

POWER SECTOR IN BANGLADESH: FACTS AND FUTURE

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Abstract Out of the hundred and thirty million people in Bangladesh only 35% of the people have access to electricity. In the era of technological development this scenario portrays a very poor feature of Bangladesh. There are several reasons behind this condition starting from poor infrastructure ending with corruption, system loss and lack of commitment of the concerned authority. To improve the situation some steps have already been taken and some are yet to be implemented. This paper aims at identifying the sector where improvement is called for. Special attention is given to the independent power producing sector and environmental aspects of power generation.

Key words: Power system master plan, environment, independent power producer

INTRODUCTION

There has been growing concern through out the world about the ever-increasing environmental degradation due to industrialization and other human activities. There is total agreement through out the world that any further environmental degradation should be effectively checked. For that a management equipped with effective pollution control measures is essential. However due to several pressing priorities such as need for higher productivity etc it is not possible to make all out efforts to eliminate pollution but we need to select a suitable pollution control and abatement tool in order to leave a live able environment to our future generation.

As in all the developing countries in Bangladesh also power (electricity) is the lifeblood of all economic activities. Most of the technological development depends on adequate power generation. Our power sector is under going reform activities with installation of new power plants, diversification in power generation and intrusion of independent power producers in the market. So, it is high time that we build in a system in the power sector to protect the environment. This paper aims at giving some light as to how to address the environment in power sector reforms. In Bangladesh, only 35% of the total population can use electricity. Nevertheless, the power system Master plan includes bringing the entire country under electricity coverage [1]. For that ambitious plan the government has to undertake huge restructuring starting from the existing plants to the plants under construction. For that commitment from all side is required. Adequate and reliable supply of electricity at reasonable price is essential to improve the standard of living of the people

and the economic development of the country. The accepted index of electricity in the developing countries is 1.5-1.8 times the GNP [2].

BRIEF HISTORY

Though the history of power generation in Bangladesh is very old, the “Bangladesh Power Development Board” came into its existence in 1972 with a capacity of 550 MW. After almost 30 years the total installed generating capacity of the power plants in Bangladesh now stands at 4010 MW and the highest generation at only 2920 MW. This huge difference in the two figures refers to the huge system loss in power generation and indicates a very poor performance of BPDB. The demand of electricity in the fiscal Year 2001-2 as projected in the fifth five-year plan with an 8% growth rate is 3659 MW. Generation capability, peak demand, firm capacity and reserve margin is shown in the table with graphical representation. The present situation of the power sector is not encouraging. With corruption at all level of Power Development Board, System loss of more then 30%, Poor management, Lack of employee commitment aggravates the problem more. In order to improve the situation first system loss is to be controlled by any means. Because of the huge system loss the donor agencies are now reluctant to give loans to our government. In Bangladesh the per capita electricity consumption is around 100 kilo watt-hour (KWh).

System Loss

High system loss is another major problem of Bangladesh power sector. In the fiscal year 1999-2000, the total transmission and distribution loss was 33.71%.

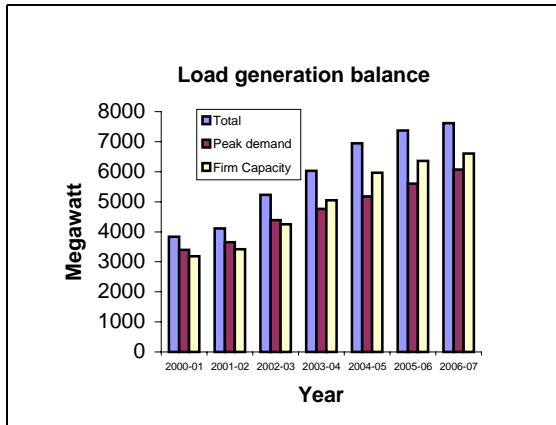


Fig. 1 Load generation balance and forecast.

Due to this high system loss donor agencies are becoming reluctant to invest in the power sector. They are showing their inclination to the private sector investments. However, we have to consider some facts before considering system loss as the sole criminal. As a ready reference, we can use the United Nations publication on standard system loss in the utility sector in terms of energy. The total transmission and distribution loss of a strong well managed well designed power system is 8.75%, and a weak, bad poor utility has transmission and distribution loss around 16.50%. We have to consider the life of the power plants. Most of the power plants in Bangladesh perform very poorly because of poor management. But this situation calls for establishment of new plants with sophisticated technology and that requires more investment.

IPP’s in the Power Sector

One of the component of restructuring the power sector is installation of private power plants on BOO basis. At present 450 MW electricity is supplied by the Independent power producers. The projected demand of the electricity supplied by the IPPs is 1920 MW in the fiscal year 2005-06. A conservative estimate of capital needs for the next five years for power sector is around USD 5 to 6 billion. The amount of the debt and other factors has substantially reduced the capacity of the government of Bangladesh to guarantee new loans. There are several other reasons behind the strong participation of the Independent Power producers like inability to raise financing, not qualifying for WB and other international donor agency loans, competing demands by other sectors for public funding, better performances by the private sector enterprises, huge system loss etc. Presently Bangladesh has six power plants by private investments. Four of them are in operation and the rest are under construction.

As the newer power plants are installed by the private companies the new plants should be equipped to meet the requirement of the present days with regard to sophisticated technology

Environmental Aspects of Power Generation

Now a day there is tremendous public interest in the global environment and public scrutiny of industrial activities and their environmental impact. A large quantity of carbon dioxide is emitted to the atmosphere by many sources, both natural and man-made. These emissions are mostly derived from fossil fuel used in electric power generation, transportation, various residential and commercial uses and industrial processes. Some 78% of the worldwide energy use comes from burning fossil fuels as is shown in figure 2 [3].

Although the idea that in the future electric power plants may have to curb carbon dioxide emissions seems far fetched now, the history of the recent acid rain/ clean air legislation may serve as an example of possible future actions.

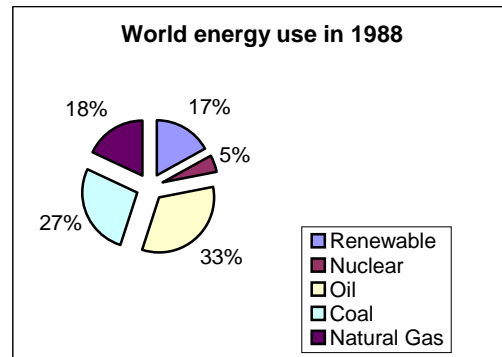


Fig. 2 World energy use in 1988

In order to be prepared for any eventual global warming legislation, it is extremely important that the electric utilities are aware of their possible contributions towards the green house gases. Continued global warming can potentially melt polar ice, causing a rise in sea level resulting in coastal flooding and salt water intrusion. It can cause changes in winds and ocean currents, precipitation and water resources, there by reducing availability of irrigation water, forest and crop yields. It can also increase both peak electric power demands in hot summer months and frequency of extreme events.

The amount of CO₂ emissions from the electric power plants depends on both the amount of fossil fuel used and the type of combustion process. Table [1] shows the CO₂ emission rate for the direct combustion of various fuels in both kg of carbon per billion joules of energy and the ratio

of carbon dioxide relative to natural gas or methane [4]
 Natural gas combustion produces the least amount of CO₂.

Fuel	CO ₂ emission rate	Ratio relative to natural gas
Methane	13.5	1
Ethane	15.5	1.15
Propane	16.3	1.21
Butane	16.8	1.24
Gasoline	18.9	1.4
Diesel oil	19.7	1.46
Bituminous coal	23.8	1.73
Subbituminous coal	25.3	1.87

It is possible to reduce CO₂ emissions per KWh of Electrical energy produced by using newer and novel power production technologies. Emissions from fossil fuel electric power plants have increased steadily over the years. CO₂ emission is associated with green house effect there is public interest I it. Our government should take in to account that CO₂ release from the power plants can also recovered and disposed off. Whenever permission for installation of a power plant is granted the government should ensure that environmental aspects should be addressed properly and effluent treatment plant and other chemical methods of CO₂ removal is used to treat the CO₂ release to the atmosphere.

CONCLUSION

Modern power plants are sophisticated products of advanced technology. These are production units whose production and consumption is simultaneous. The product can neither be stored nor the demand can be altered. For that high quality and dynamic management along with employee commitment and concern for environment is the need of the time. The authority has a lot of work to do. To achieve optimum generation and distribution mix linear programming and other technological tools can be used effectively. The customer is to be satisfied and service quality gaps in the power sector should be diminished. Commitment from the employee management as well as the people is essential for the optimum distribution of electricity and to reach electricity every nooks and corners of Bangladesh. Our Government should take into consideration all these factors and it is high time to start working for that.

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