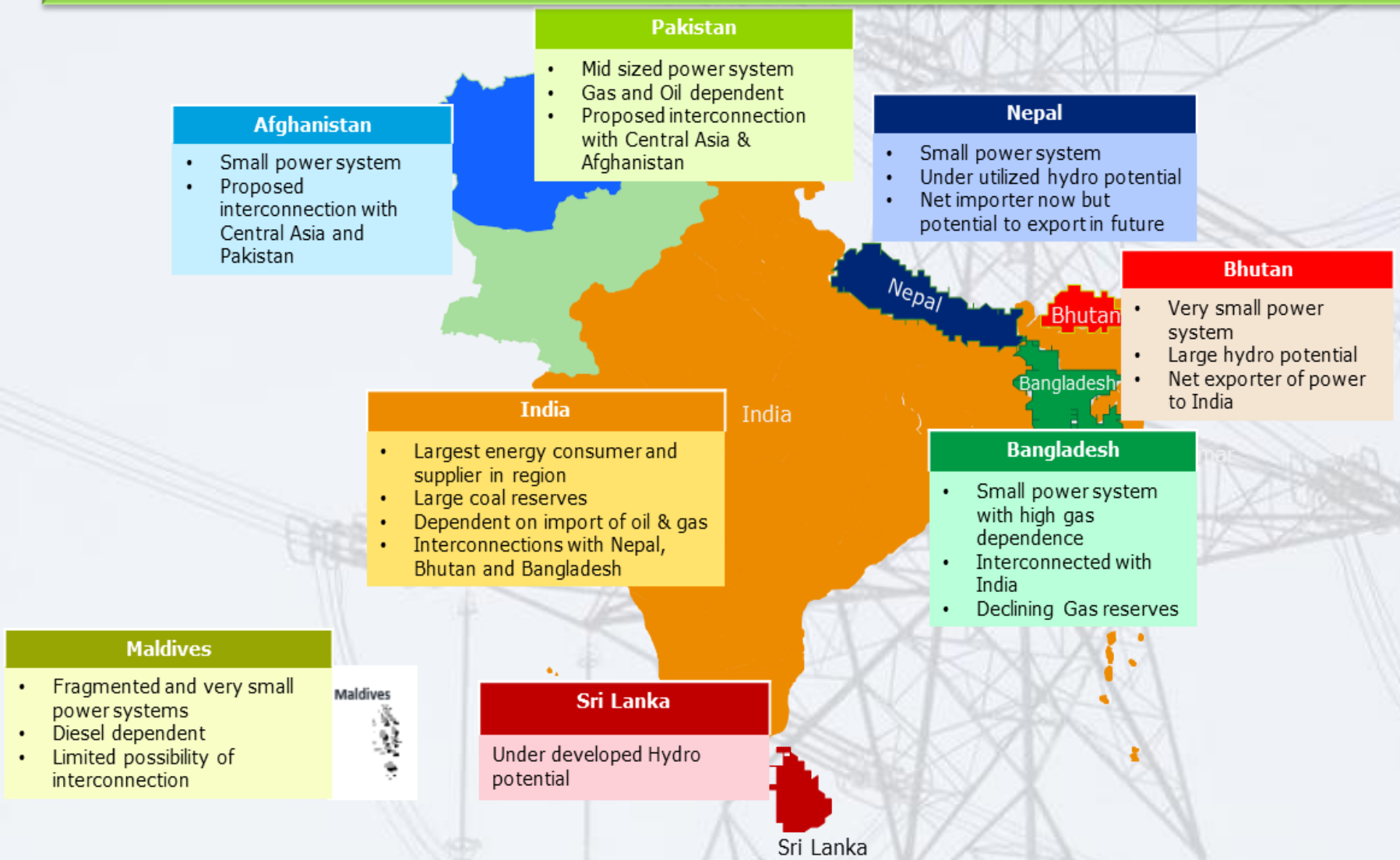
Bhutan
- Very small power system
- Large hydro potential
- Net exporter of power to India

India
- Largest energy consumer and supplier in region
- Large coal reserves
- Dependent on import of oil & gas
- Interconnections with Nepal, Bhutan and Bangladesh

Bangladesh
- Small power system with high gas dependence
- Interconnected with India
- Declining Gas reserves

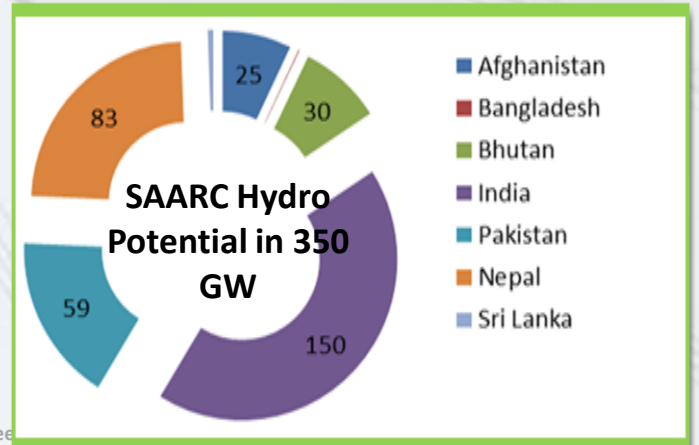
Maldives
- Fragmented and very small power systems
- Diesel dependent
- Limited possibility of interconnection

Sri Lanka
Under developed Hydro potential



Country	Installed Capacity (MW)
Afghanistan	1341
Bhutan	1,614
Bangladesh	16048
India	**334146**
Nepal	765
Sri Lanka	4050
Pakistan	24,829
Total	**382793**

Source : Compiled form various sources PGCB, DGPC,CEA,Annual Report NEA, Status of Industry Report NEPRA, Task Force 1 Report IRADe Report on CBET in South Asia: Challenges and investment oppoutinuties, etc.



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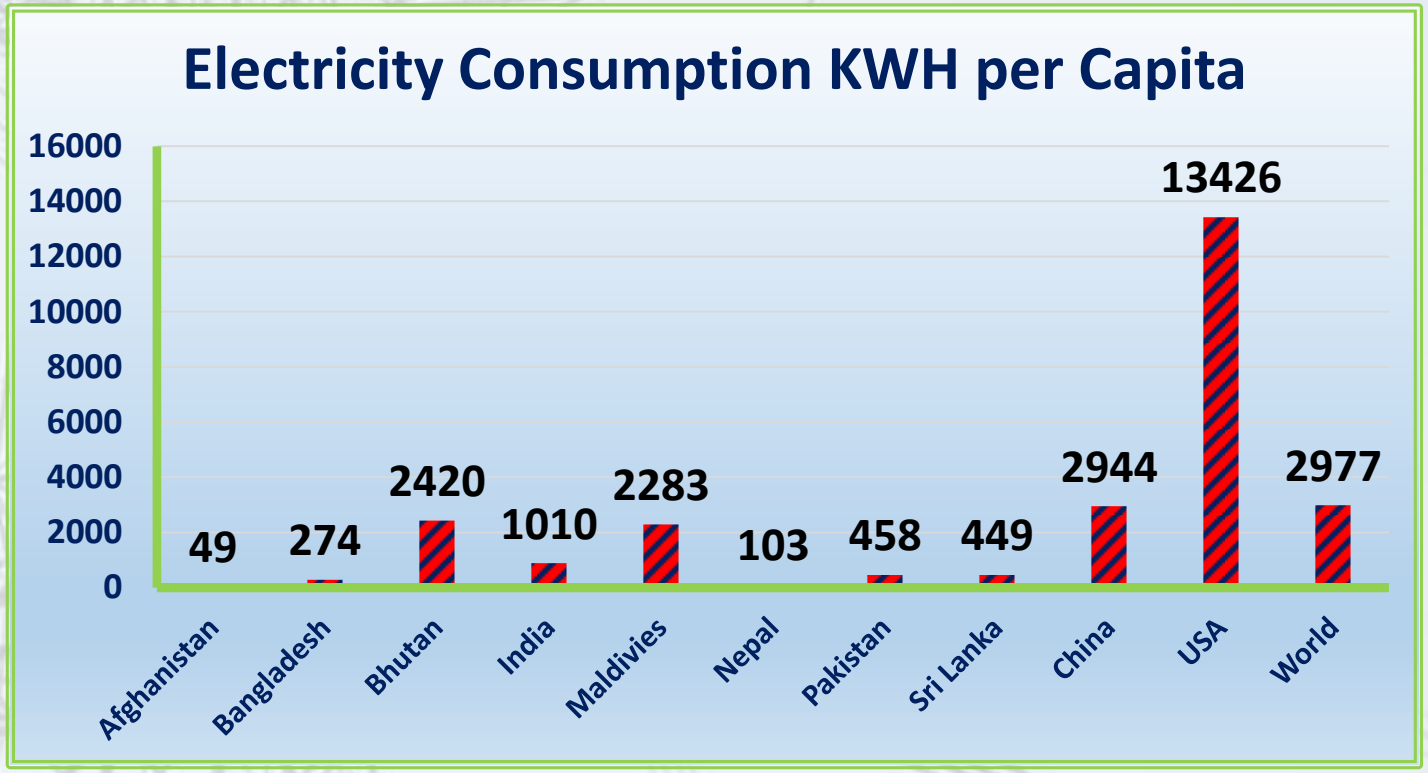
Per Capita Electricity Consumption, Access to electricity and Key Drivers for CBET

Country/ Region	Electricity Use kWh/capita/yr
SAARC	576
USA	13, 426
EU	6,592
BRAZIL	2,206
MALAYASIA	3,614
CHINA	2,944
WORLD	2,977

Source:SAARC Energy Centre



Key Drivers for CBET

- ✓ Energy and Peak Shortages.
- ✓ Low per Capita electricity consumptions
- ✓ Poor access to electricity.
- ✓ Resource Crunch (In Bangladesh)

- ✓ Optimal utilization of energy resources.
- ✓ Availability of Prices on Market Based.
- ✓ Enhancing Liquidity
- ✓ Economic benefits.

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Energy Cooperation in South Asia

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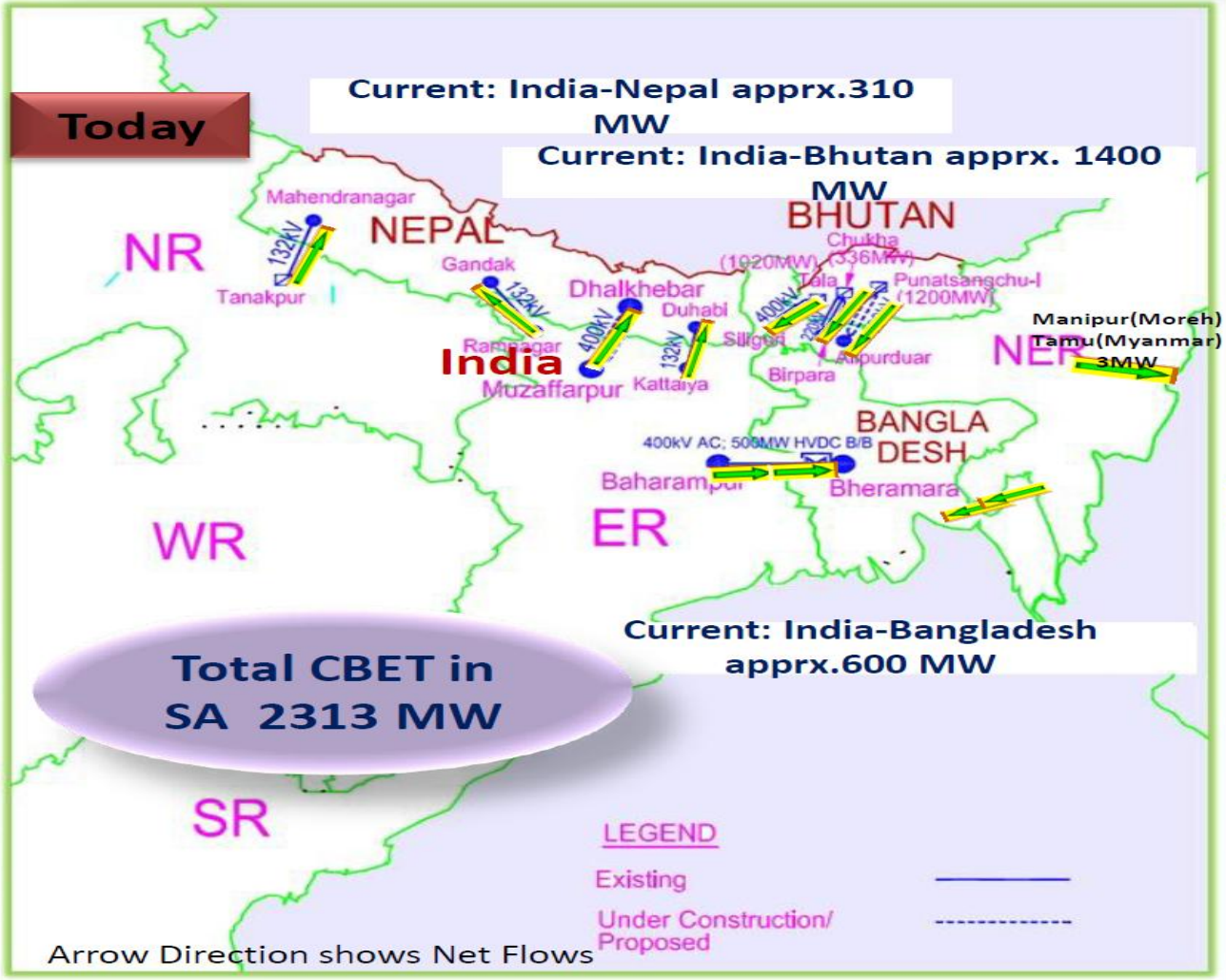
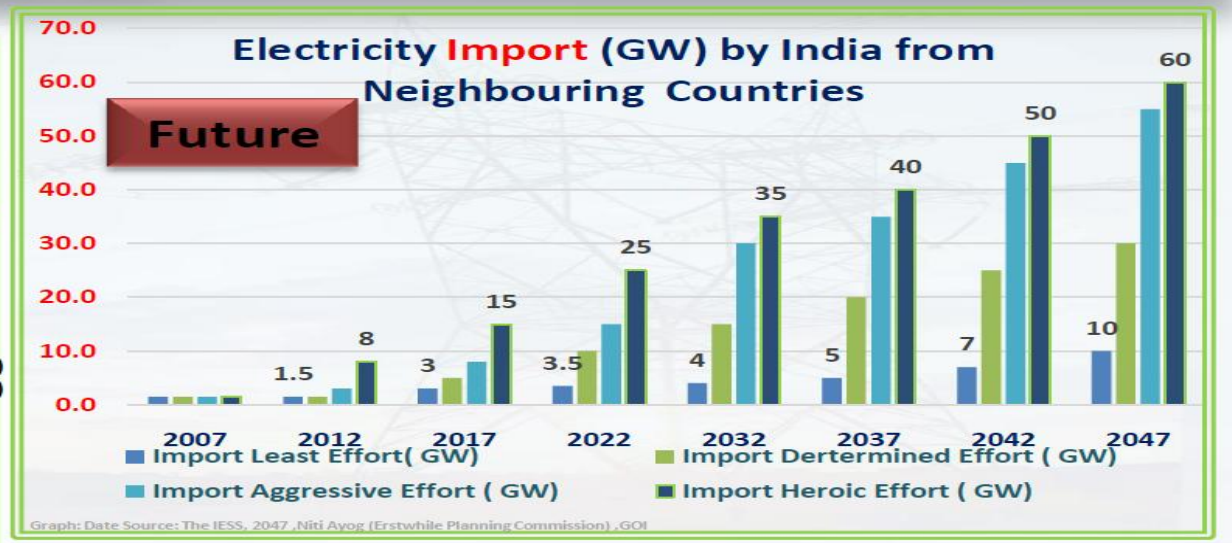
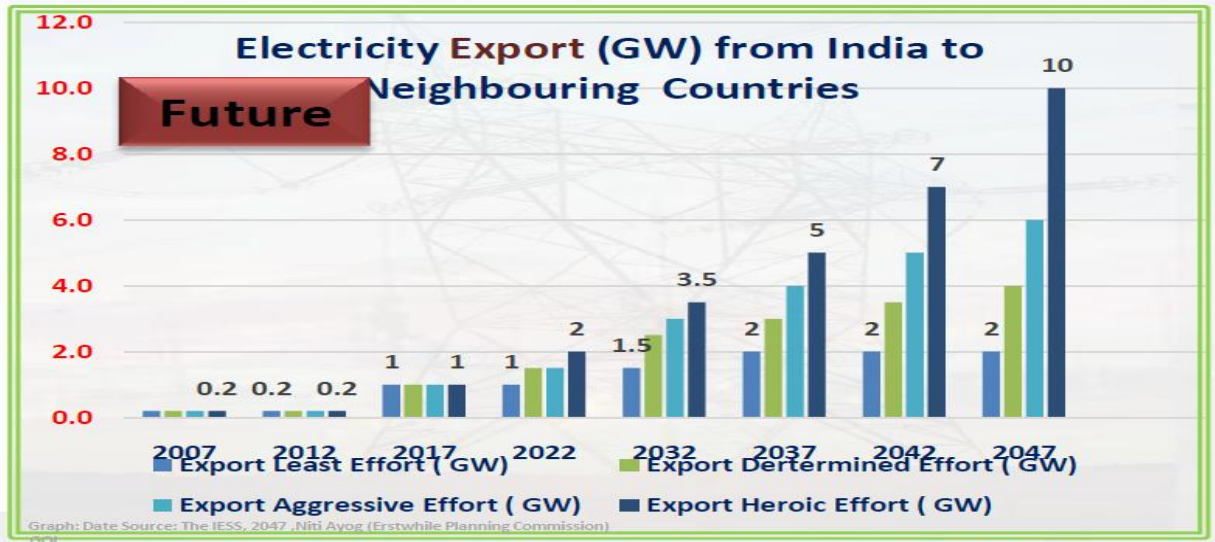
Current Status of Cross Border Electricity Trade (CBET) and Future Trading Scenarios







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Experience and Lessons from existing Cross Border Electricity Trade in South Asia: Benefits of Power Trade

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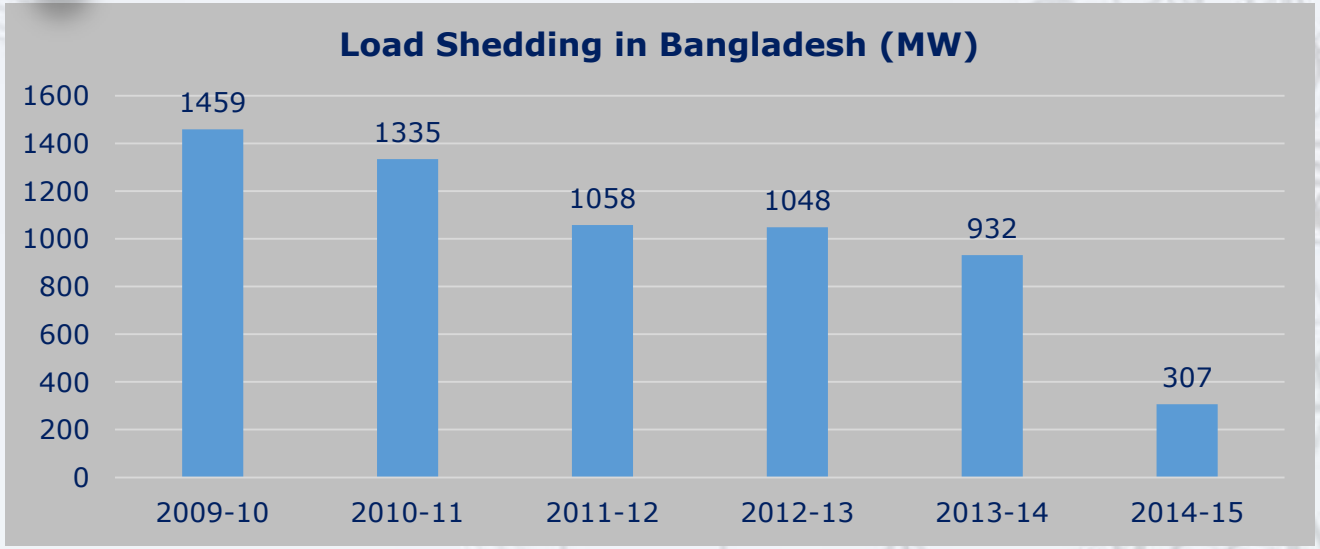
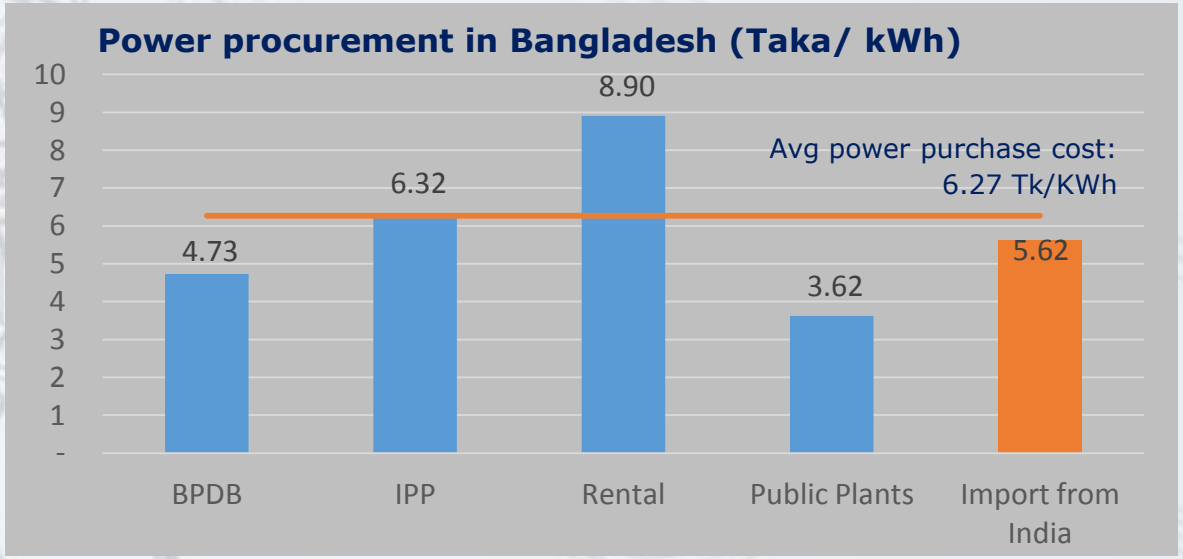
Benefits of India-Bangladesh Power Trade

CBET has immensely benefited India and Bangladesh

- Reduced load shedding since import from India started in 2013.
- Reduction in power purchase cost leading to substantial savings due to cheaper tariff from India
- Future possibility to have access to cheaper and clean hydropower from Bhutan and Nepal
- The estimated savings from the energy transfer would be around USD 500 Million per year (Shahi 2014)
- India also benefits from Optimization of Generation assets and earning export revenue.





Source: BPDB Annual Report, 2015

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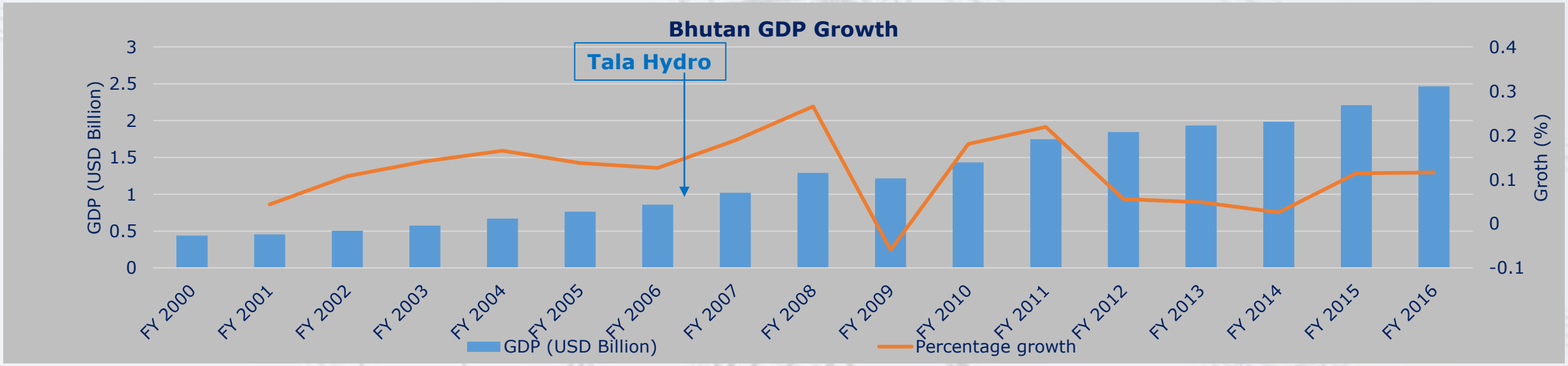
Benefits of India-Bhutan Power Trade

- Bhutan has huge hydro potential but it has limited demand. The cross border electricity trade has provided Bhutan an access to growing Indian power market.
- Since 2003, hydro power development has immensely helped Bhutan's GDP to grow and its electricity export to India is growing. Hydropower exports contribute ~ 40% to Bhutan's revenue and 25% of its GDP.
- The energy sales within Bhutan has become three times over past one decade and has also led to development of energy intensive industries like cement, Iron and Steel, Carbide, etc.



Source: IMF Estimates, BMA Report

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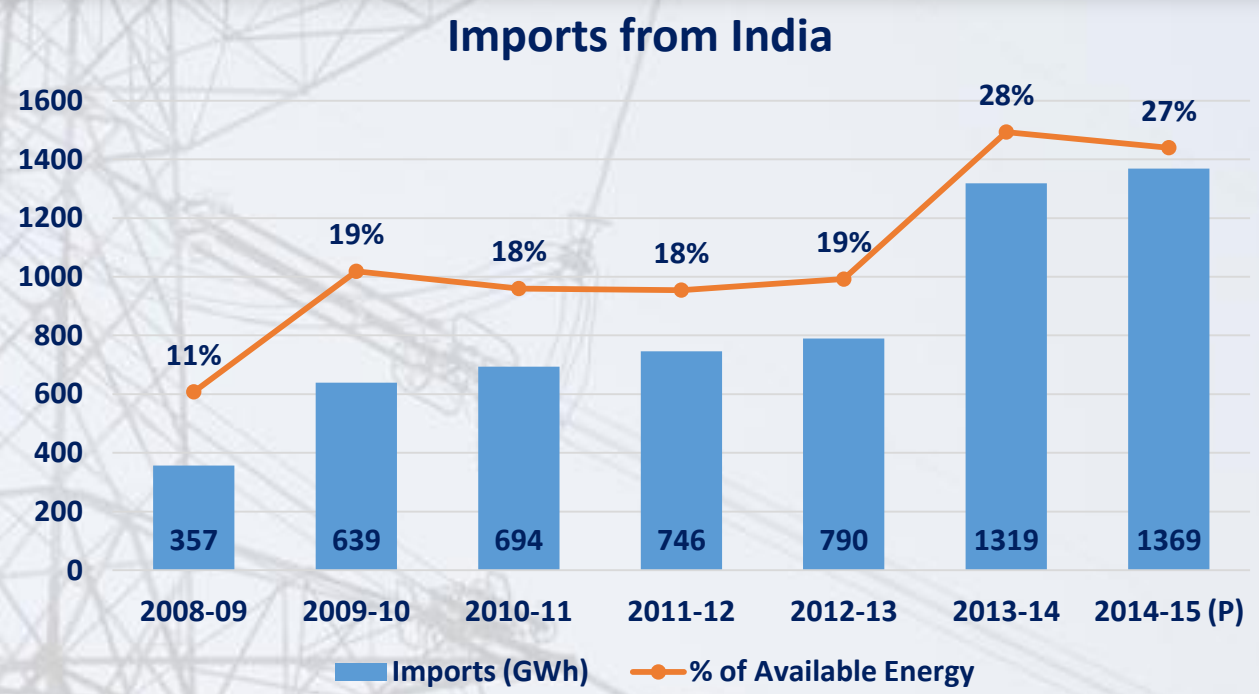
Benefits of India-Nepal Power Trade

- Indo-Nepal power exchange began in 1971 with exchange of 5 MW of power.
- Currently, the power trade is in the range of 150-500 MW. Has helped in reducing load shedding and saving in purchase cost to Nepal.
- Imports from India has been rising due to delays in domestic capacity additions in Nepal
- As per USAID/SARI/EI study, with accelerated power trade scenario between India and Nepal, Nepal's GDP could reach NPR 13,100 billion (over US$120 billion) in 2045, which is 39 percent more than with existing trading mechanisms.



Nepal will continue to be a net importer of energy in the short term, specifically during the dry season (winter months).

The power trading opportunities and option to sell to India will improve with the commissioning of domestic hydropower projects in Nepal

Source: NEA Annual Report

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Potential Benefits of Energy Cooperation and Cross Border Electricity Trade in South Asia

Technical and Operational Benefits

1. Optimal Use of Regional Resources and System Operation
2. Economies of scale in the development of regional resources
3. Improved energy security and reliability of respective power systems
4. Increased Power Availability
5. Optimized transmission Network
6. Reduce environmental impact
7. Reduce fossil fuel imports
8. Reduction in spinning reserves
9. Management of peak energy deficit
10. System reliability

Economic and Financial Benefits:

1. Power availability at competitive price
2. High export income
3. Cost effective power system
4. Better return to investors in generation assets
5. Improvement in industrial productivity and competitiveness
6. Less exposure to volatile international energy prices
7. Economic Growth
8. High export income

Environmental Benefits

1. Less Impact on Local and Global environment
2. Reduce Adverse Impact of Indoor Air Pollution
3. Improvement in Social Indicators
4. Renewable Energy Development

Market Development

1. Bringing Resource to the Market
2. Market Development
3. Efficient Pricing

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Energy Cooperation: International Experience

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International Experience: Aspiration behind the Regional integration

West African Power Pool

14 member countries

Trade Volume : ~7 GWh

To give the end user a choice of electricity supply

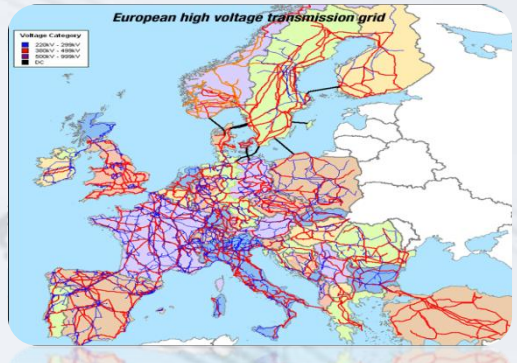
Ensure the citizens of Member States with a stable and reliable electricity supply at competitive costs

Greater Mekong Subregion Power Trade and Interconnection

6 member countries

Rapid increase in energy demand, uneven distribution of energy resources and underdeveloped infrastructure for electricity trade

Provide efficient, transparent and secure energy markets to the consumers



SAPP

12 member countries

Trade Volume :1 TWh +

Ensure the efficient use of energy resources

28 member countries

Trade Volume :1,263 TWh

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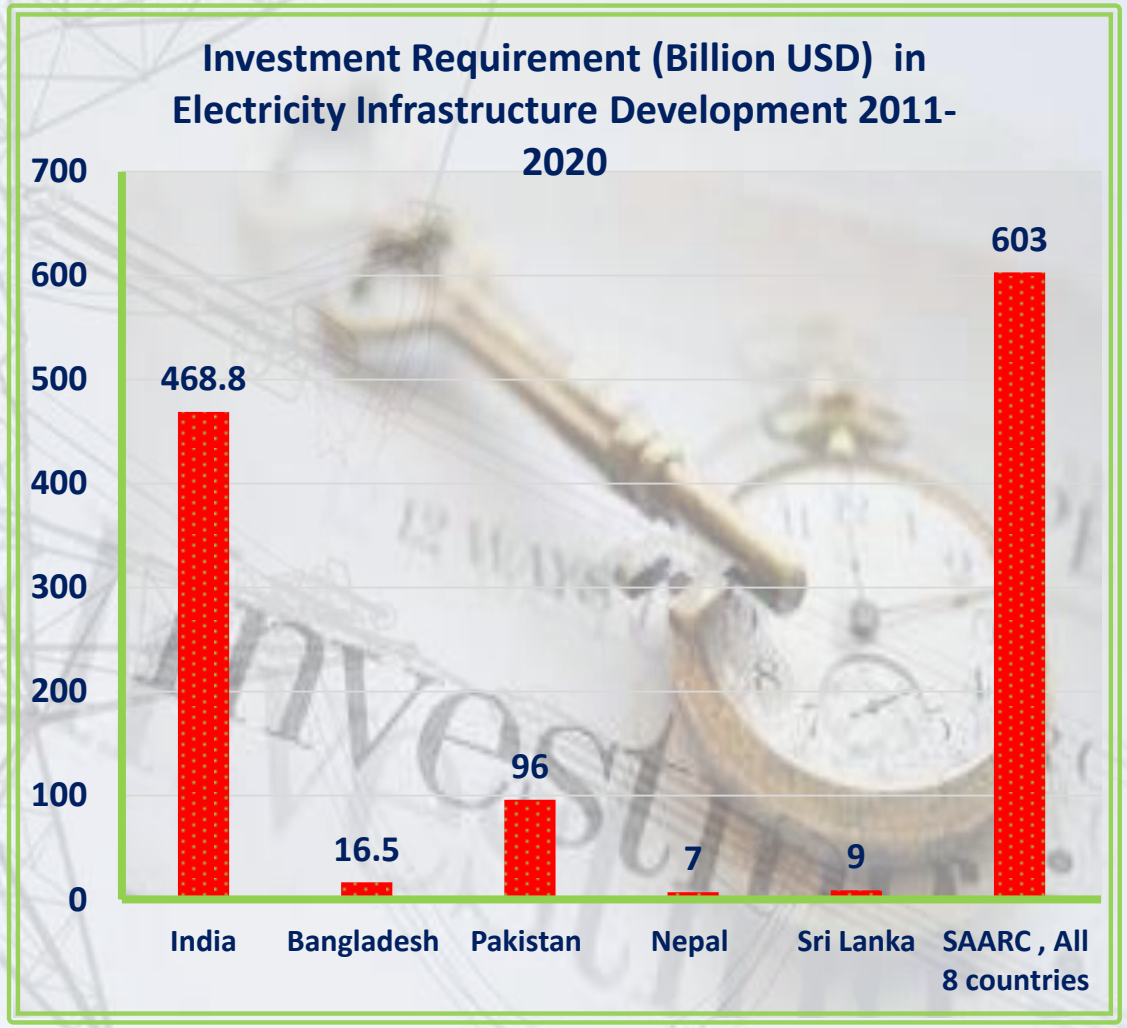
Investment Scenario In South Asia

Investment Requirement in Electricity in South Asia 2020

- ✓South Asia is one of the fastest growing regions in the world.
- ✓As per world bank estimates, SA countries needs to invest in the range of **USD 1.7 trillion to USD 2.5 trillion(2011-2020)** to bring its power grids, roads, water supplies up to the stranded needed to serve the population.
- ✓Total investment of **USD 603 billion** is required for SAARC countries for Electricity Infrastructure development.
- ✓Bangladesh, India, Nepal , Pakistan and Sri Lanka are expected to invest around **US$ 16.5 Billion, US$ 468.8 Billion, US$ 7billion, US$ 96 Billion and US $ 9** Billion respectively by 2020.



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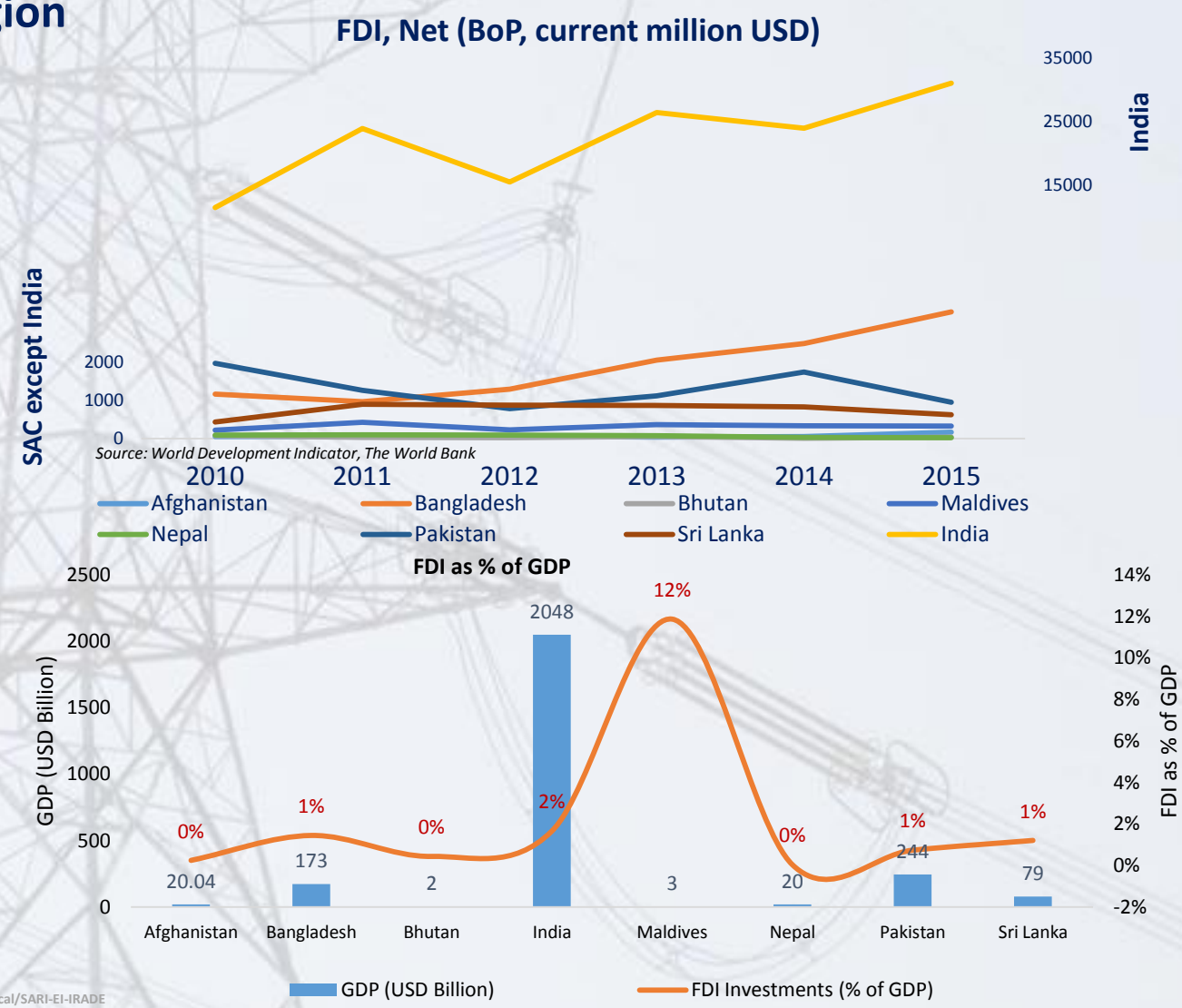
Investment Scenario in South Asia

Foreign Direct Investments have been low in the region

- The region witnessed mixed trends in net FDI inflow across countries during the period 2010-15
  - Bhutan, Nepal and Pakistan experienced a negative CAGR for net FDI inflow during the period
  - Bangladesh (23%) had one of the highest growth in FDI inflows followed by India
- India has the highest share of FDI inflow in absolute terms followed by Bangladesh
- Remaining countries contribute less than 10% to the net FDI inflows in the region
- The FDI contribution to the overall GDP is well below 2% for all the countries in the region except for Maldives



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key Challenges and Risks associated with Investment and Financing

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Key Investment Risk and Mitigation Measures

Key Issues and Mitigations

	Political and country	Policy and Regulatory	Project Development	Commercial Risk
Risk/Issues	• Political Uncertainties • Expropriation Risk • Breach of contract • Change of law • Currency inconvertibility/ Transfer Restriction • Smooth FDI norms	• Contract enforcement & Dispute settlement • Common Policies and Regulations • Lack of Effective institutions • Capacity building of regulatory institutions	• Land acquisition, • Site identification and resource assessment • Environment, R&R • Off-take risk • Skilled manpower	• Currency risk (exchange rate, convertibility) • Interest rate • Tax policies • Corporate governance • Liquidity issues, debt financing • Financial Closure
Mitigation	• Political insurances • International investment agreements (BIT, FTA) • BOO, and BOOT business models under PPP • Guarantee against expropriation	• Alternative dispute resolution mechanisms • Regional institution • Harmonization/Coordination of regulations • Capacity building	• Standard Contracts PPA/TSA • Standard Project development guidelines • Single window clearance • Payment Security Mechanism • Integrated Transmission planning • Govt. Support in land acquisition, clearances etc.	• Currency hedging (Currency swaps, options, forward contract) • USD denominated PPA • Upfront tariff for Hydro to minimize lenders risk • Regional debt market • Long term debt financing • Stable tax regime • Corporate governance

Suggested Investment Guidelines

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Suggested Investment Guidelines

1. **Regional CBET investment facilitation forum**
   - Designate or set up a regional CBET investment forum to act as a facilitator
   - Implement guidelines for investments, project identification and prioritization, coordinating CBET investments
   - Develop regional mechanism for allocation of projects between domestic and regional projects
   - Identification and prioritization of projects for investments through a regional body

2. **Promote policy, regulatory and market instruments for mobilizing investments**
   - Enactment of policies/laws for promoting investment in CBET,
   - Transparent Investment Protection framework for foreign investors
   - Setting up of rules, regulations and procedures for export oriented hydropower projects and interconnections
   - Mobilize MFIs for low interest financing options
   - Harmonize tax incentives and other benefits across the region
   - Harmonize regulations, grid operation, pricing, energy accounting, standards etc.

3. **Managing the project development risks**
   - To develop guidelines for mitigating political risks such as nationalization, expropriation etc. for power projects in domestic and CBET
   - Regional guidelines for leveraging Instruments available with MFIs like MIGA
   - Provisions for dispute resolution through regional framework; defined procedures and practices, standardized contractual provisions for arbitration in neutral third-country, legal safeguards for contract enforcement

4. **Fast track project approvals and clearances**
   - Member countries government to provide single window clearance for necessary approvals and licenses
   - Prepare inventory of processes to be followed in member countries for CBET project approvals, etc
   - Issues related to land, environment and R&R to be dealt with on priority basis

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Suggested Investment Guidelines

5 Facilitating development of hydropower projects and associated infrastructure

- Member countries to work for minimizing off-take risk and providing payment security mechanism for hydro projects
- Tap the green energy funds for hydropower projects
- Policy initiatives like interest subvention, tax breaks
- Regulatory incentives to address tariff issues to improve competitiveness of hydro vis-à-vis other resources
- Develop Public Private Partnership (PPP) frameworks for regional projects
- Involve multi-lateral funding agencies for project financing

6 Harmonization in financial regulations and institutional capacity building

- Harmonizing regulatory requirements for mobilizing investments within the region and overseas
- Evolve regional consensus on conflict management and dispute resolution framework amongst member countries
- Support the development of capital markets in the region for mobilizing long term debt funding.
- Support investor friendly FDI policies
- Institutional strengthening and capacity building of institutions in the member countries

7 Promote regional investment arrangements

- International and bilateral treaties and agreements to support investments
- Develop templates for contractual frameworks for cross border projects
- Institutionalize the Dispute Resolution Mechanism

Overview of SARI/EI

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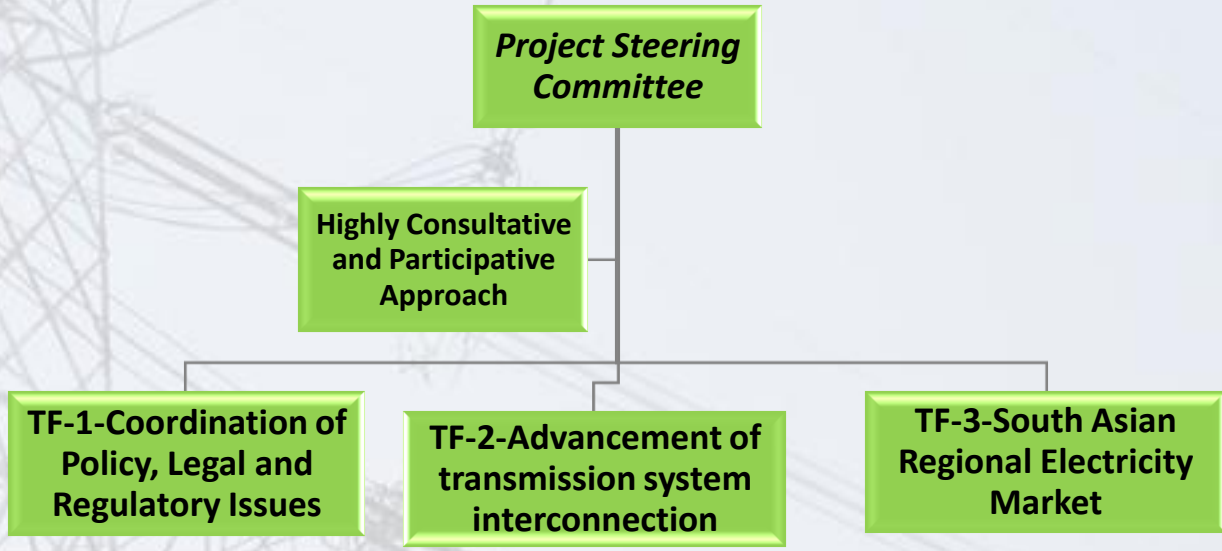
SARI/EI : Overview & Framework

- **Long standing program of USAID started in the year 2000**

- **SARI/EI–Phase IV (2012-2018):**
  1. Coordinate policy, legal and regulatory issues.
  2. Advance transmission interconnections.
  3. Establish South Asia Regional Electricity *Markets*

- **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, SAARC, ADB, Independent Energy Experts/Diplomats.**

- Task Forces are **represented by Government Nominated members of level of Directors/Chief Engineers/Members etc. from Utilities, Regulators, planners, Power Exchanges of SA countries.**



- **TF1: Coordination of Policy, Legal and Regulatory issues**

- **TF-2: Advancement of transmission system interconnection**

- **TF 3: South Asian Regional Electricity Market**

SARI/EI Overall Framework for development of CBET in SA

SAARC Framework Agreement on Energy (Electricity) Cooperation

CBET facilitation through

Institutional Mechanism

Demand Driven Studies

- Regional Regulatory Guidelines
- Regional Investment Framework and Investment Policy Guidelines
- Harmonization of Grid Codes
- Assessment of Trading Potential
- Model framework for Open Access and Trading License Regime
- Transmission Master plan and Pricing
- Model Regulation for Power Market Development
- Standard Contracts (Bankable PPAs/TSAs)
- Mock Exercise for SARPEX
- Analytical Studies

Undertaken as part of the TF-1 and has been Published

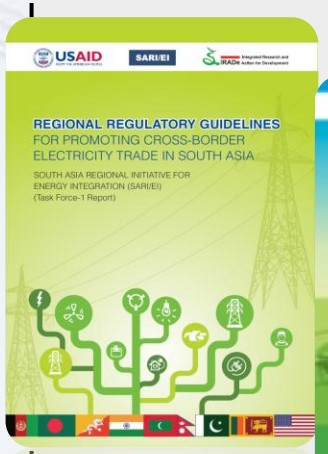
Suggested Changes/Amendments in Electricity Laws, Regulations and Policies (L&R&P) of South Asian Countries.

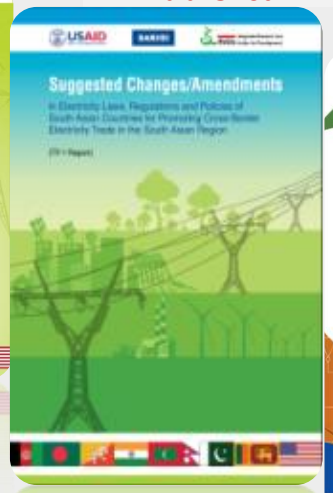
International Consultants

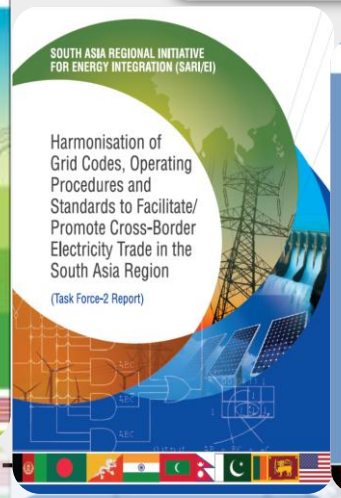
Deloitte, KMPG

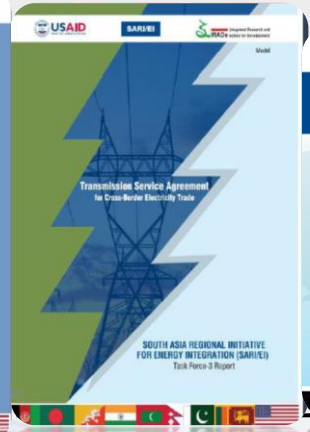
PRDC, PWC, ICF

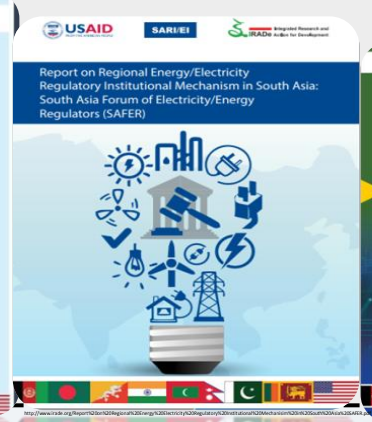
Mercados, E & Y

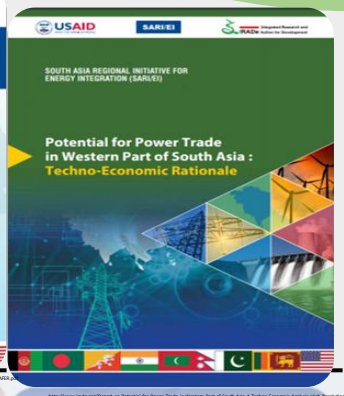












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Thoughts for Discussions

- Bilateral and Regional Approach ?
- How to accelerate the development of hydro power and investment in power/energy sector ?
- What are the innovative market instruments/ financing mechanisms for mobilizing investment ?
- Role of Government ?
- Role of Private sector, Public private partnerships, Joint Ventures etc. ?
- Need of Regional Institutional Mechanism for promoting regulatory harmonization, investment etc.?

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Thank You