

SECTOR ASSESSMENT (SUMMARY): POWER**1. Sector Performance, Problems and Opportunities**

1. The Bangladesh economy has grown by about 6% a year¹ on average since 2005, and this level of growth is expected to continue. Rapid economic growth is causing electricity demand to increase sharply as the country continues to industrialize and raise the living standards of its large population. The operational performance of the power sector (parameters such as total generation and gross revenues) has improved steadily since 1995. For instance, capacity addition in Bangladesh in both the public and private sector has resulted in a 150% increase in total generation since 1995. Losses have been steadily reduced since 1995 as a result of sector reforms, a greater focus on distribution, and better commercial performance.

Table 1: Sector Performance

Item	1995	2000	2003	2006	2009
Installed capacity of BPDB (MW)	2908	3331	3420	3895	3812
Installed capacity of IPP plants (MW)	0	380	1260	1260	1681
Total installed capacity (MW)	2908	3711	4680	5155	5493 ²
Total generation (GWh)	10806	15563	19180	23703	26604
Gross revenues (billion taka)	14.27	22.89	36.57	44.6	59.31
Sales (GWh)	8371	12461	16332	20954	23937
System losses (%) ^a	22.5	19.9	14.8	11.6	10.0
Village electrification (number)	2867	3201	3400	3495	4204

^a System losses are calculated as 1 – sales / total generation;

BPDB = Bangladesh Power Development Board; GWh = giga watt hour ; IPP = independent power producer; MW = mega watts

Source: Bangladesh Power Development Board. *Annual Report 2009*.

2. The operational and financial performance of the transmission utility and the Executing Agency in this case - Power Grid Company of Bangladesh (PGCB) - improved from 2005 to 2009, with lower transmission losses and higher revenues.

Table 2: Operational and Financial Performance of Power Grid Company of Bangladesh

Item	2005	2006	2007	2008	2009
Transmission charge (billion taka)	4.68	5.02	5.03	5.35	5.58
Profit after tax (billion taka)	0.26	0.62	1.25	1.69	1.55
Transmission losses (%)	3.42	3.44	3.15	3.55	3.23
Gross fixed assets (billion taka)	51.3	53.78	53.81	53.88	67.78
Return on NFA (%)	10	11.40	12.47	15.12	12.87
Accounts receivable (months of sales)	3.70	2.00	1.49	1.04	2.10

NFA=net fixed assets

Source: Power Grid Company of Bangladesh. *Annual Report 2009*.

¹ ADB. December 2009. *Bangladesh Quarterly Economic Update*. Manila.

² Net dependable generating capacity is around 3,800 MW

3. **Demand–supply gap.** In 2009, the country's dependable power generating capacity was 3,800 MW while the peak demand was about 5,500 MW, implying a peak deficit of nearly 1,700 MW.² This has resulted in frequent power cuts and voltage fluctuations. Power generation capacity additions have not kept up with growth in demand. Existing generating stations do not operate at their maximum efficiency or availability. Many industrial and commercial establishments depend on expensive and inefficient captive generation to combat the power shortages. The government, supported by its development partners, is attempting to implement various energy efficiency measures to reduce energy intensity as one approach to this issue.

4. **Limited access to power.** Despite its notable progress on the macroeconomic front, Bangladesh's electrification ratio is still very low. Electricity is available to only 47% of the population.³ Improving access to electricity is a key objective of the government's Vision 2021 and achieving this will require significant transmission and distribution investments. There are significant regional differences, with the western part of the country being traditionally underserved because power generation and transmission are concentrated in the east. Since 2001, ADB has provided two loans⁴ to support the less developed western region of Bangladesh to improve power and gas transmission and distribution infrastructure.

5. **Single fuel dependence.** About 85% of power generating capacity is based on gas as a fuel source. Gas supply shortages have seriously impacted power generation, resulting in power cuts that have reduced economic output. Dependence on a single source of energy for power generation weakens energy security. To address the crippling shortages of power, the government has recently announced the construction of an LNG terminal, development of new plants using dual fuel technology, construction of generation facilities using domestic and imported coal, and international power transfers. However, the time frame to realize these options remains uncertain.

6. **Environment for investment.** In the recent past, Bangladesh has been unable to attract large private sector investment for the power sector. The Ministry of Power, Energy and Mineral Resources (MPEMR) has indicated that an investment of over \$9.5 billion in the power sector is required for generation, transmission, and distribution. Private sector participation is imperative for the rapid expansion of generation capacity and MPEMR expects more than half of any additional generation capacity expansion to be developed by the private sector. Improving the enabling business environment, the policy and regulatory environment, fuel availability, and logistics and addressing barriers to the mobilization of local long-term financing are major challenges. Implementing the power sector expansion plan will require significant public sector investment and improvements to the enabling environment and implementation support for joint venture and private sector projects.

7. **Governance and planning.** Several new public sector entities, including PGCB, have been established and are listed on the country's stock exchanges. The government, through the Power Division of MPEMR continues to be a majority shareholder and supervises the functioning of these entities. The intended corporatization of BPDB is not yet complete. While the government has announced significant capacity addition plans over the next 5 years, the required planning expertise to make these plants operational and to procure power to meet demand remains inadequate.

³ Energy and Power note prepared by Ministry of Power, Energy and Mineral Resources for Bangladesh Development Forum 2010

⁴ ADB. 2001. *BAN: West Zone Power System Development Loan*. Manila and ADB. 2010. *BAN: Natural Gas Access Improvement Project*. Manila

8. **Tariffs and regulation.** The Bangladesh Energy Regulatory Commission (BERC), an independent regulatory agency, was established in 2004, but has not yet been able to completely carry out its legislated mandate. In March 2010, the regulator increased retail tariffs by 4-6%. However, carrying out politically sensitive tariff reforms remains a challenge. The government announced a 5-year road map for the power sector retail tariff in May 2010 and several important regulations governing the power and gas sector are expected to be gazetted before August 2010. However, the regulatory environment for the power and energy sector is not yet considered adequate by potential investors. The regulator needs to interact with broader energy sector planning and coordination, including reviews of the generation and transmission expansion plans. Existing electricity tariffs are inadequate, especially since use of imported fuels (such as liquefied natural gas, heavy fuel oil, high speed diesel and imported coal) is expected to increase significantly. Although the BERC reviewed consumer retail electricity tariffs in March 2010, tariff regulations for electricity transmission remain to be gazetted.

9. **Regional power trading.** Bangladesh has significant hydropower capacity that could be used to meet the power requirements of the rest of South Asia. However, there are several political, legal, operational, regulatory and technical issues that need to be addressed before regional power trading becomes a reality. Bangladesh has signed a memorandum of understanding with the Government of India to initiate cross-border electricity trade. While this is a good beginning, additional cross-border transmission capacity and power trade with other South Asian countries, such as Bhutan and Nepal, will be needed for Bangladesh to address its power sector needs. In addition, the government has signed a memorandum of understanding to develop additional generation capacity through joint ventures with Indian power utilities.

2. Government's Sector Strategy

10. To address Bangladesh's constrained economic growth and widespread poverty, the power sector development framework identifies a need to establish an adequate and reliable power supply and to increase access to power. The sector development framework identifies the government's target of increasing power generation capacity by an additional 9400 MW before 2016, including through sourcing power from India. The target of increasing electricity access to 70% of households by 2016 will be an important intermediate milestone to reaching the government's vision of 100% electricity access by 2021.

11. The Government's power sector reform road map for 2006–2008 recognizes the need to address structural weaknesses, including making the Bangladesh Electricity Regulatory Commission fully functional, improving corporate governance of sector entities, completing the restructuring of BPDB, unbundling and granting managerial independence to sector entities, streamlining the process for private sector investments, and mobilizing funds from capital markets for power sector entities. ADB continues to support such initiatives through its participation in the local consultative group (comprising various development partners) and through its technical assistance program.

3. ADB Sector Experience and Assistance Program

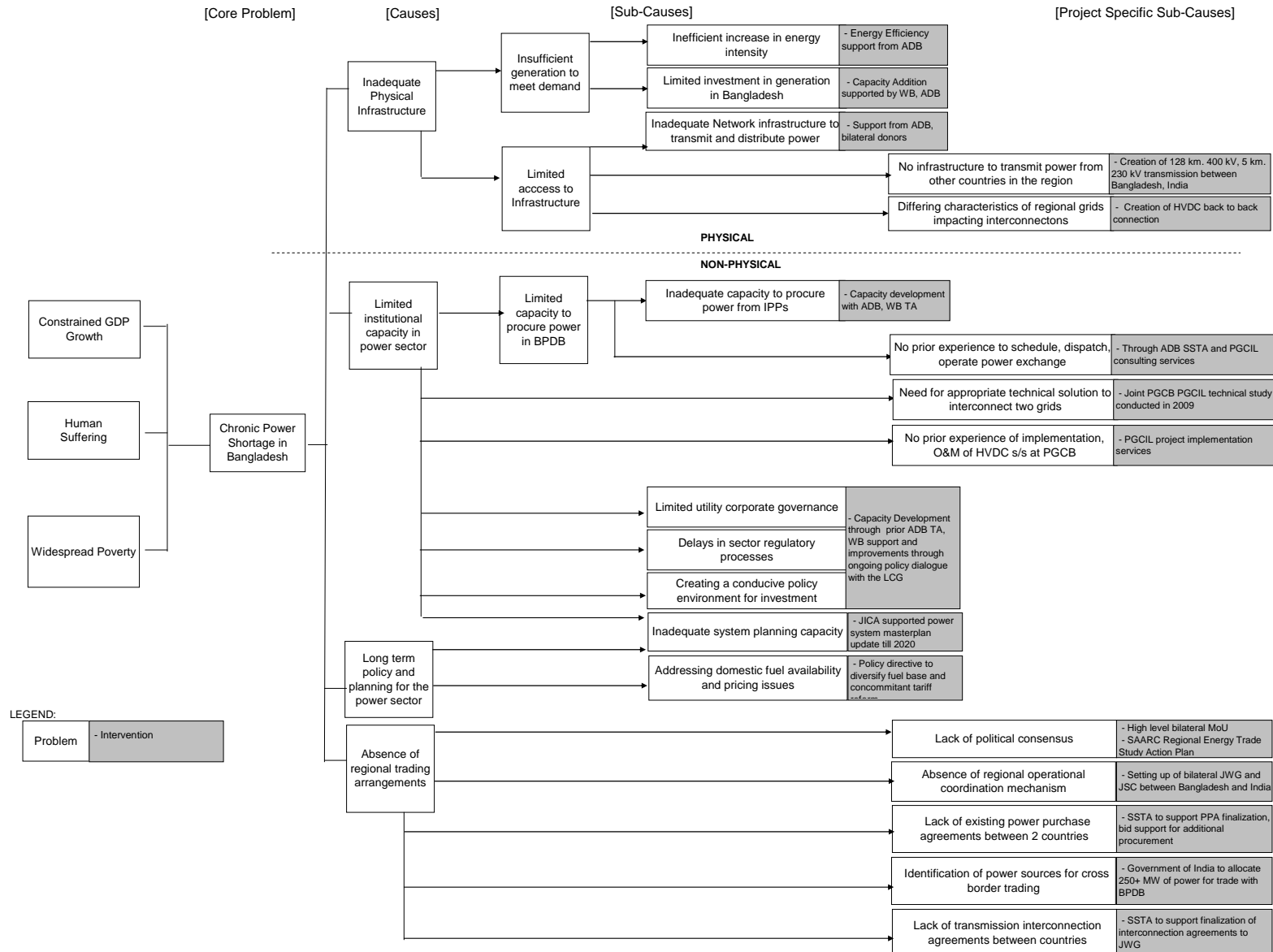
12. ADB has been a key multilateral development partner in the power sector. There are four ongoing power projects: (i) Dhaka Power System Upgrade Project (\$75 million), (ii) West Zone Power System Development Project (\$123 million), (iii) Power Sector Development Project (\$186 million) and Sustainable Power Sector Development Project (\$400 million).

13. The sector assessment program evaluation (SAPE)⁵ for the Bangladesh energy sector in 2009 noted that the operational, commercial and financial performance of the transmission and distribution entities had improved. Bill collection was better, the number of outages had been reduced, the voltage profile had improved, and cost recovery was better. The SAPE also emphasized the need to promote regional electricity trade with neighboring countries. ADB will provide technical assistance to the government to conclude the relevant commercial and technical arrangements for the Bangladesh – India Electrical Grid Interconnection Project.

14. The proposed grid interconnections with neighboring countries are expected to address power shortages in the medium term and to open up possibilities of additional regional interconnections and trade. Diversification of fuel sources and investments in energy efficiency (especially for generating stations and large consumers) are also government priorities and are being supported by an ongoing ADB TA. Immediate action is needed to finalize various aspects of the proposed generation facilities (especially with regard to fuel availability, pricing, and associated supply chain logistics) to be implemented by both private and public sectors. Procurement capacity building is also needed if the ambitious target of adding 9400 MW of generation capacity is to be achieved.

⁵ ADB.2009. *Sector Assessment Program Evaluation: Bangladesh Energy Sector*. Manila.

BANGLADESH INDIA ELECTRICITY GRID INTERCONNECTION PROJECT - PROBLEM TREE



LEGEND:

Problem	- Intervention
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ADB = Asian Development Bank, BPDB = Bangladesh Power Development Board, HVDC = High Voltage Direct Current, JICA = Japan International Coordination Agency, JSC = Joint Steering Committee, JWG = Joint Working Group, kVA= kilo Volt, LCG = Local Consultative Group, MoU = Memorandum of Understanding, PGCB = Power Grid Company of Bangladesh, PGCIL = PowerGrid Corporation of India Limited, PPA = Power Purchase Agreement, SAARC = South Asian Association for Regional Cooperation, SSTA = Small Scale Technical Assistance, TA = Technical Assistance, WB = World Bank

Sector Results Framework: Power Sector (2010-2015)

Country Sector Outcome		Country Sector Outputs		ADB Sector Operations	
Outcomes with ADB Contributions	Indicators with Targets and Baseline	Outputs with ADB Contributions	Indicators with Incremental Targets (Baselines Zero)	Planned ADB Interventions	Main Outputs Expected from ADB Contribution
Adequate and reliable power supply	By 2016		By 2016	Planned Key Activity Areas	Planned Key Activity Areas
	Power generation to increase by additional 9,400 MW from 2010	Capacity of energy sector institutions strengthened	Procurement, regulatory, and governance capacities strengthened	Continuation of energy sector reforms	Support for sector reforms, governance and pricing
		Additional generation capacity installed	Additional generation from coal, dual fuel, nuclear and other sources installed to meet demand	Construction of key in-country power transmission links	Construction of 500km 400kV power transmission lines
		Inefficient thermal plants rehabilitated or replaced	Existing open cycle state-owned power plants converted to combined cycle plants	Efficiency improvement in thermal power plants	Conversion of 2x120MW peaking plants to combined cycle power plants
Increased access to power	Cross-border power imports to increase from 0 MW in 2010 to 500MW	Cross-border transmission links established	Western border 500MW power transmission interconnection completed	Support for renewable energy projects	Establishment of solar and wind power pilot projects
			Work on the eastern border 250/500MW power transmission interconnection initiated	Implementation of regional power transmission interconnection	Construction of 250/500MW transmission link and substations on eastern and western borders
	Access to electricity increased from 47% of households in 2009 to 70%	Expansion and upgrading of power transmission and distribution networks	500km of additional power transmission lines constructed	Projects in Pipeline with Estimated Amount Power System Efficiency Improvement Project (\$500 million) Upgrade Project, 1731-BAN (\$75 million)	Projects in Pipeline Replacement of Ashuganj 226MW power plant and others