



# **Guidebook for European Investors in Bangladesh**

## **Sector Profiles**

**European Commission  
Asia Investment Facility**



# **SECTOR 1**

## **THE ENERGY SECTOR IN BANGLADESH**

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### GLOSSARY OF ABBREVIATIONS

ADB	Asian Development Bank	IPP	Independent Power Producer
AES	A U.S. Power Company	JGTDS	Jalalabad Gas Transmission and Distribution System Ltd.
BAPEX	Bangladesh Petroleum Exploration Company	kV	kilo Volt
BGFCL	Bangladesh Gas Field Co. Ltd	kW	kiloWatt
BGSL	Bakhrabad Gas Systems Ltd.	kWh	kiloWatt-hour
BMPP	Barge Mounted Power Plant	LNG	Liquefied Natural Gas
BOO	Build – Own – Operate	LPG	Liquified Petroleum Gas
BOT	Build – Operate – Transfer	MEMR	Ministry of Energy & Mineral Resources
BPC	Bangladesh Petroleum Corporation	MMCFD	Million Standard Cubic Feet Per Day
BPDB	Bangladesh Power Development Board	MW	Megawatt (one thousand kilowatts)
CIDA	Canadian International Development Agency	OC	Operating Company (under Petrobangla)
CNG	Compressed Natural Gas	OPIC	Overseas Private Investment Corp.
DESA	Dhaka Electricity Supply Authority	PBS	Palli Bidyut Samity (Rural Electrification Co-operative)
DESCO	The Dhaka Electric Supply Company	PGCB	Power Grid Company of Bangladesh
DFID	UK Department for International Development	PPA	Power Purchase Agreement
FDI	Foreign Direct Investment	PSC	Production Sharing Contract
GDP	Gross Domestic Product	PSIDF	Private Sector Infrastructure Development Fund
GETCO	Greenland Engineers and Tractors Co. Limited	RAPSS	Remote Area Power Supply System
GOB	Government of Bangladesh	PSIDP	Private Sector Infrastructure Development Project
GTCL	Gas Transmission Company Ltd.	REB	Rural Electrification Board
GTZ	Deutsche Gesellschaft fuer Technische Zusammenarbeit (German Development Agency)	RPC	Rural Power Company
IDA	International Development Agency	RPGCL	Rupantarita Praktitik Gas Co. Ltd
IDCOL	The Infrastructure Development Company Limited	SGFCL	Sylhet Gas Field Company Ltd.
IFC	International Finance Corporation	TCF	Trillion Cubic Feet
IIFC	Infrastructure Investment Facilitation Centre	TGTDCL	Titas Gas Transmission and Distribution Company Ltd.
		USGS	United States Geological Survey
		USPC	United Summit Power Company

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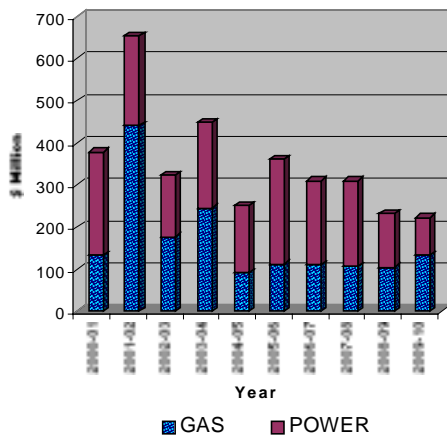
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## 1. THE SIZE AND NATURE OF THE SECTOR

The energy sector consisting of natural gas, oil and power industries has been by far the largest recipient of all foreign investment in Bangladesh during the past few years. According to an estimate (World Bank 1999), the inflows of FDI into gas and power sectors of Bangladesh amounted to US\$635 million and US\$381 million respectively during the period 1994/95 through 1998/99. The total inflows of FDI into the country were estimated 1816 million US dollars for the same period. In other words, the combined share of gas and power sectors in total FDI was about 60% for the mentioned period

The energy sector is also likely to continue receiving high levels of investment for the next ten years, as the World Bank projections in Figure 1 shows. Until recently, the energy sector has been exclusively in the public

Estimate of Private Capital Flow  
in the Energy Sector



Source : World Bank - FDI in Bangladesh, 1999

Figure 1.1

domain under the overall control of the Ministry of Energy and Mineral Resources, and administered through sub-sector specific state owned enterprises.

The American oil companies that are the largest investors in both the gas and power sub-sectors are very strongly supported by the

### An Overview

The energy sector in Bangladesh has been the largest recipient of foreign investment in the country. Still, with a population of 130 million -- almost 100 million of whom have no access to commercial forms of energy like power and gas -- and with abundant known reserves of natural gas in the country, there is considerable scope for new foreign direct investment (FDI) in the sector.

What is holding up further FDI and a potentially explosive growth of the sector is the Government's current policy of not allowing exports of natural gas to the much larger market in neighbouring India. However, it is widely believed that this may change if the impending general election, expected before October, 2001, results in a stronger government with a significant majority in the Parliament. There is somewhat less opposition currently to the export of power produced from natural gas, but the long-term commitment that is necessary for this to happen is still not there.

With projected GDP growth in excess of 6% per year, the domestic energy market is also likely to grow at a fast rate in the long run.

Concerns about environmental pollution, particularly in the Dhaka area, may eventually force the Government to take some important policy decisions favouring greater use of compressed natural gas (CNG), as has been recently done in New Delhi. This, in turn, will create significant investment opportunities for European SMEs.

Potential investors must be aware that the government bureaucracy normally works at a slow pace in the country (often by design aimed at extracting unofficial premiums). The impending election has now caused a virtual standstill in any bureaucratic decision making, and the situation is not likely to change before the New Year. Most of the current projects listed later in this report are affected by this lull. So, potential investors must not be in too much of a hurry to realize the benefits of their investments.

American-Bangladesh Chamber of Commerce, which represents some of the world's largest energy companies and contractors. The Chamber has been able to generate considerable political support in the United States for the positions of their members, culminating in an official visit by President Clinton to Bangladesh, and visits by senior members of the Clinton administration to lobby for the export of Bangladeshi gas to India.

While European investors are not able to muster the same level of government support as American and Japanese investors, they have still been able to achieve considerable success on their own, with a Shell/Cairn Energy joint venture being a major player in gas exploration and development. There are also a significant number of smaller firms investing in specialised niche areas to support gas exploration and development, and power generation.

## 2. REVIEW OF PRINCIPAL ENERGY SUB-SECTORS

### 2.1 Gas Sub-Sector

Bangladesh has abundant proven reserves of natural gas, estimated in 2000 at ranging between 15 and 45 trillion cubic feet (TCF). Discovered reserves reached 19 TCF in 2000, after the discovery by the Unocal Corporation of a new reserve containing 6 TCF<sup>1</sup>. These wide differences are mainly the result of the

**With a daily current production of 1,000 million cubic feet per day (MMCFD), and prospects for further gas discoveries, the energy sector in Bangladesh continues to remain by far the biggest sector of interest for foreign investors, in terms of exploration, production, support and downstream activities.**

<sup>1</sup> However, according to a report by the US Geographical Survey that was quoted in volume 5, issue #16 of "Alexander's Gas & Oil Connections" on 4 September 2000, Bangladesh has natural gas reserves of 33 TCF, both on land and offshore in the Bay of Bengal, and a potential natural gas reserve of over 45 TCF.

limited amount of seismic and drilling work that has been carried out to date.

**Proven gas reserves are located in nine producing fields, two suspended fields and nine non-producing fields, total 15 Trillion Cubic Feet (TCF) according to Petrobangla, the state owned oil and gas company.**

Currently Petrobangla and two foreign oil companies, namely Shell/Cairn Energy and Unocal from the United States, are producing an average of 1,000 MMCFD from 9 gas fields, which supplies some 75% of Bangladesh's commercial energy consumption. Gas production is scheduled to increase further to 1,100 MMCFD during 2000.

**The Petroleum Policy of July 1993 has sought to encourage foreign oil companies to invest in gas exploration in Bangladesh, with Petrobangla regulating the activities of foreign companies under Production Sharing Contracts (PSC), and acting as the sole purchaser of any gas produced by foreign operators**

Until the beginning of the 1990s, Petrobangla, the State Oil Company, together with its eight operating companies, maintained an exclusive monopoly position in the oil and gas sector, with two national gas production companies, the Bangladesh Gas Field Company Ltd (BGFCL) and the Sylhet Gas Field Company Ltd. (SGFCL) responsible for gas production. In 1994, Petrobangla set up exploration contracts with four foreign oil companies, which included Cairn Energy from the United Kingdom and Occidental Petroleum, Rexwood-Okland and the United Meridian Company from the United States. By 1997, six Production Sharing Contracts (PSCs) had been signed for eight blocks by the four operators,

leading to the first offshore gas production in 1998 from the Sangu Gas Field by Cairn Energy which is now supplying the Chittagong market, followed by the joint development of the Jalalabad field by Unocal and Occidental Oil of the United States, which started production in the first quarter of 1999. In the past year Occidental Oil have sold their interests in Bangladesh to Unocal and so have withdrawn from the Bangladesh market. In July 1997, a Second Bidding Round attracted 20 oil and gas companies from 11 countries. However, it then took one full year of deliberation before any exploration rights were awarded to Enron/Okland, Pangea/OMV, Unocal and Shell/Cairn Energy. However by 2000, only Enron had signed to the production sharing. Subsequently OMV has withdrawn entirely from Bangladesh.

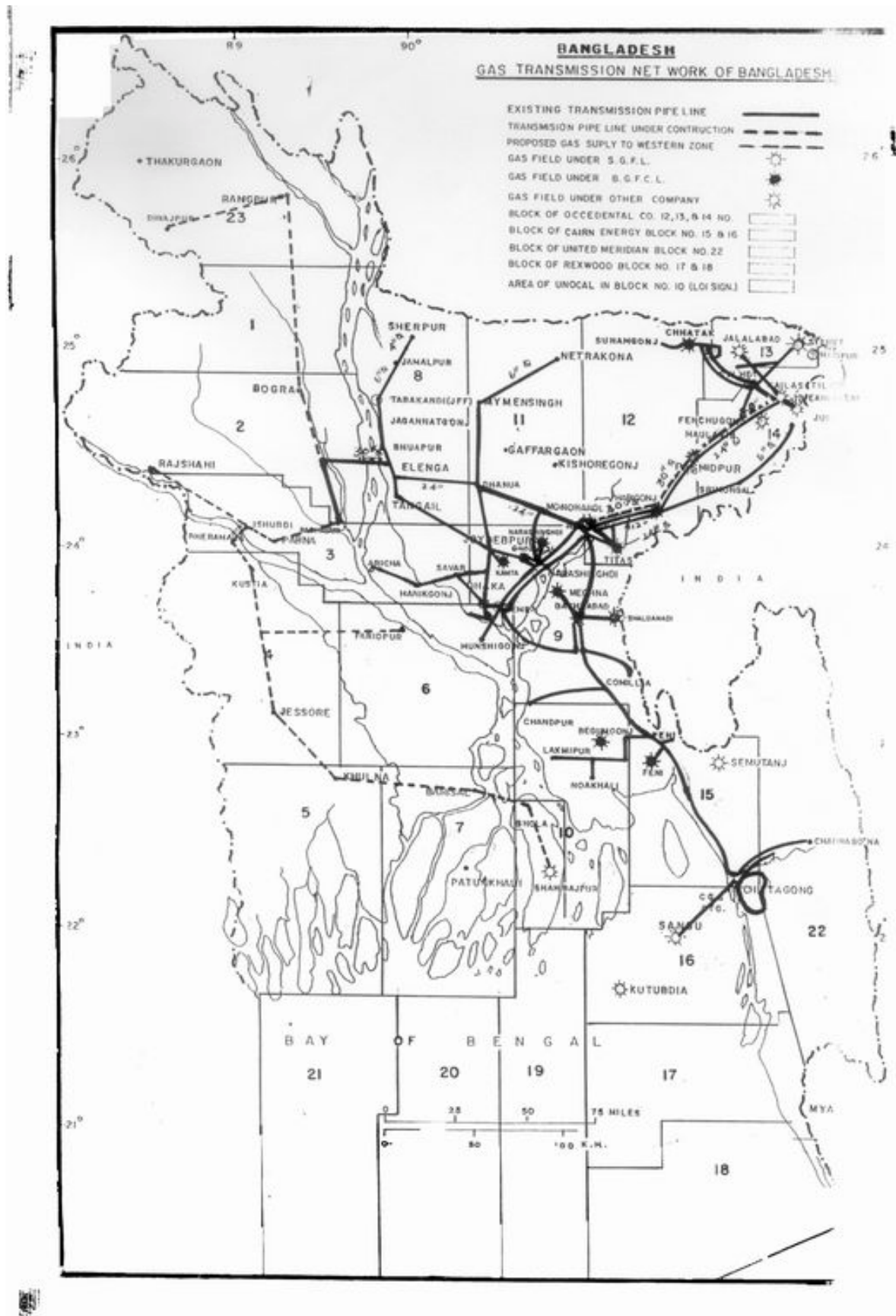
The remaining 12 onshore and 3 offshore blocks were then offered to international companies, with Tullow Oil Plc, an Irish oil and gas exploration and production company being awarded two exploration blocks. Initially the company tried unsuccessfully for three years to finalise the production service contract before going into partnership with Chevron and Texaco. Then in February 2000, the Tullow Oil, Chevron and Texaco consortium received permission to drill three exploratory wells in Block 9. Although the permission to drill was received in February, it was still necessary to negotiate the production sharing contract, which again is another time consuming effort, but was expected to be concluded at the time of the visit to Washington of Prime Minister Sheikh Hasina.

Some specific priority projects in the gas sub-sector that were being developed during 2000 and which were identified during the work programme in Bangladesh are presented in the adjacent Table 2.1

Table 2.1

Some Priority Gas Projects	
PROJECT	DESCRIPTION
<b>Rashid-pur-Ashu-gonj gas transmission pipeline project</b>	Construction of an 82 km gas transmission pipeline to be funded by Petrobangla, with provision for two backup manifold stations. The government would like to have the project implemented before June 2001, with a further 57 km extension by June 2002.
<b>Nalka-Ishwardi gas transmission pipeline</b>	Construction of an 85 km gas transmission pipeline to be funded by Petrobangla, intended to be implemented by December 2001, in order to facilitate the gas supply to new planned industries in the Ishwardi export processing zone and the power plants at Ishwardi-Bheramara.
<b>Ashu-gonj-Dhanua gas transmission pipeline project</b>	Construction of a 53 km gas transmission pipeline with provision for manifold stations at Monohardi and Dhanua, that is intended to be implemented by June 2003, with possible funding by the Asian Development Bank and Petrobangla.
<b>Dhanua-Joydebpur pipeline project</b>	In order to give additional flexibility to the supply of gas to Dhaka City, a 30 km spur pipeline from Dhanua-Joydebpur (or any suitable location on the out cut of Dhaka City) may be constructed by June 2003, with funding being requested from the Asian Development Bank and/or Petrobangla.
<b>Dhaka City ring main</b>	In order to maintain a stable pressure throughout the City of Dhaka, a new 80 km city mains ring will connect city gate stations at Demra and Joydebpur as well as other locations, and is intended to be developed by June 2005.
<b>250 km 20-24" pipeline project under J.V or BOT/BOO basis</b>	Bangladesh Petroleum Corporation (BPC) plan to install on either a joint venture or BOT/BOO basis, a 250 km multi-product pipeline from Chittagong to Dhaka. The pipeline will transport a range of products, which include: diesel, petrol, octane, kerosene, lubricant etc. It is intended that the pipeline will be built to run parallel to an existing natural gas pipeline between Dhaka and Chittagong.
<b>Bakhrabad gas field</b>	A number of priority projects for enhanced gas recovery from both marginal fields and fast depleting fields, including the Bakhrabad gas field, are under consideration by a number of gas companies. Following a three dimensional seismic survey, a work-over drilling programme will be taken, after which the BGFL intends to install a power plant.

The following sketch map gives the gas network (planned ones are dotted). **Figure 2.1**



## 2.2. Power Sub-Sector

The Government of Bangladesh [through the Ministry of Energy and Mineral Resources (MEMR)] bears overall responsibility for the power sub-sector in Bangladesh.

Consumption of commercial energy per head in Bangladesh is one of the lowest in Asia, if not the world. A lack of commercially priced sources of electricity has been a major factor in

**The estimated capital requirement for the power sector during the next five years is \$5-6 billion .**

[Source: MEMR]

deterring foreign investment hindering GDP growth. Per-capita generation of electricity was 110 kWh in 1997/98, according to Bangladesh Economic Survey, Ministry of Finance (2000). With about 22% of households receiving electricity, most commercial energy is consumed by industrial and residential customers.

Frequent power failures due to inadequate maintenance continue to disrupt industrial production, water supplies and irrigation. In 2000, the currently installed capacity of public power plants as listed by the World Bank, is 3,300 MW, though actual daily generating capacity is often reduced to 2,400 MW, against a total daily demand of 2,675 MW to 2,725 MW. This usually results in extensive load

**Since the Government of Bangladesh cannot finance the power system's expansion and development programmes from their own resources, they are now seeking multilateral and bilateral assistance, as well as private sector investments for adequate and sustainable development of the power sector.**

shedding, which has now become a factor of daily life in Dhaka. The situation is worse

outside the capital city. In 1999, there were some recorded 1,690 hours of load shedding.

**The Power Development Board's Master Plan stipulates raising present generation capacity from 2900 MW to 10,000 MW by 2015. As part of the plan, about 2000 MW of power generation capacity is expected to be added by 2005 at a cost of \$1.2 billion through foreign investment by Independent Power Producers (IPPs).**

There is considerable foreign investor interest in the power sector. Contracts for four barge mounted power plants (BMPPs) with a total capacity of 470MW have already been signed and several other contracts are in the pipeline. A total of US\$750 million of FDI in this sector is expected in the next three years, reflecting

### Areas of Power Sector Business Opportunities for European SMEs

- New independent power projects in the private sector that are being sought on both BOO/BOT basis;
- Rehabilitation, maintenance and up-grading of a number of existing public sector power generating plants;
- Maintaining and expanding existing power transmission systems;
- Supply of mini-power generation plants to private sector industry, particularly in areas that lack transmission networks;
- Technology transfer through manufacturing/assembly of power equipment;
- Commercialisation of state owned power transmission and distribution agencies.
- Services to support the above opportunities.
- Privately owned Remote Area Power Supply Systems (RAPSS).

principally the external financing of imported power plants and auxiliary equipment.

**Future power generation projects of BPDB include 40 MW gas turbine plant at Gazipur, 450 MW combined cycle plant at Serajganj, 220 MW thermal power station at Khulna and 50 MW thermal power station no. 2 at Sikalbaha which are expected to be commissioned by 2005.**

At the suggestion of the Infrastructure Investment Facilitation Center (IIFC)<sup>2</sup>, the Government has recently agreed to license privately owned remote area power supply

<b>Power Projects in the Pipeline</b>	
<b>Name of project</b>	<b>Status of the project</b>
<i>Dhaka area Two 100-MW gas turbine power plant project.</i>	Five consulting firms, each in a joint venture with a local Bangladeshi firm, have submitted proposals to conduct the feasibility study, and then prepare tender documents for two 100 MW power plants. BPDB will begin the tendering process afterwards.
<i>Chandpur 100MW peaking power plant</i>	BPDB has already completed the feasibility study and selected a site adjacent to the existing grid substation, and after necessary approval from the board regarding site selection, BPDB will prepare the tender documents and issue a call for the tender.
<i>Fenchugonj 90 MW combined cycle power station. (Phase II)</i>	BPDB is preparing the tender document for a 90 MW combined cycle power station, containing 2 gas turbines and a steam turbine plant, to be added to an existing 90 MW combined cycle power plant at Fenchugonj. The existing plant was built by the Sumitomo Corporation from Japan, with equipment by Hitachi, also from Japan.
<i>210 MW-steam power plant at Khulna</i>	BPDB is preparing the tender documents for an additional 210 MW steam power plant to be added to the existing 60 MW & 110 MW steam power plants at Khulna which were manufactured by Skoda Export from the Czech Republic.
<i>Bheramar a 450 MW combined cycle power plant project</i>	BPDB has completed the project proforma for the above mentioned project and after getting approval from the Ministry, will appoint a consultant to prepare the tender documents, and so allow them to release for the tender.

systems (RAPSS) in rural areas. These may provide very good investment opportunities for European SMEs in foreseeable future. Some specific power projects that were being developed during 2000 are summarised in Table 2.2.

### **Transmission Projects**

A number of projects are being funded to upgrade the highly inadequate transmission system in Bangladesh. These include new sub-stations, extension of existing sub-stations, and new transmission lines across the country.

The Power Grid Company of Bangladesh (PGCB) was created mainly to take over management and development of transmission network throughout the country, but in reality it only has a small transmission corridor under its control so far. PGCB had hoped to implement the first three of the following projects during 2000, with financing provided by the Asian Development Bank:

1. A new sub-station at Aminbazar, with a budget of US\$ 16 million, to be completed within a time frame of three months;
2. Sub-station extension project at Hasnabad & Tongi, with a budget of US\$ 12 million and to be completed within a time frame of three months;
3. A 60 KM transmission line running between Hasnabad, Aminbazar and Tongi, to be completed within a time frame of three months.
4. 367Km – Ishwardi-Bogra-Barapukuria 230KV transmission line to be implemented by 2001.
5. 100Km Tangail-Modhupur-Jamallpur 132KV single ckt line to be implemented by 2001.
6. 88 Km Dohazari – Cox's Bazar 132KV second ckt second string to be implemented by 2001.

<sup>2</sup> A GOB entity set up in 1999 (with initial funding from the World Bank, CIDA, and DFID) to promote and facilitate private sector investments in infrastructure sectors

### **Bangladesh Power Development Board (BPDB) Projects**

During 2000, BPDB had plans to tender for the construction of two new electricity sub-stations at Satkhira and Gopalganj and for the construction of two new transmission lines between Khulna and Satkhira and between Madaripur and Gopalganj.

### **Dhaka Electricity Supply Authority (DESA) Projects**

DESA plans to seek offers during 2000 for the construction of two new sub-stations at Kamrangirchar and Tongi, and for the extension of two existing sub-stations at Bhulta and Palash.

### **2.3 Oil Sub-sector**

The oil sub-sector in Bangladesh is negligible in comparison with other Asian countries, with proven reserves of only 5.69 million barrels and a production of 2,900 barrels per day, according to an Oil & Gas Journal's Worldwide Survey in December 1999.

Up until the 1990s, Petrobangla, the State owned oil company, together with its eight operating companies maintained an exclusive monopoly position in the oil and gas sector. In recent years, the Government has sought to encourage foreign oil companies to invest in oil exploration in Bangladesh through private sector participation, with Petrobangla regulating the activities of foreign companies under Production Sharing Contracts, and acting as the sole purchaser of oil and gas from the companies. Currently Shell, Texaco, Cairn Energy, Holland Sea Search, Unocal, Rexwood-Okland and UMC Bangladesh Corporation are active in exploration under six Production Sharing Contracts (PSC) partnerships with Petrobangla, though up to now, oil exploration has not been successful.

### **3. LIST OF MAJOR LOCAL COMPANIES AND REVIEW OF THEIR EXISTING COLLABORATIONS WITH FOREIGN FIRMS**

#### **3.1 Gas Sub-Sector**

The Petrobangla Group employs in excess of 8,000 employees, with some 600 employed by Petrobangla itself and the rest spread over the eight operating companies. Exploration and drilling activities are managed by one company, Bangladesh Petroleum Exploration Company (BAPEX). Two national companies, the Bangladesh Gas Field Company (BGFCL), employing 900 people and the Sylhet Gas Fields Company (SGFCL), employing 400 people, manage gas development and production activities.

The transmission, distribution and marketing of natural gas in Bangladesh is managed by three franchised operating companies of the Petrobangla Group, namely: Titas Gas Transmission and Distribution Company (TGTDC), employing 2,500 people; Bakhraabad Gas Systems Ltd (BGS), employing 1,400 people and Jalalabad Gas Transmission and Distribution System Ltd. (JGTDSL), employing 600 people. A fourth company, the Gas Transmission Company Ltd. (GTCL), incorporated in 1993 will eventually be responsible for the high-pressure national trunk system. GTCL, with 100 employees, was set up as a common carrier and is permitted to form joint ventures with private sector partners to facilitate equal pipeline access by private gas producers. However, due to the bureaucracy and long delays in the transfer of assets by the three Transmission and Distribution companies, GTCL currently only operates less than 20% of the high-pressure trunk network.

Natural gas, liquids and liquefied petroleum gas (LPG) are products handled by the Rupantarita Prakritik Gas Company (RPGCL). With 100 employees, it was set up in 1991 for the transportation and fractionation of natural liquid gas, as well as the distribution of compressed natural gas. Petrobangla has recently set up a new operating company to operate the Barapukuria coal mine, which is under development by a Chinese consortium, with a full production of one million tons per year scheduled to commence in 2002.

### 3.2 Power Sub-Sector

There are three main operating entities in this sector. The Bangladesh Power Development Board (BPDB), was until recently the sole public sector power generator in Bangladesh. It is also responsible for transmission and distribution of electricity outside Dhaka and in some of the rural areas, as well as for generation and transmission planning. It is an integrated utility that distributes electricity directly to retail consumers, owning some 3,091 MW of generating capacity. At present BPDB owns the majority of the transmission network, and is responsible for distributing about 42% of the total capacity sold in Bangladesh.

The Dhaka Electricity Supply Authority (DESA) is responsible for transmission and distribution of electricity in and around Dhaka, which is the largest load centre in Bangladesh, consuming about 41% of all electricity sold.

The Rural Electrification Board (REB), which was established in 1977, distributes electricity in rural areas through 67 operating Palli Bidyut Samities (PBSs), or consumer-owned co-operatives. REB's mandate is to electrify rural areas. The rural electrification has been extended to 61 of the country's 64 districts (excluding the three hill districts), but not to the remote islands.

BPDB, DESA and REB are all controlled by MEMR (Power Division), including the award of contracts over specified limits, namely US\$ 2.1 million for BPDB and DESA and US\$1 million for REB.

***Since the mid 1990's, a number of international foreign developers have presented several unsolicited proposals for private sector power plants to meet the growing power shortages. Following this, the Power Cell of the MEMR was set up to act as a single window for the solicitation and evaluation of proposals on the basis of competitive bidding.***

The Bangladesh Government also created two new companies in November 1996, namely the Power Grid Company of Bangladesh and the Dhaka Electric Supply Company (DESCO), with the intention of handing over all of the transmission assets of both BPDB and DESA to PGCB, and the distribution system from DESA to DESCO. Both companies are fully owned by the Bangladesh Government through shares held on their behalf by ex-officio members of BPDB and DESA respectively.

***The Bangladesh Government has signed three PPA with private sector barge-mounted power companies all of which are now producing power. During February 1999, US companies signed contracts with the Government for two combined cycle power projects (360 MW in Haripur and 450 MW in Meghnaghat). A U.K. based subsidiary of the American Company Cinergy signed a letter of intent with the Government to build a 100 MW barge-mounted power plant (BMPP) in Baghabari.***

The Rural Power Company (RPC), a public limited company, has been formed to generate electricity under the sponsorship of REB and a few large PBSs.

#### 4. FORMS OF CO-OPERATION

##### 4.1 Gas Sub-Sector

The main form of collaboration in the gas sector is the requirement that all private sector participation be by way of a production-sharing contract (PSC) with Petrobangla.

***Under the PSC model, the Government of Bangladesh and Petrobangla enter into a contractual relationship with a contractor for the exploration, development and production of oil or gas. The title of the assets and the oil or gas remain with the government and in exchange for the capital resources invested in the exploration, development and production, the contractor obtains a share of the volume of the gas produced at an agreed price in order to cover both costs and profits. The contractor then recovers its costs by selling the gas to Petrobangla or through a Liquefied Natural Gas (LNG) export project.***

Under the PSC system, all of the costs of exploration, development and production are paid by the contractor but are fully recovered, if sufficient gas is discovered. Hence under PSCs, the private producer cannot sell directly to the customer or to other private producers, but only to Petrobangla who are required to buy all the gas produced, with one exception.

According to the PSC, the Contractor has the right to export gas in the form of LNG, with the only limitation being that Petrobangla can claim up to 20% for the first 10 years and up to 30% thereafter. But if the Contractor chooses to sell its share of the gas domestically, Petrobangla is bound to buy their full share regardless whether it can access supply from any source.

However, oil and gas exploration and production programmes require considerable support services for their implementation. There are a large number of oil service

industry support firms that are involved in the oil and gas industry in Bangladesh that normally work under sub-contract to the main contractors. Hence, in general, the major investment opportunities for smaller and medium sized companies in the gas sector in Bangladesh, are mostly in providing support services for exploration, production and transmission of gas. In this way, cash flow to these smaller companies is usually guaranteed by the main operator and not the Government of Bangladesh.

In April 2000, the government awarded block 7, which is located in South West Bangladesh to Unocal Bangladesh Limited, as a joint venture with the Bangladesh Petroleum Exploration Company Limited (BAPEX). The agreement gives Unocal five years for exploratory drilling, as opposed to the standard three years in most other PSCs.

Under this contract, Unocal became the first among the 22 companies that took part in the second round bidding in 1997, to have been awarded a production sharing contract. It was also the first time that BAPEX has formed an alliance with an international gas exploration company.

##### 4.2 Power Sub-Sector

As part of the private sector power generation policy of Bangladesh, the Bangladesh Government solicits proposals from independent power producers (IPPs), to develop facilities to generate power and then sell the power generated to a local power distributor under a Power Purchasing Agreement (PPA) and be paid in hard currency. These independent power generating facilities, which would increase electricity supply and reduce Bangladesh's power shortages, would be built on a build, operate and transfer (BOT) basis over a 15 year concession period. However, development of these facilities also requires the IPP not only to develop a power purchasing agreement, but first to secure an implementation agreement in

order to ensure a continuous fuel supply, a fuel supply agreement and possibly the most difficult, a land purchase or lease agreement. Many potential investors are believed to have withdrawn not only on account of the bureaucratic delays encountered, but mostly on the difficulty in securing the vast array of agreements needed.

*It was observed that most of the successful independent power producers usually consist of a consortium of various complementary parties, both local and foreign working in joint ventures. Hence, the major opportunities for small to medium sized companies in the power sector are to approach investments as part of a consortium.*

It was noted that the developers of the first barge-mounted power plant were able to joint venture with a local firm who was already involved in fuel distribution, thereby removing much of the complication of a fuel supply contract.

One local company that has been particularly active in developing all types of business collaborations with foreign firms in all aspects of the energy sector, both in oil and gas, was the Cosmos Group, whose own customers include all of the major state oil, gas and power companies in Bangladesh. They also act as representatives of a number of foreign firms and also seek selected partners for specific projects. Two other private companies named United Summit Co. and Kaltimex are active in power generation.

## **5. EUROPEAN AND OTHER FOREIGN COMPANIES PRESENT IN THE ENERGY SECTOR**

The energy sector in Bangladesh is dominated by a small number of very large international energy companies, mostly from the United States, Europe and Japan, with over US\$1 billion already invested in gas exploration and production. The largest investors being Cairn Energy, Shell and Unocal in gas exploration,

and AES Corporation and Marubeni from Japan in power generation, plus a much larger number of small to medium sized foreign firms that provide specialised support services. Currently there are at least 40 foreign companies who are actively involved in development and production in the various oil, gas and power sub-sectors. A list of foreign companies operating in the energy sector is given in Appendix 3.

During the visit of the Bangladesh Prime Minister Sheikh Hasina to the United States in October 2000, it was claimed by the Bangladesh Foreign Ministry that the United States investment in gas exploration and power generation had risen from US\$ 20 million in 1996 to US\$ 800 million in 2000.

### **5.1 Gas and oil Sub-sectors**

In October 2000, only two international oil companies had commercial gas fields in production, namely Unocal Bangladesh Limited, which is producing 100 million cubic feet per day from its Jalalabad gas field, and the Shell Cairn Energy joint venture, which is now producing more than 100 million cubic feet per day from its offshore Sangu gas field in the Bay of Bengal.

Although bids have been submitted by a number of major oil companies such as Chevron, Texaco, Unocal, Mobil Union, Texas Petroleum and others for a number of key blocks, for which competitive bids were launched, to date no new exploration contracts have been awarded. However, Tullow Oil in collaboration with Chevron and Texaco expect to finalise their production sharing contract in October 2000.

As mentioned above, although each gas field is operated by a major international oil company, a large number of medium to large sized companies (supported by foreign oil industry)

have developed business collaborations with

**Following the merger between Mobil Oil and Exxon Corporation and their subsequent global reorganisation, both companies have decided to cancel two major investment projects, abandoning their joint venture plans with Mohammadi Petrotrade Private Limited to set up a liquefied petroleum gas (LPG) import terminal at Mongla, and the Mobil-Jamuna lubricant plant and import project in Chittagong. Potential European investors may benefit from this development.**

the field operators. Such companies include: Western Atlas Logging and Schlumberger for line logging, Brown and Root and Halliburton for oil field engineering and development,

**The approach taken by Niko Resources, a medium sized Canadian company, should be of particular interest to European SME investors, as it demonstrates that if a joint venture can be developed with a strong and competent state owned enterprise, such as BAPEX, and is strongly supported by their national government, with access to bilateral institutional investors, then it would have a good chance of being successful.**

Mott Macdonald and Momentum Engineering for engineering services, Canadian Helicopters and Bristow Helicopter for transportation services to remote and offshore sites, Geoservices for geological surveys etc. Hence, the presence of many international operators such as Shell and Unocal has a positive multiplier effect, since neither firm can operate in Bangladesh without a very wide range of essential niche support services that are necessary for gas exploration and production.

## 5.2 Power Sub-Sector

### Status of Private Sector Power Development in Bangladesh

1. The first private power project, a joint venture of two local companies and the Finnish firm Wartsila NSD (now majority owned by Coastal Energy), began generating electricity from a 110 MW barge plant in Khulna in September 1998.
2. The second barge-mounted power plant owned by the Malaysian firm, Westmont, is also generating between 90-100 MW.
3. A third barge project of similar size became functional in June 1999. This project was jointly developed by 2 U.S. energy companies Ogden and El Paso in collaboration with Wartsila NSD. It is seeking finance and credit insurance from the US export credit agency, Overseas Private Investment Corporation (OPIC).
4. The U.S. firm AES, which was the lowest bidder for both Haripur 360 MW and Meghnaghat 450 MW power plants, signed its contract for Haripur in September 1998 and Meghnaghat in July 1999, and has 30 months from signing to deliver power.
5. During early 1999, the Bangladesh Government started to negotiate with Marubeni from Japan, for the second phase of the Meghnaghat power plant, in conflict with an agreement the government had made with the World Bank-led donors group, that they would not negotiate any new projects with independent power producers, other than the 1,330 MW projects that were already in the pipeline. Despite this agreement Marubeni was awarded a contract on the basis of unsolicited negotiations. Initially the donor protested and took steps to stop the financing of Meghnaghat I, but later, following negotiations with the government, the donors agreed to relax the conditions on the understanding that in future the government would follow the conditions originally agreed in the "aide memoire".
6. The Government Power Cell signed a letter of intent in September 1998 with the British firm, Cinergy Corp., for a 100 MW project at Baghabari.
7. Meanwhile, a smaller 70 MW plant in Mymensingh, with the European Gas Turbine from France contracted to supply the equipment, and Sumitomo from Japan, acting as the main engineering contractor.

## 6. ANALYSIS OF IMPORT AND EXPORT FLOWS

The Bangladesh Government refuses to allow natural gas to be exported, since the government is afraid of not having sufficient supply to meet medium term demand, since at its current rate of production, the country has only sufficient proven reserves for the next 38 years<sup>3</sup>. However, on account of considerable pressure being exerted by foreign oil companies who are only willing to keep on investing capital to explore for more gas, providing they can export a part of their discoveries, it is expected that the government will eventually allow exports, particularly to India.

However, if exports were to be permitted, it would take at least five years to create the necessary infrastructure to make exports to neighbouring countries viable.

## 7. ANALYSIS OF THE MAIN MARKETS

### 7.1 Location of energy markets (local, regional and international)

Currently the main market for both gas and power is the domestic market in Bangladesh. Bangladesh is now producing 1,000 million cubic feet per day of natural gas, of which about 80% is consumed by the power and fertiliser industries, about 10% by other industries, 8% by residential consumers 2% by others.

Currently, power is marketed only within the country, though there have been some proposals from India, whereby India would invest in power stations in Bangladesh to generate power from natural gas for transmission to India. At a Trade and

Investment Opportunities Seminar held in Singapore on 30 August 2000, the Bangladeshi Industries Minister claimed that Bangladesh was seeking to attract more independent power producers to undertake more than 2,000 MW of new power, which would then enable the government to allow electricity exports to India.

### 7.2 Market trends

#### 7.2.1 Gas Sub-Sector

**While Petrobangla is currently targeting gas production to reach 1,700 to 1,800 million cubic feet per day between 2003-2005, market trends are more difficult to predict on account of many degrees of uncertainty, particularly regarding the failure of Petrobangla to expand the country's pipeline infrastructure and the frequent problems encountered with gas delivery to power stations.**

There is also a very large uncertainty on how gas will be utilised in the medium term, with the major oil companies wishing to see a portion of the gas exported to neighbouring countries, particularly India, while the government's energy plan calls for doubling electricity capacity by 2010 and Petrobangla preferring to see the gas used domestically to produce value-added items such as fertilisers, or to see gas turned into liquified natural gas (LNG) that could then be exported by tanker.

**Currently all gas production is restricted to domestic consumption and cannot be exported, until the Government can be assured that Bangladesh has sufficient gas reserves to guarantee gas production for 50 years.**

In order to provide information that will be necessary to resolve this issue, the United States Government had sent a US Geological Survey (USGS) team in September 2000 to

<sup>3</sup> According to a paper "Bangladesh Natural Gas Exports to India" published in the Oil & Gas Journal on the 19<sup>th</sup> June 2000.

map and estimate the gas reserves in Bangladesh and report their findings to the Bangladesh Government by December 2000.

If this issue is resolved and international oil companies are allowed to export gas, Unocal have publicly claimed that they would be prepared to consider building a US\$1.7 billion pipeline from New Delhi, India to Ashuganj in Bangladesh to allow the exportation of gas to India.

### 7.2.2 Power Sub-Sector

It is assumed that the market for power in Bangladesh will remain solely a domestic market, however, predictions of market trends is not straightforward and so this cannot be said to be definite. It is also assumed that power demand will increase at around 6% per year for the foreseeable future. However, while demand increases each year, generating capacity never seems to catch up with it due to numerous bottlenecks in distribution, system losses (that have now reached up to 40%), delays in the construction of new plants.

Nevertheless, some of this uncertainty could be resolved through power sector reform and establishing a sound regulatory system .

### 7.3 Role and power of local agents

***The role of the local agent or distributor can be of vital importance for small to medium sized European enterprises trying to enter the Bangladesh market.***

This was confirmed by companies like Cosmos Marketing Consultants or Greenland Engineers and Tractors Co. Limited (GETCO), both of which have over the years developed joint venture relationships with foreign firms, either

on a project by project or a long-term basis, within the energy sector. While both companies are listed in the global directories of support services to the oil and gas industry,

***It must be noted that the public sector still commands the dominant share of the energy sector and that the public sector procurement in Bangladesh is substantial. Officials responsible for government procurement in the country usually prefer to deal with Bangladeshi principals, particularly in those niche areas that will be of most interest to small and medium sized firms from Europe. Hence the role of local agents may not only be vital, but also essential.***

Cosmos is also listed in Europe at the Energy Industries Council in London, where they provide information concerning new energy projects in Bangladesh

### 7.4 Competition

Since the distribution of gas and power are both in the hands of public sector companies, there is no competition in domestic markets at this time. If Bangladesh were to export gas, they would likely face considerable competition from several neighbouring countries as well as other countries in the region, namely, India, Indonesia, Malaysia, Myanmar and Vietnam, all of which have attracted foreign investment for gas exploration, and where Bangladesh is ranked in the lower half of the group on account of their poor economy and only a small to average field size on an oil equivalent basis. However Malaysia, Myanmar and Vietnam are ranked in the upper half, with Vietnam being especially attractive due to its large offshore potential and large concessions. Table 7.1 below lists the energy supply indicators in South Asian countries.

However, New Delhi and Eastern India would be a market where Bangladesh could have a

competitive advantage, since the indigenous gas fields of India are located primarily in Western India and the transport infrastructure from Bangladesh would be both closer and more convenient than competing LNG imports from the Middle East or domestic sources that would have to be piped across the country.

The US Energy Department in October 2000, stated that since it would take at least five years to create adequate infrastructure to pipe natural gas to New Delhi, they believe that LNG would represent a better option for the potential export of gas to neighbouring China, India and Pakistan. However if they were to do this, they would then be in direct competition.

### 7.5 The Roles of Two New GOB Companies, IDCOL and IIFC

The World Bank funded a Private Sector Infrastructure Development Project (PSIDP), to facilitate private sector infrastructure projects. The project first created two institutions, the Infrastructure Development Company Limited (IDCOL) to administer project financing on behalf of the government, and the Infrastructure Investment Facilitation Center (IIFC) to promote and facilitate implementation of privately sponsored infrastructure projects.

Both IDCOL and IIFC were created as GOB-owned companies in 1998. Their first draft business plan included several energy related projects.

IDCOL is already operational and is providing project financing for three small power plants in Savar, Comilla and Narshingdi, which are being developed by the United Summit Power Company (USPC), who have already signed power purchase agreements with the Rural Electrification Board (REB) to develop the three 11 MW plants by the end of 2000. USPC, a local independent power producer, is investing 30% of the project cost of the three plants, which is estimated to be US\$20 million from their own resources, with the rest coming from IDCOL and local banks. The initial funding for IIFC comes from the Government of Bangladesh, IDA, the soft loan wing of the World Bank, DFID of the United Kingdom and CIDA of Canada.

IIFC is expected to engage specialised energy consultants for energy projects. IDCOL, which is also supported by IDA, offers subordinated loan finance on concessional terms to infrastructure companies, to reduce investors' risk, and thus attract private investment. It has a policy of not lending over 40% of total project cost.

**Table 7.1: Energy Supply Indicators in South Asian Countries**

	Fossil Fuel Proved Reserves			Fossil Fuel Production, 1998			Electric Generating Capacity, 1/1/98 (Million kilowatts)	Crude Oil Refining Capacity, 1/1/00 ('000 barrels per day)
	Crude Oil, 1/1/00 (Million barrels)	Dry Natural Gas, 1/1/00 (Trillion cubic feet)	Coal, 12/31/97 (Billion short tons)	Petroleum (Million barrels per day)	Dry Natural Gas (Trillion cubic feet)	Coal (Million short tons)		
Bangladesh	57	10.6	0	0.002	0.3	0	3.3	33
Bhutan	0	0	0	0	0	0.001	0.3	0
India	4,838	22.9	82.4	0.76	0.8	358.8	100.3	1,858
Maldives	0	0	0	0	0	0	0.03	0
Nepal	0	0	0.002	0	0	0.01	0.3	0
Pakistan	208	21.6	3.2	0.06	0.7	3.5	13.0	143
Sri Lanka	0	0	0	0	0	0	1.6	48
Total	5,103	55.1	85.6	0.82	1.8	362.3	118.8	2,082

<sup>1</sup> Includes crude oil, natural gas plant liquids, other liquids, and refinery processing gain.  
Sources: Crude Oil and Natural Gas Reserves: PennWell Publishing Co., *Oil & Gas Journal*, 12/28/99. Crude Oil Refining Capacity: PennWell Publishing Co., *Oil & Gas Journal*, 12/21/98. All Other Data: Energy Information Administration, International Energy Database, December 1999.

## 8. MAIN ENERGY SECTOR-RELATED ISSUES

### 8.1 Ability of Bangladesh Government to service investments

One of the major concerns of all major investors in the energy sector is the long to medium term debt-servicing ability of the Bangladesh Government to sustain the increasing foreign exchange payments that would be necessary to cover profit repatriation, interest payments and amortisation of private

debt, particularly from a sector that cannot directly generate foreign exchange.

This concern was particularly highlighted by the World Bank study, Foreign Direct Investment in Bangladesh: Long-run Sustainability, which was published in 1999. Table 8.1 below presents the projections from that study. It illustrates how the projected outflows by 2010 will be so much greater than projected capital inflows.

**Table 8.1**

#### *Profile of Private Capital Inflows and outflows in the Gas and Power Sectors(US\$ million)*

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Inflow Gas	51	134	441	177	246	92	113	110	107	105	133
Outflow Gas	111	111	111	111	111	111	158	147	138	131	282
Inflow Power	185	245	214	146	203	158	248	200	203	128	90
Outflow Power	30	76	114	160	188	141	141	304	343	386	414

**Source:** World Bank. FDI in Bangladesh: Issues of Long-run Sustainability. 1999

This particular concern was further illustrated during the middle of 2000, when it was reported in the Economist Intelligence Unit Country Report on Bangladesh that Petrobangla had been accumulating large debts to foreign oil and gas companies and the report suggested that it owed about US\$ 72 million to Shell and Unocal as outstanding dues for the purchase of gas from these companies during 2000 alone, with some US\$ 50 million owed to Shell and US\$ 22 million to Unocal.

During the visit of the Bangladesh Prime Minister Sheikh Hasina to the United States in October 2000, when the subject was constantly discussed in the media, Petrobangla explained that these payment delays are the result of non-payment of gas bills by domestic users and state owned enterprises, claiming they are

owed some Taka 2.5 billion by the Bangladesh Power Development Board, Taka 670 million by the Bangladesh Petroleum Corporation, and the Bangladesh Chemical Industries Corporation also owed a substantial amount. In defence of breaching their contractual obligations of the production sharing contracts signed with the oil companies, Petrobangla claim that the delay of payments is not a breach of contract, since they are paying interest on payment of arrears.

These payment problems are of particular concern to medium sized investors, who see the problems being experienced by large international oil companies to get their payment, especially since these oil companies are able to obtain high levels of national support, even from the US President.

Similar concern is also felt by the independent power producers, who sell under power purchase agreements to the Bangladesh Power Development Board (BPDB), when it was reported that the BPDB was facing liquidation at the end of 1999, when its major distributor and marketing agent Dhaka Electric Supply Authority (DESA) failed to make any payments for a number of months. It would appear that DESA had failed to collect arrears from many of its customers, and owes BPDB some US\$ 491 million. Already the oil and gas companies that supply fuel to the various power stations have warned BPDB that fuel supplies would be cut off, if large unpaid bills are not paid. While this may be a temporary state of affairs, it is still of great concern, particularly to new potential investors, who have to make risk assessments of the returns they might expect for investing in the energy sector and the ability of the Bangladesh Government to meet their obligations.

### 8.2 Exports of natural gas

At the rate of production, Bangladesh has enough recoverable gas to meet consumption

***There has been constant pressure on the Bangladesh Government by those foreign oil companies that are involved in gas exploration, to allow gas to be exported and more specifically, exported to India. The current position of the government is that exports would only be considered if Bangladesh had proven reserves to meet their consumption needs for a minimum of 50 years.***

for between 38-40 years. The potential investors are particularly concerned that Petrobangla's financial resources are not sufficient to absorb any substantial increase in gas purchases and unless they have a hard-currency market for increased production, it is very hard to justify investment on which returns are uncertain.

### 8.3 Land Lease Agreement

One key issue that had created considerable publicity during 2000 was the problems encountered by the AES Corporation in their negotiations with the Bangladesh Power Development Board (BPDB) over the suitability of the land being offered by the BPDB as part of their agreement to allow AES to build and operate the 450 MW Meghnaghat Power Station. A land lease agreement is an integral part of the complex negotiations that a foreign independent power producer must conclude before it can initiate the construction phase.

However in the case of the Meghnaghat Power project, the dispute began in December 1997, when AES declined a site that the Bangladesh Power Development Board (BPDB) had offered them as part of the land lease agreement, on the grounds that it had not been adequately developed, as per their land lease agreement. However, the BPDB insisted that AES take possession within 7 days, which AES refused to do. The dispute then dragged on for some months with AES threatening to withdraw from the project. The dispute was only settled with the intervention of the Prime Minister Sheikh Hasina, who had to dictate a supplementary agreement. However repeated disagreements between AES and the BPDB may well have delayed the project for some two years.

Because of flood problems and alluvial soil, in Bangladesh, selection of the correct site is of fundamental importance, and all prospective investors in new power stations are strongly advised to review with extreme caution the land that is offered as part of land lease or land purchase arrangements in such ventures.

#### **8.4 Fuel Supply**

Fuel supply and connectivity is also another area of concern to new independent power producers (IPP) wishing to negotiate fuel supply contracts prior to concluding power supplies and in the case of natural gas, the pressure at which it is delivered. Since the BPDB have had considerable problems in paying Petrobangla for fuel purchases, there have also been a number of supply disruptions. This can be a problem area, where an IPP signs a contract to deliver a certain quantity of power at a certain time, but cannot operate their generators due to lack of fuel.

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**APPENDICES****Appendix 1: Information Sources about the energy sector in Bangladesh**

*Alexander's Oil & Gas Connections* is a free news-site for the global gas, oil and gas and power industry. The site gives a selection of news, trends and happenings in and around the global energy markets, including reports about the gas, power and oil industry in Bangladesh [www.gasandoil.com/goc](http://www.gasandoil.com/goc)

*Annual Energy Statistics and Balances of Non-OECD countries*. Published annually by OECD, Paris and covers Bangladesh

*Bangladesh Energy Report February 2000*, published by the US Energy Information Administration, Washington DC and available on Internet at [www.eia.doe.gov/emeu/cabs/bangla.html](http://www.eia.doe.gov/emeu/cabs/bangla.html)

Bangladesh Natural Gas Exports to India. *Oil & Gas Journal*. 19 June 2000

Comprehensive Bangladesh gas strategy. *Oil & Gas Journal* 21 August 2000

**Economic Intelligence Unit (EIU)** publications: *Bangladesh Annual Country Profile* and quarterly reports as well as the Asia Business all cover energy sector in Bangladesh and can be downloaded on a fee basis at [www.eiu.com](http://www.eiu.com)

*Power in Asia: Financial Times Energy*. London. Published every two weeks. £760 per year. Details at [www.ftenergy.com](http://www.ftenergy.com)

*Private Power Generation Sector Report* DTI London July 1998

*World Bank: Staff Appraisal Report: Gas Infrastructure Development Project*, 7 April 1995

World Bank: *Bangladesh Energy Strategy Note* 9 November 1998

*World Bank 1999. Foreign Direct Investment in Bangladesh: Issues of Long-run Sustainability. October 1999.*

**World Markets Online** provides a fee based online that covers risk assessment service in the energy sector in Bangladesh, including both the oil & gas sub-sectors at [www.worldmarketsonline.com](http://www.worldmarketsonline.com)

A certain amount of the information used in the sector profile originated from an initial search carried out on the Reuters Online Press Service, which identified a number of press sources for newspaper articles concerning the energy sector in Bangladesh, where it was noted that a significant amount of the Reuters News coverage came from two Bangladeshi newspapers, the Independent, whose quoted articles were accessed online at <http://independent-bangladesh.com/news> and the United News of Bangladesh, whose quoted articles could be found at both [www.unbd.com](http://www.unbd.com) and [www.dhakacourier.com](http://www.dhakacourier.com). The Daily Star, the largest circulation English newspaper in Bangladesh, is available at [www.dailystarnews.com](http://www.dailystarnews.com).

## Appendix 2: List of Key Contacts

<p><b>Ministry of Energy &amp; Mineral Resources (MEMR)</b>  Bhaban 6, Bangladesh Secretariat (1<sup>st</sup> Floor)  Dhaka 1000  Tel: 880 2 861 3992  Fax: 880 2 861 11101/ 880 2 861 5097</p>	<p><b>Bangladesh Oil, Gas, &amp; Mineral Corp. (Petrobangla)</b>  Petrocenter Bhabhan , 3 Kawran Bazar C/A,  Dhaka-1000  Tel: 880 2 814972, 880 2 814936  Fax: 880 2 811613</p>
<p><b>Bangladesh Petroleum Corporation (BPC)</b>  1/D Agrabad C/A  Chittagong  Tel: 880 2 235 046/ 880 2 721 064 (Dhaka)  Fax: 880 2 891 3375 (Dhaka)</p>	<p><b>Bangladesh Petroleum Exploration Company (BAPEX)</b>  Bapex House Building,  Finance Corporation Bhaban  Dhaka 1000  Tel: 880 2 956 1473  Fax: 880 2 956 1473</p>
<p><b>Bangladesh Power Development Board</b>  WAPDA Building, 48 Motijheel C/A  Dhaka 1000  Tel: 880 2 956 2154, 880 2 956 3532  Fax: 880 2 956 4765</p>	<p><b>Rural Electrification Board (REB)</b>  Joarsahara, Khilkhet,  Dhaka,  Tel: (880-2) 891-6412, 891-6403,  Fax: (880-2) 891-6400</p>
<p><b>Power Grid Co. of Bangladesh Ltd</b>  House No. 1/A (5<sup>th</sup> flr), Rd. No. 13, Mirpur Rd.,  Dhanmondi, R/A,  Dhaka 1209  Tel: 880 2 812-3225, 812-3226, 812-3228,  Fax: (880-2) 812-3227</p>	
<p><b>International Finance Corporation IFC</b>  C/o World Bank  3A Paribagh  Dhaka 1000  Tel: 880 2 861 1056  Fax: 880 2 861 7521  Email: <a href="mailto:Hahmad@ifc.org">Hahmad@ifc.org</a>  Web site: <a href="http://www.ifc.org">www.ifc.org</a></p>	<p><b>The World Bank office in Bangladesh</b>  3A Paribagh, G.P.O. Box 97  Dhaka-1000, Bangladesh  Tel: (880-2) 9669301-8,  Fax: (880-2) 8613220  <a href="http://www.worldbank-bangladesh.org">www.worldbank-bangladesh.org</a></p>
<p><b>Asian Development Bank</b>  2<sup>nd</sup> Floor BSL Office Complex  Sheraton Hotel Annex  1, Minto Road, Ramna  Dhaka 1000  Tel: 880 2 933 4017 to 22,  Fax: 880 2 933 4012  Email <a href="mailto:adbbrm@mail.asiandevbank.org">adbbrm@mail.asiandevbank.org</a>  Web site: <a href="http://www.adb.org">www.adb.org</a></p>	<p><b>The Federation of Bangladesh</b>  Chambers of Commerce and Industry  Standing Committee on Oil, Gas and Natural Resources.  Biman Bhabban, 4<sup>th</sup> floor  100 Motijheel C/A,  Dhaka-1000, Bangladesh  Tel: 880 29563641,  Fax: 880-2-9551195  E-mail: <a href="mailto:resource@citechco.net">resource@citechco.net</a> or  <a href="mailto:Spring@bdonline.com">Spring@bdonline.com</a></p>

**Appendix 3: List of Foreign Companies Operating in Bangladesh in the Energy Sector**

<p><b>Cairn Energy PLC</b> House N° 8, 28 Park Road Baridhara, Dhaka 1212 Tel: 880 2 8829845, 880 2 600680 Fax: 880 2 8822592</p>	<p><b>Unocal Bangladesh Ltd.</b> House N° 12, Road N° 137 Gulshan-1 Dhaka 1212 Tel: 880 2 9885881, 880 2 855983 Fax: 880 2 988 4398</p>
<p><b>Shell Company of Bangladesh</b> Shell Explorations &amp; Development B.V. IDB Bhaban (9<sup>th</sup> Floor) E-8A Rokeya Sharani Arargaon Dhaka 1207 Tel: 880 2 9882954, 880 2 8828194 Fax: 880 2 9882947</p>	<p><b>Maersk Bangladesh Limited</b> Jahangir Tower (93<sup>rd</sup> Floor) Kawran Bazar, Dhaka 1215 Tel: 880 2 8117824, 880 2 811 7847 Fax: 880 2 811 2154</p>
<p><b>Mott Macdonald</b> House # 122, Road # 1, Block # F, Banani, Dhaka-1213 Tel: 880 2 882 4026 Fax: 880 2 882 3393</p>	<p><b>Cosmos Energy Services Pvt Ltd.</b> 69/1 New Circular Rd. Malibagh, Dhaka-1217 Bangladesh Tel: +880-2-9330859, 411564, 8312024 E-mail: <a href="mailto:cosmos@citechco.net">cosmos@citechco.net</a> Web site: <a href="http://www.cosmosgroup.net">http://www.cosmosgroup.net</a></p>
<p><b>Deutag Bangladesh</b> Plot CES -18, Road N° 123/125 Gulshan, Dhaka Tel: 880 2 98886104, fax: 880 2 988 7060 Email: <a href="mailto:deutag@dhaka.agni.com">deutag@dhaka.agni.com</a> Web site: <a href="http://www.deutag.com">www.deutag.com</a></p>	<p><b>Pangaea Partners</b> Chandrasshila Tower, 5<sup>th</sup> Floor 69/1 Panthapath, Dhaka 1205 Tel: 880 2 867 625, fax: 880 2 867 624 Website: <a href="http://www.pangaeapartners.com/banglipri.htm">www.pangaeapartners.com/banglipri.htm</a></p>
<p><b>Cinergy Global Power/Baghabari Power Co. Ltd</b> 54 Park Road Baridhara Dhaka 1212 Tel: 880 2 9881854</p>	<p><b>Brown &amp; Root Bangladesh Ltd/Halliburton</b> House N° 11, Road N° 7 Baridhara, Dhaka 1212 Tel: 880 2 873 391 4 Fax: 880 2 988 6122</p>
<p><b>Banamco Energy Limited</b> Concord Tower, Suite N° 201 113 Kazi Nazrul Islam Avenue Dhaka 1000 Tel: 880 2 933 5063 Fax: 880 2 418435</p>	<p><b>Khulna Power Co. Ltd</b> Summit Centre (5<sup>th</sup> Floor) 18 Kawran Bazar C/A Dhaka 1215 Tel: 880 2 913 2437-8 Fax: 880 2 811 7901</p>
<p><b>Greenland Engineers &amp; Tractors Co. Ltd (GETCO)</b> 26 Syamoll, Mirpur Road Dhaka Tel: 880 2 812 164/175 Fax: 880 2 713319 Email: <a href="mailto:getco102@citechco.net">getco102@citechco.net</a></p>	<p><b>AES</b> IDB Bhaban 5<sup>th</sup> Floor Agargaon, Shere-e-Bangla Nagar Dhaka 1207</p>