SECTOR OVERVIEW

A. Bangladesh’s Energy Sector

1. Gas is the primary source of energy in Bangladesh, and the country has 18 producing gas fields. Gas is mainly used for the production of grid-connected power (41%) but also for captive power (14%), fertilizers (14%), other industries (13%), domestic uses (14%), and for the production of compressed natural gas (4%). Gas accounts for 89% of the grid-connected power generated (furnace oil accounts for 3%, diesel for 2%, coal for 4%, and hydro for 2%).

2. Indigenous gas is, however, insufficient to meet Bangladesh’s current and future energy needs; the country is already facing shortages. Against a daily demand of 2,200 million cubic feet (MCF), total gas production is 1,950 MCF, representing an 11% shortfall (footnote 1). This shortfall is seriously hampering operations in all sectors. In particular, gas shortages contribute to the power demand–supply gap in Bangladesh, which currently stands at 29%—despite an installed capacity of 5,823 megawatts (MW), the maximum peak available capacity is 4,606 MW, while demand is estimated at 6,454 MW (footnote 2). Gas shortfalls will become an increasing problem. Even when taking into account all proven, probable, and possible reserves, gas production is expected to decline from 2019, and by some estimates gas reserves may be fully depleted within 10–20 years (footnote 1).

3. Power and gas shortages have undermined external competitiveness. According to garment industry leaders, garment orders cannot be fulfilled because of energy constraints. Frequent power cuts and low gas pressure add to production time, forcing exporters to airfreight merchandise at their own cost. Power cuts and gas shortages have reportedly rendered a significant part of the country’s garment capacity idle. Many industrial and commercial establishments depend on expensive and inefficient captive generation during power interruptions. Overall, the energy crisis is said to be responsible for an estimated two percentage point loss in gross domestic product growth potential (footnote 3).

4. Securing new sources of energy will take time. The country’s coal reserves remain largely unexploited because of a lack of policy decisions in respect of mining methods and the resettlement of affected people. The country has limited renewable energy potential (footnote 3). Because of the lack of immediate internal solutions, the Government of Bangladesh is increasingly looking at importing fuels: oil in the short term (rental power plants), and liquefied natural gas and coal as longer-term solutions. However, to successfully implement projects based on imported fuels, the government will need to set electricity tariffs at unsubsidized, full cost-recovery levels (footnote 5). Current tariffs do not reflect the real cost of inputs. The expensive power produced by the new oil-fired rental power plants will increase the sector deficit from around $300 million in 2011 to around $600 million per year by 2014 (footnote 3). The government’s budget will not be able to support this deficit on an ongoing basis. To avoid widespread defaults in the sector, electricity prices paid by consumers will need to increase.

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5. Because securing new sources of energy will take time, Bangladesh needs to promote more efficient uses of existing resources, both on the supply and on the demand sides. On the supply side, power plants have to become more efficient. Despite gas being the main fuel, only 23% of existing power plants use modern and efficient combined-cycle technology; the majority are old and very inefficient steam thermal plants. On the demand side, the government has taken certain initiatives in the commercial and residential sectors (e.g., introducing daylight saving time, staggering of holidays, controlling shopping hours, and promoting compact fluorescent lamps) (footnote 3). Industries should also be a key focus area for energy efficiency initiatives, as industries directly and indirectly consume about 50% of Bangladesh’s gas. Industries also directly consume other types of fossil fuels: oil for captive generators but also coal (the brick-making industry imports 2–3 million tons of coal per year) (footnote 1). Given the increasing importance of oil and coal in the country’s energy mix, energy efficiency is critical if Bangladesh is to control its carbon emissions.

6. There are, however, several barriers to the adoption of energy efficiency solutions in Bangladesh. These include (i) financing barriers (high initial costs, long payback periods, financial institutions lacking energy efficiency expertise, and development costs being high relative to energy savings because projects are small and sometimes complex), (ii) information barriers (lack of familiarity with energy efficient products, lack of awareness of benefits, and a perceived risk penalty when evaluating potential investments), (iii) price distortions (the artificially low level of gas and electricity prices make energy efficiency projects in Bangladesh generally less profitable than in other countries), and (iv) technical and availability barriers (equipment may not be available or distribution networks and local capacity may not exist) (footnote 1).

B. Potential for Industrial Energy Efficiency

7. There is significant energy efficiency potential in industries in Bangladesh. Industries are big energy consumers, and most are inefficient in their energy consumption compared to international benchmarks. Barriers to energy efficiency adoption are relatively low for industries. Investment projects are large compared to household projects. Lack of awareness and technical solutions can be addressed through energy audits and pilot studies. Price distortion remains a key barrier, even for industries. However, specific industry sectors where energy efficiency projects are still commercially attractive, despite low energy prices, can be identified.

8. Several promising industry sectors have been identified for the Bangladesh Industrial Energy Efficiency Finance Program. Five industries in particular show great energy efficiency potential: brick making, textiles, steel, cement, and chemicals. For all these industries, the energy savings potential is large and the energy efficiency improvement technologies are readily identifiable (either retrofits of existing systems or entirely new systems). Two other industries have been included in the finance program based on feedback received from the Industrial and Infrastructure Development Finance Company (IIDFC): ceramics (including glass) and agri-industries (including food processing, sugar, pulp and paper, and jute).6

9. Brick making. There are over 4,000 brick-making enterprises producing over 12 billion bricks annually in Bangladesh, and the industry is a big consumer of coal. The great majority of brick kilns in Bangladesh are highly inefficient—as of 2010, 92% of the kilns were still fixed-chimney kilns (FCKs), a technology outdated in most countries. As a result, the industry is one of the largest sources of greenhouse gas emissions in the country, with emissions estimated

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6 Certain sectors (e.g., fertilizer) are dominated by public sector entities and cannot be promoted by private sector finance (except as part of a hypothetical privatization process), despite their huge energy efficiency potential.
at 9 million tons of carbon dioxide (CO$_2$) annually. Because brick kilns are often located on the outskirts of urban areas, the pollution released by the chimneys affects the air quality of millions of people. The situation is expected to worsen as the pace of urbanization increases, creating a growing demand for bricks. The hybrid Hoffman kiln (HHK) is an alternative to the FCK and is 50% more energy efficient. One HHK costs about $2 million and can reduce CO$_2$ emissions by about 5,500 tons annually compared to the FCK, for the same number of bricks produced. The HHK is not only more energy efficient but also less polluting (HHKs do not require any tall chimneys) and have improved labor conditions. The government intends to phase out all FCKs by December 2013, and no new licenses for FCKs will be issued after December 2011. According to financial analysis conducted by the IIDFC, the expected project payback period for HHKs is 4 years and the internal rate of return is 22%. However, brick-making entrepreneurs need the incentive of long-term financing to invest in HHKs.\(^7\)

10. **Textiles.** The textile and garment industry is an important and growing sector in the Bangladesh economy, accounting for 79% of the country’s exports (footnote 3). The industry needs a lot of process heat, hot water, and steam, and relies on gas-fueled boilers for this. However, industrial boilers in Bangladesh tend to be highly inefficient, with estimated thermal efficiency of 50%–80%. Hence, the textile and garment industries, as well as other industries relying on boilers, could save on their energy bills by investing in more efficient boilers. GTZ and the World Bank conducted a pilot study on a boiler replacement project and estimated the internal rate of return at 36%. For every $9.60 invested, any such project would save 1 ton of CO$_2$ over the project’s life (footnote 1).

11. **ISO 50001,** an energy management standard released in June 2011 by the International Organization for Standardization, will be another driver of energy efficiency adoption for the textile and garment industry and other exporters in Bangladesh. The standard provides organizations “with management strategies to increase energy efficiency, reduce costs and improve energy performance.”\(^8\) It will become critical for Bangladesh’s textile exporters to comply with this new standard to retain their accreditation with environment-conscious buyers.

12. **Steel.** Steel rerolling mills are the largest gas consumers in the private sector. These mills use gas-fired furnaces to process steel ingots into iron rods and flat bars. A few large mills have modernized and lowered their specific energy consumption by more than 50%. However, most of the sector remains inefficient—out of the approximately 250 mills, only 25 are modern. Improvements in energy efficiency can be achieved through waste heat recuperation, better furnace insulation, combustion control, and improved control over operations. Energy savings would make such projects commercially attractive. GTZ and the World Bank conducted a pilot study on a steel rerolling mill in Bangladesh and estimated the internal rate of return at 28%. For every $8.70 invested, each project would save 1 ton of CO$_2$ over the project’s life (footnote 1).

13. **Cement.** The cement industry is also a large consumer of energy in Bangladesh. There are opportunities for energy efficiency projects in the cement industry worldwide. In particular, wet-type kilns can be replaced by modern dry-type kilns to reduce fuel consumption on a per ton of clinker basis. In June 2010, the Asian Development Bank (ADB) Board approved the financing of one such project in Azerbaijan.\(^9\) The GTZ–World Bank road map on energy efficiency in Bangladesh also identifies cement as a large industry with significant potential for energy efficiency improvements, although no pilot study was conducted (footnote 1).

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14. **Chemicals.** The chemical industry has a great demand for steam, making it a good candidate for cogeneration solutions (power plus steam). Cogeneration can make many of Bangladesh’s captive power plants more efficient. Captive power generators (with an estimated capacity of 1,200 MW) consume 14% of Bangladesh’s gas. These generators have an average size of 1–2 MW, and are generally of good quality (e.g., Caterpillar, GE, and Cummins). However, because they operate under variable load conditions, the overall thermal efficiency is lower (30%) than a comparable utility-scale gas turbine generator. The addition of a simple waste heat boiler can recover much of the nearly 70% of thermal content currently lost in flue gas. Hence, the chemical industry, as well as other industries with process heat requirements, could save on their energy bills by investing in cogeneration. GTZ and the World Bank conducted a pilot study on a cogeneration project and estimated the internal rate of return at 16% (22% when carbon credits are assumed). For every $9.40 invested, each such project would save 1 ton of CO₂ over the project’s life (footnote 1).

15. The chart summarizes the cost-effectiveness of various energy efficiency solutions as part of the GTZ–World Bank road map for energy efficiency in Bangladesh. It shows how much needs to be invested in each project to save 1 ton of CO₂ over the project’s life. It is clear from the chart that industry energy efficiency projects (e.g., steel, cogeneration in the chemicals industry, boilers in the textile industry) are the most cost-effective.

![Cost-Effectiveness of Various Energy Efficiency Solutions](chart)

**Cost-Effectiveness of Various Energy Efficiency Solutions**

($ per ton of carbon dioxide)

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<thead>
<tr>
<th>Program's Focus: Industrial Energy Efficiency</th>
<th>CCGT</th>
<th>T5</th>
<th>T8</th>
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<th>Cogeneration</th>
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CCGT = Combined Cycle Gas Turbine, T5 = Fluorescent lamp with 5 inch tube diameter, T8 = Fluorescent lamp with 8 inch tube diameter, VSD = Variable Speed Drive.


C. **Bangladesh’s Finance Sector**

16. The financial system in Bangladesh consists of Bangladesh Bank, four state-owned commercial banks, five government-owned specialized banks, 30 domestic private banks, 9 foreign banks, and 29 nonbank financial institutions. In addition, the Microcredit Regulatory Authority (MRA) has given licenses to 298 microfinance institutions. The financial system also includes insurance companies, stock exchanges, and cooperative banks. Financial intermediaries formally contribute around 1.6% of the country’s gross domestic product. However, the informal sector is still very large in Bangladesh—Bangladesh Bank estimates that only 20%–35% of all financial services are handled through the formal sector. The formal finance
sector is heavily dominated by the four state-owned commercial banks, which hold over 30% of all deposits and operate more than 3,000 (of a total of 5,730) branches in the country.\textsuperscript{10}

17. Supervision of the finance sector is done through three separate regulatory bodies: Bangladesh Bank, the MRA, and the Securities and Exchange Commission (SEC). Bangladesh Bank acts as the central bank and the regulatory body for the country’s monetary and financial system. Banks and nonbank financial institutions are regulated by the Bangladesh Bank, although under separate regulatory regimes.\textsuperscript{11} The MRA was established in 2006 to promote and foster sustainable development of the microfinance sector. It monitors, supervises, and issues licenses for the microfinance operations of both nongovernmental organizations and microfinance institutions operating in Bangladesh. The SEC is responsible for the administration of securities legislation and developing and maintaining fair, transparent, and efficient securities markets. Following the stock market bubble and crash in 2010, the chair and several members of the board of the SEC were replaced following severe criticism from experts and the public.

18. In 2000, a comprehensive reform program was launched to improve prudential regulations, strengthen Bangladesh Bank’s oversight capacity, deregulate interest rates, improve competition by introducing more private banks, and develop a banking legal system for faster resolution of loan disputes. It is suggested that good progress has been made in the first two of these areas. Since the reforms, bank deposits and credit have seen a sharp increase, private banking activities have risen, interest rates have been mostly determined by market forces, and the quality of bank portfolios has improved. The performance of the private banks was most notable, whereas improvements in the state-owned banks were marginal (footnote 3).

19. The Bangladesh finance sector still faces a number of key challenges:

(i) \textbf{Rising inflation.} The contractionary monetary policy used by the government to fight inflation has caused some liquidity tension in the finance sector. The cash reserve requirement and statutory liquidity ratio were increased twice in 2010, each time by 50 basis points.

(ii) \textbf{Access to credit.} Small and medium-sized entrepreneurs have remained underserved in terms of their demand for credit, with microfinance programs focused on low-income groups and the banks and nonbank financial institutions mainly focused on large businesses.

(iii) \textbf{Lack of long-term debt instruments.} Historically high nonperforming loan ratios have resulted in the banks offering debt instruments of mostly short maturities. To serve the unmet demand for credit, long-term maturity instruments are needed.

(iv) \textbf{Lack of alternatives to banks.} The financial services sector in Bangladesh is largely dominated by banks. The market for debt securities is underdeveloped—there are currently only three corporate bonds floated in the capital market. The lack of efficiency in the debt and equity capital markets makes investors dependent on the banks, and results in a wide interest spread.

(v) \textbf{Lack of hedging instruments.} The recent rise in commodity prices highlights the need for financial derivative instruments for importers to hedge their risks. The foreign currency swap market is extremely illiquid, even for short maturities, which makes it hard for companies to hedge foreign currency exposure.


\textsuperscript{11} Activities where some restrictions are imposed on nonbank financial institutions include (i) deposit acceptance, (ii) dealing in gold and foreign currencies, (iii) the size of loans provided compared to capital and total credit facilities, and (iv) trading.