



## Structure, Growth and Associated Problems in Bangladesh Power Sector: A Glance Into The Pre-Reform Period

### KEYWORDS

Bangladesh, Power Sector, Generation, Distribution

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**ABSTRACT** *Power sector in Bangladesh has a long history. It started with a small production in private ownership and increased to a large extent. Bangladesh come under the segment of developing country and started power sector reforms in 1991. In Bangladesh the electric power supply system suffers from operational and managerial deficiencies which are reflected in very high and increasing system losses at the generation level. This is because of the obsolete generating stations and bad maintenance. In the pre-reform period the transmission and distribution (T&D) losses in the power sector were proportionately higher in terms of total power generation. This was due to the inadequate investment in the sector vis-à-vis increasing load on transmission and distribution entities, which resulted in over loading. The paper attempts to provide over view of the power sector development and related problems in the country.*

Power generation growth rate and economic growth rate are interlinked because the agricultural as well as the industrial sectors are heavily dependent on power supply. To provide adequate power supply to these sectors adequate domestic power generation is necessary. As modern economic activities mostly rely on power, the economic development demands steady growth in availability of power. In Bangladesh, even though the installed generation capacity of electricity is higher than peak time demand the future projections indicate demand for larger power production (Power Division:1).

Electricity generation in Bangladesh region of the undivided India started in private sector with the start of a mini power generation plant at the residence of the then Nawab of Dhaka in 1901 (DESA, 1992:1). After India's partition in 1947, the North-West and East Bengal parts of India came to be known as Pakistan. The Planning and Development Division under the Ministry of Planning and Development was responsible for the overall electricity and energy planning in Pakistan. Its main functions were to formulate strategies for power sector development in consultation with the Ministry of Finance, Planning and Economic Affairs, Water and Power, Petroleum and Natural Resources and Science and Technology.

To develop and expand the power generation, transmission and distribution areas in different parts mainly the metropolitan areas like Karachi, Rawalpindi and Multan three separate entities were established in between 1947-55. In the Karachi and its neighboring Baluchistan areas Karachi Electric Supply Corporation (KESC), for the Rawalpindi area Rawalpindi Electric Power Company (REPCO) and for Multan areas Multan Electric Supply Company (MESCO) were formed.

Later in 1958, to coordinate the executive and planning stages of power and water development in Pakistan, a statutory, semi-autonomous body for water and power development- the Water and Power Development Authority (WAPDA) was established by government. The REPCO and MESCO were merged in to WAPDA converting it responsible for about 80 percent of the production and distribution of the power supply. WAPDA was responsible for the plan-

ning and execution of all electric power projects and promoting the sale and assessing the needs for power in different parts of Pakistan, along with irrigation, water supply and drainage, flood control and internal navigation. It was also responsible for generation, transmission and distribution of power in the country. In 1959 the then Pakistani government established East Pakistan Water and Power Development (EPWAPDA) to look after the same functions of WAPDA in the East Pakistan area.

The efforts of the Government of Pakistan in power development were then confined primarily to setting up of local power plants in the main industrial and urban areas with associated high and low voltage transmission and distribution systems, followed by interconnection at generating stations. The Government initiative also included the gradual taking over of private electric supply undertakings where they failed to give proper service to the customers.

At the beginning of 1947 the whole West and East Pakistan had an installed capacity of about 69 MW. This has risen to 948 MW by the beginning of the First Five year plan (1955-60). In the First Five Year plan period of Pakistan, the generating capacity rose to 6, 60,000 kilowatts. By the Second Five Year Plan (1960-65) the installed capacity of power was about 1, 065, 000 kilowatts. In the Third Five Year Plan (1965-70) the installed power generation capacity rose to about 1800 MW (FBS, 1998:329-330).

In the beginning of 1947 East Pakistan region had a share of 30.43 percent in the total power generation of Pakistan which was stagnant through out the decade till 1954. By the end of 1960 this share further decreased to 8.44. In 1965-66 the power generation share of East Pakistan rose to considerably 21.30 percent. By the time of Bangladesh independence in 1971 the share recorded at 29.34 percent higher than previous periods. It never touched the earlier 30.43 percent recorded at the time of Pakistan formation. During the first half of 1960's a thermal power plant at Siddhirajganj with the installation capacity of 44 MW and two units of 44 MW each were set up at Karnafauli reservoir in 1962 (Power, 1965:9). In 1970, two units of gas based power plants were setup Ashuganj with the installation capacity of 64 MW each (Power Cell, 2006). These

power stations were interconnected with 33 and 11 kV distribution system and 132 kV transmission system (Planning Commission, 1973:323).

In 1947, when the Indian subcontinent became independent from the British colonial rule, this geographical part of the sub continent had only 21 MW of electricity generating capacity (Ibid) for households, mills, factories, tea garden and railway workshops etc. These enterprises had their own captive power or were supplied by small private electricity supply companies. A year later, Electricity Directorate under the Ministry of Industry came into being and soon started taking over the small companies. The Directorate started to build diesel power plant in a planned way-first in Siddirganj and later in Bhermara and Goalpara. By 1960 the electricity directorate, which was merged Water and Power Development Authority (WAPDA), built about 74 MW new diesel and steam power plants (Ibid).

On the other hand, the irrigation department launched the process of building two 40MW hydro power stations at Kaptai on the Karnafaly River (Ibid:324). This capacity was increased to 230 MW (Five units) in different phases by 1980. Simultaneously, a 132 KV transmission line was built in the early 1960 between Kaptai and Dhaka (Ibid). This transmission line is still in operation with reduced capacity and risky operating condition.

The demand which stood at 42 MW in 1960 rose to 225 MW in early 1970 (Ibid:344). By the middle of the third plan (1985-90), the system loss stood at 37.5% (Planning Commission, 1990:XII-32). Due to such high system losses low account received, high load shedding, poor management and inability to improve the performance, concessional loans for the power sector from the multinational donors were not available in most part of the Fourth plan (1990-95) period (Musharraf Hussain). The operation capacity was again interrupted by occasional power outages owing fluctuations in gas pressure, transmission and distribution faults. During this period inadequate government resources could add only about 581 MW to the country's generation capacity (Ibid). However, due to non-completion of scheduled rehabilitation of some power stations, generation capability decreased by 271 MW capability were retired during this period.

The net capacity increase was 300 MW against a new demand of at least 1000MW as per growth rate during the same period (Power Cell, 2006). This led to a shortfall of generation of about 700 MW and led to chronic load shedding in 1996 and 1997 (Ibid). In September 1997 Raozan-2 of 210 MW power station came into operation and the first private power company of 110 MW was commissioned in October 1998 (Ibid). In spite of these, it has not been sufficient enough to meet the ever-growing demand.

An evaluation of the power sector development in Bangladesh shows that, although the installed capacity increased from 882 MW from 1980 to 5275 MW in 2005 there have been still significant system losses. The system losses in 1982 were about 34 percent they recorded 22.79 percent in 2005 which is still a large amount in net generation of 4150 GWh. It means out of 4150 GWh generated about one fourth is i.e. 1000 GWh are going in waste. This is because of the older generating stations and lower maintenance. The loss due to load shedding ranges between 1.5 percent and 33 percent. The renovation and repair of existing old transmission lines and utilities never been achieved timely (Rizwan, 2002:8). Another problem is the availability of

raw materials for power generation as large percentage of power in Bangladesh is thermal based on gas; the supply of gas to power generation plants influences the generation of power. The interruption in supply of gas affects negatively the operational efficiency of generating companies.

The Power System Master Plan done in 1995 by BPDB projected future electricity requirements and stated that the maximum demand by 2005 will be 4500MW, which will increase to 6700MW by 2010 and by 2015 the demand will be rising up to 9900MW. The investment to fulfill this generation is estimated around US \$ 6.6 billion by 2005 (Kamal, 1998:19). The generation of this much amount is a huge exercise. Moreover there had been a gap maintaining increase in installed capacity and in two years in 2002 and in 2003 not a single MW was added to the installed capacity.

The examination of the commercial performance of Dhaka Electricity Supply Authority (DESA) from 1991 to 2003 shows that although the billed amount of DESA increased from 3602.48 Million Taka (MTK) in 1991-92 to 17388.48 in 2002-03 it suffers from huge commercial losses. In 2000-01 the gap between billed amount and collection mounted to 89 percent losses. It never been achieved a hundred percent collection in all these years. As an average except 2000-01 its losses were about 15 percent in the total billed amount. It indicates large scale commercial losses (Power Division, 2003:30). This had its impact on investments and results in government subsidies to those losses.

The over view of the categories of consumers in Bangladesh power sector gives the idea that the domestic consumption sector dominates the other consumer sectors. In any country's development agricultural and industrial activities plays a crucial role. And the development of these activities largely depends on the power consumption. The industrial power consumption in Bangladesh was marginally lower than other sectors with only 4.70 percent and commercial sector share was only 2.65 percent. Domestic and rural sector occupied a significant share in whole power consumption with 19.90 and 32.03 percent respectively (Power Division, 2003:30).

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