August 2005

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Bangladesh

With its large potential natural gas reserves, Bangladesh is becoming increasingly important to world energy markets.

Note: Information contained in this report is the best available as of August 2005 and is subject to change.

GENERAL BACKGROUND

Bangladesh has received over $30 billion in disbursed grant aid and loans from foreign donors since its independence in 1971, but remains one of the world's poorest and most densely populated countries. The country historically has run a large trade deficit, financed primarily through foreign aid and remittances from the many Bangladeshi workers abroad (largely in the Persian Gulf region). Overall, foreign aid provides Bangladesh with around 40 percent of government revenues and 50 percent of foreign exchange. According to the World Trade Organization (WTO), Bangladesh's main problems include civil unrest, political instability, natural disasters, and inadequate infrastructure. Bangladesh's real GDP grew at an estimated rate of 5.3 percent in 2004, and is projected to remain steady at 5.2 percent in 2005.

Although urbanization is proceeding rapidly, agriculture, which employs about two-thirds of the labor force and accounts for 35 percent of the gross domestic product (GDP), remains Bangladesh's primary sector. The heavy reliance on agriculture makes Bangladesh vulnerable to natural disasters such as cyclones, floods, and droughts, as well as to fluctuations in world commodity prices. Severe flooding in 2004, reportedly the worst in a decade, damaged crops and infrastructure.

While the majority of large enterprises remain under state control, Bangladesh has been moving towards a market-oriented economy since the mid-1970s. In an attempt to diversify its economy away from agriculture, industrial development has been made a priority. Bangladesh is attempting to attract foreign investment, and has established export processing zones (EPZs) in Chittagong (the country's major port), Dhaka and Comilla. Exports of natural gas could provide an additional revenue source, but the issue remains controversial, and no final decision has been made. Although

cotton textiles and garments account for about 80 percent of Bangladeshi exports, the impact of the end of textile quotas under the Multi-Fiber Arrangement in January 2005 has been moderate.

A new government under the leadership of Prime Minister Khaleda Zia took office in October 2001 after the Bangladesh National Party (BNP) won the majority of seats in parliament. Political tensions remain high as the opposition Awami League party continues to stage strikes. In 2005, Mahmadur Rahman was appointed adviser for the energy portfolio, after the resignation of Moshrraf Hossein following a bribery scandal.

Bangladesh (along with Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka) is a member of the South Asian Association for Regional Cooperation (SAARC), which seeks to promote regional economic cooperation, as well as economic and social development in South Asia. In 2004, the seven SAARC members agreed to create a South Asian Free Trade Area (SAFTA) by 2006.

ENERGY

Bangladesh has small reserves of oil and coal, but very large natural gas resources. Commercial energy consumption is around 66 percent natural gas, with the remainder mostly oil (plus limited amounts of hydropower and coal). About 20 percent of the population (25 percent in urban areas and 10 percent in rural areas) has access to electricity, and per capita commercial energy consumption is among the lowest in the world. Noncommercial energy sources, such as wood, animal wastes, and crop residues, are estimated to account for over half of the country's energy consumption. The World Bank has estimated that Bangladesh loses around $1 billion per year in economic output due to power outages and unreliable energy supplies.

Bangladesh's Ministry of Energy and Mineral Resources (MEMR) has overall responsibility for the country's energy sector, controlling both policy formulation and investment decisions. Within MEMR, the "Power Cell" acts as a single point of contact to facilitate the electricity reform and restructuring process, including the development of Independent Power Projects (IPPs).

OIL

Bangladesh contains proven oil reserves of 56 million barrels and produces around 6,725 barrels per day (bbl/d), of which 6,000 bbl/d is crude oil. Until the early 1990s, the state oil and gas company Petrobangla, along with its eleven operating companies, was the sole player in the Bangladeshi oil and gas sectors. Since then, Bangladesh has encouraged foreign oil companies to do business in the country. Foreign companies currently hold ten blocks through eight Production Sharing Contracts (PSCs) with Petrobangla. Petrobangla serves as the sole purchaser of oil and gas from the companies. Around 65 percent of Petrobangla's gross revenues are paid to the government in the form of taxes and compulsory dividends. A third licensing round for blocks is expected before the end of 2005. To date, oil exploration has proven largely unsuccessful.

Refining/Downstream

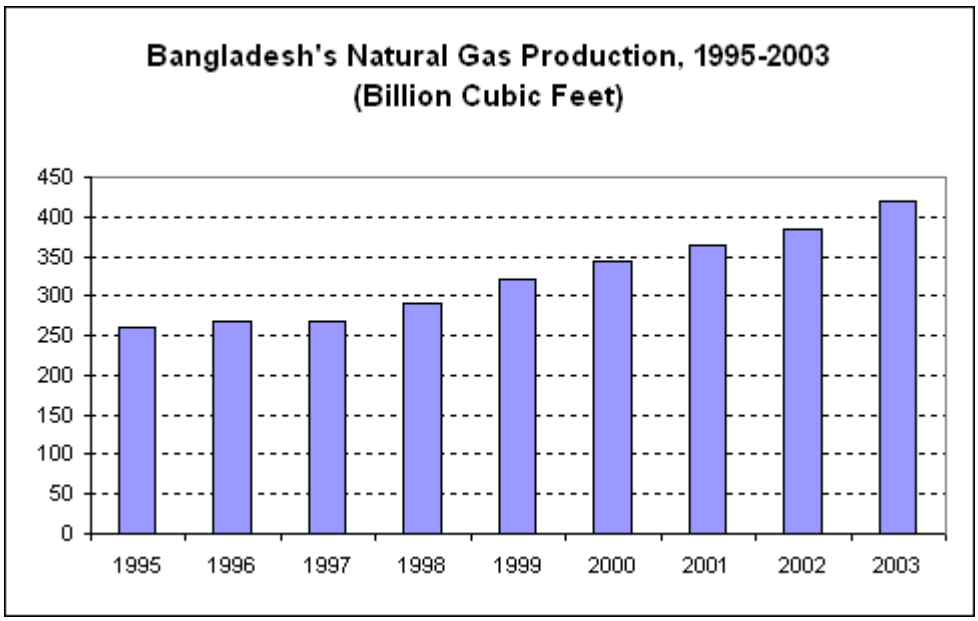
Bangladesh has one refinery, a 33,000-bbl/d unit at Chittagong. In December 2000, TotalFinaElf announced plans to set up a $16 million plant to bottle liquefied petroleum gas (LPG), in a joint venture with Bangladesh's Premier LP Gas Ltd. LPG is used in Bangladesh for domestic cooking, as well as in some industries and vehicles.

In July 1999, Bangladesh decided to remove lead from gasoline sold in the country, mainly due to health and environmental concerns, particularly in Dhaka. In 2003, the Bangladeshi government approved price increases on retail sales of petroleum products by the Bangladesh Petroleum Corporation (BPC). The move reduced consumption subsidies and helped to reduce border

smuggling, which had existed due to the price differential between retail petroleum in Bangladesh and India. The government also reportedly has considered allowing firms other than BPC to enter the downstream market.

NATURAL GAS

Natural gas is Bangladesh's only significant source of commercial energy, with 2003 production of 420.2 billion cubic feet (Bcf). Bangladeshi natural gas production began in 1960 from the Chattak Field. There is much uncertainty and debate about the size of Bangladesh's natural gas reserves. Whereas January 1, 2005 estimates by the *Oil and Gas Journal* put the country's proven natural gas reserves at 10.6 trillion cubic feet (Tcf), mid-2004 estimates from Petrobangla put net proven reserves at 15.3 Tcf. The US Geological Survey has estimated that Bangladesh contains 32.1 Tcf of additional "undiscovered reserves." Bangladesh may have the potential to become a major gas producer, as well as supplier to the vast potential market in neighboring India.



Natural gas exports are controversial within Bangladesh as many people feel that the gas resources first should be used for domestic purposes. In addition, the size of the country's gas reserves remains highly uncertain, particularly in relation to future domestic demand projections. Both major political parties officially are committed to considering natural gas exports only if Bangladesh's proven reserves will cover 50 years of domestic demand.

Bangladesh's natural gas demand is expected by some independent analysts to grow by around 6 percent annually over the next two decades. Potential uses for natural gas in Bangladesh include petrochemicals, compressed natural gas (CNG) for vehicles, power generation, and fertilizer. CNG already is used to fuel over 20,000 vehicles, mainly in the Dhaka area. Bangladesh also contains around 55 million barrels of natural gas liquids (NGLs), which could be used for petrochemicals production or as a cooking fuel. Besides foreign energy companies, natural gas in Bangladesh is produced by two subsidiaries of Petrobangla -- Sylhet Gas Fields Ltd. and Bangladesh Gas Fields Co. Ltd. -- for domestic consumption. Over 80 percent of the natural gas is consumed for power and fertilizer production, and the remainder by industry and households.

Petrobangla has approximately 20 natural gas fields, half of which are active. The main fields include: Bibiyana (discovered by Unocal in Block 12); Titas (the country's second largest natural gas field); Habiganj, Kailashtilla, Rashidpur, and Jalalabad, nearly all of which are located in the eastern part of the country, plus the Sangu offshore natural gas field (being developed by Cairn Energy and Halliburton) in Block 16 of the Bay of Bengal, 30 miles southwest of Chittagong. Production from Sangu, Bangladesh's first offshore field and first foreign-run field (with estimated reserves of around 850 Bcf), began in June 1998. In January 2000, Shell Bangladesh Exploration

and Development (SBED) along with partners Cairn Energy and HBR Energy reportedly discovered a new natural gas field near Sangu (South Sangu-1). In August 2000, SBED announced a $40-$50 million investment in new offshore natural gas exploration projects in Bangladesh, including the Sandwip East 1 well in Block 15. Other possible natural gas fields include Shaldanadi (estimated reserves of 500-1,000 Bcf), Fenchuganj, Feni, Kumta, and Shahbajpur. In March 2005, Unocal began production from the Moulavi Bazar field in Block 14, which is expected to produce up to 150 Bcf per day. Shahbazpur, discovered by Petrobangla subsidiary Bapex (Bangladesh Petroleum Exploration Company) in 1995, is estimated to contain 330-400 Bcf of recoverable natural gas. In 1998, Unocal and Petrobangla signed a PSC to develop the field. In January 2005, Bapex announced the discovery of natural gas at the Srikail field, with possible reserves of 200 Bcf.

In March 2004, Unocal, the largest foreign investor in Bangladesh's natural gas sector, shelved a proposal to export gas from the Bibiyana field to India, given the political obstacles to exports. Unocal plans to develop its assets in Bangladesh for sales to the domestic market. India's Tata Group has recently shown interest in Bibiyana gas. In August and September 2003, ChevronTexaco and Shell sold their natural gas assets in Bangladesh to Canada's Niko Resources and Cairn Energy, respectively. In November 2004, Niko Resources and Tullow Oil, the operator of Block 9, reported natural gas flowing at up to 120 million cubic feet (Mmcf) from the Bangora-1 well. In September 2004, Niko Resources announced that its Feni Block test well was producing at a rate of 32 Mmcf/d. In August 2005, Cairn Energy's PSC for Block 16 in the Bay of Bengal was extended until May 2008. Over the next three years, Cairn plans to drill three exploration wells in the block at a cost of $50 million.

In 2005, two blowouts occurred at the Chattak-2 well in the Tengratila gas field, operated by Niko Resources under a joint venture with Bapex. The first took place in January and led to $2.5 million in losses and significant damage to the local environment. Although the site was secured, a second blowout occurred in late June. An inquiry committee formed to investigate the incidents has net yet submitted a report. As of early August 2005, the fire from the second blowout reportedly continues to burn out of control.

In March 2005, the state-run Gas Authority of India Ltd. (GAIL) signed a memorandum of understanding (MOU) with the Bangladesh Business Development Corp. Ltd. (NNCL) to co-operate gas transmission, pipeline and distribution network development in Bangladesh. This follows a February 2005 MOU signed by GAIL and Bangladesh's Spectra Group to develop compressed natural gas (CNG) pipelines and retail outlets in Bangladesh. Tullow Oil also won state approval in March 2005 to build a pipeline and gas processing plant.

In January 2005, Bangladesh agreed to allow a proposed 559-mile pipeline to transport natural gas from Burma (Myanmar) to India through its territory. Bangladesh's approval for the tri-nation gas pipeline, however, was contingent upon several trade concessions including the removal of tariff, non-tarriff and administrative barriers to help Dhaka close its trade deficit with India, access to hydroelectricity from Nepal and Bhutan and the establishment of a free trade corridor to these countries. According to the plans, Bangladesh's Gas Transmission Co. would manage the 180 miles of the pipeline in its territory and the country would earn annual transit fees of $125 million dollars. As Bangladesh has continued to demand these trade concessions, India and Burma (Myanmar) have begun to consider alternatives such as a pipeline that bypasses Bangladesh (undersea or on land through northeastern India) or LNG shipments. These options, however, are more costly. While India and Bangladesh continue their bilateral negotiations to resolve these issues, the future of the pipeline project remains uncertain.

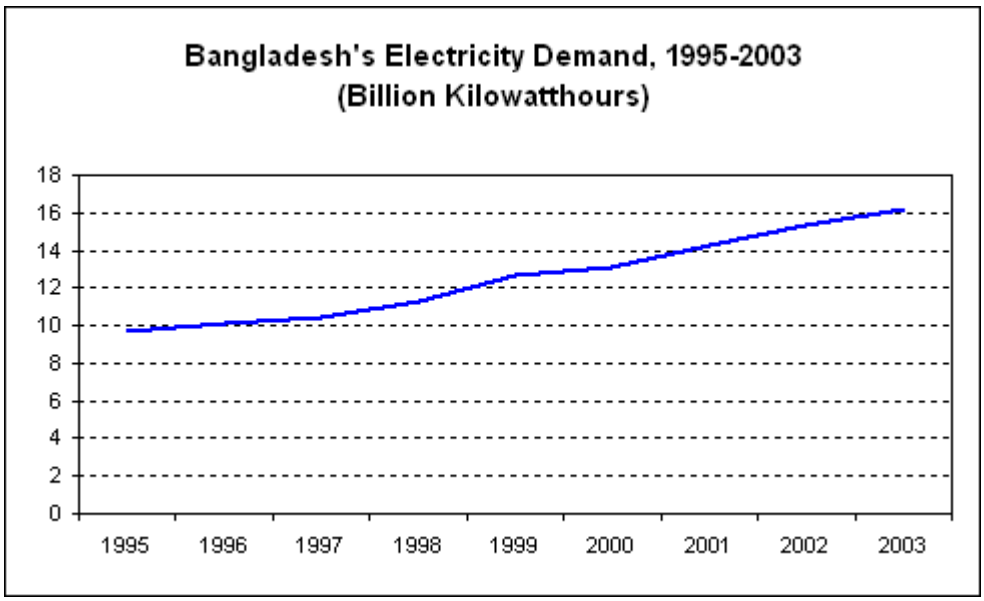
COAL

Bangladesh began its first significant coal production in April 2003 at the Barapukuria coal mine in the Dinjapur area of northwest Bangladesh. In June 2005, a consortium of the China National Machinery Import and Export Corporation (CMC) and the Xuzhou Coal Mining Group Company Ltd. signed a contract to run the management and production of the Barapukuria mine. The project is expected to produce about one million short tons of coal per year, primarily for electricity generation. A possible coal mining project at Khalashpir is also under consideration.

In July 2005, Australia's Asia Energy Corp. submitted a $1.4 billion plan to develop a coal mine in the Phulbari region. The Phulbari mine, which is located approximately 12 miles from the Indian border, is expected to begin production in 2007.

ELECTRICITY

Bangladesh's installed electric generating capacity in 2003 was 3.6 gigawatts (GW) (94 percent - thermal, 6 percent - hydroelectric), at 18 power stations. However, only two-thirds of Bangladesh's total electric generating capacity is considered to be "available." Problems in the Bangladeshi electric power sector include high system losses (up to 40 percent), delays in completion of new plants, low plant efficiencies, natural gas availability, erratic power supply, electricity theft, blackouts, shortages of funds for power plant maintenance, and unwillingness of customers to pay bills. Overall, the country's generation plants have been chronically unable to meet system demand over the past decade. With only about 20 percent of the population connected to the electricity grid, and with power demand growing rapidly, Bangladesh's Power System Master Plan (PSMP) projects a required doubling of electric generating capacity by 2010. In addition, Bangladesh may need to replace 30 to 40 percent of its current generating capacity, due to aging infrastructure.



The Padma-Jamuna-Meghna river system divides Bangladesh into Eastern and Western zones. The East contains nearly all of the country's electric generating capacity, while the West, with almost no natural resources, must import power from the East. A 230-kilovolt (kV) power transmission line, completed in 1982, connects the East to the West. The vast majority of Bangladesh's electricity (78 percent) is consumed in the East, with greater Dhaka alone consuming around 50 percent.

Through the Ministry of Energy and Mineral Resources, the Bangladeshi government owns and supervises the Bangladesh Power Development Board (BPDB). BPDB is an integrated utility that distributes electricity to retail consumers, as well as to two other distribution utilities -- the Dhaka Electric Supply Authority (DESA, established in 1991), and the Rural Electrification Board (REB, established in 1977).

Given Bangladesh's electricity supply shortage, in 1996 the government issued the "Private Sector

Power Generation Policy of Bangladesh" and began to solicit proposals from international companies for IPPs. Among the first IPPs were a 360-MW gas-fired combined-cycle plant at Haripur, which began operation in October 2001, and a 450-MW gas-fired combined-cycle plant at Meghnaghat, which began operation in November 2002. Both plants were sold to the British firm CDC Globeleq in December 2003. India's Bharat Heavy Electricals Ltd. (BHEL) completed a 124-MW gas-fired Baghabari generating unit in November 2001. BHEL currently is planning a 280-MW gas-fired plant for Sylhet. A power purchase agreement for a barge-mounted unit at Baghabari, which will have a 130-MW capacity, was signed with Malaysia's Westmont Power in May 2004. A consortium of Chinese firms concluded an agreement with Bangladesh in June 2001 for the country's first coal-fired power plant, to be located at Barapukuria near the country's main coal deposits. It is expected to start generation in October 2005. In May 2005, U.S.-based Global Vulcan Energy International announced plans to build several power plants with a total generating capacity of 1,800 MW, including at least one 100-MW gas-fired plant, which may be online by the end of 2006, and two 450-MW coal-fired plants. In 2005, India's Tata Group proposed a 1,000-MW coal-fired power plant.

In addition to large IPP projects, in April 1998, Bangladesh adopted a "Small Power Generation Policy," which encourages development of small local generation projects of up to 10-MW in capacity in underserved areas. The country has an active rural electrification program, which is to receive $280 million from the Asian Development Bank (ADB) under a program announced in December 2003. All of these initiatives aim to increase power generation and to reduce the country's power shortage significantly, with a goal of universal electrification by 2020.

In April 2005, China and Bangladesh signed an agreement on nuclear cooperation. Under the agreement, Bangladesh is to receive Chinese assistance in exploration for nuclear materials and construction of a 600-MW nuclear power plant.

Discussions have been underway for several years about the possibility of Bangladesh connecting its electric grid to those of India, Nepal, and Bhutan. Nepal and Bhutan have substantial untapped hydroelectricity potential, which could be exported to India, Pakistan, and Bangladesh. In March 1999, India's Power Grid Corporation completed a feasibility study on possible exchange of 150 MW of power between Bangladesh and India. Interconnection points would be Ishwardi, Bangladesh-Farakka, India and Shahjibazar, Bangladesh-Kurnarghat, India.

COUNTRY OVERVIEW

President: Iajuddin Ahmed
Prime Minister: Begum Khaleda Zia (since 10 October 2001)
Independence: December 16, 1971 (from Pakistan)
Population (July 2005E): 144 million
Location/Size: Southern Asia, bordering Bay of Bengal, between India and Burma/55,813 square miles (about the size of Wisconsin)
Major Cities: Dhaka (capital -- population, 10 million), Chittagong (2.8 million), Khulna (1.8 million), Rajshahi (1 million)
Languages: Bangla (official, also known as Bengali), English
Ethnic Groups: Bengali (98%), tribal groups, non-Bengali Muslims
Religions: Muslim (83%), Hindu (16%), Christian, Buddhist, others (1%)

ECONOMIC OVERVIEW

Finance Minister: M. Salifur Rahman
Currency: Taka (Tk)
Market Exchange Rate (8/05/05): US$1 = 65.0 Tk

Gross Domestic Product (GDP) (2005F, market exchange rates): $60.1 billion
Per Capita GDP (market exchange rate, 2005F): $421
Real GDP Growth Rate (2004E): 5.3% **(2005F):** 5.2%
Inflation Rate (consumer prices) (2005F): 6.0%
Merchandise Exports (2005F): $8.7 billion
Merchandise Imports (2005F): $12.4 billion
Merchandise Trade Balance (2005F): -$3.7 billion
Major Trading Partners (2005): United States, India, China, Japan, United Kingdom, Germany, France, Singapore
Major Export Products: Garments and knitwear, frozen fish, jute and jute goods, leather and leather products, tea, urea fertilizer, ceramic tableware
Major Import Products: Capital goods, foodgrains, petroleum, textiles, chemicals, vegetable oils

ENERGY OVERVIEW

Minister for Energy and Mineral Resources: Begum Khaleda Zia
Proven Oil Reserves (1/1/05E): 56 million barrels
Oil Production (2004E): 6,725 bbl/d, of which 6,000 bbl/d was crude oil
Oil Consumption (2004E): 96,000 bbl/d
Net Oil Imports (2004E): 89,275 bbl/d
Crude Oil Refining Capacity (1/1/05E): 33,000 bbl/d
Natural Gas Reserves (2005E): 10.6 trillion cubic feet (Tcf) (current estimate from *The Oil and Gas Journal*. Other estimates vary widely. The US Geological Survey has estimated that Bangladesh has an additional 32.1 Tcf in "undiscovered reserves.")
Natural Gas Production (2003E): 420.2 billion cubic feet (Bcf)
Natural Gas Consumption (2003E): 420.2 Bcf
Coal Production (2003): None
Coal Consumption (2003): 0.8 Mmst
Electric Generation Capacity (2003E): 3.6 gigawatts
Electricity Production (2003E): 17.4 billion kilowatthours (94% thermal, 6% hydro)

ENVIRONMENTAL OVERVIEW

Minister of Environment & Forests: Shajahan Siraj
Minister of Water Resources: L.K. Siddiqui
Total Energy Consumption (2003E): 0.61 quadrillion Btu* (0.1% of world total energy consumption)
Energy-Related Carbon Dioxide Emissions (2003E): 35.7 million metric tons of carbon dioxide (0.1% of world carbon dioxide emissions)
Per Capita Energy Consumption (2003E): 4.2 million Btu (vs U.S. value of 339.9 million Btu)
Per Capita Carbon Dioxide Emissions (2003E): 0.24 metric tons of carbon dioxide (vs U.S. value of 20.0 metric tons of carbon dioxide)
Energy Intensity (2003E): 2,663 Btu/$nominal -- PPP (vs. U.S. value of 9,569 Btu/$nominal -- PPP)**
Carbon Dioxide Intensity (2003E): 0.15 metric tons of carbon dioxide/$nominal -- PPP (vs. U.S. value of 0.56 metric tons/$ nominal)**
Fuel Share of Energy Consumption (2003E): Natural Gas (68.3%), Oil (28.8%), Coal (2.5%), Hydro (1.8%)
Fuel Share of Carbon Dioxide Emissions (2003E): Natural Gas (60.9%), Oil (35.3%), Coal (3.9%)
Status in Climate Change Negotiations: Non-Annex I country under the United Nations Framework Convention on Climate Change (ratified on April 15, 1994). Not a signatory to the Kyoto Protocol.

Major Environmental Issues: Many people are landless and forced to live on and cultivate flood-prone land; limited access to potable water; water-borne diseases prevalent; water pollution especially of fishing areas results from the use of commercial pesticides; intermittent water shortages because of falling water tables in the northern and central parts of the country; soil degradation; deforestation; severe overpopulation.
Major International Environmental Agreements: A party to the Conventions on Biodiversity, Climate Change, Desertification, Endangered Species, Environmental Modification, Hazardous Wastes, Nuclear Test Ban, Ozone Layer Protection and Wetlands. Has signed, but not ratified, the Law of the Sea.

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

***GDP based on CIA World Factbook estimates using purchasing power parity (PPP) exchange rates*

OIL AND GAS INDUSTRIES
Organizations: Bangladesh Oil, Gas, and Minerals Corp. (also known as **Petrobangla**), formed in 1974, is the state company responsible for oil and gas exploration, production, and distribution. Petrobangla also is involved in exploration and production for minerals, including coal. Petrobangla has 11 operating companies, including **Bangladesh Petroleum Corporation** , formed in 1976 and a separate corporate entity, handles oil imports, refining, and marketing. **Bangladesh Petroleum Exploration Company (Bapex)** is the exploration subsidiary of Petrobangla. Besides Bapex, Petrobangla has 7 other subsidiaries: **Bangladesh Gas Fields Company Ltd.** (gas development and production, mainly in central gas fields); **Sylhet Gas Fields Ltd.** (responsible for northern gas fields operation) Gas Transmission Company Limited (national gas transmission system); **Rupantarita Prakritik Gas Company Ltd.** (natural gas liquids and liquefied petroleum gas); **Titas Gas Transmission and Distribution Company** (regional gas distribution, with 73% of the market); **Bakhrabad Gas Systems Ltd.** (regional gas distribution, with 21% of the market); **Jalalabad Gas Transmission and Distribution System Ltd.** (regional gas distribution, with 6% of the market).
Refinery: Chittagong (33,000 bbl/d)
Foreign Energy Company Involvement: Cairn, Halliburton, Occidental, Rexwood-Okland, Shell, Texaco, Unocal
Gas Fields: Bakhrabad, Beani Bazar, Chattak, Feni, Habiganj, Jalalabad, Kailashtilla, Narshingdi, Rashidpur, Sangu, Shahbazpur, Sylhet, and Titas
Ports: Chittagong, Mongla (Khulna)

Sources for this report include: Central Bank of Bangladesh; Dow Jones News wire service; Global Insight Asia Economic Outlook; Economist Intelligence Unit ViewsWire; Electric Utilities Databook for the Asian and Pacific Region; Financial Times; the Independent; Modern Power Systems; New York Times; Oil and Gas Journal; U.S. Commerce Department, International Trade Administration -- Country Commercial Guides; U.S. Energy Information Administration; U.S. State Department Background notes on Bangladesh; U.S. Trade and Development Agency -- Bangladesh Strategic Gas Utilization Study; World Gas Intelligence, World Markets Online.

LINKS

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