

CHAPTER 10

POWER AND ENERGY

Electricity

Planned and appropriate use of electricity is fundamental to the economic progress of Bangladesh. There is a huge demand for electricity for all sectors of the economy including agriculture, industry and service sectors. Other than household use of electricity in rural areas, the scale of demand for electricity in agricultural, SMEs and income generating activities is going up. However, there is a huge gap between the supply and demand of electricity.

Now, 47 percent of total population has access to electricity and per capita generation being 182 Kwh which is very low compared to other developing countries. Government has given highest priority to the development in Power Sector and has committed to make electricity available to all by 2021. For this purpose, the Government has initiated reforms in Power Sector and also taken up various expansion programmes. By 2011 Bangladesh will generate 7,030 MW of electricity which will be further increased to 8,865 MW in 2013. Steps will be taken to improve power generating capacity assuming that the necessity for power will reach the level of 20,000 MW in 2021.

Under a three year crash programme on an urgent basis, quick execution of ongoing power generation stations, arranging 100-150 megawatt gas turbine projects, and construction of 10, 20 and 30 megawatt power stations through private sector, are on the card. A schedule for repair, maintenance and overhauling or salvaging of old power stations will be made to boost and stabilize power production. There is a plan to execute Rooppur Nuclear Power Project in the near future.

Contribution of electricity to GDP and growth rate of electricity in the last 7 years are presented below:

Table-10.1: Contribution of electricity in GDP and its growth rate

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09 (Provisional)
Contribution of electricity in GDP (%)	1.30	1.34	1.37	1.38	1.30	1.31	1.29
Growth rate of electricity (%)	7.29	9.19	8.58	7.45	1.08	6.68	3.64

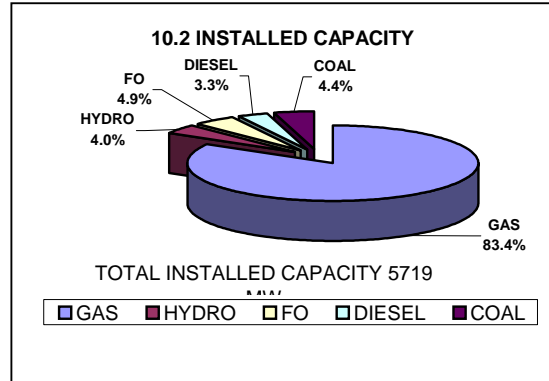
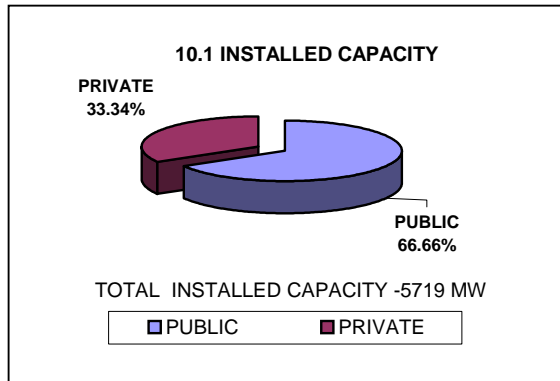
Source: Bangladesh Bureau of Statistics

Bangladesh Power Development Board (BPDB)

Generating Capacity and Demand

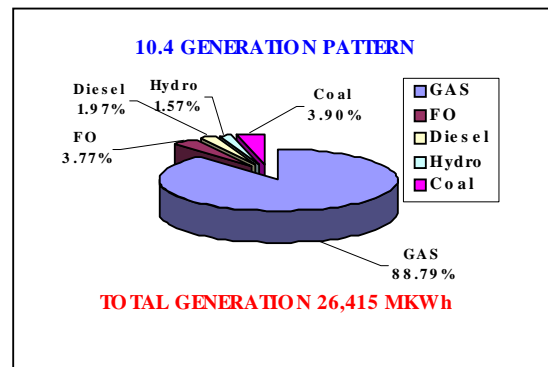
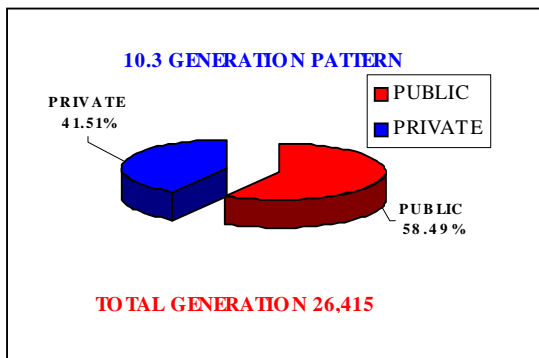
In FY 2008-09, the total installed generation capacity was 5719 MW including 3812 MW in public sector and 1907 MW in private sector (including REB). In the public sector, a good number of generation units have become very old and has been operating at a much-reduced capacity. As a result, their reliability and productivity are also poor. For the last few years, actual demand could not be met due to shortage of available generation capacity. Besides, due to shortage of gas supply some

power plants are unable to utilise their usual generation capacity. Maximum demand of 4162 MW was supplied till to-date. The installed capacity by ownership basis and fuel basis for FY 2008-09 is shown in Graph 10.1 and 10.2.



Power Generation

A total of 26,415 Million-KiloWatt hour (MKWh) net energy comprising 15,449 MKWh in public sector and 10,966 MKWh in private sector was generated during FY 2008-09. Of the total net power generation 58.49 percent was generated in public sector and 41.51 percent in the private sector. Again of the total power generation 88.79 percent was gas based, 1.57 percent hydro, 3.9 percent coal and 5.74 percent oil based. In FY 2007-08, 24,311 million-kilowatt hour (MKWh) net energy was generated. Generation pattern by ownership & fuel use is shown in Graph 10.3 and 10.4.



The natural gas consumption in power generation through BPDB's power plant was 1,06,593 million cubic feet in 1995-96, which increased to 1,61,008 million cubic feet in FY 2008-09. The consumption of natural gas and liquid fuel are given in Table-10.2

Table-10.2: Fuel Consumption by BPDB Power Plant

Fiscal Year	Natural gas (Million cft)	Liquid fuel (million liter)	
		Furnace Oil	HSD, SKO & LDO
1998-99	1,36,802	44.25	204.07
1999-00	1,41,330	114.38	92.02
2000-01	1,51,312	94.96	76.62
2001-02	1,51,577	85.03	54.96
2002-03	1,31,180	128.41	61.70
2003-04	1,34,482	174.19	95.20
2004-05	1,41,021	185.66	129.80
2005-06	1,53,920	170.59	124.60
2006-07	1,46,262	93.11	99.24
2007-08	1,50,992	137.09	111.51
2008-09	1,61,008	90.27	112.79

Source : Bangladesh Power Development Board

Maximum Generation

Actual demand could not be met for the last few years due to shortage of available generation capacity though the installed capacity increased slightly. The maximum generation of 4,130 MW in 2007-08 therefore, could not address the power crisis in the country. In the FY 2008-09, maximum served generation stood at 4,162 MW. The installed capacity and maximum generation are shown in Table-10.3.

Table-10.3: Installed Capacity and Maximum Generation

Fiscal Year	Installed capacity (MW)	Maximum generation (MW)
1998-99	3611	2449
1999-00	3711	2665
2000-01	4005	3033
2001-02	4230	3218
2002-03	4710	3458
2003-04	4710	3622
2004-05	5025	3751
2005-06	5275	3812
2006-07	5262	3718
2007-08	5262	4130
2008-09	5719	4162

Source: Bangladesh Power Development Board

Sale of Electricity by BPDB

Total electricity sale in PDB system was 23,937 MKWh in FY 2008-09. The share of total BPDB's sale was 22.76 percent to DPDC, 11.46 percent to DESCO, 37.73 percent to REB, 6.23 percent WZPDC and 21.82 percent to BPDB's own retail consumer.

Power Generation Programme

The Government has prepared Power System Master Plan (updated in 2006) to realise its goals. According to the reference forecast of Power System Master Plan, 2006, the maximum demand in 2010, 2012 and 2015 would be about 6608, 7732 and 9786 MW respectively. The demand is expected to be 13,993 MW in 2020 and 14,924 MW in 2021. To meet the demand with reasonable reliability, installed capacity will be increased to 16,643 MW and 17,455 MW by the year 2020 & 2021 respectively. In this period, transmission and distribution line will also be increased to 12,500 km and 4,87,558 km respectively. To meet this demand of electricity, short, medium and long term generation, distribution and transmission lines expansion projects are at the various stages of implementation. According to the existing generation expansion programme, a total of 3,547 MW of new generation will be added to the national grid by FY 2014. Moreover, 3,300 MW newly initiated generation plant will be implemented by FY 2014. The present status of the existing generation programmes are given in the Table-10.4.

Table-10.4: Power Generation Projects up to 2014 (Under existing Plan)

Sl. No	Name of the Power Plant	Capacity (MW)	Expected Commissioning Date
Public Sector (Under Construction):			
1	Fenchuganj 90 MW CCPP (BPDB)	90	-
2	Siddhirganj 2X120 MW Peaking Plant (EGCB)	240	Sep. 2009 (1 st unit) Nov. 2009 (2 nd unit)
3.	Shikalbaha 150 MW Peaking Plant (BPDB)	150	December'2009
Private Sector			
4.	Bhola –3 yrs rental	35	July, 2009
5.	Bogra –3 yrs rental	20	December, 2009
6.	Fenchuganj –3 Yrs rental	50	December, 2009
7.	Shikalbaha –3 yrs rental	55	December, 2009
8.	Ashuganj –3 yrs	62	December, 2009
9.	Fenchuganj –15 Yrs rental	50	September, 2009
Total (under construction)		752	
Under Procurement Process:			
10.	Sylhet 150 MW CCPP (BPDB)	150	FY 11
11.	Siddhirganj 2x150 GT (EGCB)	300	FY 12
12.	Chandpur 150 MW CC (BPDB)	150	FY 12
13.	Khulna 150 MW GT (NWPGC)	150	FY 12
14.	Sirajganj 150 MW GT (NWPGC)	150	FY 12
15.	Bibiyana 450 MW CCPP (Power Cell)	450	FY 13
Total (under procurement)		1350	
Committed:			
16.	Bhola 150 MW CCPP (BPDB)	150	FY 13
17.	Barapukuria 125 MW Coal (3 rd Unit) (BPDB)	125	FY 13
18.	Haripur 360 MW CCPP (EGCB)	360	FY 14
19.	Bheramara 360 MW CCPP (NWPGC)	360	FY 14
20.	Sirajganj 450 MW CCPP/ 500 MW Coal (Power Cell)	450	FY 13
Total Committed		1445	
Grand Total		3547	

Transmission System

Power Grid Company of Bangladesh (PGCB)

Before formation of Power Grid Company of Bangladesh Ltd. (PGCB), Bangladesh Power Development Board (BPDB) was responsible for operation, maintenance and development of transmission system including power generation and distribution system all over Bangladesh. PGCB was created in November, 1996 as a fully state-owned company with an authorized capital of Tk.10 billion under the Power Sector Reform Programme of the Government. PGCB is running according to the Companies Act, 1994. The Government decided to offload 25 percent of its shares i.e. a total of 91,08,940 Nos. of shares (Tk.100 each) through the Stock Exchanges under direct listing in order to bring more accountability on the company's activities and to strengthen the capital market of the country. Accordingly, PGCB was listed in Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE) in October 2006 and trading of shares was started and 86,53,490 shares were sold. Now, the number of share holder is 7,964. It is notable that, BPDB owns 76.25 percent of shares.

Power generated in different power plants all over the country is transmitted to the national grid through 230 kV and 132 kV transmission lines. In 1996, when PGCB was formed, the total lengths of 230 kV and 132 kV line were 838 ckt km and 4,755 ckt km respectively. At present, the lengths of 230 kV and 132 kV transmission lines stand at 2,644.5 ckt km and 5,607.6 ckt km. The total length of the OPGW installed in the transmission line from 1996 to June, 2007 was 2200 km. This has been increased to 3,963 km up to June, 2008. After completing the ongoing NLDC project and other transmission projects, the total length of the OPGW will be 4,200 km by June, 2009. Therefore, the major parts of the country will be covered by the PGCB optical fiber network.

To improve the whole transmission system, the company so far completed the following transmission facilities:

1. Comilla-Meghnaghat-Haripur 230 kV transmission line.
2. Turn in and out of existing Ghorasal-Haripur 230 kV line at Rampura.
3. Hasnabad-Aminbazar (Savar)-Tongi and Haripur-Meghnaghat 230 kV transmission line.
4. Rampura-Gulshan 132 kV double ckt cable line.
5. Khulna Central-Khulna south double ckt 132 kV transmission line.
6. Khulna 230/132 kV substation.
7. Barapukuria 230/132 kV substation.
8. Extension of Joydebpur 132/33 kV substation with GIS bay.
9. Natore-Rajshahi 132 kV single circuit transmission line with PGCB's own financing.
10. Barapukuria-Rangpur and Barapukuria-Sayedpur 132 kV transmission Line.
11. Ashuganj-Sirajganj 230 kV line & Sirajganj switching station.
12. Construction of Joydebpur-Kabirpur-Tangail 132 kV double circuit line.
13. Khulna-Ishwardi & Bogra-Barapukuria 230 kV double circuit transmission line.
14. Bogra 230/132 kV S/S.
15. Third 230/132 kV transformer (225 MVA) each at Haripur, Aminbazar and Rampura.
16. Sirajganj-Bogra 230 kV transmission line.

Government has already undertaken a comprehensive plan to strengthen the transmission system and meet the future demand of electricity with the aim of reaching electricity to all by 2021 and as part of achieving the target, the following projects as shown in Table-10.5 are being implemented:.

Table 10.5: Projects under implementation

Sl. No.	Name of the Project	Physical Target up to June-09	Physical Progress up to June-09	Financing Status
1	Ishurdi-Baghabari-Serajganj-Bogra 230 kV Transmission line. Implementation Period : 2002-03 to 2007-08	100.00%	100.00%	ADB, KfW, Suppliers Credit and Bangladesh Govt.
2	National Load Despatch Centre(NLDC) Implementation Period: 2003-04 to 2007-08	92.26%	92.848%	ADB & Bangladesh Govt.
3	Shunt Compensation at Grid Substations by Capacitor Banks (Phase-1) Implementation Period: 2005-06 to 2007-08	100.00%	93.81%	ADB & Bangladesh Govt.
4	Construction and Extension of Grid Substations including Transmission line facilities (Phase-1). Implementation Period : 2005-06 to 2008-09	49.53%	45.74%	ADB, JBIC & Bangladesh Govt.
5	Three Transmission Line. Implementation Period : 2006-07 to 2009-10	67.10%	67.1%	ADB & Bangladesh Govt.
6	Meghnaghat-Aminbazar 400 kV Transmission Line (Phase-1). Implementation Period: 2006-07 to 2008-09	5.05%	4.8%	ADB & Bangladesh Govt.
7	Aminbazar-Old Airport 230 kV Transmission Line and Associated Sub-Stations. Implementation Period : 2006-07 to 2009-10	22.3%	21.3%	ADB & Bangladesh Govt.
8	Transmission Efficiency improvement through Reactive Power Compensation at Grid Substations and Reinforcement of Goalpara Substation. Implementation Period 2007-08 to 2009-10	6.00%	6.00%	KfW & Bangladesh Govt.
9.	Naogaon-Niamatpur 132 kV Transmission Line. Implementation period: 2008-09		80%	Own financing
10.	Aminbazar-Savar 132 kV Transmission Line. Implementation period: 2008-09		84%	Dhaka PBS-1
11.	Ashuganj-Shajibazar 132 kV Single Circuit Transmission Line Implementation period: 2008-09		90%	Own financing

Source: PGCB, Power Division.

Future Development Plan of PGCB

The following projects are under active consideration to be implemented over the Prioritized Investment Plan (Three Years Road Map for Power Sector Reform) period:

- (1) Siddhirganj-Maniknagar 230 kV Transmission line with associated substations.
- (2) Sylhet-Shajibazar-Brahmanbaria 230 kV Transmission line with associated substations.
- (3) Barisal-Bhola 132 kV Transmission line.
- (4) Eight new 132/33 kV Sub-Stations including 132 kV interconnector Line

- (5) Ishwardi-Rajshahi 230 kV Transmission line.
- (6) Construction of 230/132 kV Substations at Shyampur, Jhenaidah (Or Jessore), Bheramara and Sreepur.
- (7) Raujan-Madunaghat-Shikalbaha 230 kV Transmission line.
- (8) Chandraghona-Rangamati-Khagrachari 132 kV Transmission line.
- (9) Enhancement of Capacity of Grid Sub-stations and Transmission lines (Phase-I).

Distribution system comprises of 33 kV, 11 kV and 0.4 kV lines. In 1995-96, total distribution lines in the BPDB system stood at 35,962 km, which has increased to 48,215 km in FY 2008-09 (Some distribution lines are handed over to REB & WZPDCL). The number of consumers has also increased to 19,22,361 in FY 2008-09 from 11, 56,672 in FY 1995-96.

System Loss

BPDB is committed to bring down the system loss to an acceptable limit. Various measures are underway to reduce the system loss. In FY 2007-08, the system loss (on net generation), distribution loss (excluding bulk) was 6.95 percent and 14.43 percent respectively. The distribution loss in BPDB system came down to 13.57 percent in FY 2008-09. System loss and distribution loss during FY 1998-99 to 2008-09 are shown in Table-10.6.

Table-10.6: System Loss of BPDB

Fiscal Year/Month	System loss (%Of net generation)	Distribution loss (%) excl. bulk
1998-1999	16.8	30.56
1999-2000	15.4	27.73
2000-2001	13.85	26.11
2001-2002	12.62	24.50
2002-2003	11.35	22.35
2003-2004	10.16	21.33
2004-2005	9.29	20.00
2005-2006	7.86	19.06
2006-2007	7.03	16.58
2007-2008	6.95	14.43
2008-2009	6.14	13.57

Source: Bangladesh Power Development Board.

Accounts Receivable

Accounts receivable is a great problem to BPDB. In 2007-2008 it was about at Tk. 39196 million. Of the receivables, DPDC (DESA) alone accounts for Tk. 29,298 million. Accounts receivable of BPDB during FY1998-99 to 2008-09 is shown in Table-10.7.

Table -10.7: Accounts receivable of BPDB

In Million Taka

Fiscal Year / Month	Accounts receivable
1998-99	24645.30
1999-00	27892.20
2000-01	33549.90
2001-02	36717.40
2002-03	39938.00
2003-04	43681.00
2004-05	41557.00
2005-06	42711.00
2006-07	37523.00
2007-08	39196.00
2008-09	38534.00

Source: Bangladesh Power Development Board.

Dhaka Power Distribution Company Limited (DPDC)

Dhaka Power Distribution Company Limited (DPDC)- a newly formed state-owned Power Distribution Company started functioning with the assets and liabilities of DESA with a view to ensure better customer service, accountability and dependable power supply to the customers since July 1, 2008. DPDC has already taken various steps to improve and upgrade the electricity distribution system under its jurisdiction.

Purchase of Energy and Revenue Collection

The amount of energy purchased by DESA was 5203.922 MKWH in FY 2007-08. The purchase of energy in FY 2008-09 by DPDC stands at 5443.899 MKWH. Revenue collection from energy sold has increased significantly. Revenue collection by DESA was Tk 1617.69 crore in FY 2007-08. The revenue collection of DPDC in FY 2008-09 is Tk 1764.15 crore.

Dhaka Electric Supply Company Ltd. (DESCO)

As part of the process of on-going Power Sector Reforms by way of unbundling the power sector and increasing efficiency in the area of generation, transmission and distribution, Dhaka Electric Supply Co. Ltd. (DESCO) was created in November 1996 under the Companies Act 1994 as a Public Limited Company with an authorised capital of Tk. 500 crore. However, the operational activities of DESCO at the field level commenced on September 24, 1998 with the taking over of the electric distribution system of Mirpur area from Dhaka Electric Supply Authority (DESA). Starting from a consumer base of 71,161 and load demand of 90 MW in 1998, the company has grown to cater to 4,15,842 consumers with a load demand of 545 MW as of June 2009, recording an increase of 484.00 percent and 506.00 percent respectively over the last ten years. During the same period, the company's gross fixed assets, including capital works in progress, increased from Tk. 130 crore to Tk. 1017 crore with a growth of 682 percent, while the shareholders equity increased from Tk. 121 crore to Tk. 465 crore, recording a growth of 284 percent.

Commercial & Technical Activities

Key commercial and technical activities conducted and the performances during FY 2003-04 to 2008-09 are summarised in Table-10.8.

Table-10.8: Commercial and Technical Highlights of DESCO

Description	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
1	2	3	4	5	6	7
Technical Highlights						
33/11KV Sub-stations (No.)	13	13	16	19	21	21
Capacity of 33/11KV Sub-stations (MVA)	425/ 593	430/ 602	620/ 868	680/ 952	760/ 1064	760/ 1064
Maximum Demand (MW)	351.82	377.25	397.60	451	505	545
33KV Overhead Line (KM)	76.70	76.70	76.70	82.80	82.80	82.80
33KV Underground Line (KM)	125.30	142.80	143.80	182.20	182.20	184.84
11KV Overhead Line (KM)	552	600	720	860.40	884.00	959.25
11KV Underground Line (KM)	205	238	262	314.35	317.10	317.10
LT Line(KM)	1030	1105	1250	1473.25	1521	1591.39
Distribution Transformer (No.)	3594	3785	4106	4316	4497	4563
Commercial Highlights						
Energy Import (MKWh)	1739.87	1842.89	2023.22	2191.46	2573.76	2742.96
Energy Import (MTk.)	3775.52	3999.07	4390.39	4946.36	6151.29	7117.53
Energy Sales (MKWh)	1405.03	1536.31	1695.55	1897.00	2293.03	2474.51
Energy Sales (MTk.)	4902.32	5428.08	6280.06	7219.58	9094.19	9888.30
System Loss (%)	19.24	16.64	16.20	13.44	10.91	9.79
Collection Ratio (%)	87.33	97.07	99.11	104.40	100.01	98.18
C. I. Ratio (%)	70.93	80.92	83.06	90.37	89.10	88.57
Consumers	241964	259580	281960	347614	385037	415842

Source: DESCO

Billing/ Collection

The primary objective of maintaining the financial strength of the company is achieved by continuous efforts to maintain a sound billing/ collection ratio. During last fiscal year, Tk.9,708.619 million was collected against sales amounting Tk. 9,888.304 million and the billing collection ratio stood at 98.18 percent while the Collection/ Import (C.I.) ratio 88.57 percent.

System Loss

This is the key performance indicator of any electric distribution company, and is determined by the quantity of energy purchased and sold. The system loss has been worked out to 9.79 percent this year as against 10.91 percent in the previous year.

E-Governance

To keep pace with the modern technological advancement in IT (Information Technology) sector and to make the utility management more user friendly, DESCO management decided to launch e-governance programme with a unified plan. IICT, BUET is assisting DESCO in this regard. One Point Service Complaint, New Connection, Monthly Bill and Collection, Miscellaneous Bill and Collection, DESCO Website and E-mail Communication, Inter Office Wide Area Network (WAN) connectivity,

Central/Local Store Management Software have already been developed and implemented. Training programme of DESCO officials on these newly implemented softwares are going on. Citizen's charter has been included in DESCO website and now a consumer can check the status of his/her bill and load shedding schedule from it.

Accounts Receivable

The Company maintains a system of continuous monitoring of accounts receivable by way of monthly reports and analysis. The Accounts Receivable becomes 2.73 equivalent months during last FY 2008-09.

West Zone Power Distribution Co. Ltd. (WZPDCL)

West Zone Power Distribution Co. Ltd. (WZPDCL), a public Ltd. company started functioning with assets and liabilities of the Distribution of Western Zone comprising Khulna and Barisal divisions and greater Faridpur district with a view to ensure better customer service, accountability, reliable and dependable power supply to the customers since 1st April 2005. WZPDCL has already taken various steps to improve and upgrade the electricity distribution system under its jurisdiction. The following are the performance statistics of the company during FY 2008-09:

- System loss of WZPDCL stood at 12.22 percent in FY 2008-09.
- Purchase of Energy: The volume of energy purchased was 1492.418 (mKWH).
- Revenue collection: Revenue collection from energy sold was Tk. 4680.310 million
- Maximum demand : The maximum demand of power in WZPDCL area was 330 (MW)
- Number of Consumers: Total number of consumers in FY 2008-09 was 5,44,428.

Accounts Receivable

The Accounts Receivable in FY 2008-09 was Tk. 1374.151 million which is 3.16 equivalent months.

Rural Electrification Board (REB)

Rural Electrification programme has made remarkable strides since its inception. REB through its 70 PBSs up to June 2009, has constructed 2,20,067 km distribution lines, has given a total 76,41,132 electricity connections in 47,641 villages., Of which the share of domestic connections is 65,62,850, irrigation 1,70,086 , commercial 7,68,818, industrial 1,26,038 and other connections 13,340. However, the following tables (10.9) show the targets and achievements made against Rural Electrification Programme during FY 1997-98 to 2008-09:

Table - 10.9 : Physical Target and Achievement

FY	Distribution Line (km)			No. of Consumers Connected		
	Target	Achievement	Variance (-) / (+)	Target	Achievement	Variance (-) / (+)
1997-98	10370	10467	291	300000	343870	81286
1998-99	8325	9505	-962	200000	373822	29952
1999-00	10325	11408	1903	300000	512445	138623
2000-01	13750	12989	1581	325000	504074	-8371
2001-02	14528	14641	1652	350000	662641	158567
2002-03	14922	16002	1361	450000	650126	-12515
2003-04	14661	15706	-296	550000	682283	32157
2004-05	15400	16260	554	650000	670263	-12020
2005-06	14500	15091	-1169	750000	741095	-70832
2006-07	5476	4764	-10327	650000	453426	-287669
2007-08	5042	3089	-1675	245000	226252	-227174
2008-09	6116	5062	1973	368275	405990	179738
Total	118754	134984		5138275	6226287	

Source: REB

[Variance = Current year Achievement – Previous year Achievement]

It is to be noted that, as per government decision line constructions and consumer connection of various categories were withheld from 30-11-2006 to 08-11-2007. Due to this bar, the target of line construction and consumer connection of 2006-07 and 2007-08 could not be achieved. In addition, a huge number of consumer connections were disconnected / abolished and only the existing number of consumers is included in the statistics. For this reason, the total number of consumers decreased in FY 2007-08.

On going projects under Rural Electrification Board (REB)

REB is an infrastructure development organisation of the Government and there all activities of REB financed by the Government.

In the revised ADP for FY 2008-09, REB has been provided with an allocation of Tk. 66,844.00 lakh (of which Tk. 24,094.00 lakh will be financed from GoB fund and Tk. 42,750 lakh will be financed from Project aid) for implementation of 10 projects (8 investment projects and 2 technical assistance projects).

In the remote areas where power can not be distributed in conventional way, REB has implemented 3 renewable energy projects to provide domestic connection through Solar Home Systems. Around 13,000 domestic connections have been given. REB purchases electricity from PDB and distributes/sells to the consumers. Table 10.10 shows the statistics of purchase and sale of electricity by REB in FY 2008-09:

Table 10.10: The Statistics of Purchase and Sale of Electricity among the Consumers by REB.

Year/ month	MWH purchased		MWH sold/consumed						Avg. System loss of 70 PBS (%)	
	Grid Meter	Sub- station	Domestic	Industry	Commercial	Agriculture	Others	Total	Grid Meter	Sub- station
2008-09										
July' 2008	801,147	768,095	352,850	231,841	58,171	9,881	1,197	653,942	18.37	14.86
Aug' 2008	802,062	773,424	377,121	225,140	58,308	11,228	1,201	673,007	16.09	12.98
Sept' 2008	819,547	786,648	379,998	219,446	58,973	11,118	1,167	670,703	18.16	14.74
Oct' 2008	805,823	780,191	436,739	193,652	64,543	16,521	1,208	712,660	11.56	8.66
Nov' 2008	719,178	697,461	338,916	232,570	56,849	16,044	1,191	645,583	10.23	7.44
Dec' 2008	735,876	706,501	328,394	189,047	56,420	20,934	1,301	596,092	19.00	15.63
Jan' 2009	861,264	829,011	342,558	215,415	58,255	135,521	1,177	752,927	12.58	9.18
Feb' 2009	861,638	830,804	295,844	189,076	52,633	240,355	1,099	779,011	14.87	11.45
Mar' 2009	994,043	950,905	264,854	217,537	53,281	275,936	1,079	812,687	14.97	11.60
April' 2009	946,791	906,536	318,211	201,650	58,216	212,515	991	791,591	15.17	11.80
May' 2009	833,529	804,679	350,993	235,870	60,681	39,632	1,165	688,342	15.31	11.97
June' 2009	904,616	867,567	406,847	244,861	65,968	24,211	1,211	743,114	15.56	12.19

Source: REB

Table 10.11: The Statistics of Accounts Receivable and Accounts Payable in of REB.

Year	Accounts receivable (Months)	Accounts receivable (Taka,000)	Aging of Accounts Payable (PDB Bill Outstanding) (12 Month average) (Taka,000)
1997-98	2.46	912511	14,659
1998-99	2.49	1271428	35,706
1999-00	2.30	1493264	148,523
2000-01	2.23	1864124	550,383
2001-02	2.21	2349959	427,547
2002-03	1.92	2687177	423,410
2003-04	1.81	3022224	324,628
2004-05	1.85	3446585	90,183
2005-06	2.00	4288939	128,864
2006-07	1.72	3743158	126441
2007-08	1.54	3765651	11161
2008-09	1.55	4081795	19192

Source: REB

Development and Expansion of Information Technology in REB

The Government has taken an initiative to conduct a feasibility study on establishing countrywide Fiber Optic Network using electricity transmission and distribution network. A committee, constituted for the purpose, has delivered its recommendations to setup Fiber Optic Network by using the existing infrastructure of power sector institutions.

So far REB has made remarkable progress in the development and expansion of IT. Payroll software has been installed in 70 PBS of REB. Computerized systems to produce financial and statistical reports have already been established in 70 PBSs. In addition, computerized systems have already been introduced in goods inventory, billing systems of these PBSs. Graphic Information System (GIS)

is being used in PBSs and by phases it will be introduced in all PBSs to develop the standard of consumers' services.

Reforms and Efficiency Improvement measures

The government has taken a number of reform and restructuring programmes. Under reform programme, BPDB will be converted into a holding company. As part of reform process, DESA has been converted into a Public Ltd. Company in the name of "Dhaka Power Distribution Company Limited" and started functioning since July 2008. A brief on reform programme in power sector is stated below:

Generation

- ◆ A 1907 MW power plant has been installed under the "Private Sector Power Generation Policy".
- ◆ North West Zone Power Generation Company Ltd. (NWPGCL) has been registered. Khulna & Sirajganj 150 MW and Bheramara 360 MW power plants will be implemented by this company.
- ◆ "Policy Guidelines for Enhancement of Private Participation in Power Sector" has been approved to allow commercial power plants in private sector.
- ◆ Ashuganj Power Station has been converted into Ashuganj Power Station Company Ltd. (APSCL) in 1996.
- ◆ Electricity Generation Company of Bangladesh (EGCB) has been established to implement, own and operate about 900 MW power plants including the proposed 2x120 MW and 2x150 MW peaking power plants at Siddhirgonj and 360 MW Combined Cycle Power Plant at Haripur.

Transmission

- ◆ Power Grid Company of Bangladesh Limited (PGCB) has been created in 1996. All the transmission assets (100 percent) including Load Dispatch Center (LDC) have been transferred from BPDB to PGCB.
- ◆ PGCB offloaded its 25 percent share to public through Capital Market in 2006.

Distribution

- ◆ DESCO was established in 1996 and is now functioning at Mirpur, Gulshan, Baridhara, Uttara and Tongi area of Dhaka by taking over assets from DESA. DESCO offloaded its 25 percent share to public through capital market.
- ◆ West Zone Power Distribution Company (WZPDC) has been created corporatizing West Zone Power Distribution System of BPDB.
- ◆ Dhaka Power Distribution Company Limited started functioning since July 2008.
- ◆ North West Zone Power Distribution Company (NWZPDC) System of BPDB has been formed.
- ◆ Corporatization of South Zone Power Distribution Company System of BPDB is under process.
- ◆ Programmes have been undertaken to introduce pre-paid metering system in Chittagong, Sylhet, Sirajganj and Bogra under BPDB. Under DESA this system will be piloted at Lalbag and at Uttara under DESCO to increase revenue collection. ATM Card has been introduced for payment of Electricity Bill in Dhaka and Chittagong areas.
- ◆ Steps taken to bring the people of remote areas of the country under electricity system through "Remote Area Power Supply System (RAPSS)" programme. This programme will be implemented by the private sector.

Future Plan

The government has prepared Power System Master Plan to realize the vision. According to the plan, installed capacity will rise to 16,643 MW by the year 2020. During this period transmission and distribution line will reach 12,000 km and 4,77,558 km respectively. Future plan of the Government up to 2020 is stated below:

Table 10.12: Future Plan of Power Sector Development

Sl. No.	Items	FY 2009 (Actual)	FY 2013	FY 2020
1.	Installed Capacity, MW	5,719	8,865	16,643
2.	Maximum Demand, MW	4,162	8,364	13,993
3.	Net Generation, MkWh	26,416	33,000	72,222
4.	Transmission Line, km	8,253	9,553	12,000
5.	Grid Substation Capacity, MVA			
	(a) 400 KV & 230 KV	5,850	12,910	19,075
	(b) 132 KV	7,485	13,990	27,367
6.	Distribution Line, km	2,83,494	3,30,000	4,77,558
7.	Number of Consumers (million)	11.25	140.00	207.67
8.	Number of Village Electrified	51,136	56,000	80,000
9.	Per Capita Generation, kWh	182	218	450
10.	Access to Electricity	47%	60%	90%

Source: Power cell, Power division

Private Investment in Power Sector

The Government encourages private sector participation in power sector to ensure electricity for every citizen by 2020. Policy guidelines for enhancement of private participation were approved in 1996 by the Government. Power Grid Company of Bangladesh (PGCB) and Dhaka Electric Supply Company (DESCO) were therefore created in 1996. In FY 2008-09, total installed generation capacity was 5719 MW including 1907 MW in private sector. The large power generation projects in private sector include: (i) Bibiyana 450 MW (ii) Shirajganj 450 MW and (iii) Meghna Ghat 450 MW power plants.

Renewable energy and efficiency enhancement management

By using renewable energy, 20 MW of electricity is now being produced in the country. The Government is encouraging generation of renewable energy by providing various financial incentives to both public and private sectors. Alongside the efforts for increasing in power generation, efforts are under way to ensure efficiency enhancement. As part of these efforts, all the stores and shopping malls of the town have been asked to close down after 8 o'clock in the evening and industrial area's holiday have been staggered to save up to 300 MW of electricity. The saved power diverted towards irrigation helped the achieving bumper Boro production this year.

Consumers have been asked to use energy saving bulbs to save electricity. A project has been undertaken at a cost of Tk. 105 crore to produce these bulbs. Once the project is fully executed 350 MW of electricity could be saved.

Fuel

Natural Gas

In Bangladesh natural gas is one of the important sources of energy that accounts for 75 percent of the commercial energy demand of the country. So far, 23 gas fields have been discovered in the country which contain 29.234 trillion cubic feet (tcf) of gas, of which 21.055 tcf is recoverable. As of June 2009, total 8.37 tcf gas has been produced leaving 12.678 tcf net recoverable.

The total gas reserve, extractable gas and cumulative gas production up to June 2009 are shown in Table 10.13.

Table 10.13: Total Gas Reserve, Extractable Gas and Cumulative Production of Gas

In Billion Cubic Feet			
Gas field	Recoverable Reserve (Proved + Probable)	Cumulative Production Upto June 2009 (Provisional)	Remaining Recoverable Reserve (Proved+ Probable)
Producing			
Bakhrabad	1049.0	692.3	356.7
Habiganj	3852.3	1617.5	2234.8
Jalalabad	836.5	509.6	326.9
Kailashtilla	1903.3	466.0	1437.3
Meghna	119.6	35.8	83.8
Narsingdi	215.1	98.9	116.2
Rashidpur	1401.2	448.4	952.8
Sylhet	478.7	188.5	290.2
Sangu*	848.5	457.9	390.6
Salda Nadi	116.1	58.6	57.5
Titas	5127.5	2996.1	2131.4
Beanibazar	170.2	57.3	112.9
Fenchuganj	282.8	60.4	222.4
Feni	130.0	61.8	67.8
Moulvibazar	359.6	139.6	220.0
Bibiyana	2400.8	360.8	2040.0
Bangura	546.0	79.2	466.8
Not In Production :			
Begumganj	32.7	0.0	32.7
Kutubdia*	45.5	0.0	45.5
Semutang	150.3	0.0	150.3
Shahbazpur	465.6	0.0	465.6
Production Suspended:			
Chhatak	473.9	26.4	447.5
Kamta	50.3	21.1	29.2
Total	21055.1	8376.3	12678.8

Source: Energy and Mineral Resources Division

* Offshore field

Currently, 79 wells in 17 gas fields are in production. The producing gas fields are: Titas (14 wells), Bakhrabad (4 wells), Habiganj (9 wells), Rashidpur (5 wells), Kailashtila (6 wells), Sylhet (2 well) Narsingdi (2 wells), Meghna (1 well), Saldanadi (2 wells), Fenchuganj (2 well), Sangu (6 wells), Jalalabad (4 wells), Beanibazar (2 wells), Feni (1 wells), Moulvibazar (4 wells), Bangura (4 wells)

and Bibiyana (12 wells). A total of 653.75 billion cubic feet (BCF) gas was produced in FY 2008-09, compared to 600.86 BCF in FY 2007-08.

The main source of fuel for power, fertilizer, industrial, commercial and domestic sectors is natural gas. Year and sector wise gas consumption and demand are shown in Table 10.14 and 10.15 respectively.

Table 10.14: Consumption of Natural Gas by Sector

(In Billion Cubic Feet)

Fiscal Years	Production	Sectors									Total Sales
		Power	Fertiliser	Industry	Captive Power	Tea Estates	B. Fields (Season)	Commercial	Domestic	CNG	
1999-00	332.35	147.62	83.31	41.52		0.64	0.35	3.85	29.56	0	306.8
2000-01	372.16	175.27	88.43	47.99		0.65	0.44	4.06	31.85	0	348.6
2001-02	391.53	190.03	78.78	53.56		0.72	0.53	4.25	36.74	0	364.6
2002-03	421.16	190.54	95.89	63.76		0.74	0.52	4.56	44.80	0.23	401.0
2003-04	454.59	199.40	92.80	46.49	32.03	0.80	0.12	4.83	49.22	1.94	427.6
2004-05	486.75	211.02	93.97	51.68	37.87	0.80	0.00	4.85	52.49	3.62	456.3
2005-06	526.72	222.72	88.58	63.44	49.02	0.76	0.00	5.24	57.13	6.71	493.6
2006-07	562.22	221.10	93.47	77.48	62.51	0.75	0.00	5.66	63.25	11.9	536.2
2007-08	600.72	234.28	80.23	78.67	92.19	0.71	0.00	6.60	69.02	22.8	584.5
2008-09	653.75	256.3	94.7	74.85	104.3	0.65	0.00	7.46	73.78	31.0	643.1

Source: Energy and Mineral Resources Division

Table-10.15: Sector-wise Demand for Natural Gas

(In Billion Cubic Feet)

Sector	2007-08	2008-09	2009-10	2010-11	2011-12
Power	234.3	256.3	278.2	300.5	324.5
Captive	80.2	94.7	120.9	142.6	164.0
Fertilizer	78.67	74.85	94.0	94.0	94.0
Industry	92.2	104.3	133.9	160.7	184.8
Commercial	6.6	7.46	9.0	9.8	10.8
Brick Field (Seasonal)	0.0	0.0	0.0	0.0	0.0
Domestic	69.02	73.78	88.9	99.5	111.44
Tea-Estates	0.71	0.65	1.0	1.0	1.0
CNG	22.82	31.02	37.2	44.7	51.36
*System Loss	16.1	20.0	20.0	20.0	20.0
Total	600.7	707.0	802.5	913.9	961.9

Source: Energy and Mineral Resources Division

*Including own use.

In Bangladesh, exploration and development of new gas fields to meet the increasing demand of gas has become an imperative. To intensify exploration activities, the whole country has been divided into 23 blocks. As a result, International Oil Companies have signed 10 Production Sharing Contracts (PSCs) for 12 acreage blocks. Out of these, 02 PSCs have already expired. Currently, 08 PSCs are in force in 10 acreage blocks. Besides these, offshore area of the country has been divided into 28 new blocks and an international tender has been floated to start exploration activities in offshore areas under Production Sharing Contract. 7 IOCs, in response, have submitted bids for 15 blocks.

LPG

With a view to reduce the import of fuel and to keep the environment clean, an LPG plant was installed at Kailashtila in Sylhet in 1998. In November, 2007 another NGL/Condensate fractionation plant was installed and commissioned by a foreign contractor on turn key basis at the same premises. Both the plants are producing sulphur and lead free and environment friendly quality LPG and Motor Spirit (Petrol) and the recently installed plant is also producing HSD through the processing of NGL and condensate respectively. It is to be noted that the capacity of both the plants for processing of NGL and Condensate are 175 metric tonnes NGL and 110 metric tonnes Condensate from which 62 MT LPG, 2,70,000 litre MS and 43,000 litre high speed diesel (HSD) can be produced per day. However, due to the shortage of raw materials, 16 metric tonnes LPG, 1,02,000 litre MS and 20,000 litre HSD are being produced per day by processing about 52 metric tonnes NGL and 44 metric tonnes condensate.

Condensate produced from the gas fields of Sylhet region are being transported to the Ashugonj Installation of RPGCL through the north-south pipeline. The supplied condensate is stored at Ashugonj storage tank and then delivered to the ship of BPC for carrying it to the Eastern Refinery Ltd. for processing. Initially condensate delivery quantity was 50-60 lakh litre per month. Now this quantity has reached up to 220 – 250 lakh litre. As of June 2009, 26,24,37,657 litres condensate has been delivered.

CNG

Vehicle conversion to Compressed Natural Gas (CNG) is being carried out and promotion of this mode of fuel is being encouraged. Before using CNG, the uncontrolled emission of motor vehicles especially from two stroke three-wheeler baby taxis and diesel buses was a major cause for air pollution in urban areas specially Dhaka City. Natural gas of Bangladesh consists of typically more than 96 percent methane and practically contains no sulfur. By raising the usage of CNG substantial improvement in air quality is observed in urban areas.

. The CNG stations are supplying approximately 67.24 MMCM gas monthly which is equivalent to more than 08 (eight) crore litres of petrol. Thereby, the Government is saving foreign exchange worth Tk. 7500 crore per year. The number of CNG run vehicles is on the increase following the measures taken by the Government. In 2001-2002 the number of CNG run vehicles was 6734 and this number has reached to 1,64,128 up to June 2009.

Coal

Bangladesh has 5 coal fields with a coal deposit of about 2,700 million tonnes. The 5 coal fields discovered so far are Barapukuria, Khalashpir, Phulbari, Jamalganj and Dighipara. The deposit is equivalent to 37 tcf gas. So far, only one field, i.e. Barapukuria, has been developed under a Chinese supplier's credit. Commercial production of Barapukuria coal mine commenced from 10 September 2005 with the targeted capacity of one million metric tonnes per year. However, the targeted capacity could not be reached as yet due to certain constraints. On an average 0.40 million metric tonnes of coal is extracted each year. Most of the coal is used in 2x125 MW Barapukuria power plant while a small portion is used in coal based industries. Up to June 2009, about 24,04,318 metric tons of coal was produced.

Hard Rock

The annual demand of hard rock in Bangladesh is about 60-65 lakh metric tons, out of which Madhyapara hard rock mine can meet the demand of 16.50 lakh metric tons per year. Since inception to June 2009 about 1,00,261 metric tones hard rock was extracted from Madhyapara hard rock mine. The extracted hard rock is used for various construction works like flood control, coastal and town protection, embankment construction and maintenance of bridges, roads, highways, railways, river control, high rise buildings and other construction works.

Petroleum Commodities

Bangladesh Petroleum Corporation (BPC) has completed development and expansion of fuel reserve system by modernizing and upgrading the fuel supply system conforming to international standards for international and domestic flights. Apart from this, BPC is responsible for development and expansion of fuel reserve system throughout the country. Currently, its total fuel stock capacity is 8.53 lakh metric tons.

The following two tables (Table- 10.16 and 10.17) present the information on import of refined and crude petroleum commodities by Bangladesh Petroleum Corporation during FY 1998-99 to 2008-09:

Table 10.16: Import of Crude Petroleum Commodities

Fiscal Year	Quantity (Metric Ton)	C & F Price (Million US Dollar)	Crore Tk.
1998-99	9,55,874	98.10	473.72
1999-00	12,36,049	218.68	1110.96
2000-01	13,37,121	290.73	1598.60
2001-02	12,24,707	220.19	1277.78
2002-03	13,31,003	289.30	1693.03
2003-04	12,52,424	314.12	1848.43
2004-05	10,63,208	364.01	2261.98
2005-06	12,53,285	552.12	3750.69
2006-07	12,11,037	659.09	4455.06
2007-08	12,41,815	914.50	6179.12
2008-09	8,60,877	494.44	3431.40

Source: Bangladesh Petroleum Corporation

Table 10.17: Import of Refined Petroleum Commodities

(Quantity in Metric ton, Value in Crore)

Fiscal Year	JP-1, Kerosene, Petrol, Octane and Diesel		Lubricating	
	Quantity	Value	Quantity	Value
1998-99	22,21,872	1350.10	39961	45.62
1999-00	18,23,400	2021.23	50229	86.41
2000-01	20,68,913	2999.20	29918	69.34
2001-02	20,72,300	2535.62	15316	30.59
2002-03	22,13,899	3319.35	1911	5.10
2003-04	22,62,348	4015.81	6516	18.38
2004-05	26,91,750	7213.88	10189	38.14
2005-06	23,80,533	9382.77	5137	35.53
2006-07	25,36,092	10542.88	778	4.36
2007-08	22,27,754	14346.68	5005	29.99
2008-09	25,07,819	10945.24	4828	23.63

Source: Bangladesh Petroleum Corporation

BPC's Financial Loss

BPC incurred a loss of Tk. 7.61 crore during FY 2002-03 from marketing of imported POL products. This was attributable to lower local sales price (transfer price) against higher purchase price. In FY 2002-03, BPC contributed Tk.2,766.13 crore to the national exchequer on account of import duty and tax. During FY 2003-04, BPC incurred an annual trade deficit of Tk. 958.93 crore against contribution of Tk. 3,087.28 crore to the national exchequer as import duty and tax. During FY 2004-05, BPC incurred loss to the tune of Tk. 2,317.88 crore while its contribution to national exchequers was Tk. 2,458.95 crore. BPC incurred a loss of Tk. 3,337.78 crore in FY 2005-06 while it deposited Tk. 2,620.26 crore to the national exchequer during the same period and in 2007-08 the loss of BPC stood at Tk. 6,362.08 crore while BPC deposited Tk. 3018.00 crore in the same year. BPC estimated a loss of Tk. 14,123.63 crore in FY 2008-09, and deposited to the National Exchequer during the same period Tk. 2,794.56 crore.

Bangladesh Petroleum Institute (BPI)

Considering the contribution of the oil, gas and mineral resources sector in the industrial development of Bangladesh, the Bangladesh Petroleum Institute (BPI) was set up as a development project under the Ministry of Energy, Power & Mineral Resources in 1981. BPI is providing higher training to the officers and professionals working in the oil, gas and mineral resources sector, carrying out research and other development activities and improved data management activities under the guidance of a 10 member governing board. Since its inception, BPI has been carrying out photo-geology, geophysical modeling and other similar surveys in order to identify likely locations/sites for petroleum and gas exploration.

Geological Survey of Bangladesh (GSB)

Geological Survey of Bangladesh (GSB) is entrusted with the tasks of exploration, discovery and evaluation of mineral deposits, and research in different disciplines of geosciences. To strengthen the mineral exploration and evaluation activities, the department is implementing various development projects. As a result, low sulfur high-grade bituminous coal at Barapukuria and Dighipara of Dinajpur District and Khalashpir of Rangpur district, and Maddhyapara hard rock of Dinajpur district have been discovered. Besides these, glass sand, white clay, limestone, peat and gravel deposits have been discovered in different places of the country. Moreover, skilled manpower and a good number of resource persons of different fields of geo-sciences have been developed by imparting training. Enough research facilities have also been created to work in different laboratories.