



Prospects and Challenges of Power Sector in Bangladesh

Nibedita Datta¹

Lecturer (Dept. of Business Administration)

Ishakha International University, Bangladesh

Emran Hasan²

Hoda Vasi Chowdhury & co

Dhaka, Bangladesh

Abstract

The rising economy of Bangladesh is moving very fast towards growth and development. The goal is decided, building a prosperous Bangladesh. Power sector is playing a vital role to achieve it. Government is given the utmost importance in this sector. To increase power production the government has took short, mid and long term planning. Within eight years electricity generation of this country is increased three times more than last 38 years. One crore and fourteen lacks people got new connection. Power production will be 40,000 MW within 2030 and it is essential to achieve the sustainable development goal. Power production capacity has also been increased by four times. In 2016, Bangladesh got the aptitude of producing 15,000 MW and achievement was celebrated in style. In 2009, number of beneficiaries was 1 crore 4 lacks and in 2018 it stands at 2 crore 54 lacks. Now 92% people are under electricity coverage and soon will be 100%. 10 Thousands circuit kilometers of transmission line and 4 lacks kilometers of distribution lines were built in last 7 years. Now we have 134 power plants. This plant ensures commitment on producing 12,881 MW electricity. As a part of the long term planning, Bangladesh has now heading towards coal based power plants. Construction of Rampal, Pyra and Matarbari, three mega projects is going on smoothly. Power production is the main tool to ensure growth and development. Construction of the first ever nuclear power plants of Bangladesh is going on at Pabna in association with Russia. Regional grid lines are invited as well. Bangladesh is getting 600MW from India now. More 2000 MW are in the pipeline. Bangladesh will also invest to produce hydro power in Nepal and Bhutan. Power division is working on environment friendly renewable energy. According to plan at least 3000 MW will be produce within 2021 to ensure a prestigious, self-sufficient and humanitarian Bangladesh.

Keywords: Power, BPDB, Electricity generation, Installed capacity, CPD

Introduction

The power and energy sector plays a vital role in every sphere of our lives and works in industry, agriculture and transportation etc. The living standard and prosperity of a nation vary directly with increase and effective use of this power and energy. This sector is one of the success cases of the present government during its earlier regimes. For a sustainable and successful economic development, sufficient and reliable source of electricity is a major prerequisite.

The energy sector of Bangladesh is now booming. The total installed capacity in national grid is 20,000 MW combining solar power. The Rooppur Nuclear power plant is now in under construction and expecting that in 2023 it will go into operation with 2.4 GW. The sector is

moving towards attaining long term goals for ensuring energy sustainability: 27400 MW (in 2030) and 51,000 MW (in 2041).

The main objective of this paper is to reveal the scenario of the power sector over the last five years with a view to identify the growth of this sector and to put forward a set of recommendation on long term sustainability. Data are mainly collected from the secondary sources such as Bangladesh Power Division, Bangladesh Power Development Board, APSCL, EGCBL, RPCL, NWPGL and national dialogue on power and energy sector: immediate issues and challenges organized by the CPD. The paper highlights on different issues related to the power and energy sector, these include installed capacity of power plants, sector wise electricity generation, and growth percentage of yearly power generation, distribution system loss and challenges faced by this sector.

Present structure of Power generation

Apex institution: Power division, Ministry of Power, Energy and Mineral resources.

Regulator: Bangladesh Energy Regulatory commission (BERC)

Power Generation:

- Bangladesh Power Development Board (BPDB)
- Ashuganj Power Station Company Limited (APSCL)
- Electricity Generation Company of Bangladesh Limited (EGCBL)
- North West Power Generation Company Limited (NWPGL)
- Independent Power Producers (IPPs)

Transmission: Power Grid Company of Bangladesh Limited (PGCL)

Distribution:

- Bangladesh Power Development Board (BPDB)
- Dhaka Power Distribution Company (DPDC)
- Dhaka Electric Supply Company Limited (DESCO)
- West Zone Power Distribution Company
- Rural Electrification Board (REB) through rural co-operations.

Prospects of Power Sector in Bangladesh

The electricity generation capacity in the country is growing. Table 1 shows that the power sector has experienced a considerable progress in meeting the demand for electricity. Electricity access, coverage, level of consumption have significantly increased over the few years. All about 90% of the total population access to the electricity and the following data depicts that about 91.5% change between 2008 and 2018. The power demand has always been increasing and total number of consumer has increased over the last five years and it stands at 30 million in 2018. Now 74,400 villages are electrified and number of irrigation connection stands at 364,000 in 2018. The maximum energy consumer in Bangladesh are industries and residential sectors, followed by the commercial and agricultural sectors.

Table: 1 Demand side of the Electricity in Bangladesh

	2008	2013	2015	2018	% change between 2008 and 2018
Access to electricity (% of total population)	47	62	74	90	91.5
Per capita generation (KWh)	220	321	371	464	110.9
Total number of consumers (million)	11	14	18	30	178.0
Number of villages electrified	-	-	54,000	74,400	
Number of irrigation connection	233,906	307,640	361,000	364,000	55.6
Maximum demand (MW)	5,569	8,349	10,283	14,014	151.6
Maximum peak generation (MW)	4,130	6,434	7,817	10,958	165.3
Projection for 2021,2025, 2030 and 2041	2021			2041	

Source: Power Division, Bangladesh

After a strong effort of the government Bangladesh electricity generation capacity is increased by installing new power stations through both public and private sectors. In 1974-75, the installed electricity generation capacity was 667 MW whereas in August 2016 it was 12,780 MW including the 600 MW power import from India. Now Bangladesh’s power capacity increased from 5201 MW in June 2008 to 20,133 MW in September 2018. Table: 2 shows the increase in installed capacity from 2013 to 2018 and it is evident from the analysis that the capacity has grown rapidly over the last decades. Government policies have attracted private investment and independent power producers and that’s create a favorable scenario in power sector.

Table: 2 Installed Capacity of Power Plants 2013-2018(MW)

	2013	2014	2015	2016	2017	2018
MW	10,264	11,265	11,534	12365	13,555	15,953
CHANGES (%)	-	9.75%	2.39%	7.20%	9.62%	17.69%

Source: Power Division, Bangladesh

Table: 3 Source wise Electricity Generation 2018

	No. of Plants	Installed Capacity (MW)	Share of total capacity (%)	Plant capacity wise (MW/plant)
Government	48	8845	59	184
Rental	20	1745	12	87
IPP	66	4452	30	67
Total	134	15042	100	112

Source: Annual Report of Power Division, Bangladesh

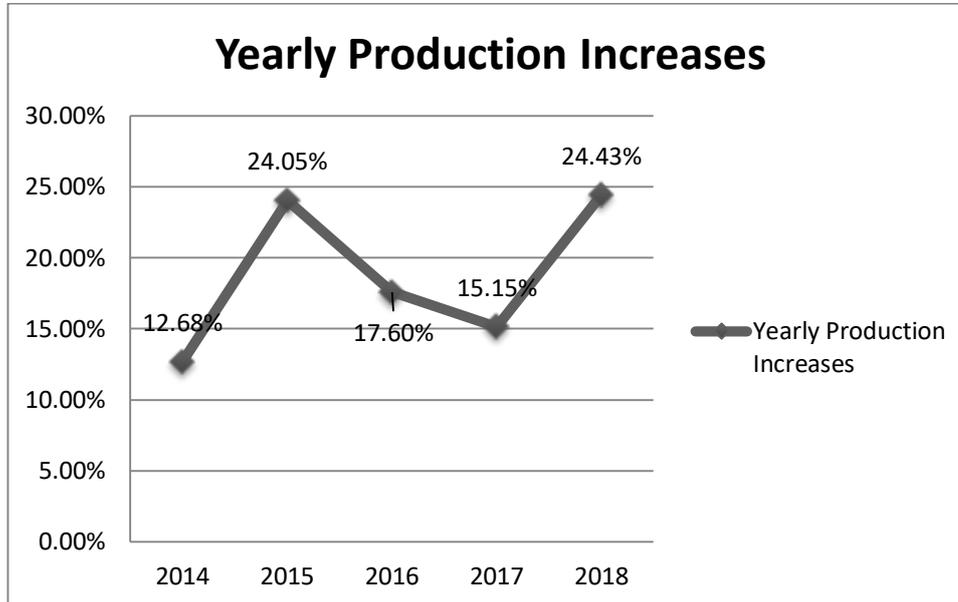
In 2018 total installed capacity 15,953 MW which includes 4,452 MW IPP, 1745 MW Rental power plant and 251 MW in REB (for PBS) and 660 power import from India. The maximum peak generation was 10,958 MW which was 15.60% higher than that in the previous year.

Yearly Production Increase at a percentage

Figure 1 shows that the power sector witnessed a significant progress in power generation in the Fiscal year 2017-18. During the year 2817 MW new capacity added which raised the total

generation capacity to 15,953 MW and the percentage of yearly production increases at 24.43% rather than the previous year 2017. In 2014 the percentage of production increases at 12.68% and now in 2018 it stands at 24.43%.

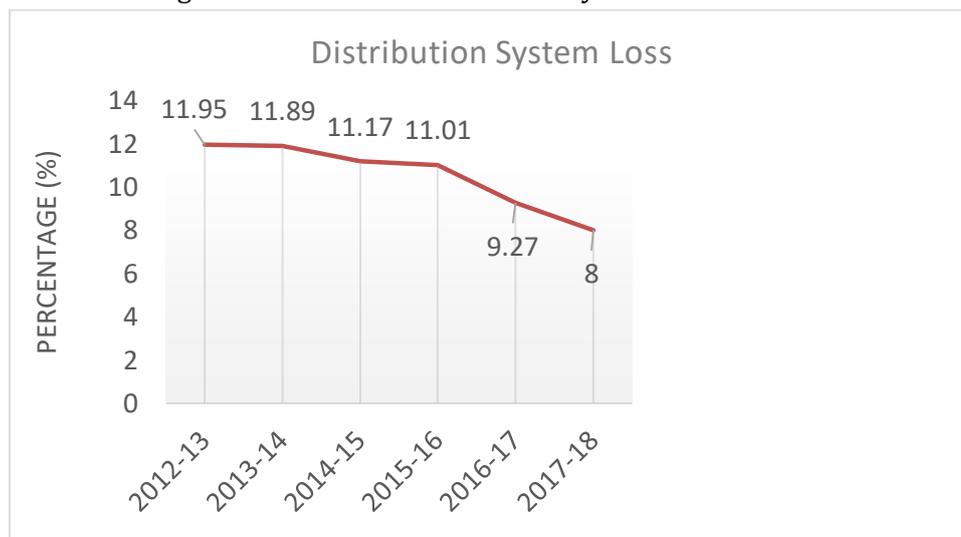
Figure: 1 Yearly increase in power generation (%)



Source: Power Division, Bangladesh

Distribution system loss

System loss in a distribution process refers to both technical loss and non-technical loss which is occurred by different process and forms. Distribution loss was 11.95% in 2012-13 which has been decreased to 8% in FY 2017-18. Mainly the losses vary from entity to entity. This decrease in system loss happened after the government started to take various reform programs in power sectors over the last few decades. The government is planning to introduce regular third party audit performance to figure out the deficiencies in the system.



Source: BPDB

Challenges of power sector in Bangladesh

Energy plays a crucial role in poverty eradication, sustainable economic growth, infrastructure development of any country. In Bangladesh, electricity is the most widely used form of energy. So economic growth is significantly depends on future economic growth. Bangladesh government should ensure affordable and environmentally healthy source of electricity generation for the people. Since its independence the country has to struggle to fulfill the electricity demand. The state owned electricity utilities suffer from energy shortage. Moreover, due to poor pricing policy and other limitations, the power sector has to fail to attract adequate private investments. Now the present government is committed to ensuring access to affordable and reliable electricity for all citizens by 2021⁰. The considerable principle challenges of power sector are analyzed in this paper.

Dependency on domestic gas supply:

Existing power plants of Bangladesh are mostly gas and oil based. Required oil has been imported from other countries. Gas has been taken from the internal sources. At this moment, it is no longer possible to depend on it largely. The government is considering to reduce dependency on these two primary fuels and to go for alternative fuels. The following table show the data regarding fuel based capacity of electricity generation and technology based electricity generation.

Table: 3 Fuel-mix in power Generation

Fuel based capacity of Electricity Generation (%)	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Hydro	2.25	2.00	1.99	1.86	2.00	1.44
Gas	64.5	63.00	62.77	61.69	65	60.89
F. oil	19.22	20	20.44	21.26	21	21.58
Diesel	6.69	8.00	8.29	8.31	6.00	8.65
Coal	2.45	2.00	2.17	2.02	2.00	3.28
Renewable	-	-	-	-	-	0.02
Import	4.9	5.00	4.34	4.85	4.00	4.14
Total Generation Capacity (MW)	10213		11534	12365	13,555	15953

Source: Power division, Bangladesh

Table: 4 Technology Based Electricity Generation

Technology Based Electricity Generation (%)	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Gas Turbine	14.95	15	16.63	9.65	8.15	8
Reciprocating engine	33.06	19	34.72	36.16	33.87	35
Steam Turbine	25.83	24	23.24	20.85	34.12	15
Combined Cycle	19.01	19	19.08	26.63	17.74	36
Hydro	2.25	2	1.99	1.86	1.70	2
Import	4.9	5	4.34	4.85	4.43	4
Solar	-	-	-	-	-	-
Total Generation capacity (MW)	10213		11534	12365	13555	15953

Source: Power division, Bangladesh

From the above data it is clear that domestic gas is used largely to generate electricity and is more than 60%. According to the PSMPs, a major share of primary energy had been planned to be supplied from coal and renewable energy and lesser use of gas and petroleum. But from the above data table it has been said that, the energy mix has been changing but not that level as stipulated in the PSMP's. Natural gas is still playing a major role as primary energy and no major breakthrough in the use of coal. Renewable energy is still playing an insignificant role. Besides in case of utilization of modern technology in electricity generation, use of gas and steam turbine in power plants are less than the use of combined cycle.

Sufficient level of efficiency not acquired:

The power generation is not yet ensure the required level of efficiency. Installed capacity is around 20 GW but actual generation is less than 12 GW, which falls short of current demand. From the Table 5 it shows that the level of efficiency of existing power plants has been found within range of 31.7% to 41.91%. Power generation cost is still higher. Relatively high efficiency in costly HFO led power plants instead of low cost HSD plants indicate weakness in managing power generation costs. Purchase of electricity from QRRs at higher cost by less using low cost other plants indicates an operational inefficiency. Beside this providing huge amount of capacity charges is another type of inefficiency ^[CPD]. So it is a challenge for the power sector to set up a strategy to reduce inefficiency in power sector to smooth its grown up trends and to address the issue in the future efficiently.

Table: 5 Level of efficiency in different types of power plants

Type of fuel	No of Plants by IPP	Installed capacity (MW)	Net Energy Generation (Gwh)	Efficiency (%) (Net)
Gas	34	7943	43145	33.97
HSD	10	1923	3695	31.69
F Oil	18	1667	4795	41.91
HFO	37	2917	9908	39.89

Source: BPDB

Lack of transparency, corruption and irregularities

The power sector has been expanded rapidly particularly with the public expenditure in this. The demand for better management and operations has been widened. Lack of governance in some of the institutions to the power sector has been widened. Several incidence like illegal connections of gas and electricity supply, disappearance of 142000 tons of coal from the Barapukuria coal mining company, illegal operations of LPG companies etc. are the symbol of lack of governance, transparency. To overcoming this hindrances are the one of the major challenge of this sector.

Concluding Remarks

To achieve the target of electricity supply to all by 2021, the government should a have a look to reduce lack of transparency, accountability, efficiency, irregularities and corruptions. It needs to ensure the proper implementation of all allocated money in the regarding sector. It is high time to pay attention to the primary energy sector particularly domestic and coal. Due to the shortage of gas, other renewable sources of power generation should be developed. This emerging power sector needs to keep balance between public and private sector power plants in case of power

generation. Separate allocation for the maintenance and modernization of age old power plants is urgently needed to enhance the power generation.

References

- [1] Asif Hassan et al. “*Electricity Challenge for Sustainable Future in Bangladesh*” ICESD 2012: 5-7 January 2012, Hong Kong.
- [2] Bangladesh Economic Review 2017-18. Retrieved from: <https://cpd.org.bd/wp-content/uploads/2018/06/Bangladesh-Economy-in-FY2017-18-Interim-Review-of-Macroeconomic-Performance.pdf>
- [3] BER. (2018). Bangladesh Economic Review. Finance Division, Ministry of Finance. Government of the People’s Republic of Bangladesh.
- [4] BERB. (2018). Annual Report 2017-18. Dhaka: Bangladesh Rural Electrification Board. Retrieved from: http://reb.portal.gov.bd/sites/default/files/files/reb.portal.gov.bd/page/8596cfe6_8cde_4643_acb1_68cd973e413c/AnnualReport_2017-18_Part_1.pdf
- [4] BPDB. (2018). *Annual Report 2017-18*. Dhaka: Bangladesh Power Development Board. Retrieved from: http://www.bpdb.gov.bd/bpdb_new
- [5] CPD, 2011, State of Bangladesh Economy in FY 2010-11 (second Reading), Centre for Policy Dialogue (CPD), Dhaka.
- [6] CPD, 2019, The power and Energy sector: Immediate issues and Challenges, Centre for Policy Dialogue (CPD), Dhaka. Retrieved from: <https://cpd.org.bd/wp-content/uploads/2019/03/The-Power-and-Energy-Sector-of-Bangladesh.pdf>
- [7] Haque and Rahman, Power Crisis and Solution in Bangladesh, Bangladesh Journal of Scientific and Industrial Research, Vol: 45(2), 2010, PP 155-162
- [8] M. E. Haq, “*Bangladesh’s Power Sector: Investment Opportunities*,” Ministry of Power, Energy & Mineral Resources, Bangladesh, Presented in London, Mar. 2011.
- [9] Power Division. (2011). *Power System Master Plan 2010*. Dhaka: Power Division.
- [10] Power Division. (2018). Annual Report 2017-18. Dhaka: Power Division. Government of the Peoples Republic of Bangladesh. Retrieved from: https://powerdivision.portal.gov.bd/sites/default/files/files/powerdivision.portal.gov.bd/annual_reports/24667a36_b7b9_49ed_a0b6_8fecb3151023/Final%20Annual%20Report%202017-2018.pdf
- [11] Rafia Zaman et al. *Energy governance in resource-poor setting: The case of Bangladesh*, Energy Procedia Vol: 142(2017) PP 2384-2390, 9th International Conference on Applied Energy, ICAE2017, 21-24 August 2017, Cardiff, UK
- [12] Saiful Islam and Md. Ziaur Rahman Khan, *A review of energy sector of Bangladesh*, Energy Procedia, Vol: 110 (2017) PP 611-618, 1st International Conference on Energy and Power, ICEP2016, 14-16 December 2016, RMIT University, Melbourne, Australia
- [13] Vineet Tiwari, M. Kapshe, A. Deshpande, V.K. Khare, “*Developments in Indian Energy Sector: Problems and Prospects*”, IOSR Journal of Business and Management (IOSR-JBM), Volume 9, Issue 5 (Mar. - Apr. 2013), PP 11-17