

SECTOR ASSESSMENT (SUMMARY): POWER

1. Sector Performance, Problems and Opportunities

1. The Bangladesh economy grew by 6.2% in 2012.¹ This is expected to be lower in 2013 on account of global macroeconomic factors and supply-side constraints such as shortages in electricity and gas. Rapid economic growth in the last decade has caused electricity demand to increase sharply as the country continues to industrialize and raise the living standards of its large population.

2. The operational performance of the power sector (on 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 sectors has more than doubled since 2000. Losses have been steadily reduced since 1995 as a result of sector reforms, a greater focus on distribution, and better commercial performance (Table 1).

Table 1: Sector Performance

Item	2000	2003	2006	2009	2012
Installed capacity of public generation (MW)	3,331	3,420	3,895	3,812	4,329
Installed capacity of private generation (MW)	380	1,260	1,260	1,681	3,771
Total Installed capacity (MW)	3,711	4,680	5,245	5,719	8,716
Net generation (GWh)	14,739	18,458	22,978	26,553	35,118
Revenue collection (Tk billion)	22.5	36.1	44.3	58.9	102.2
Sales (GWh)	12,461	16,332	20,954	23,937	29,974
Distribution system loss (%)	26.1	22.3	19.1	13.6	12.2
Villages electrified (number)	3,201	3,400	3,495	4,204	4,810

GWh = gigawatt-hour, MW = megawatt.

Source: Bangladesh Power Development Board. *Annual Report 2012*. Dhaka.

3. The operational and financial performance of the transmission utility—Power Grid Company of Bangladesh (PGCB), in this case also the executing agency—improved from 2006 to 2012, with lower transmission losses and higher revenues (Table 2) while profit after tax declined.

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

Item	2006	2008	2010	2012
Transmission charge (Tk billion)	5.0	5.3	5.9	7.0
Profit after tax (Tk billion)	0.6	1.7	1.6	1.2
Transmission losses (%)	3.4	3.6	3.1	2.7
Gross fixed assets (Tk billion)	53.8	53.9	70.4	84.3
Return on net fixed assets (%)	11.4	15.1	10.4	8.9
Accounts receivable (months of sales)	2.0	1.0	2.0	2.0

Source: Power Grid Company of Bangladesh. *Annual Report 2012*. Dhaka.

¹ Asian Development Bank (ADB). March 2013. *Bangladesh Quarterly Economic Update*. Manila.

4. **Demand–supply gap.** In 2012, the country's dependable power generating capacity was 8,100 megawatts (MW) while the recorded peak deficit exceeded 1,000 MW.² Acute shortages in generating capacity have resulted in frequent power cuts and voltage fluctuations. Power generation capacity additions since 2009 have been a combination of public sector projects and rental power plants to mitigate electricity shortages.² Existing generating stations do not operate at their maximum efficiency or availability due to fuel shortages. 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. A master plan has been drawn up for 34,000 MW of capacity by 2030.

5. **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 50% 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 big regional differences, and the western part of the country is traditionally underserved because power generation and transmission are concentrated in the east. Since 2001, the Asian Development Bank (ADB) has provided assistance such as the West Zone Power System Development Project and Natural Gas Access Improvement Project to assist the less developed western region of Bangladesh in improving power and gas transmission and distribution infrastructure.⁴

6. **Single-fuel dependence.** Over 80% of power generation capacity is based on gas as a fuel source. Gas supply shortages have 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 minimize the shortages, the government has announced plans for development of plants using dual fuel technology, domestic and imported coal, and international power transfers. However, the time frame for realizing these options remains uncertain.

7. **Environment for investment.** The Ministry of Power, Energy, and Mineral Resources (MPEMR) has indicated that an investment of over \$9.5 billion is required for power 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 to be developed through private investment. Improving the enabling environment for business, the policy and regulatory environment, fuel availability, and logistics and removing barriers to the mobilization of local long-term financing are major challenges. Implementing the power sector expansion plan will require both significant public sector investment and improvements to the enabling environment, and implementation support for joint ventures and private sector projects.

8. **Governance and planning.** Several public entities have been created, including PGCB, and are listed on the country's stock exchanges. The government, through the Power Division of

² Bangladesh is placed at a country ranking of 185 on the parameter of getting electricity. World Bank. *Doing Business 2013*. Washington, DC.

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

⁴ ADB. 2001. Report and Recommendation to the Board of Directors on Proposed Loans and Technical Assistance Grant to the People's Republic of Bangladesh for the West Zone Power System Development Project. Manila (RRP: BAN 31296) and ADB. 2010. Report and Recommendation to the Board of Directors on Proposed Loan to the People's Republic of Bangladesh for the Natural Gas Access Improvement Project. Manila. (RRP: BAN 38164)

MPEMR, continues to be a majority shareholder and supervises the functioning of these entities. The intended corporatization of the Bangladesh Power Development Board (BPDB) is not yet complete. The government has announced significant capacity addition plans by 2015 and needs to strengthen planning expertise to make these plants operational as early as possible to meet growing demand.

9. **Tariffs and regulation.** The Bangladesh Energy Regulatory Commission (BERC), an independent regulator, was established in 2004 and has been receiving assistance from multilateral and bilateral agencies to carry out its legislated mandate. Existing retail electricity tariffs are inadequate, given that the proliferation of imported fuels (e.g., liquefied natural gas, heavy fuel oil, high-speed diesel, and coal) is expected to increase significantly. While carrying out politically sensitive tariff reforms is challenging, retail tariffs have increased in 2011 and 2012. Important regulations for the sector, including tariff regulations, have been notified. The regulation for electricity transmission tariffs is expected to be notified in 2014 and will improve the transmission utility's revenues and profitability.

10. **Regional power trading.** South Asia has significant hydropower capacity and there are potential opportunities for trading between Bangladesh and other countries in the region if political, legal, operational, regulatory, and technical issues are sorted out. Bangladesh has made a start by signing a power purchase agreement with India in 2012 for 250 MW to initiate cross-border electricity trade, and conducted bidding for another 250 MW from India in 2013. Additional cross-border transmission capacity and power trade with other South Asian countries, such as Bhutan and Nepal, are being explored through the power market. The government is also developing additional generation capacity in Bangladesh for imported coal projects through joint ventures with National Thermal Power Corporation of India.

2. Government's Sector Strategy

11. In response to Bangladesh's constrained economic growth and widespread poverty, the power sector development framework identified a need to establish adequate and reliable power supply and to increase access to power. During 2007–2011, generation capacity increased by 2,900 MW, of which 1,850 MW was added by the private sector. The Sixth Five Year Plan, 2011–2015 targets addition of over 12,000 MW of capacity to eliminate the demand–supply gap and increase access to 68%.

12. The government's power sector reform road map for 2010–2016 recognizes the need to remove structural weaknesses, e.g., by empowering BERC to link tariffs to costs, improving corporate governance of sector entities, completing the restructuring of BPDB, unbundling and granting managerial independence to sector entities, streamlining the process for private investments, and mobilizing funds from capital markets for sector entities. ADB continues to support such initiatives through project financing, participation in the local consultative group (comprising various development partners), and through its technical assistance program.

3. ADB Sector Experience and Assistance Program

13. ADB has been a key multilateral development partner in the power sector. Ongoing assistance supports interconnection including through the ongoing Bangladesh–India Electrical Grid Interconnection Project (\$100 million) and generation, transmission, and distribution through the Power System Expansion and Efficiency Improvement Investment Program

(multitranche financing facility of \$700 million) and the Power System Efficiency Improvement Project (\$300 million).

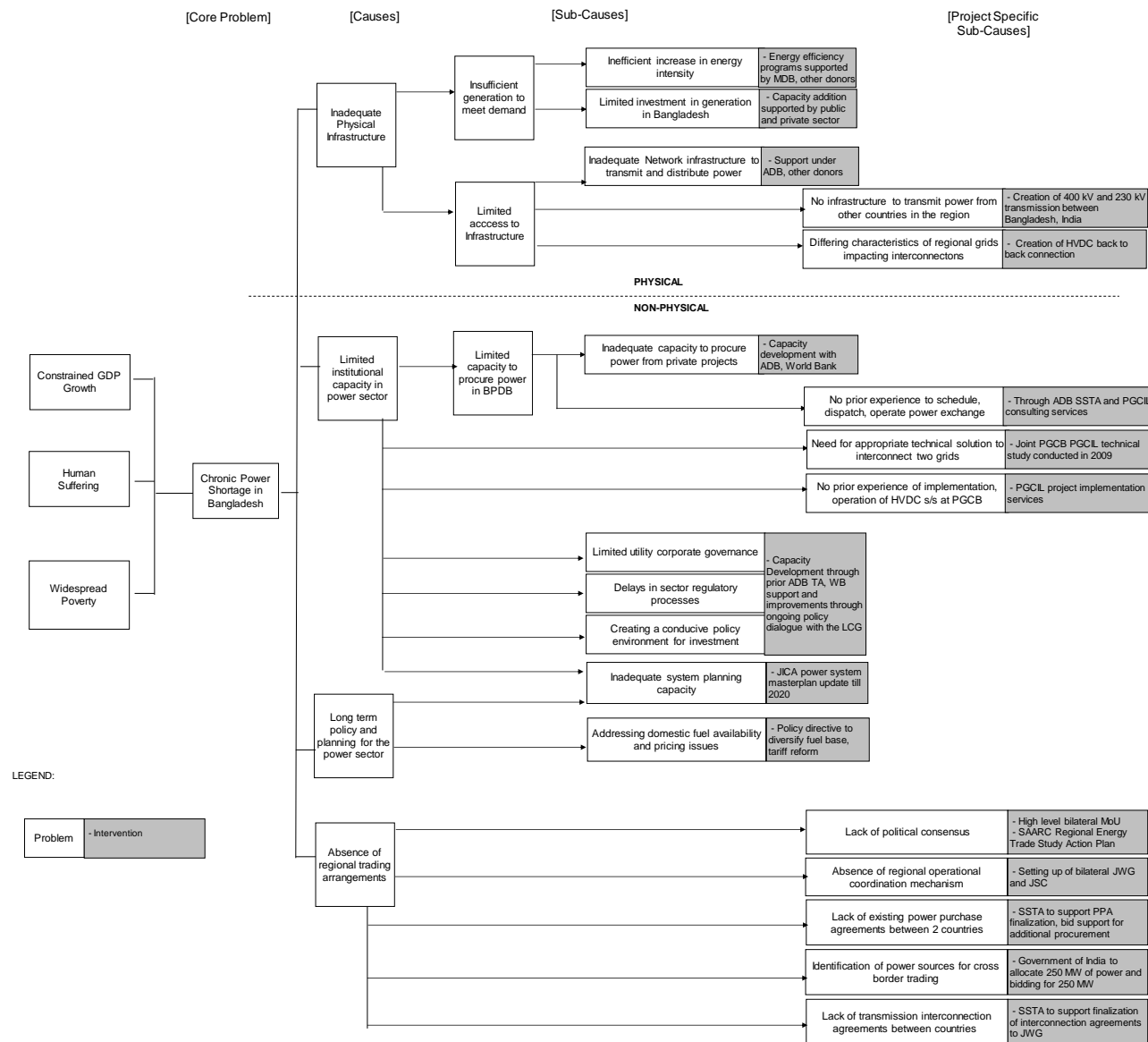
14. The 2009 sector assessment program evaluation for the Bangladesh energy sector noted that the operational, commercial, and financial performance of the transmission and distribution entities had improved.⁵ Bill collection was better, the number of outages had been reduced, the voltage profile had improved, and cost recovery was better. The evaluation also emphasized the need to promote regional electricity trade with neighboring countries.

15. The proposed grid interconnections with India and eventually the linkage of South Asian countries in the medium term is expected to minimize power shortages 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. ADB is supporting efficiency improvements projects through investments in public sector generation projects to enhance output using combined cycle gas technology as well as required transmission and distribution investments. Grid connected renewable energy hybrid projects are also being supported.

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

SASEC Bangladesh India Electrical Grid Interconnection Project – Additional Financing (RRP BAN 44192)

SASEC BANGLADESH INDIA ELECTRICITY GRID INTERCONNECTION PROJECT - PROBLEM TREE



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 and Ongoing ADB Interventions	Main Outputs Expected from ADB Contribution
Reliable power supply with expanded access to power	<p>By 2016 Power generation to increase by additional 9,000 MW from 2011 to 2016</p> <p>Per capita consumption of electricity increased from 170 kilowatt-hours in 2010 to 390 kilowatt-hours in 2015</p> <p>Cross-border power imports to increase from 0 MW in 2010 to 500 MW by 2014</p> <p>Access to electricity increased from 47% of households in 2009 to 65% of households by 2015</p>	<p>Capacity of energy sector institutions strengthened</p> <p>Additional generation capacity installed</p> <p>Inefficient thermal plants rehabilitated or replaced</p> <p>Cross-border transmission links established</p> <p>Expansion and upgrading of power transmission and distribution networks</p>	<p>By 2016 Procurement, regulatory, and governance capacities strengthened</p> <p>Additional generation from coal, dual-fuel, nuclear, and other sources installed to meet demand</p> <p>Existing open-cycle state-owned power plants converted to combined-cycle plants</p> <p>Western border 500 MW power transmission interconnection completed</p> <p>Eastern border power transmission interconnection under discussion</p> <p>Construction of additional 500 kilometers of power transmission and distribution systems undertaken</p>	<p>Planned key activity areas Continuation of energy sector reforms</p> <p>Construction of key in-country power transmission links</p> <p>Efficiency improvement in thermal power plants</p> <p>Support for renewable energy projects</p> <p>Implementation of regional power transmission interconnection</p> <p>Ongoing projects Power System Efficiency Improvement Project, (\$300 million)</p> <p>Power System Expansion and Efficiency Improvement Investment Program (\$700 million, MFF)</p> <p>Bangladesh–India Electrical Grid Interconnection Project (\$100 million)</p>	<p>Planned key activity areas Support for sector reforms, governance and pricing</p> <p>Construction of 400 kV power transmission lines</p> <p>Conversion of peaking plants to combined cycle power plants</p> <p>Establishment of solar and wind power pilot projects</p> <p>Construction of transmission link and substations on borders</p> <p>Ongoing projects Construction of Ashuganj 450 MW combined cycle power station</p> <p>Conversion of Khulna 225 MW, Baghabari 150 MW, and Shahjibazar 105 MW to combined cycle power stations.</p> <p>Construction of HVDC substation and 400 kV transmission lines on the western border</p>

ADB = Asian Development Bank, HVDC = high-voltage direct current, kV = kilovolt, MFF = multitranche financing facility, MW = megawatt.
Source: Asian Development Bank.