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SOUTH ASIA REGIONAL INITIATIVE FOR ENERGY COOPERATION AND  
DEVELOPMENT

REGIONAL ENERGY MARKETS INITIATIVE - NEEDS ASSESSMENT REPORT

February 2006

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**SOUTH ASIA REGIONAL INITIATIVE FOR ENERGY  
COOPERATION AND DEVELOPMENT  
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ASSESSMENT REPORT (FEB 2006)**

**DISCLAIMER**

**The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.**

## ACRONYMS

ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
APEC	Asia Pacific Economic Cooperation
CEB	Ceylon Electricity Board
GCC	Gulf Cooperation Council
IFC	International Finance Corporation
Kwh	Kilowatt hour
MW	Megawatt
REMI	Regional Energy Markets Initiative
SAARC	South Asian Association for Regional Cooperation
SARI/E	South Asia Regional Initiative for Energy
US \$	United States Dollar
WB/WBG	World Bank/World Bank Group

## I. EXECUTIVE SUMMARY

South Asia comprises of Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka, and is one of the poorest and most populous regions of the world. The countries of this region range in size from India, one of the largest countries in the world with a population of over 1 billion, to Maldives one of the smallest with a population of 340,000. The region has the highest population density with 22% of world's population occupying only 4% of the landmass.

The energy sector in all countries within South Asia is characterized by the following:

- Increasing demand for energy over the next decade due to economic growth
- Low rates of access for electricity
- Low per capita energy consumption
- Inadequate energy infrastructure to meet the projected demand
- Large capital requirements to keep pace with the demand
- Dependent on hydrocarbon imports to meet their present fuel needs
- Absence of well developed regulatory and policy frameworks
- Countries are in varying stages of restructuring the energy sector

### Benefits of regional energy trade

The current cross-border energy trading and investment activities are limited to relatively small transactions between India-Bhutan and India-Nepal. The maximum transfer capacity between India-Bhutan is 400 MW which is less than 0.5% of India's peak demand. In 2003-2004, India imported 1,720 million kwh which comprises less than 0.3% of its total consumption during that time period. The link between Nepal and India has a capacity of 50 MW through which India imported 139 million kwh and exported 186 million kwh in 2003-04. The major cross border energy project currently in progress is the Tala generation and transmission project that is being built in Bhutan by Indian company – Tata Industries.

The complementary nature of the resource endowments of the countries in the region makes energy trade an economically feasible route to greater access and supply security. For example: South Asia has a net hydropower potential of over 192,000 MW (Bhutan 30,000 MW, India 84,400 MW, Nepal 38,000 MW, Pakistan 40,000 MW), which when exploited, would provide an excellent opportunity for energy trade within the region to bridge the demand-supply gap. Even under the current infrastructure constraints, there is untapped potential for power cross-border exchanges due to varying seasonal and daily load curves. Such arrangements would reduce transmission losses, investment requirements, reserve margins, and enhance the reliability of supply. There are huge gas reserves in Bangladesh and coal deposits in India that can be developed for meeting the region's energy requirements.

This report is organized as follows:

Section II contains a discussion of the critical factors for increasing trade and investment in the energy sector. It also contains an analysis of the key barriers for regional trade and identifies critical factors for the success or failure of individual energy sector projects. There is a brief discussion of risk factors that energy projects face in the region along with strategies for mitigating these risks.

Section III discusses the critical needs for increasing the volume of energy trade and investment in South Asia.

Finally, section IV provides regional and country-specific recommendations for enhancing cross border trade and developing the domestic energy sector within each of the SARI/E countries.

## II. CRITICAL FACTORS IN INCREASING ENERGY TRADE AND INVESTMENT

As stated earlier, all the countries in the region face acute energy shortages. They require huge amounts of capital to upgrade their infrastructure to meet the projected demand. Their capital requirements cannot be met by the individual governments and hence, the region is dependent on private investments. However, capital is not flowing to the energy sector in these countries for a variety of reasons. In some cases, like in India which is attracting record amounts of foreign direct investment (FDI), the energy sector is unable to compete with other sectors due to its relative unviability. Other countries like Bangladesh and Nepal are unable to attract any significant investment due to their political and economic instability. Following topics are discussed in this section:

- (i) Key barriers for regional trade and investment in energy
- (ii) Key factors for the success/failure of energy projects that have taken place in the region
- (iii) Risk mitigation strategies for successful energy projects

### Key Barriers for Regional Trade and Investment in Energy

Regional trade in South Asia is small relative to other regional trading blocs like ASEAN, APEC and GCC. This trend is visible in the volume of regional energy trade which is a fraction of that of similar economic regions such as Central America (where efforts are underway to integrate electricity systems), the South African and West African Power Pool. There are certain barriers which must be addressed to move the region towards greater integration.

1. Political conflicts and tensions between various countries (notably, India-Pakistan) are impeding efforts to integrate the region.
2. Lack of a strong regional institutional presence to create a framework for energy trading. SAARC is not strong enough to push such an agenda forward at this time.
3. Lack of capital and difficulty in financing projects. The energy sector in all countries in South Asia is perceived to be volatile due to lack of credit worthy offtakers, commercial risk and lack of clarity in government policies. This inhibits the flow of capital and also raises the cost of financing.
4. Non-alignment of energy pricing and policies. Each country within the region has a legacy of subsidizing energy prices and determining policies in isolation of each other. This creates economic differentials which are not conducive for cross border trade.

### Key factors for the success/failure of energy projects:

The following factors have been identified as critical to the success/failure of projects.

1. Fuel supply – Hydrocarbon fuel supply is primarily controlled by state enterprises in all of the SARI/E countries. For instance, in Pakistan by the Pakistan State Oil Company, in Bangladesh by the Bangladesh Petroleum Corporation, in Nepal by the Nepal Oil Company. India has opened up the oil and gas sector to private investment but state owned companies (ONGC, GAIL, IOC) still have large operations. These countries are also becoming increasingly reliant on oil and gas imports for their needs. There are efforts to increase the contribution of renewable fuels to the energy mix in all these countries. These efforts have had limited success. India is now the fifth largest wind energy producer. Sri Lanka has installed home photovoltaic systems. The region has great potential for bio-fuels, wind and solar power. However, the technologies to harvest this energy are not cost competitive with

conventional power plants (without factoring in environmental costs and subsidies). Having access to a steady quantity of fuel at a reasonable price (a price that has been factored into project costs and revenues to ensure an appropriate rate of return) is critical for the success of any project. For this reason, power plant developers are partial towards indigenous fuel since it eliminates some uncertainty in the supply chain. Additionally, imported fuel (the exception to this is imported coal from Indonesia which is cost competitive with indigenous fuels due to lower extraction costs) increases the cost of power which makes the power less competitive than indigenous fuel based power. Strong fuel supply agreements have been identified as critical success factors in a number of generation projects such as the AES/Kelanitissa combined-cycle diesel-fired power plant located in Colombo and the gas-fired plant built by the Torrent group of industries in Surat in the state of Gujarat

2. Management expertise of the project sponsors: This has consistently been identified as a key factor by project financiers. A strong management team is one of most important factor for success for any project. This is especially important for the energy sector in South Asia due to the complexity of the operating landscape.
3. Support of multilateral/bilateral institutions: Almost all the projects in the energy space in the 8 SARI/E countries have had involvement from one or more of the following agencies: IFC/WBG and/or ADB. These agencies usually provide guarantees through political risk insurance and economic support (such as co-investments, loan guarantees, and interest rate subsidies) by making it more attractive for other institutions to invest.
4. Support of local governments: The designation of certain projects as “fast track” (what mechanisms are triggered in fast tracking that makes it so important) or giving them special status is a key success factor since it makes it easier to secure the necessary approvals and line up financing. This has been cited as a key success factor for the Jegurupadu IPP project in the Indian state of Andhra Pradesh.
5. Lack of local participation: The involvement of local personnel in the engineering, procurement, construction and operations of a project decreases labor costs making the project more viable. The lack of local participation in the Dabhol Project was viewed as a key reason for its failure.
6. Managing commercial risk: Projects that have managed their payment risks through security arrangements, guarantees or letters of credit have a great chance of succeeding. This includes managing foreign exchange risk through shifting the burden or through hedging instruments.

### Risk Mitigation Strategies in Successful Energy Projects

Several successful energy projects in the region have been analyzed to assess risk mitigation techniques. It is difficult to draw blanket conclusions on effective risk mitigants due to the uniqueness of each project and its operating environment. However there are certain common mitigants which are described below:

1. Fuel supply risk: Fuel supply risk is usually mitigated by long term supply contracts with state agencies that control the production and import of fuels.
2. Foreign Exchange (FX) Risk: This is mitigated by indexing agreements to changes in FX ratios. However, this might not always be the most viable solution since it merely shifts

the burden from the project, usually to state utilities which might delay payment if FX rates move against them. This is a very plausible scenario given the poor financial condition that many of them are in. A more effective solution would be to work with the banking sector to utilize FX hedging tools. See Appendix 3 on FX hedging options.

3. Involvement of multilateral/bilateral agencies: All the projects profiled below have had the backing of bilateral/multilateral agencies during their financing process. This is seen as an effective way to mitigate the commercial and political risks that are prevalent in the region.
4. Due to the heavy involvement of the government in the energy sector (federal or state) of all these countries, they usually become the (implicit) guarantors for the state utilities that are purchasing the power or for the agencies that are supplying the fuel. This has worked well in certain cases (as is evidenced by the projects we have analyzed). However, the political instability that characterizes many of the countries in the region could pose a potential problem for using government guarantees to move projects forward.

Among the projects analyzed, there was no effective mitigant for contract risk. This is most likely a reflection of the legal environments of these countries where it is difficult to establish arbitration procedures that are binding or seek legal recourse. See Appendix 4 for specific mitigants used by various successful projects.

#### Non Energy Sector Cross Border Trade and Investment:

India is the dominant economic player in the region. Its GDP in 2005 was \$750 billion. Pakistan is the next highest at \$90 billion. Given this disparity, it is natural that India is the largest investor in terms of establishing projects in the remaining countries.

- Majority of the cross border investments and trade in the region have involved an Indian company
- Investments have spanned multiple sectors – consumer goods, infrastructure, hotels, services, automobiles and heavy industry
- Projects financed without government subsidies or grants
- Investments made primarily in the form of joint ventures or by establishing wholly owned subsidiaries

See Appendix 5 for further detail.

### **III. CRITICAL NEEDS FOR ENERGY SECTOR TRADE AND FOREIGN INVESTMENT IN SOUTH ASIA**

- a. Contract enforceability: The commercial risk of owning assets and having operations in South Asia is very high due to political and economic stability. In Appendix 3, we have identified in detail the macroeconomic risks for businesses in each country. The legal and political systems in all of these countries are characterized by extreme slowness, bureaucracy and corruption. All these factors make it difficult for companies to seek recourse in the event of a breach of contract or any other dispute. It is important for each country to improve their legal and arbitration systems to provide effective recourse to businesses.
- b. Harmonizing Regulatory and Investment Policy: All the countries in South Asia are in the process of restructuring their energy sector. Within the power sector, there is a movement towards increased private sector participation and the unbundling of vertically integrated

state utilities. Laws and regulations governing these activities have been passed in almost all the countries. These laws and regulations are in varying stages of implementation. There is a distinct lack of clarity in how these are being interpreted and applied. It is important for regulatory agencies to bring consistency and clarity to the restructuring process for the region to move towards stable energy markets. Also, the framework for governing the energy sector is developing in isolation within each country. For cross border trading and investment activity to become a reality, it is necessary to harmonize regulations regarding policies, taxes and investment across all countries.

- c. **Willingness to pay:** The distribution sector in South Asia is plagued by problems of theft, inadequate metering and non payment. This has led to a vicious cycle where revenues collected are insufficient to maintain the infrastructure and the quality of service. This issue is exacerbated by politicians who make promises of free or subsidized power. The population in these countries must be educated about the true cost of power. It has been proven that despite relatively low incomes, people in these countries are willing to pay for quality and reliability of service. This is best illustrated by the widespread penetration of mobile phones in India.
- d. **Rational Pricing:** There is no transparent tariff setting process. Electricity rates are subsidized through the region. As a result, the revenues collected from the users by the state electricity companies are not enough to pay the generators. An inefficient system of cross-subsidies, where certain groups of users (usually large industrial consumers) subsidize other groups (agricultural and domestic users) has created further economic distortions. The paying customers have begun to set up captive power plants or taken advantage of merchant power (where available). In India, this trend has worsened the condition of state electricity companies who are losing revenue generating customers. In Bangladesh, fuel prices are subsidized despite purchases at international prices. This price differential creates “informal” cross border trade. Without rational pricing, such opportunities will continue to exist.
- e. **Technical Issues:** To enable large scale electricity trading, it is important for common codes and standards to be adopted by all countries for their electricity grids, especially at connection points. It requires the establishment of institutions which will oversee the operation of the grid as well as enforce rules for trading and use. Detailed system planning studies must be undertaken by the participating countries to establish the feasibility and location of interconnection points. Cost sharing arrangements for building/upgrading connection points must also be examined along with other issues such as reliability and choice of technology. Commercial issues such as power pricing, payment security mechanisms and procedures for arbitration must also be addressed and formalized.
- f. **Support from multilateral/bilateral institutions:** As stated previously, almost all successful generation projects have had involvement from these institutions. The participation of these entities is essential to the development of cross border projects since they usually provide technical expertise and their presence makes financing easier.

Note: When asked about factors to develop a regional energy market, virtually all interviewees cited the lack of political will as a deterrent.

## IV. APPROACHES TO FACILITATE REGIONAL TRADE AND INVESTMENT

### 1. National Approach

Following are some broad recommendations which should be undertaken within the energy sector of each SARI/E country, specifically the power sector to facilitate the development and private investment. Country specific recommendations are detailed in the next subsection.

- a. Eliminating subsidies in power pricing; consumer prices should reflect the true cost of the power delivered to them
- b. Rationalize tariff making process and make it transparent
- c. Greater focus by regulators on ensuring clarity and consistency of rules
- d. Facilitating investments by following the “one stop” model for processing project proposals
- e. Simplifying approvals process for siting and constructing power plants
- f. Fast tracking certain projects based on need and merit (least cost generation,
- g. Standardized security packages for power projects which include a model implementation agreement, power purchase agreement and fuel supply agreement) to reduce transaction costs
- h. Innovative financing schemes like the Special Purpose Vehicles (SPV) launched by the Government of India. Another mechanism that can be explored is the establishment of an extra debt service reserve account.
- i. Automatic indexation formulae to provide protection against fuel cost changes and currency depreciation
- j. Measures to improve contract enforceability. One possible solution would be create arbitration boards specifically for power sector disputes
- k. Guaranteeing fuel supply (quantity and cost) for generators
- l. Transmission
  - i. Upgrading transmission grid to minimize system losses and increase capacity
  - ii. Implementing open access
- m. Distribution
  - i. Improved metering and collection systems
  - ii. Reduction in losses (technical and theft)
  - iii. Full tariff recovery from consumers

#### 1.1 Bangladesh

- 1.1.1 Use of Special Purpose Vehicles such as those being developed by the Energy Coordination Committee (ECC) in India. These SPVs which are prepared in consultation with commercial and donor entities will ensure that all the relevant project reports are completed; PPAs are signed with the SEBs, coal linkages established and environmental clearances obtained. Once these are completed, the projects will be sold to developers through an international bidding process. Bangladesh could develop a similar model to mitigate a majority of the risks that IPPs are facing.
- 1.1.2 Creation of irrevocable guarantee facilities to mitigate commercial risks.
- 1.1.3 Building institutional capacity to overcome problems of leadership.
- 1.1.4 Contract enforceability is a big issue since that determines the viability of PPAs which are key in obtaining financing.
- 1.1.5 Transparency in the bidding process – the IFC has stepped in to run the tender process for IPPs. This should be formalized into a domestic institution so that the sector becomes more self-sustaining.

- 1.1.6 The transmission grid does not have sufficient capacity for the current generation. The grid must be upgraded so that it is aligned with the generation capacity as well as demand.
- 1.1.7 The draft policy on coal is currently unviable due to the certain clauses which must be modified for the policy to have successful results:
- Clause 1: There are limitations on the export quantities. Initially to two tonnes for every one tonne sold domestically and progressively to one tonne for every tonne sold locally. This could place a potentially serious burden on the financing of a coal mine.
- Clause 2: The policy also proposes that payment for the coal to be sold locally has to be in taka although the enormous capital costs of mining are mostly in foreign currency.
- Clause 3: The draft coal policy also proposes a variable royalty rate of 16 per cent on coal to be exported at US\$50 per tonne -- the current average international price. On top of corporate taxation and import duties on equipment, such levels would be viewed as extremely unattractive, they added.
- Clause 4: The draft coal policy proposes mandatory power stations at mine sites, which is potentially another serious disincentive as mining companies are not usually the best operators of power plants and they might be reluctant to take on board the additional commitment. Coal mining experts say that it would make more sense for the coal policy to propose incentives for the building of power plants, rather than make them mandatory.
- Clause 5: The draft coal policy also sets out very ambitious targets for Bangladesh -- 20 million tonnes of coal to be produced annually by 2016 and 40 million tonnes by 2026. The target has been set although it can take up to 15 years to explore and discover a resource and then put in place all the logistics, and the internationally benchmarked social and environmental preparations and safeguards on the ground, to start actual mining.
- Overall, international coal experts believe that the draft contains too many regulations and restrictions. It will make coal mining in Bangladesh over-regulated and controlled by bureaucrats rather than miners discouraging the international investors.

## 1.2 India

- 1.2.1 Special Purpose Vehicles/Innovative Project Structures: The Energy Coordination Committee, headed by the PM has approved 5 ultra mega thermal projects. To facilitate these projects, the government has launched 5 Special Purpose Vehicles. (SPVs). These SPVs—in consultation with commercial banks and financial institutions—will prepare the project reports, sign power purchase agreements (PPAs) with respective state governments where the projects will be located, establish coal linkages, and put in place environment clearances before selling the projects to independent power producers (IPPs) through an international bidding process. Essentially, the prospective buyers of the SPVs will get a package deal with all possible clearances and PPAs in place. This is the first instance of the central government negotiating for PPAs and other relevant clearances for power projects to be managed by private participants. This approach will mitigate a majority of the political and commercial risks inherent in such projects. The development of this initiative must be closely monitored and used as a model for structuring similar arrangements since this could potentially serve as a powerful mitigant for the risks facing the sector.
- 1.2.2 Enhancing Fuel Supply Security: Initiatives to mitigating fuel supply issues through long term arrangements with other countries must be given to priority. Power generation during calendar 2005 registered a paltry 4% growth, primarily on account of shortage of gas/liquefied natural gas. Had this gas been available, 26 billion units (bu) of electricity would have been generated, and the growth rate would have been an impressive 8.4%

in generation alone. India has embarked on a series of efforts to ensure its energy security through oil and gas deals with countries around the world. Such efforts should be stepped up to serve as a long term mitigant to fuel supply risk.

- 1.2.3 Creation of a “one stop” window: Creating an entity similar to the Private Power Investment Board (PPIB) of Pakistan which would serve as a single stop for obtaining necessary approvals and clearances for power projects.
- 1.2.4 Enhancing Captive Power Plant Policy: Smaller captive power plants are an area of potential growth and energy security given the demands of industry for reliable power, the possibility of selling some of the excess power to the grid, and the ease of setting-up such plants. There are already some tax incentives in place for such projects. These should be further enhanced.
- 1.2.5 Transmission Pricing: The current system of “postage stamp” pricing does not capture economic realities of plant location and fuel/power movement.
- 1.2.6 Need for greater clarity in policy and regulation: There is currently some confusion about jurisdictional issues for multi state projects such as tariff pricing. Regulatory agencies must focus on communicating policies with greater clarity and simplicity.
- 1.2.7 Distribution sector reforms: Metering and payment systems must be instituted and upgraded to ensure better billing and collection. Also, the infrastructure must be improved to reduce losses. Pricing, payment and infrastructure issues in this sub sector are affecting the entire value chain.

### 1.3 Nepal

- 1.3.1 Institutional capacity building. There is a constraint in terms of the requisite expertise to handle credit risk assessment of hydro projects in banks within the country such as RBB. These banks are trying to develop “hydro teams” which can perform this role. Pending creations of teams, lending activity is limited.
- 1.3.2 Forming an entity which can deal with capital intensive projects in a high political risk climate. Such specialized financial institutions will be able to develop the necessary expertise and manage the huge requirement of funds. The present consortium lacks the desired expertise, which in turn reduces the confidence level among banks.
- 1.3.3 Further enhancement of the Power Development Fund and participation of large commercial (foreign and domestic) financial institutions.
- 1.3.4 FDI investment policies need to revisit by the government with maximum sops for hydro project investors.

### 1.4 Pakistan

- 1.4.1 Greater use of proven financing models like Kot Adu Power Company (KAPCO) Generator KAPCO has a take or pay return structure which covers most operating variable and overhead costs, indexed for exchange rate and US CPI. It also guarantees payment for a minimum 65 percent capacity utilization. As a result, the company has very few business risks. It is seen as a quasi-bond with a fairly reliable dividend stream and limited opportunities for unexpected earnings gains (or losses). However, KAPCO is planning to enhance capacity, and this may change the overall return profile in the future. Nonetheless, this model has proven its effectiveness in the local environment and it should be formalized and applied to other instances.
- 1.4.2 Resolve fuel supply issues. Currently, the PPIB is not approving any thermal projects unless they obtain fuel supply approvals from the petroleum ministry. This is due to the supply constraints that are expected to hit critical levels in the coming decade based on current reserves/purchase agreements.
- 1.4.3 Integrated energy planning to offset oil prices – GOP is in the process of evaluating financial hedging as an offset and is identifying financial institutions to partner with.
- 1.4.4 Two track approach for developing renewable energy:

- Advancing projects on the ground like wind power, small hydro, biomass etc through a cost plus basis by investor assured returns (by GOP).
- Looking at Medium/Short term (beyond 2 years) – Implementing a policy framework to promote renewable energy. India currently has a 50-60 page “Comprehensive Policy Framework for Renewable Energy” which can be used as a model.

## 1.5 Sri Lanka

- 1.5.1 Delayed payments by the CEB: Financing projects has become a bigger issue recently due to delayed payments by the CEB. One project was able to hedge financing risks associated with local borrowing by purchasing a fixed rate note and selling a variable rate note to HSBC in Dubai. This mechanism must be further explored to meet the financing needs of other energy sector projects.
- 1.5.2 Eliminating restrictions on funds transfer: At present, Central Bank approval is needed to repatriate monies and projects need to prove net foreign exchange benefit to Sri Lanka before getting approval. These restrictions must be removed to make capital flows easier.
- 1.5.3 Developing micro financing schemes: Sri Lanka’s small scale generation sector has performed extremely well (attracted an investment of \$100 million since 1998 with another \$150 - \$200 million expected over the next 5-10 years) due to the Small Power Purchase Act. This can be further enhanced by developing specific micro-financing schemes tailored to this sector.

## 2. Regional Approach

- a. Create a strong regional entity which is tasked with conducting a comprehensive planning exercise and for standardizing regulations
- b. Identify projects which provide maximum returns on investment
- c. Create a mechanism to enforce the recommendations of the above entity
- d. Engage in public private partnerships

## 3. Banks and Financing Institutions

- a. Establish special financing mechanisms which are tailored to the unique needs of this sector/region
  - i. Create payment security mechanisms
  - ii. Spreading risk by establishing extra debt service reserve accounts
- b. Provide low-cost risk mitigation and risk sharing tools

## 4. Role of International Community

- a. Establishing forums for knowledge sharing, policy discussions and consensus building
- b. Providing training based on successful regional trade models
- c. Providing financial support

## Appendix 1

### SARI Energy

#### WHAT THE PROGRAM DOES

Promoting Energy Cooperation: The South Asia Regional Initiative for Energy Cooperation and Development (SARI/Energy) program, launched in 2000, promotes regional energy cooperation and cross-border energy trade between Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka.

#### WHY THE PROGRAM EXISTS

Focusing U.S. Energy Policy in South Asia: SARI/Energy represents the leading effort of the United States to work jointly with the nations of South Asia on critical issues relating to regional energy security, cross-border energy trade and investment, and economic growth. The program began at a time when national energy policies in South Asia were largely focused on self-sufficiency models for energy security, with vertically integrated public sector monopolies in each country. These models are transitioning to meet new economic challenges. Each country in the region is in some stage of restructuring its power and energy sectors, and recognizes the need for energy cooperation. SARI/Energy is responding to this situation by intensifying its focus on how regulatory and distribution reform can promote cross-border energy trade to enhance regional energy security, with emphasis on:

- Regional cooperation, agreements, and trade development
- Regulatory entities to foster private sector involvement
- Power sector efficiencies and rural energy access

#### HOW THE PROGRAM WORKS

Working With Key Stakeholders: SARI/Energy works closely with government ministries; public sector oil, gas, and power organizations; parliamentarians and policymakers; private sector oil, gas, and power companies; energy utilities; utility regulators; non-governmental energy and environmental organizations; and academic research institutions. The program works directly with these stakeholders to support and promote:

- Multi-party dialogues on technical and regulatory topics
- Technical studies on topics such as the feasibility and impact of energy technologies and regional energy trade, and strategic regional energy security issues
- Training on technologies, standards, regulatory functions, and pricing
- Technology assistance—mapping and toolkits; technology and research grants

#### KEY RESULTS AND IMPACTS

Over the past 5 years, SARI/Energy has been directly responsible for a number of critically important regional energy milestones:

- Championed regional energy trade throughout South Asia, creating a favorable environment for the regional energy ring concept adopted by the South Asian Association for Regional Cooperation (SAARC)
- Promoted cross-border energy trade agreements in the “South Asian Growth Quadrangle” (Bangladesh, eastern India, Bhutan, and Nepal) that culminated in the recent signing of the MOU between India and Bangladesh allowing energy access between Bangladesh, Nepal, and Bhutan via India

- Facilitated formation of new regulatory agencies by supporting legislation and policy development and providing direct technical assistance and training to help establish new energy regulatory entities in Bangladesh, Sri Lanka, and Nepal
- Impacted critical legislation, through technical assistance, partnerships, and capacity building, including India's Electricity Act, 2003, the region's precedent for regulated, market-based power trading
- Built a unique regional network of advocates—some 4,000 senior-level technical experts, decision-makers, and policymakers who are actively advocating energy policy reform and restructuring in their respective countries
- Produced and distributed critically important and influential studies on energy security and the benefits of regional energy trade that have received widespread media coverage and influenced key decision-makers
- Promoted regional energy efficiency by training scores of professionals, supporting policy development, and developing investment tools leading to the creation of energy service companies in Nepal; implementation of energy-saving demand-side management programs by Nepal Electricity Authority; and creation of a self-sustaining energy efficiency fund in Sri Lanka
- Encouraged business advocacy by facilitating forums and regional interactions between leading business associations that resulted in the formation of the South Asia Regional Energy Coalition (SAREC), which actively champions energy reform and cross-border energy sector investment
- Promoted grassroots development by providing seed funding for innovative technical and policy initiatives that promote cross-border collaboration between NGOs, academics, and think tanks on energy sector reform and cooperation issues
- Promoted rural electrification through formation of the Rural Energy Training Network (RETN) that links development institutions and utilities to deliver and adapt successful rural energy service models for local implementation

## Appendix 2 Methodology

The objective of the Regional Energy Markets Initiative (REMI) is to understand trade and investment practices in the energy sector and to facilitate investments in cross border and domestic energy projects. To address these objectives, the following tasks were undertaken:

### Task 1: Desk Research

The first activity under this initiative consisted of extensive desk research to analyze macroeconomic conditions for investment in each of the countries. This was followed by a targeted review of existing literature to complement this analysis. As part of this exercise, a subset of energy projects within each country were reviewed to determine key factors in their success/failure. These also provided insights into risk mitigation techniques which can be shared across the SARI/E countries and adapted for cross border projects. To better understand the dynamics of regional trade, the team analyzed cross border investments in a variety of sectors made by companies headquartered in one of the SARI/E countries.

### Task 2: Interviews

The REMI seeks to involve public and private sector stakeholders to facilitate dialogue and investments in cross border projects. With this objective in mind, we have identified the following groups of stakeholders. Representatives from each group have been interviewed to ensure a comprehensive understanding of current conditions and barriers to achieving greater investments in domestic and cross-border energy projects.

- Generation: utilities, independent power plants, merchant plants, captive power plants
- Transmission
- Distribution: public and private distribution companies, utilities
- Regulators
- Government officials
- Project financiers: domestic and multilateral institutions
- Traders
- NGOs

### Task 3: Needs Assessment Report

The findings from the desk research and interviews have been synthesized into a document which also contains regional and country specific recommendations.

### Task 4: SARI/E Action Plan

Based on the Needs Assessment Report, a one year implementation plan and a 5-year action plan have been developed which are contained in sister documents.

### Task 5: Regional Energy Markets Initiative (REMI) Launch

A launch is to be held in Delhi in March which will bring together key stakeholders from the region. The launch will include international speakers on regional trade and energy investment issues and outline the findings of the needs assessment report.

### Task 6: One Year Implementation Plan

Will include a series of training sessions targeting stakeholders and will highlight approaches to risk mitigation that have been identified; 3 sessions within the first six months. Several analytical studies will be initiated including prefeasibility of energy ring, developing a road map for codes and standards. Further details in sister document

### Appendix 3 Foreign Exchange Hedging Tools

Following are some commonly used instruments to hedge foreign exchange risk. There are also more exotic derivative instruments. However, these are more complex and more expensive. As with any decision, the transaction costs of the hedging operations must be considered before employing any of these tools. To engage in FX hedging, it is important to correctly identify the project's exposure to changes in the exchange rate.

**Forward Transactions:** A way of eliminating exchange rate risk when you are to receive or make a foreign currency payment in the future. A forward transaction enables you to buy or sell a currency at a fixed rate on a specified future date. By linking this date to the date of your currency payment, you in effect lock in the exchange rate you want and eliminate the risk of future volatility. Wachovia offers short and long-dated forwards in a variety of currencies.

**Window Forwards:** A window forward contract gives you a range of days (a "window" of time) on which to buy or sell the foreign currency. Window forwards are often used when there is uncertainty regarding the actual payment date.

**Options:** Options are contracts that, for a fee, guarantee a worst-case exchange rate for the future purchase of one currency for another. Unlike a forward contract, the option does not obligate the buyer to deliver a currency on the settlement date unless they exercise the option. Foreign exchange options thus protect you against unfavorable currency movements while allowing you to participate in favorable movements.

**Currency Swaps:** A way for a corporation with recurring cash flows in a foreign currency, or one seeking financing in a foreign country, to eliminate exchange rate risk. With a currency swap, you simultaneously purchase and sell a given currency at a fixed exchange rate and then re-exchange those currencies at a future date allowing you to convert a stream of cash flows in one currency into another currency at a fixed exchange rate.

**Non-Deliverable Forwards:** A way to hedge exposures in emerging market currencies where a conventional forward market does not exist or is restricted. Like a conventional forward, a non-deliverable forward makes it possible to hedge future currency exposure. However, in contrast to a conventional forward, a non-deliverable forward is settled in U.S. dollars and involves no physical exchange of foreign currencies at maturity.

Appendix 4  
Energy Sector Case Studies

Sent as a separate attachment (large file: 16 pages)

Appendix 5  
Existing cross border projects

Project Description	Sector	Government Policy	Structure of trade	Dates	Company
Dabur announced plans to set up a manufacturing plant in Pakistan	Consumer goods - personal care products	Govt of Pakistan has allowed Indian companies to set up subsidiary ventures in Pakistan to make products available to consumers at lower prices	Joint Venture	2005	Dabur - India
Reliance Industries is in advanced negotiations to acquire the petrochemical business of ICI Pakistan	Petrochemicals		Acquisition, valued at \$300 million		Reliance Industries - India
Path Finder Group announced plans to explore creation of a joint venture with Hindustan Construction Company	Infrastructure - transport		Joint Venture to get around technicalities of business laws in both countries	Nov, 2005	Path Finder - Pakistan , HCC - India
Mahindra & Mahindra signed an MoU with a private entity to export tractors to Pakistan	Heavy equipment	Firms looking to export goods into Pakistan must have a local partner since Pakistani law does not allow direct export (from India).	Potential joint venture	Dec, 2005	Mahindra & Mahindra - India, Saigal Family - Pakistan
Tata Motors signed a technical assistance agreement with Afzal Motors to export vehicles to Pakistan	Vehicles			Dec, 2005	Tata Motors - India, Afzal Motors - Pakistan
Bharti Telecom won a global tender for a telecom network expansion project in Nepal against global and regional competitors	Telecom		Sole provider of equipment, deal valued at \$500,000 - financed by WB		Bharti Telecom - India, Nepal Telecom Corporation - Nepal
Dabur Nepal Private Ltd has manufacturing operations in Nepal	Consumer goods - personal care products			1992	Dabur Nepal Pvt Ltd is a subsidiary of Dabur (an Indian company)

Project Description	Sector	Government Policy	Structure of trade	Dates	Company
Tata Group announced a \$2 billion investment in Bangladesh: A \$700 million, 1000 MW power plant; a \$600 million, 1-million ton per year fertilizer plant & a \$700 million, 2.4 million ton, steel mill.	Infrastructure, heavy industry	Bangladesh agreed "in principle" to guarantee a 20-year supply of natural gas for the projects. Feasibility studies completed in March and discussions to start in April 2005		2004	Tata Group - India
VIP Industries set up a joint venture with Nitol Industries to manufacture suitcases and chairs in Bangladesh	Suitcases/Chairs		Joint venture to save on taxes and get around trade barriers	2002	VIP Industries - India, Nitol Industries - Bangladesh
Dabur teamed up with Advanced Chemical Industries to set up production operations in Bangladesh	Consumer goods - personal care products		Joint venture (74:26 split)	2003	Dabur - India (74%), Advanced Chemical Industries - Bangladesh (26%)
Indian Oil Company took over petrol and diesel retail stations in Sri Lanka and also signed a lease for operating an oil farm	Petroleum/Oil	LIOC given exclusive license (along with two others) to import, sell, supply and distribute petroleum products in Sri Lanka. LIOC given income tax exemption for 10 years from the date of commencement of operations and a concessional tax rate of 15% thereafter as opposed to the prevailing rate of 35%	IOC set up a wholly owned subsidiary called Lanka IOC Pvt Ltd - LIOC	2003	Indian Oil Company - India
Gujarat Ambuja set up a cement plant in Sri Lanka in 2000 and the plant achieved profitability in 2002	Cement		Gujarat Ambuja set up a wholly owned subsidiary called Ceylon Ambuja Cement and bought another small plant - Midigama Cement	2000	Gujarat Ambuja - India
Ansal Housing & Construction Ltd is building a huge housing project in Sri Lanka in a collaborative effort with the Sri Lankan	Housing			1998	Ansal Housing & Construction - India

government. Project expected to take 8-10 years					
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Appendix 6  
Country Assessment Reports  
Separate documents – Bangladesh, India, Nepal, Pakistan & Sri Lanka