

Bangladesh Power Sector Reform and Multi-dimensional Reflections

Sabuj Das Gupta, S.M. Ferdous, Ahmed Mortuza Saleque

Abstract— Bangladesh has practiced some reform since 1970s, more intensely in the 1990s and 2000s and is still works in progress. Electricity industry has been functionally unbundled to encourage competition. The industry is driving away from public domain to private domain. There is a lack of analysis and debate on the social, environmental, political and other agendas of reform. A condense scrutiny on these issues are essential for the development of policy prescriptions. While the review focuses on Bangladesh power sector, the messages are relevant for other developing countries undertaking reform, as they begin to dismantle and privatize their electricity infrastructures.

Index Terms— Electricity reform, efficiency, employment, foreign investments, IPP, economic, price, CO₂.

1 INTRODUCTION

Countries across the globe have been changing the structure of their electricity industry since 1970s and the process continues to grow apace. Electricity has the ability to improve social status through facilitating provision of basic needs such as health, education, food and water. Yet many developing countries have significantly low levels of electrification and successful reform need to ensure universal access to electricity. During the 1970s and 1980s the public production in power sector illustrated some aggravation, which eventually leads to expand experiment with privatization of local services in many countries. Bangladesh also practiced some reform in those decades but more profoundly in the 1990s and 2000s and is still works in progress. At present the reform condition has reached the interim position in the developing countries and still need to find ways to attract private investment sustainably and develop the regulatory capacity. The main agendas of this game are cheaper rate of electricity, higher efficiency, competition, transfer of risks, improved customer choice and services etc. It is really very difficult to come to a conclusion with the right choice as both (private and public) have failed to follow the rules of the game precisely. However, increased reliance on private production of power sectors has created new dimensions of problems. For instance, things have been proved that private production is not cheaper than public production. [1, 2] On the other hand, under public production the managers feel uncomfortable to deal

with the management with proper administration. Public administration is always prone to different forces like politics, trade unions etc. As a result profit maximization and improvement in efficiency diminishes. Now it is quite obvious to define that none of these types of production is the perfect choice. Eventually, it leads to the opportunity for the firms to do experiment with a combine form of them. [3, 4] This paper demonstrates how worth it has been to restructure the electricity sector in Bangladesh. Pressures for rapid results should not obscure the point that power market reform is a long process-not an event. Such outcomes as improving service quality for electricity consumers, strengthening the government's position and providing affordable access to the poor segment of society take time to accomplish. So far now much of the debate about the industry reform is being conducted exclusively in the economic area revolving around one economic indicator – price. Political, social, environmental and other dimensions of reforms are always deprived from the attention and hence serious debate on these dimensions is necessary. This paper is one such attempt. It does not seek to a breakthrough in the methodologies for the economic reform but it puts together the various dimensions of electricity reform in the context of Bangladesh and provides a foundation for meaningful analysis and a condense debate. While the discussion in this paper focuses mainly on the Bangladeshi experience, the messages are relevant for other developing countries engaged in electricity reform.

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2 EVOLUTIONS IN POWER INDUSTRY

This section of the paper provides a brief overview of the advancement of electricity industry in Bangladesh with a view to demonstrate the multifariousness of the influences that have shaped the electricity industry. The demand for electricity in 1970s and 1980s was very low and hence there were no major reforms in electricity industry. From 1990 to 2000 the industry

experienced some remarkable changes in their management & administration system. This was fairly assisted by factors like post-war development euphoria, social welfare, equity, justice, belief in the role of electricity in development, realization by the political parties of the electoral appeal of electricity, meet the existence demand of the country, improvements in technical efficiencies of electricity generation and perception about the responsibility of the government in promoting economic development. A review of history suggests that electricity infrastructure was used by the political parties in Bangladesh to promote their political agendas and hence to improve their electoral prospects. During the 1990s, concerns began to be expressed about the term efficiency in the electrical industry. There are few cited reasons behind such inefficiencies, namely, system loss, technical loss, corruption, improper management, tariff system etc. Ensuring supply ahead of demand is the ideal situation in case of electricity for meeting manufacturing, irrigation, commercial and domestic needs of any economy. However, it was not possible to do so in Bangladesh. For the last few years, actual demand could not be supplied due to shortage of generation capacity. The operational capacity was again interrupted by occasional power outages owing to fluctuations in gas pressure, transmission and distribution faults. These caused enormous losses to industrial production and commercial activities. Hence traditional view on the control of industry by the technical experts only came under serious challenge due to the social & political climate changes, public awareness, equity and justice issues. The politicians took these measures as an opportunity to improve their credentials as effective economic managers and their vote banks eventually. On the other hand, the technical cluster views these concerns as an openings to undertake strategic initiative to improve their image and to ensure their longer term survival. Consequently, a number of legislative and non-legislative measures focusing mainly on improving efficiencies, better management and control of the industry were taken by the governments to reform the electricity industry. At the same time the electricity utilities also took a number of reform initiatives comprising of independent enquires to review industry performance, developing accountability criteria, tightening the scrutiny of industry plans etc [5, 6].

3 BACKGROUND OF BANGLADESH POWER INDUSTRY

This section of the paper provides snapshots with an overview of the electricity structure of Bangladesh, prior and subsequent of restructuring- moving from monopoly to competition. Starting with the generation then transmission & distribution and retail all were taken care by the Bangladesh Power Development Board (BPDB) in monopoly business mode under the direct authorization of Ministry of Power, Energy and Mineral Resources (MPEMR). The line of operation was single line from generation to retail, as shown in the fig.1.

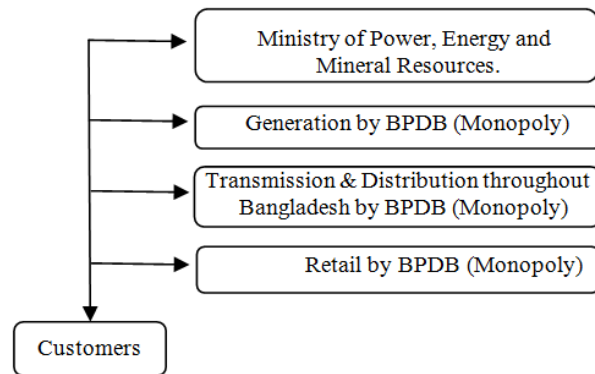


Fig1: Prior to Restructuring.

The first reform took place in the history of Bangladesh electricity in distribution segment in 1977. After 1977 BPDB was responsible for the distribution in urban areas only and the rural areas were taken care by the new body Rural Electrification Board (REB). Bangladesh electricity sector experienced the reform vastly during the 1990s and 2000s. At the year 1996 Private Sector Power Generation Policy enacted and hence few numbers of Independent Power Producers (IPP) were added with the existing power plants and hence a new era of competition formed. These IPPs tried to break the shekel of monopoly business of BPDB in generation. Sooner these IPPs got serious response over BPDB operated plants and hence their contribution towards the grid also increased. Later on Public-Private-Partnership (PPP) power plants came in the system. Power cell was created under the MPEMR in 1995 to conduct the reforms associated with power industry and to promote private power development vastly. Besides, in order to meet the immediate demand Bangladesh Government also took the initiative for Quick Rental Plant- (QRP) most of them are privately owned. Another major scheme was Corporatization of Ashugonj Power Station (APSC) in 2002. These initiatives actually brought a message towards the generation and other sectors that, competition in a sector can lead to improve the efficiency and profit with a quality service and creates scope of improvements in the other segments. Moreover, introduction of IPP in generation sector has encouraged the transmission & distribution to privatize them. Dhaka Electric Supply Authority (DESA) and Dhaka Electricity Supply Company Ltd. (DESCO) have formed in 1991 and 1994 respectively and hence operation of BPDB has further reduced. Later on in 2003 West Zone Power Distribution Company (WZPDC) was created. Presently DESA is known as Dhaka Power Distribution Company (DPDC). The retail segment in the capital city (DHAKA), which has almost 50% of total country demand, is mainly maintained by two independent bodies- DESCO & DPDC and REB undertaken distribution in the rural areas and west zone by WZPDC. As a result outlying areas outside metropolitan Dhaka with 4,100 km of assets was transferred to REB. This

transfer resulted in an increase in demand of eight (8) Palli Bidyut Samities (PBSs) around Dhaka from 110 MW in FY 1997 to 575 MW in FY 2003 and also resulted in system loss reduction [7]. In 1996 Government took initiative to split the transmission segment and formed Power Grid Company of Bangladesh (PGCB). PGCB has taken over 100 percent of transmission assets from BPDP. National Load Dispatch Center (NLDC) works under PGCB. Transmission assets of DESA (other than those that form integral part of DESA operation) have been handed over to PGCB by December 2002. PGCB is fully responsible for construction of all new transmission assets. During 1998 Power Division was established under the MPEMR vide Cabinet Division Notification No. CD-4/1/94-Rules/23(100), dated 25 March 1998. It is entrusted with the responsibility of overall management of the power sector in Bangladesh. A better functioning market it needs an independent regulator. Considering this Bangladesh Energy Regulatory Commission (BERC) was established on March 13, 2003 through a legislative Act of the Government of Bangladesh to regulate Gas, Electricity and Petroleum products of Bangladesh. In April 2004, Regulatory Commission was established and started functioning. Chief Electrical Inspector (CEI) was created to ensure the human safety, standards of equipments & issuing licenses to all working in electricity industry. As a result of this restructuring there are notable changes in the electricity sector pattern. A simplified pictorial representation of electricity sector subsequent to this restructuring is given below.

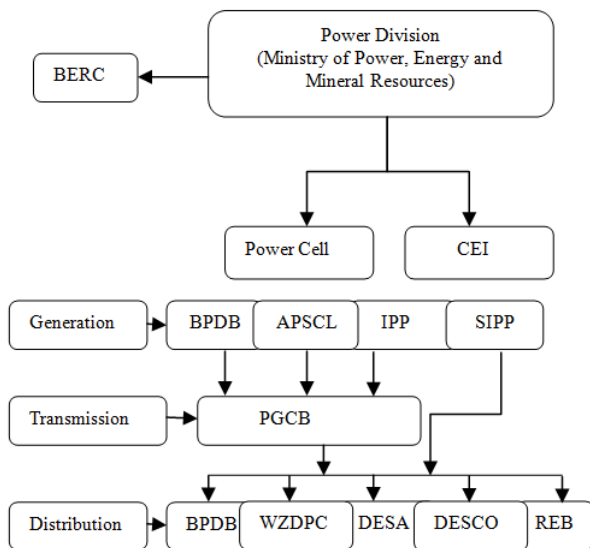


Fig 2: Subsequent to restructuring.

4 MISMATCHED AGENDAS

There are emerging evidences that reform has been designed to mainly address economic and, in particular, financial concerns with insufficient consideration for social and environ-

mental issues. Consequently, most of the evaluation undertaken has focused on financial issues. To be more specific the objectives of reform are to increase efficiency through better investment decisions, introduction of competition, better use of existing plant, better management; better choices for customers, improved productivity and more importantly, to increase power supply to alleviate the acute shortage. Moreover, setting up a level playing field for all stakeholders and ground rules for participation were also the main reasons. Furthermore, advocates of reforms claimed this reform would certainly attract foreign investments, result in productivity gains with lower electricity prices, transfer of risks from taxpayers to private investors, creates employment and significant economy wide benefits. This-they contend- is due to the lower risk associated with private ownership and the earnest efforts by richly-incentivized private managers to seek effective risk and cost minimizing techniques. The main message that was highlighted, the other countries that have exercised the reform process to their industries have indeed received significant benefits. This section of paper provides a reflection on the veracity of these arguments with the help of some other countries post reform conditions.

4.1 Economic Indicator - Price

The argument that reform would result in improved productivities of the electricity industries and hence lower the electricity prices does not appear to be supportable on the basis of available evidence about the developing countries. Some analysts fear that, in the mid-to-long-run, electricity tariffs will increase due to the high marginal cost of production emanating from the expected technological mix. With new technological developments, such as combined gas cycle, the cost of investment for small power plant has decreased considerably [8]. Compared to the 1970s the cost of installation per MW has decreased, making small scale technologies more competitive [9]. The new player are therefore investing in small scale fossil fuel and gas powered generation units which have higher marginal costs of production than the conventional large hydro units which were the commonly used technologies [10], and so drive consumer tariff upwards. Another issue is Subsidy. It is a common thing in Bangladesh.

TABLE 1
ELECTRICITY SUBSIDY RATES IN BANGLADESH.

Average Subsidization Rate	46.1%		
Subsidy (\$/person)	33.8		
Total subsidy as share of GDP	4.8%		
	2008	2009	2010
Subsidy on Electricity (billion \$)	1.89	2.03	2.79

Source: [30].

It is certain that, any removal of subsidies on the electricity

prices in terms of its marginal cost cannot lower electricity prices. On the other hand, these countries have been under sustained pressure from the multilateral aid agencies to increase electricity prices to better reflect their marginal costs of electricity supply. For example, recently the Bangladesh Government is thinking about further increase of electricity price. While it is true that political considerations have contributed to an appreciable misuse of subsidies, it is also unavoidable that such subsidies have provided considerable benefits to the economically lagged segments of society. The withdrawal of these subsidies may therefore be neither socially desirable, nor politically feasible [11]. Hence the claim that, power sector reform is an opportunity to help the poor turned to an illusion. The reform of the various portions of the electricity industry and introduction of the IPPs in Bangladesh could not decrease the electricity price. Considering the above debate, without government support as subsidiary, favorable terms offered by the government and considering the inability to support the existing bill by the poor segment people; the notion of cost reduction in the capacity constrained system in Bangladesh is quite unclear.

4.2 Employment

The electricity industry is also a source of employment, and given that one of the major challenges facing developing countries is the ever rising level of unemployment, reform can only be beneficial if it creates rather than eliminating jobs. Privatization has also been expected to result in job creation, higher incomes and economic growth [12]. In reality, reform has accompanied with retrenchments as a measure to cut costs and increase financial efficiency. The number of utility customers per employee is used as a measure of performance efficiency, a necessary stipulation for countries seeking conventional multilateral financing. The internationally accepted standard is about 160 customers per employee [13], but many developing countries including Bangladesh have tended to have lower ratios and are thus considered overstaffed. With the initiation of reform the customer/employee ratios are changing, as reformers have been tasked with downsizing, particularly as a condition for attracting private sector players. In Côte d'Ivoire, the operations/management contract reform under the private sector resulted in a reduction of employees per customer from 9.5 to 6.9 within a few years – that is, one employee serving 0.14 customers [14], while Argentina experienced a 23% improvement between 1992 and 1998 [15]. Clearly, the reduction of staff might be beneficial to the entrepreneurs, but is detrimental to the employees and perhaps to the country's macro-economy as well. Notably, while on one hand the sector is laying off staff, on the other hand the new management has enjoyed significant and socially controversial large salaries [16]. This argument failed to establish position in the developed country as well. For example, in Australia this reform also

showed adverse effect. A table having the number of employment in the electricity industry for different states of Australia is presented below.

TABLE 2
EMPLOYMENT IN ELECTRICITY INDUSTRY.

	NSW	Victoria	Queensland	South Australia
1986	28754	19989	11440	5111
1990	22240	17962	8553	5214
1994	17060	9382	7658	2881
1998	12527	5420	7024	2298

Source: [17].

This information clearly indicates the declination of the number of employee in the electricity industry since the onset of reforms in the mid-80s. The major concern in this table is about Victoria where restructuring of the industry was accompanied by its privatization, the number of employees nearly halved between 1994 and 1998. Based on the above discussion, for a country like Bangladesh it is obvious that, the privatization of the existing government owned plants will lead to lose jobs for many personnel. In this region unemployment is one of the critical problems that economy is facing and this reform will add more fuel to the existing problem.

4.3 Environmental

The global environmental problems cannot be overstated. The Intergovernmental Panel on Climate Change has documented imminent climate change and advocated changes in energy production and consumption patterns as a measure to curb global warming. However, to embark on a sustainable development path, developing countries will have to increase total energy consumption. Clearly this trend has environmental implications. In the course of their implementation, however, power sector reforms have had some notorious repercussions, which have elevated electricity to an issue of concern at international level and driven developing countries to question the wisdom of undertaking reform. The necessity and desirability of reform is often taken for granted. Regarding the adverse affect on environment for example, in case of Australia, Transgrid (1998) [18] and ABARES (2000) [19] showed evidences that CO₂ intensities have significantly increased over the electricity industry reform period 1994-95 to 1998-99. This is widespread in many countries. Fortunately, the amount of CO₂ emissions by the power plants in Bangladesh is low for the time being. The main reason for that is majority of the power plants use natural gas as their fuel. But the continuous growing demand for electricity forced the government to seek for the alternative fuel and they are concentrating on furnace oil and coal mainly. In the road map of 2015, government has contracted almost 2600MW of coal fired plants in Chittagong and Khulna in the form of IPP and joint venture [20]. This issue will certainly increase the rate of CO₂ emissions and hence

a threat to global warming. So it is just a matter of time that CO₂ emissions will be a peril to Bangladesh. It is always argued that promoting renewable technologies would minimize this problem to some extent. But that approach clearly conflicts with the competitive market objective – cost minimization.

4.4 Technical efficiencies

The electricity industries in the region of ASEAN and Bangladesh have shown poor technical efficiencies. But this claim should however be viewed with caution as they are often compared with countries that are different in terms of geographical location, maturity of electricity systems, economic development, governments policies, institutional factors, resource endowments etc. For example, in the context of electricity distribution sector in the Philippines, the Asian Development Bank (ADB) has the following to say: "...Geography imposes constraints and costs on the networks. The nine largest islands, containing 95 per cent of the population are served by 7 separate grids, most of them too small to optimize within each island, the topography and the settlement patterns make electrification expensive ... Moreover, the lack of the effective coordination also resulted in technical inefficiencies in the industry..." [21]. Besides the experts are more concern about the longer run detrimental effects of operating technical systems on the basis of costs rather than technical specifications. The reasons for this concern are mainly, driving the plant focusing on cost effective operation schedules and hence the potential life span of the equipments are reducing, maintenance schedule is slackened hence will face problems in the near future, R&D department have been closed in order to reduce the cost hence no innovation. All these reasons leave doubt about the reliability, quality of service and system stability.

4.5 Foreign Investments

One of the key arguments for reform in Bangladesh was, this type of reform will bring heaps of foreign investments as electricity industries are capital intensive. The ADB has also made privatization of the power sector a pre-condition for approving loans, in line with its recent energy policy for 'availing of all possible opportunities to "crowd in" private sector participation' [22]. Government has also provided various incentives, including tax holidays and guarantees of fuel supply, in order to attract the private sector [23]. Consequently the electricity sub-sector has experienced the highest private sector activity within the energy sector. IPPs have boomed. While there may be no legal barriers to local private sector participation, it is becoming increasingly evident that foreign investors dominate, mainly because the former lack access to the necessary capital [24]. This may have some security implications in the future. Foreign domination through foreign investments in the power sector is one of the main reasons why the institution

of the Industrial Engineers in Bangladesh opposes reform, citing lack of financial strength and capacity among indigenous companies [25]. It is argued these investments will flourish the economy, create job scopes and many other opportunities. At the same time certain conditions need to fulfill in order to have these investments. These criteria whether a market will be striking to private investors are generally defined as, clear indication of demand for additional capacity, government and industry regulator have demonstrated stable and predictable performance over last few years, power to change market conditions is reasonable & balanced and generation projects using new technology or an alternative fuel have significant cost advantages over existing plants.

A common area for failure lies in the excessive bureaucracy that exists in most industries and planning authorities before liberalization changes are made in the course of restructuring. Often, too many authorities have an interest in power projects, meaning that obtaining approvals can take years. Other common problems include market-specific risks perceived by foreign investors, inefficient application approval methods, contract management & regulatory and legal frameworks. Generally, an investor will only invest if the economy of that country have shown bright panorama. Such confidence is typically shaped by the investor's assessments of the robustness of the political, legal regulatory and Government institutions in a region. Moreover, International Finance Corporation and World Bank released a report on 18th October'2011 titled, 'Doing Business 2012: Doing Business in a More Transparent World' mentioned that, Bangladesh ranked 122 on the overall 'ease of doing business' index. The Government of Bangladesh has planned to increase the installed capacity to 17,765 MW by the year 2020. In order to implement this plan investment required is 3 billion US\$ up to the year 2007 and 4.5 billion US\$ and 7.0 billion US\$ during 2007-2012 and 2012-2020 time period respectively [7]. The existence of political disturbances, lack of practice of laws, change of Government in quick sessions and wide range of variation in the mindset of the political leaders, all these issues are driving the plan to fade. These eventually raise doubt about the foreign investment to take place effectively.

4.6 Risk issues

Advocates of reforms argue that, it would transfer the risks towards the private sector from the tax payers and enhanced transparency in decision making. Past experience in this regard had showed different outcomes. A rationale advanced for increasing private sector participation is to release public finance for alternative development projects. However, the private sector has largely sourced the bulk of the finance extremely but used the Government as guarantor [24]. This implies that the private sector has not been as financially independent as had been anticipated and may have placed the

public sector at relatively high risks. Besides, the majority of the private sector owned generation facilities use fossil fuels which have to be imported and paid for in foreign currency, which exposes the country to erratic foreign exchange problems. For example, in Indonesia one of the main causes of financial problems of the national utility is high purchasing costs of power from IPPs which are paid in US dollars while the electricity tariff is in rupiah [26]. It is also experienced that the argument associated with 'risks' could not hold in the developed countries. For instance, in case of Australia this argument looks really puzzling if one recalls one of the key reasons for electricity nationalization in the 1930s and 1940s. Regarding this D. Sharma (2005) [27] have mentioned the followings; "...the private industries were not anymore interested to take the risks associated with the developing electricity infrastructure. That unwillingness was due to the relatively low state of technological developments in those years is equally unconvincing if one realizes that 'that' technology was indeed advanced for 'those' years. Besides, electricity demands in those years were rising rapidly, thus offering attractive prospects of higher returns from investments in electricity. Further, in market regimes motivated by the principles of cost-reflective pricing and user-pays, the notion of private investors as the bearer of market risks appear unintelligible; in such case it is the tax payer who ultimately bears much of the market risk..."

Moreover, the claim that privatization would bring transparency and eventually public trust does not appear to be supportable on the basis of the present evidence. In order to monitor the accounting methodologies that have been adopted by the electricity industry, it is important that one have a good idea about the cost information. But previous experiences showed that this indicator is commercially confidential and hence not available in the public domain. Besides, costs associated with private companies and public regulated companies are largely unreliable due to the legendary regulatory problems arising from "information asymmetry" and "asset valuation". The transparency arguments gets further faded if one takes note of the veil of secrecy and duplicity that has shrouded much of the debate leading up to the decision to privatize the electricity industry, and the process of privatization itself, in the states of Victoria and South Australia [28, 29]. This argument failed to establish itself in the developed countries, where issues like public trust, transparency, loyalty and justice are highly valued and hence it leaves dilemma about the efficacy of it in a developing country like Bangladesh - where these issues are lightly considered.

5 EPILOGUE

The Preceding discussion suggests that there are several dimensions embedded in the electricity industry, such as, technical, social, environmental, economic, political, cultural etc.

There is complex nexus between these dimensions and conflicting relationships. The planners in this region anticipated to achieve a wide range of objectives – foreign investments, providing mass electrification, improving technical efficiency, environmental aid, cost minimization and ensuring economic growth. An industry reform is a means to achieve the overall objective of that industry in the best possible way. It must also be ensured that during implementation of reform programme, the services being provided is not retarded or disrupted. Clearly then, the efficacy of a particular structure would be determined by how effectively it meets these objectives. However, the structure of electricity sector is not a rigid one and it needs the evolution in time to time basis to incorporate with the past experience, history and suggestion of the experts. For this to happen adequate preparations should be made and all the relevant issues should be addressed and above all, on implementation of the reform programme, the objectives should be attained.

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