Chapter 3
FACTORS INHIBITING TRADE IN THE PAST

3.1 Political and Security Considerations

There is a wide range of factors which have hitherto inhibited the growth of intra regional and inter regional energy trade. The most important among them relate to the political and security situation prevailing in the region and its neighbors. Afghanistan is a key transit country sandwiched between the other South Asian countries on the east (potential markets for the imported energy) and the Central Asian Republics and Iran on the west (potential major energy exporters). The unstable political situation and armed conflicts in that country lasting for over three decades had been a major factor inhibiting energy trade between Central Asia and South Asia. The dispute over Kashmir had soured the relations between India and Pakistan for more than half a century. The political instabilities and circumstances in Nepal, Sri Lanka and Bangladesh and Myanmar had not provided an environment conducive for the evolution of regional energy trade. Central Asia itself had only recently recovered from the economic decline and political instabilities it faced upon the dissolution of the Soviet Union towards the end of 1980s.

Discussions in 1998-99 on the possible export of surplus power from the IPPs in Pakistan to India are believed to have stalled, partly on account of concerns over possible supply disruptions due to political uncertainties.[16] The proposal to construct a pipeline through Bangladesh for transporting natural gas from an off shore field in Myanmar (in which two Indian state owned entities had a 30% stake) to India was stalled by Bangladesh's reluctance largely on political grounds. Proposals for export of gas (or power or fertilizer produced using gas) to India from Bangladesh by several international and Indian investors did not materialize largely on account of the hesitancy of the Bangladesh government.[17]

3.2 National Policies and Political Mindset

National policies and the political mindset towards the concept of energy security also proved to be major inhibitors of energy trade. Till recently the region followed inward looking import substitution strategies which regarded energy trade as reducing energy security by creating import dependency and by enhancing disruption risks. Macroeconomic policies pursued resulted in a persistent shortage of foreign currency resources which did not allow the countries to think in terms of discretionary imports. On the whole there was a pervasive perception which regarded national self sufficiency as a synonym for energy security. Energy trade was strictly limited to the inevitable import of oil and oil products only. Despite the serious problems faced by Indian power companies in the use of poor quality domestic coal, import of good quality coal from abroad for blending took several decades to materialize. Nepal has the highest average tariff in the region at about 9 cents/kWh and still is unable to cover its cost of supply, mainly on account of its choice to operate a high cost all hydro system, avoiding import of thermal

[16] There were also other concerns such as price, and the ability of IPPs to offer firm and long term supplies with penalties for failure to supply. Further the surplus situation in Pakistan was perceived, with some justification, to be temporary lasting only for a few years.
[17] Also the Government of Bangladesh had concerns about the adequacy of the country's gas reserves to meet domestic demand and export obligations.

power from India to balance its hydro power system or to encourage the construction of large hydropower plants, which will be cost effective on the basis of export of power to India.

3.3 Infrastructure Constraints

The absence of infrastructure in the region by way of electrical interconnections and gas pipelines across the borders (except in the case of the few interconnections between India and Nepal, India and Bhutan, and between Afghanistan and Central Asia and Iran) is a physical constraint to the energy trade. This is not attributable to any difficult terrain, except perhaps in the border areas between India and China and to a lesser extent between Pakistan and Afghanistan. There is no special geographical reason for lack of interconnections between India and Pakistan and between India and Bangladesh.

Such infrastructure constraints exist even within the large power systems of India, Pakistan and Bangladesh (the potential markets for imports). Power interconnections and power transfer capacities between the East and West zones of Bangladesh, between the North and the South of Pakistan and among the five electrical regions of India (North East, East, West, North, and the South) till recently was inadequate to enable the best utilization of the domestic generation capacities, let alone handling the transport of imported power from one part of the country to another. After several years of investment, the inter-regional power transfer capacity in India (a country with an installed capacity of over 124,000 MW) has reached 9,450 MW by FY 2006. Similar constraint exists to a great degree in Afghanistan, the major transit country. The main backbone 220 kV double circuit North-East Power System (NEPS) is still under construction and would be operational perhaps in a couple of years, as a partial solution to the problem. Within the Central Asian Power System bottlenecks in the national transmission networks have to be eliminated, and links to Afghanistan strengthened to enable trade growth (especially in relation to Uzbek power exports to Afghanistan). The present level of ability of the national power systems to coordinate dispatch, maintain voltage and frequency and keep international flows within the prescribed contract limits and to maintain the stability of the interconnected systems in the region is inadequate to manage large trade flows.

3.4 Poor Operational Efficiency and Lack of Creditworthiness of the Utilities

Absence of solvent utilities is a major constraint to trade. Power systems in the region operate in a supply constrained environment with a level of quality and reliability substantially lower than international utility standards. Load shedding and power outages are common during peak hours and during certain seasons of the year. Electricity utilities are used as vehicles of social policy and average tariffs are kept substantially lower than supply costs. Households and agricultural consumers are heavily cross subsidized by industrial and commercial consumers, who pay some of the world’s highest prices for a very poor quality of supply. Consequently theft of power and nonpayment are extensive and most utilities are not solvent enough to access commercial sources of funds except on the basis of expressed or implied sovereign guarantees. Nonpayment of electricity bills by government entities had been a significant problem.

Afghanistan is estimated to have a system loss level of 35% to 45% of the total available energy (generation plus imports) by way of technical losses in the transmission and distribution systems and non-technical losses arising from theft and poor metering and billing practices. Collection efficiency is estimated at 60% to 70% of the value of the bills issued. Its average tariff is believed to cover only about 50% of the cost of supply.

Bangladesh operates a power system with a total system loss level in the range of 20 to 32% and collection efficiency in the range of 80% to 90%.Its average tariff at about 5.2 cents/kWh is inadequate to cover the cost of supply and the key sector entities (BPDB and DESA) are insolvent.[18]Bulk supply tariffs had not kept pace with the average of the cost of generation and the cost of power purchased from the IPPs. The financial losses of the BPDB alone were estimated at $100 million in FY 2005 and it may have increased to about $110 million in FY 2006. The accumulated financial losses of BPDP at the end of FY 2006 were about $841 million.[19]

Bhutan operates a very small power system in which the system losses are contained at around 13.5%. Power supplied to the Bhutan Power Corporation is priced substantially lower than the export price to India. For example power from Chukka Hydropower Company is sold to India at 4.65 cents/kWh, while the sale price to BPC is around 0.78 cents. Still BPC makes only marginal cash surplus and makes book losses.

Nepal had a total energy loss level of about 25% in FY 2005 of which a significant portion is attributed to theft of power. Despite an average tariff of about 9 cents/kWh (which is perhaps the highest in the region), the Nepal Electricity Authority made a net financial loss of about $25.9 million in FY 2005 and faced liquidity problems. While its collection of bills from other consumers were reasonable at a ratio of about 95%, collection from municipalities and other government entities was poor and arrears mounted to about $20.3 million.

India operates a large power system in which the electricity distribution responsibilities are handled by the state government owned Electricity Boards in most states.[20] Most of them face high levels of system losses (a substantial part of which is theft of power) and low levels collection. Also un-metered supplies are provided to a variety of consumers such as agricultural pump sets and small rural households. Sales on the basis of metering ranged from 70% of the total energy input into the system in West Bengal state to about 45% in Haryana and Rajasthan states. As it is difficult to separately estimate the technical losses and commercial losses under these circumstances, the concept of Aggregate Technical and Commercial Losses (ATC Losses) is used.[21] In well run utilities this should not exceed 10% to 12%. In India ATC losses in 2005 were higher than 40% in eleven electricity boards, 30% to 40% in seven electricity boards, and 20% to 30% in eight electricity boards. Only in two electricity boards (Tamil Nadu and Goa) the ATC losses were less than 20%.[22] Tariffs lag substantially behind cost of supply. The Central

---

[18] See The Final Report of the consulting firm Nexant to ADB under T.A No. 4379-BAN Power Sector Development Program II, June 2006

[19] Based on information in the BPDB website http://www.bpdb.gov.bd/index.htm

[20] Provinces in India are called states with their own elected governments and legislatures. India is a Union of such states.

[21] ATC loss = [1 - (Billing Ratio x Collection Ratio)], where, Billing Ratio = energy input into the system in GWh/ energy billed in GWh and Collection Ratio = energy billed in money terms/ collection in money terms

[22] See *State Power Sector Performance Ratings, Final Report to the Ministry of Power, Government of India*, June 2006, (prepared by CRISIL and ICRA leading rating agencies of India)available at the website of the Ministry www.powermin.nic.in

Electricity Authority of India estimates that the average cost of supply/kWh in FY 2005 was 5.6 cents, while the average revenue/kWh was only 4.62 cents or about 82.5% of the cost of supply.[23] The total losses made by all electricity boards in FY 2005 amounted to $4.9 billion or about 1.2% of the GDP. Apart from the inadequate level of tariffs, the structure of tariffs is highly skewed in favor of agricultural pumps and household consumers and penalizes industrial consumers severely eroding their competitiveness and inducing high levels of theft. In 2002, the industrial consumers of India had a tariff of 47 cents/kWh compared to 20 cents in China, 17 cents in Brazil, 12 cents in Japan, 5.5 cents in USA and 5 cents in Germany.[24] It is estimated that about $4.5 billion of budget and cross subsidies are channeled through India's power sector mainly to farmers (who account for 25% of total consumption) and households (who account for another 20%) with monthly consumption ranging from 50 to 250 kWh. Of this, a sum of $2.3 billion came from the budget of the state governments, and the rest came from cross subsidies. In many states subsidies for power supply exceed public expenditures on health and education.[25]

Pakistan also faced significant system losses and financial losses. During the 10 years between FY1996 and FY2005, WAPDA's total system losses (including auxiliary consumption of generation plants, transmission and distribution losses) ranged between 24.13% (the lowest in the period) in FY1997and 27.55% (the highest in the period) in FY1999. KESC's system losses during the same period ranged between 35.14% in FY1996 and 47.39 in FY2003.[26] Theft of electricity and non-payment of bills were so rampant in KESC area that the army was called in to prevent theft and enforce collections.

Collection had been particularly difficult in the Federally Administered Tribal Areas also. Tariffs have traditionally lagged behind costs of supply and both WAPDA and KESC had been accumulating substantial losses despite periodic financial recovery packages. One estimate places the annual financial losses of WAPDA and KESC at about $585 million in the early years of this decade. The losses are increasing since WAPDA's losses alone were estimated at $817 million for FY 06

Sri Lanka had a relatively moderate system loss at around 17.2% during 2004 and 2005. Its overall average revenue/ kWh covered only about 88% of the average cost in 2003. Its average revenue in 2004 at about 7.66 cents/kWh produced a net loss and a negative rate of return of (-) 5.11% on average net fixed assets in operation. Its internally generated cash was inadequate to service its debt.[27] Households, religious institutions, street

---

[23] See *Annual Report of the Central Electricity Authority of India for FY 2005-2006* available at its website www.cea.nic.in . The cost of supply is likely to be an underestimate and the gap may actually be wider.

[24] See *Integrated Energy Policy Report of the Expert Committee,* August 2006 of the Planning Commission, Government of India, New Delhi available at website www.planningcommission.nic.in . The data is calculated using PPP exchange rates. When market exchange rates are used, the gap between India and USA would be narrower, but still substantial, and Indian rate for the industrial consumers would continue to remain the highest.

[25] See South Asia Running Brief, pages 29-31 available at World Bank South Asia Website

[26] WAPDA Power System Statistics, NTDC, Lahore, December. 2005

[27] See CEB website at www.ceb.lk and also the Presentation by A.Perera of CEB in the BIMSTEC conference on Hydropower during 30-31 October 2006, New Delhi, India. A slight increase of average revenue/kWh to 7.71 cents in 2005 enabled CEB to achieve a debt service ratio of 1.07, though the rate of return still remained negative at (-) 1.15%.

lighting and low voltage industrial consumers were cross subsidized by the remaining categories of consumers, mostly commercial and large industrial consumers.[28]

On account of such poor operational and financial performance of the power utilities and their lack of creditworthiness the entry of IPPs for generation in most cases could be only on the basis of "take or pay" obligations fully covered by sovereign guarantees. Even in such cases the inability of the utilities to absorb the rising cost of power from IPPs (indexed to variations in fuel prices, exchange rates, domestic inflation, and similar variables) resulted in disputes, cancellation, or renegotiations, which soured the investment climate. This environment was clearly not conducive for electricity trade among the countries.

3.5 Ownership Structures and Contracting Practices

Power sector in the region is predominantly state owned. Till recently, participation of the private sector was generally limited to a number of generation projects with sovereign guaranteed cash flows, established under the BOT or BOO models. Private sector involvement in the distribution segment is limited to a few states and cities in India. Given the poor financial performance of the utilities, investment resources had to come primarily from the state funds, which were scarce and which faced numerous other competing claims. In this context, the governments' finding funds for export oriented power projects or for investing in a power project of another country (even on the basis of least cost considerations) for securing power imports was politically difficult.[29] In Nepal and Bangladesh, domestic power sector was perpetually facing supply shortages and in this context, politicians could not focus on power projects for exports. India's aid for the construction of a few small hydropower projects in Nepal was essentially to help Nepal and not for generating power exports to India. India's substantial grants and loans to finance one large and two medium sized hydropower projects (Chukka, Kurichi and Tala) in Bhutan for securing import of hydroelectric power can be considered an exception rather than the rule. The countries with export potential (Bhutan, Nepal, Bangladesh) were relatively small economies[30] with no investment resources of their own and with poor access to international capital and debt markets. Even their ability to raise resources from multilateral development banks and other sources of concessional funds was so limited that they could not finance large export projects, because of the limited allocations and prudent lending limits of these institutions (and the competing claims on them). Thus the ownership structure of the sector was not conducive to seize profitable export-import opportunities. In order to unlock the power export potential in small countries new types of ownership structures and new financing structures for the projects are needed. These are taking time to emerge.

Even the few transactions, such as those between India and Bhutan, India and Nepal, Afghanistan and Central Asia and Iran are more political than economic or commercial in character. There are no long term contracts with "take or pay" or "supply or compensate"

[28] Electrowatt-Ekono Study, 2003 for the Energy Supply Committee Tariff Study

[29] In the democratic polity of India, for example, various states compete furiously for ensuring that the power project sites in their state secure the scarce investment resources of the central government. In this context it is difficult for the central government to invest in projects abroad, while there are still plenty of potentially good sites within the country.

[30] In Nepal and Bhutan the cost of any single major hydropower project may be as high as the GDP of the country or even larger. The capital cost of Tala Hydropower project was more than 1.6 times the GDP of Bhutan in 2004

obligations, long term price adjustment mechanisms and formulae, and dispute resolution mechanisms.[31] Prices are valid for short periods only and are subject to periodic negotiations. Such political agreements are acceptable in the nascent stages of trade, but unless they quickly evolve into sustainable commercial arrangement, are not conducive to growth in trade.

3.6 Sector Structures and Regulation

Trade between integrated utilities is possible and has been taking place in a small way (as indicated in Chapter 2) based on the availability and transfer capacity of the interconnection. In order to facilitate more widespread trade within and across large power systems(such as that of India), it is generally considered advantageous to unbundle the utility operation and the electricity tariff by function (generation, transmission and distribution) and provide for third party access to the transmission system and for transparent and predictable transmission tariffs. This is also especially important in transit countries. It goes without saying that at least the large consumers and distribution companies should have the freedom to choose their supplier in any of the interconnected systems and contract for their supplies. Regulation of the retail tariffs, enforcement of supply contract conditions, and resolution of the disputes are to be handled by independent regulatory bodies. In South Asia, restructuring in this direction commenced in the mid 1990s and had been progressing very slowly. Progress became somewhat noticeable only in the last few years, especially after the enactment of the new electricity law in India in 2003. The slow rate of progress in sector restructuring had been considered by many as an impediment to growth in electricity trade both within the large systems and across the systems. The actual progress and outlook are discussed in the next chapter which identifies and analyzes the emerging factors which would improve the prospects for electricity trade within the region and with its neighbors in the near future.

[31] Even though India has financed the hydropower projects in Bhutan on such generous terms as 60% grant and 40% long term loan, the price/kWh for power from Chuka had been changed from Rs 0.19 in 1988 to Rs 2.00 in 2006 through several negotiations and the price for Tala power has not yet been agreed upon though the project had been commissioned in 2006 and power is being exported.