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Effectiveness of Regulatory Structure in the Power Sector of Pakistan

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PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS

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ISLAMABAD

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ABBREVIATIONS

AEDB	Alternative Energy Development Board
CHANUPP	Chashma Nuclear Power Plant
CPPA	Central Power Purchase Agency
DISCOs	Distribution Companies
FESCO	Faisalabad Electric Supply Company
GENCOs	Generation Companies
GEPSCO	Gujranwala Electric Power Company
HESCO	Hyderabad Electric Supply Company
HUBCO	Hub Power Plant
IESCO	Islamabad Electric Supply Company
IPPs	Independent Power Producers
KANUPP	Karachi Nuclear Power Plant
KESC	Karachi Electric Supply Corporation
LESCO	Lahore Electric Supply Company
MEPCO	Multan Electric Power Company
NEPRA	National Electric Power Regulatory Authority
NTDC	National Transmission and Dispatch Company
PEPCO	Pakistan Electric Power Company
PESCO	Peshawar Electric Supply Company
PPAs	Power Purchasing Agreements
PPIB	Private Power and Infrastructure Board
QESCO	Quetta Electric Supply Company
SPPs	Small Power Producers
WAPDA	Water and Power Development Authority

ABSTRACT

This paper is an attempt to study the regulatory environment in the electricity sector of Pakistan. NEPRA, a regulatory authority was formed in 1997 to protect consumer interests in the area of electricity provision, and to ensure an efficient and competitive environment for the electricity generators and distributors, but it has so far not been able to achieve anything. The power sector (dominated by WAPDA and KESC) is still affected by institutional and organisational weaknesses, with inefficient and non-optimal tariffs, high line losses, and high level of corruption. It has been found weak administrative governance in NEPRA in the form of lack of autonomy, resulting in the overall institutional inability to carry out the desired functions effectively. In addition, NEPRA is lacked in professional expertise to supervise and control the power sector and establish a rational and equitable pricing regime.

JEL classification: G38, L33, L43, L51, Q48

Keywords: Electricity, NEPRA, Pakistan, Reforms, Regulation

1. INTRODUCTION

“..the key resource of government is the power to coerce. Regulation is the use of this power for the purpose of restricting the decisions of economic agents”

[Viscusi, Harrington, and Vernon (2005), p. 357]

Regulation is not a new phenomenon in Pakistan. Pakistan’s economy has always been a mixed market economy, where private sector activities have been regulated throughout. These regulations were in the form of various types of controls and regulations on entry and exit, prices, credit, foreign exchange, imports, investments etc. These regulations were aimed at securing national interests. [Kemal, *et al.* (2002)].

The electricity sector in Pakistan in the post-1958 period is dominated by two vertically integrated publicly owned utilities, Water and Power Development Authority (WAPDA) and Karachi Electric Supply Corporation (KESC) (Government being the operator as well as the regulator). The performance of these two remained satisfactory until the early 1980s. Afterwards the situation started deteriorating. Severe constraints in the availability of capital led to inadequate generation capacity and transmission infrastructure. Power supply lagged behind demand resulting in excessive shortage of electricity especially for the industrial and commercial consumers.¹ The economy, in general, and the manufacturing sector in particular, were adversely affected. The estimates of the economic loss of one kWh of power to the economy were between five to ten times the generation costs of one kWh of electric power [NEPRA Annual Report (2000-2001)].

Massive deterioration in governance and heavy losses in WAPDA and KESC, created the need for restructuring. It was realised that power generation and transmission capacity expansion and efficiency could only be achieved with the involvement of the private sector. The government in 1992 prepared the strategic plan for the privatisation of the power sector. It also approved the creation of an autonomous regulatory agency, National Electric Power Regulatory Authority (NEPRA) to introduce transparent and judicious economic regulation in the sector. NEPRA came into existence in December 1997. However, the situation so far has barely changed. WAPDA and KESC are still facing institutional and organisational weaknesses. The combined direct and

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¹Load shedding of up to 30 percent of peak demand.

indirect losses incurred by these utilities during the period 1996-to date have created large fiscal deficits, being covered through taxpayers money and through borrowings [Kemal, *et al.* (2002)]. What NEPRA, as an independent organisation has done so far needs to be analysed given the fact,

“Effective governments are needed to build the legal, institutional and regulatory framework without which market reforms can go badly wrong, at great cost— particularly for the poor”. [DFID (2000), p. 23-25]²

This suggestion supported by a great body of empirical evidence confirmed that quality of the regulatory environment has a significant impact on the overall performance of the sector as well as economic growth [Zhang, *et al.* (2002); Cubbin and Stern (2006); Jalilian, *et al.* (2003)].

The quality of a regulatory agency is determined primarily by the quality of its governance. Many attributes of good regulation have been identified in the economic literature, for example, regulatory autonomy, accountability, transparency, participation, predictability and clarity of functions [Levy and Spiller (1994); Stern (2000); Stern and Holder (1999); Smith (1997) and Jacobs (2004)].

This paper intends to revisit and analyse the governance attributes with reference to NEPRA to find out to some extent the reasons behind the poor performance of the sector. The performance of the new regulatory setup (with their own particular economic and social problems and instrumental characteristics) remains under-researched in the context of developing countries, in general, and Pakistan, in particular. This paper is an attempt to contribute to that research while studying the regulatory environment in the electricity sector of Pakistan.

The structure of the paper is as follows. Introduction is followed by the review of literature. This section will reflect on the two dimensions of regulation, rationale behind regulating electricity and a review of empirical literature. The second section will review in detail power sector reform and regulatory framework in Pakistan. In the third section, governance characteristics associated with an efficient regulatory authority will be discussed. This section will try to analyse critically the working of NEPRA. Finally, the fifth section will conclude the discussion.

2. THEORY OF REGULATION AND IMPORTANCE OF REGULATING UTILITIES

This section will briefly reflect on the theory and conceptual issues in regulation as discussed in the literature. It will also review the empirical literature to highlight the issues involved in regulating utilities and the regulatory reform experience of some of the countries in the electricity sector.

²Statement is cited from Kirkpatrick and Parker (2004).

2.1. Economic Theory of Regulation

The evolution of the theory of economic regulation dates back to the nineteenth century, when Adam Smith regarded market failure as the motivating reason for the entry of regulation. There are three stages of this evolution outlined in the literature [Peltzman (1989); and Viscusi, Harrington, and Vernon (2005)]. These are:

- The first theory was that regulation occurs in industries plagued with market failures, originally public interest theory, recently referred to as *normative analysis as a positive theory (NPT)*.
- Given the inconsistency in the empirical literature with this theory, the economists and the political scientists developed the *capture theory (CT)*. It states, whether by design or not, the agency that is meant to regulate an industry is ‘captured’ by that industry. The implication is that regulation promotes industry profit rather than social welfare.
- The third stage in the evolution of thought is the *economic theory of regulation (ET)*.

According to Peltzman (1989) the first two were empirical generalisations without a theoretical foundation. The third stage ET filled that theoretical gap. It was in 1971, when Nobel laureate George Stigler, in the pioneering article “The Theory of Economic Regulation”, states that the basic resource of the state is ‘the power to coerce’. An ‘interest group’ that can convince the state to use its power of coercion to that interest group’s benefit can improve its well-being. In other words, it is like a supply-demand schedule, where regulation is supplied to meet the demand of interest groups, to maximise their income. Regulation is an opportunity for an interest group to increase its income, whereby state redistributes wealth from other parts of society to that interest group.

“we assume that political systems are rationally devised and rationally employed, which is to say that they are appropriate instruments for the fulfilment of desires of members of the society”. [Stigler (1971), pp. 4]

The paper by Peltzman (1976) further supported Stigler’s analysis. There are three important aspects of Stigler and Peltzman work (observed in practice). First, regulatory legislation redistributes wealth among members of the society. Second, the behaviour of legislators is driven by their desire to remain in office, implying that legislation is designed to maximise political support. Third, interest groups compete by offering political support in exchange for favourable legislation. As a consequence, regulation is likely to be biased towards interest groups that are relatively small and better organised (so that they are more effective at acquiring political support) and gain more from favourable legislation, at the cost of weakly organised large interest groups [Viscusi, Harrington, and Vernon (2005)].

The economics of regulation literature [e.g., Averch and Johnson (1962) and Baily (1973)] has also highlighted the situations where there are regulatory failures, where the regulation of markets might reduce rather than increase economic welfare [cited from Kirkpatrick and Parker (2004)].

2.1.1. Market Failures

There are few cases of market failures generally identified in the literature, these are: **significant externalities, public goods, merit and demerit goods, incomplete or asymmetric information, incomplete markets, monopoly, and inequality**. These market failures are behind the economic rationale for state regulation of market economies. In public utilities, where there are economies of scale and scope, and monopoly exploitation, there is a need for state intervention.

2.1.2. State Failures

However, the experience of state intervention strongly suggests the presence of ‘state failure’ along with the ‘market failure’. The case for market liberalisation and privatisation is based on the poor record of government intervention in market economies over the years. The argument for **privatisation and liberalisation** is supported by ‘Austrian’, ‘property rights’ and ‘public choice’ theories [Kirzner (1997); Demsetz (1967); Buchanan and Tullock (1962) and Niskanen (1968)]. The presumption behind privatisation and liberalisation is that it will encourage competition. Parker (2002) states in the presence of competitive markets a ‘pareto optimal’ solution exists, where no further redistribution of resources will raise economic welfare. However, in some sectors like utilities where there is insignificant increase in competition, then some form of sector regulation would substitute for it [Cook, Kirkpatrick, Minogue, and Parker (2004)].

Parker and Kirkpatrick (2002) extracted following propositions from the economics of regulation literature that highlight the importance of institutional setting, regulatory rules and the regulatory process in the context of developing countries.

- The institutional context is critical to the process and outcomes of a regulatory regime.
- Regulation is associated with information asymmetries.
- Investment in a regulated environment is subject to threat of hold up leading to under investment.
- Regulatory regimes are prone to regulatory and political capture.
- A Regulatory system should be both effective and efficient.
- Competition is superior to state regulation and should be preferred.

2.2. Why Regulate Electricity?

Electricity (or power) supply industry has been viewed as an activity with natural monopoly characteristics. These monopoly characteristics result from the existence of economies of scale and scope.³ Therefore, it can best be provided by vertically integrated monopolies owned by government. However, in the last two decades, the concept of ‘natural monopoly’ has been rejected in electricity generation and supply and these parts of the supply chain have been opened up for competition (with both private and public operators) [Zhang, *et al.* (2002)]. The economic and technological developments have enhanced the potential for competition in generation by reducing the minimum efficient scale.⁴ Regulations are thus being justified for the correction of power or information asymmetries and for facilitating market transition [Cordova-Novion and Halon (2003)]. According to Teplitz-Sembitzky (1990), the rationale for power sector regulation lies in the need to substitute for the role markets are unable to play. In response to the potentially adverse consequences of market imperfections, regulations: should ensure an efficient industry structure; should control power suppliers from exploiting their market position; and to provide suppliers with incentives to perform efficiently along a least-cost expansion path.

Box. 1.

Technical Issues in Electricity

There are few technical issues associated with electricity e.g., the physical flows or supply of electricity must respond immediately to unanticipated changes in demand; secondly, it is not economically possible to have competing networks (as in telecommunications); and third electricity cannot be stored (unlike natural gas). In addition to these issues, its highly inelastic demand and captive market give way for regulations in the form of economic signals to ensure continued and efficient network operation and pricing.

2.3. Effectiveness of Regulation

There are basically two dimensions of any regulatory system: **regulatory governance** and **regulatory substance**. Governance refers to the institutional and legal design of the regulatory system. It is the framework within which regulatory decisions are made while regulatory substance refers to the content of regulation, that is, regulatory functions (setting of prices, quality-of-service, and entry-exit rules etc.). The quality of a regulatory agency (in other words

³Ghafoor and Weiss (1999) empirically find economies of scale in the case of Pakistan electric power sector.

⁴The development of low capital cost combined cycle gas powered generators have led to a dramatic reduction in the economies of scale in generation and supply of electricity.

effectiveness of regulation) is determined largely by the quality of its governance.

Cook, *et al.* (2004) argued that state regulation is unlikely to gain legitimacy, unless regulatory institutions despite criticism are accepted in society for certain decisions or behaviour. They have identified five attributes of good regulation: transparency, accountability, targeting, proportionality, and consistency. Cordova-Novion and Hanlon (2003) examined some of the issues in relation to the institutional framework for economic regulation, particularly in the infrastructure network industries. They highlight the importance of independent economic regulatory institutions for the network industries; regulatory accountability in terms of its balancing effect on independence; and institutional coherence in the design of the regulatory framework. The importance of an independent regulatory institution, with a clearly defined legal framework for the sustained output growth and efficiency in the utility services is also emphasised by Stern and Cubbin (2005).

In brief, the economic literature [Levy and Spiller (1994); Stern (2000); Stern and Holder (1999); Smith (1997) and Jacobs (2004)] has identified various governance characteristics for effective utility regulation. These include: **regulatory autonomy, accountability, transparency, participation, predictability and clarity of functions.**

The following section will briefly point out the regulatory experience in some of the countries in the utilities with reference to the effective regulatory system.

2.4. Regulatory Experience

There is a vast body of literature on the economics of regulation. But here the focus is only on those studies that deal with new regulatory structures; and those that highlight issues associated with independent regulators in the utilities (electricity). The experience of economic reforms is not very encouraging in the developing countries. Most of the studies [Appendix A (Table 1)] have emphasised

- the importance of strong institutions and regulatory quality; Reasons cited for poor performance in the developing countries being;
- the weak legislations and poor implementation of rules and regulations;
- large enterprises still enjoying the economic powers;
- resources allocated to regulation are low;
- access to information is the key for better regulation, is also poor in developing countries; and
- weakness in public policy (governments lacked the co-ordination and planning capacities).

In brief, regulatory reform process is a complex task. The countries that have been successful have adopted the path of quick and well-planned transition and have strong institutional base and more significantly, the will to do.

“Electricity restructuring...is likely to involve both costs and benefits. If the restructuring is done right...the benefits...can significantly outweigh the costs. But the jury is still out on whether policymakers have the will to implement the necessary reforms effectively”.

[Jaskow (1997), p. 136]

Followed by these brief findings from the review of literature, this study in following sections is going to review the regulatory reform process in the electricity sector of Pakistan. It will reflect on both the dimensions of regulations with reference to NEPRA (National Electric Power Regulatory Authority).

3. PAKISTAN’S POWER SECTOR REFORM AND REGULATORY STRUCTURE

3.1. Structure

The power sector in Pakistan is a mix of hydel and thermal units dominated by two vertically integrated (in generation, transmission and distribution) public sector utilities, WAPDA and KESC. In addition, there are two nuclear power plants KANUPP and CHANUPP, and a number of independent power producers (IPPs) and small power producers (SPPs) established since 1994 in the power-generating sector. In 2005-06 the total installed capacity in the country is 19439 MW.

Besides these utilities, there are five central government agencies with responsibilities in the power sector [Appendix B (Table 1)]. Provincial governments are responsible for hydropower projects of up to 50MW.

Table 1

<i>Share by Operator</i>	
	Share in Total Capacity
WAPDA	59 % (57% hydel and 43% thermal)
KESC	9% (thermal)
IPPs	30% (thermal)
Nuclear	2%

3.2. Reforms in the Power Sector

The government in 1992 prepared a strategic plan for restructuring the electricity sector. It was realised that power generation and transmission capacity expansion and efficiency could only be achieved with the involvement of the private sector. In 1994, the government formulated a power policy and invited for the first time, independent power producers (IPPs) to invest in the generation part of the power sector⁵ [details Box 2]. The structural adjustment programme under the supervision of IMF and WB later enhanced this policy shift.

Other steps taken as apart of the reform process includes:

- Establishment of an autonomous regulatory agency, to introduce transparent and judicious economic regulation in the power sector of Pakistan. National Electric Power Regulatory Authority (NEPRA) was created under the NEPRA Act 1997 to ensure fair competition and consumer, producer and seller protection.
- Private Power and Infrastructure Board (PIIB) was established in 1994, to facilitate private investors.
- Unbundling of WAPDA's vertically integrated Power Wing into separate generation, transmission, and distribution companies (as in the 1997 NEPRA Act and the 1998 WAPDA Act) in 1998. WAPDA has now been reorganised into four thermal generation companies called GENCOs, nine distribution companies called DISCOs, and one National Transmission and Dispatch Company (NTDC). The hydroelectric power development and operation functions remain with WAPDA.
- Pakistan Electric Power Company Private Limited (PEPCO) a separate agency within WAPDA is made responsible for the restructuring and preparation for privatisation for the generation and distribution companies in due course through the Privatisation Commission. Private sector participation is being encouraged to promote competition in the generation and distribution parts of the industry, while, NTDC would remain under state control and be responsible for national dispatch, transmission, and system planning as a 'single buyer'.
- Responsibility for the energy sector policy remains with the government.

⁵It was in 1986, GOP encouraged private sector on BOO (built-own-operate) basis but the response was not encouraging. GOP then later in 1994, announced a comprehensive policy package. For drawbacks of this policy see Shah (2002).

Box 2.
IPPs in Pakistan

As a result of attractive government incentives and generous tariff offers 19 IPPs started their operations in Pakistan. They brought over \$3 billion to install about 3500 MW capacity. These IPPs were allowed to sell electricity to both WAPDA and KESC under power purchasing agreements (PPAs). Hub Power Plant (HUBCO) was the first one to start its operation in 1993, with a capacity of 1292 MW and a negotiated tariff based on a “cost plus” approach. From 1998 onwards, Pakistan had excess capacity, as WAPDA and KESC were restricted to purchase expensive IPPs electricity while their own plants were underutilised. Financial problems instead of improving deteriorated even further. IPPs get involved in disputes and litigation with the government over the rates set in their PPAs with WAPDA. In response to the Governments demand for a rate reduction, IPPs demanded that prices for fuels be lowered. The government now has resolved the IPP issue with the involvement of international donors and within the framework of contractual agreements [Shah (2002) and Parish (2006)].

The process of separating out various entities and corporatisation is in progress. While unbundling has been completed, the various entities created from WAPDA still lack independence from WAPDA and from one another. The distribution companies are still financially integrated with WAPDA, lack the technical skills to operate independently, do not have notified tariffs and have managers that are WAPDA employees [Parish (2006)].

The restructuring aimed at introducing private capital, liberalising markets and introducing new regulatory institutions assumed that the private sector can more efficiently adapt to technological developments in the sector and have the ability to supply electricity at low prices especially to those with low demand through innovative customer services [Bacon and Besant-Jones (2002)]. However, in Pakistan the overall performance of the power sector and its institutions in the last 15 years has been moderate [for details see Appendix C]. The governance problems as well as institutional and organisational weaknesses in the power sector still persist. Restructuring (or unbundling), corporatisation, and privatisation are going on but very slowly. Technical transmission and distribution losses have continued and in the case of KESC, grown over the past decade, financial results have also been disappointing. According to Fraser (2004), until the expected efficiency improvements is achieved fresh private capital in the power sector in general, and for new generating capacity in particular, is not possible. In addition, the quality of the regulatory environment is very important for the investor’s confidence. Investor reservations about the quality of the regulatory environment, have contributed to a shortfall in private investment in the utilities sector in Asia [Jacobs (2004)].

For the successful implementation of economic reforms the empirical literature has suggested for an efficient and strong regulatory institution. NEPRA, an autonomous regulatory authority was established in 1997 to regulate the affairs of the sector. The following subsection will review the regulatory framework in the power sector, reflecting basically on the content of regulation.

3.3. Regulatory Framework

The objective behind the formation of NEPRA formed by an act of parliament in 1997 (NEPRA Act No. XL of 1997) was to have an independent regulatory body to improve the efficiency and availability of electric power services while protecting the interests of consumers, investors and the operators equally, and to promote competition and deregulate power sector activities where competition exists.

Initially NEPRA was established as an autonomous body without any administrative control from the government. However, for the sake of interaction with Federal and Provincial Governments it was initially attached to the Ministry of Water and Power. Later it was linked with the government through the Ministry of Law and Justice. However, in June 2000 NEPRA was directly attached with the Cabinet Division. Currently, NEPRA is working in an extremely centralised manner. All the decisions regarding tariffs and standards need to be approved by the government. It consists of a Chairman and four members (one from each province), all appointed by the government.

The initial funding of NEPRA was provided through a grant from the Federal Government amounting to Rs 100.5 Million. In addition, NEPRA is expected to meet its expenses from licensing fees on constant basis and filling fees for tariff applications etc.

Just like any regulatory system, the most important regulatory functions of NEPRA are grouped in the following five main categories [details in Appendix D]:

- **Determination of tariff rates and terms and conditions;**
- **Grant of licenses**, approval of power acquisition programmes;
- **Setting and enforcement of quality-of-service standards**, approval of operating codes and investment standards;
- **Industry structure/privatisation** including the transition towards a competitive market where feasible; and
- **Consumer rights and obligations**, complaint redressal.

NEPRA's broad policy guidelines for power sector reforms revolves around:

- Tariff structure to ensure sufficient resources to cover costs and investment in the short term;

- Encourage generation, transmission and distribution capacities on a non-discriminatory basis to meet the existing needs and growing demand in the long run; and
- Quality of service to the consumers as well as ensuring network efficiency including reliability and voltage disturbances.

3.3.1. Licenses (*Entry and Exit Requirement*)

The license provides a road map for the various transitional phases for the eventual goal of an open electric power market structure. No company is allowed to carry out business of generation, transmission and distribution without getting a license from NEPRA. It is an instrument to check the development of capacity more than required; to evaluate the professional ability of an operator to execute the project; and the financial viability of the project. The process involves a public hearing.

Table 2

Progress in the Issuance of Licenses

Type of Company	Number	Capacity
Small Power Producers (SPPs)	25	400 MW
Isolated Generation Companies (IGCs)	6	52 MW
Independent Power Producers (IPPs) ⁶	18	4774 MW ⁷
Distribution Licenses ⁸	9	–
KANUPP and CHANUPP (nuclear)		
KESC and WAPDA Generation Companies	All	
Transmission License (NTDC)	1	

3.3.2. Tariffs

Tariffs or electricity pricing is an important regulatory component. NEPRA determines tariffs as prescribed in Tariff Standards and Procedures Rules (1998), keeping in view the principle to cover costs and reward investments as applicable on a case to case basis [for details see Appendix E].

⁶Although IPPs contracts were backed by sovereign guarantees by the government, but they were carrying out their business with WAPDA/NTDC without any license. Now NEPRA has completed the process of granting licenses to all IPPs set up in response to 1994 power policy.

⁷HUBCO being at the top with the capacity of 1292 MW.

⁸All successor distribution companies namely, HESCO, QESCO, MEPCO, FESCO, LESCO, GEPCO, JESCO, PESCO and KESC.

Box 3.**Tariff Structure Pakistan**

The current tariff structure is based on rate of return or cost of service. It determines prices charged so as to achieve revenues that cover all legitimate operating and capital costs while providing the firm with a fair rate of return on its capital employed. This fair rate of return is related to the cost of capital and is similar to delivering the economist's normal profit.

Since March 2001, an **Automatic Tariff Adjustment (ATA)** mechanism for fuel cost variations has been adopted, and applied every three months, i.e., adjusting consumer end tariff of the distribution companies in order to account for variations in the price of fuel. The idea is to capture the volatility of fuel price variations⁹.

NEPRA has decided the generation tariff for SPPs. Generation tariff to the three generation companies unbundled from WAPDA has been granted after approval from the government. NEPRA also granted NTDC with their use of system charge tariff and approved a list of generation companies selling electricity to the Central Power Purchase Agency (CPPA) for onward sale to the DISCOs according to their respective demands. Hydel tariff for WAPDAs hydel generation plants has also been approved.

Box 4.**Average End User Tariff**

The average end user tariff in Pakistan for fiscal year 2005 is estimated be around 3.93 Rs/KWh. It involves significant cross subsidies, from industrial and commercial consumers to agricultural and small (under 50 kWh per month) domestic consumers. Tariff structure is consistent throughout the country but is (besides cross subsidies) divided by consumption levels (tariff slabs); and for industrial consumers, it is divided into peak and off-peak charges.

Structural Adjustment of Tariff: The ATA for ex-WAPDA distribution companies was stopped from December 2003 as all distribution companies have applied separately for their tariffs. Detailed determinations of tariff review motions filed by the 8 DISCOs were issued in November 2004. As per the requirements in the determinations a mid year review of the tariff was conducted and tariff adjustments were made in February 2005. The increase in tariffs for

⁹Since March 2001 to August 2004, NEPRA has given determinations on 11 WAPDA related tariff petitions and thirteen KESC related tariff petitions. In the next year until May 2005, 21 ATA determinations for tariff adjustments were issued for the ex-WAPDA generation companies.

IESCO, FESCO, LESCO, MEPCO, GEPCO, PESCO, HESCO and QESCO in Ps/kWh was 13.25, 12.22, 8.98, 10.32, 15.15, 11.81, 5.95, and 12.99 respectively. However, this is still waiting for government notification.

NEPRA and the government (including the PPIB) are currently in dispute over various tariff issues. WAPDA and KESC have also not been happy with NEPRA in respect of tariff determinations [Chaudhry (2002)]. This is a very serious issue given the state of our power sector. This may put future investment at risk in the generation projects and the sale of distribution companies. Pricing is the most important aspect of regulation. NEPRA has to resolve tariff disputes in such a manner that will attract investment but not at the cost of the consumers. An independent, light handed, non-discriminatory regulator is absolutely critical to the future success of the power sector [Parish (2006)]. But what if the powers or authority of the regulator has been curtailed with time.¹⁰

NEPRA has the credit to establish for the first time in South Asia a CPI-X based multi-year tariff (MYT) regulatory framework. In 2002, NEPRA approved a framework of multi-year tariff for KESC, for seven years from its privatisation (in view of its expected privatisation in the near future).¹¹ Secondly, in June 2004, NEPRA approved a CPI-X based MYT framework with an initial duration of five years for FSECO, in view of its expected privatisation. A multi year tariff has also been determined for JPC.¹² This new framework is a radical shift from the rate of return regulation regime to performance based regulation in the power sector of Pakistan [Raza (2003, 2004)].

Some of the amendments made in the tariff rate structure are: cross subsidies have been reduced¹³ by increasing the rates of subsidised classes; flat rates have been abolished; consumer bills have been simplified to include all the surcharges and additional surcharges in the overall rates in such a manner that only fixed and energy charges are reflected in consumer bills; consumers have been protected from frequent price variation by allowing only quarterly adjustment for fuel price adjustment; and unjustified demands of the utility such as charging on the basis of connected load and increase of rates to cover for inefficiencies has not been allowed.

However, in the existing tariff regime there is no clear coordination between the end user tariff set by NEPRA and the unregulated price charged by NTDC for electricity purchases; and secondly, the current end-user tariffs for some customer categories (domestic consumers with largest share in consumption) are inadequate for cost recovery [IFC (2006)]. Tariff structure is

¹⁰Recently, PPIB notified in the newspaper that the tariff determination will no more be the job of NEPRA.

¹¹Multiyear tariff is a CPI-X (consumer price index with an efficiency factor) price cap on controllable costs while uncontrollable costs are considered as pass through for the KESC.

¹²JPC is Jamshoro Power Company, one of the three companies evolved from the thermal generation part of WAPDA.

¹³NEPRA expects to abolish it completely.

not based on regional and consumer-specific long-run marginal cost but is used as an instrument to achieve political and socio-economic objectives.¹⁴

3.3.3. Quality of Service

The authority, according to section 7(2), clause c and section 34 of NEPRA Act (XL of 1997), is obliged to prescribe performance standards for generation, transmission, and distribution companies to encourage safe, reliable, service. The service providers not following the prescribed standards are to be fined. The process is quite slow. The Performance Standards (distribution) Rules, proposed by the authority, have been approved by the federal government and notified in the official gazette in January 2005. While the performance standards for transmission have been finalised, in the document titled Performance Standards (transmission) Rules 2005, on April 19, 2005, it is still waiting for its approval from the government. While the performance standards for the generation companies are yet to be drafted and are expected to be finalised by August 2006 [NEPRA Annual Report (2004-05)].

NEPRA has not prescribed environmental standards, all the generation companies granted license by NEPRA are required to maintain environmental standards as may be prescribed by the Federal Environmental Protection Agency.

The authority approved the Grid Code on June 9, 2005, which was circulated to all stakeholders for enforcement and compliance. The distribution code for MEPCO, GEPCO, PESCO, HESCO, QESCO, and IESCO have also been approved. Guidelines on power Safety Code have also been approved by the authority for circulation to all generating, transmission and distribution companies, which will submit their respective power safety codes to NEPRA for approval.

3.3.4. Privatisation

Privatisation as such is not directly the function or responsibility of the NEPRA. But NEPRA has to facilitate the process to bring efficiency in the power sector and helps in ensuring competition where feasible. The privatisation process started at a slow speed. Kot Addu Power Plant (1638 MW) was the first to be privatised in 1996. Initially 26 percent of the shares were transferred to the private owner, and then later on 10 percent more of the shares were transferred to the private owner. In December 2005 a majority stake (73 percent of shares) in KESC was sold to a private investor. It is the major step although the process took many years to materialise.¹⁵ Next in line is the distribution company,

¹⁴Different tariffs being charged in Karachi are often criticised in the parliament [see Kiani (2006)].

¹⁵Process of privatising KESC started in 2000.

FESCO.¹⁶ It is intended to sell 56 percent of its shared capital by the second quarter of 2006 but so far nothing has happened. It is because of the delay in the notification of the tariff approved by NEPRA. A multi year tariff has already been determined for JPC. All the short listed bidders for these companies, who had invested their time and money in carrying out the due hard work, are waiting for the resolution of the dispute between the Government and NEPRA. This is a major setback for the companies waiting for their privatisation.

3.3.5. Consumer Affairs

NEPRA has established a consumer affairs division to address complaints lodged by the consumers against the utility companies. Various consumer complaint hearings have been held. According to the NEPRA Annual Reports, NEPRA is 100 percent successful in the redressal of complaints but according to the Consumer Rights version, NEPRA only deals with the complaints of industrial consumers and does not give weight to the complaints of domestic consumers. Moreover, though penalties exist in the law for malpractices, yet there exist no clues under which the aggrieved could be entitled to compensation of any kind [Humayun and Anjum (2000)].

NEPRA is also encouraging and assisting the provincial governments to prescribe rules for the redressal of complaints through provincial offices of inspection established under Section 38 of the NEPRA Act. Draft procedure has already been circulated to the provincial governments. The provincial governments of Balochistan, NWFP, and Sindh have notified their procedures.

4. REGULATORY EFFECTIVENESS OF NEPRA

The reform process around the world put in forefront the issue of efficient regulatory system for the utility industries. The utility industries, in addition to being highly capital intensive, have irreversible investments. Hence, an effective institutional framework is necessary for sustained and efficient level of its output growth. It becomes even more important when private investment is involved. An independent regulatory institution, with a clearly defined legal framework is argued to be the solution for an effective institutional framework [Pachauri (2001) and Stern and Cubbin (2005)]. The quality of a regulatory agency is determined primarily by the quality of its governance. The economic literature has identified various governance characteristics for effective utility regulation [as discussed in section 2.3]. The analysis on the regulatory effectiveness of NEPRA is based on some of these governance characteristics.¹⁷

¹⁶FESCO is one of the best distribution company in terms of its operational performance, which enjoys a low degree of distribution losses (10-13.5 percent) while distribution losses to IESCO, GEPCO, LESCO, MEPCO, QESCO, PESCO, HESCO are 14.9 percent, 16 percent, 17.4 percent, 22 percent, 22.5 percent, 31.4 percent, and 41.4 percent respectively.

¹⁷Only secondary sources are used for the analysis.

4.1. Regulatory Autonomy

Independent regulator can provide assurance to investors that prices, outputs and inputs will not come under the pressure of ‘regulatory capture’ and pressures from economic and political interest groups.¹⁸ NEPRA is not autonomous (or independent), as the government continues to exercise considerable control over it in matters of tariffs and pricing. Undue interference and influence of the government hampers the independent functioning, which in turn affects the consumers as well as producers. The success of electricity restructuring in Argentina and Chile is attributed to a very large extent to the performance of their independent regulators [Stern (2000)]. However, Pachauri (2001) while talking about South Asia argued that some of the challenges existing in these countries are much bigger and complex. Most of these countries have emerged from colonial rule. Even in countries where this was not the case, the structure of society has often been characterised by major divisions, largely feudal in character. The class structure and the social forces that exist are therefore, different from those that have been seen in the countries of the North, which have practised democracy for several decades. As a result, in these developing countries, it is extremely difficult to have an independent regulator.

They also need to be financially independent of the government. The independence of the regulator must be supported by sufficient funds; otherwise the regulator can be improperly influenced by cuts to its budgetary allocation, i.e., ‘political capture’. The most appropriate approach is levies charged from regulated services (license fee for regulated firms etc.). The NEPRA operations are funded from licensing fees, filling fees etc. as prescribed by it from time to time and approved by the Federal Government. The Auditor General of Pakistan audits the accounts of the authority annually. However, there are instances where NEPRA compromised on its financial autonomy, e.g., WAPDA successor distribution companies who have been issued licenses delay the payment of fees (NEPRA Annual Report 2001-02),¹⁹ allowing the government to submit only a token amount of Rs. 1000 for the disposal of its tariff petition [Humayun and Anjum (2000)]. This can have a negative impact on consumer’s confidence in the regulatory arrangement.

4.2. Regulatory Expertise

Inadequate regulatory (human capital) resources lead to poor decision-making [Stern and Cubbin (2005)]. The key requirements for independence are the personal qualities of regulators that allow them to take independent decisions and resist improper pressure or incentives. Their technical knowledge, professional

¹⁸Interest groups tend to promote their own economic rents, for details on capture theory see Stigler (1971), Posner (1974) and Peltzman (1976, 1989).

¹⁹The information of whether they pay afterwards is not available.

expertise, and institutional capacity to discharge its responsibilities count a lot. In addition, to prevent comeback from the affected parties, regulators must be appointed for fixed terms and protected from arbitrary removal.

NEPRA has also problems in that sense. Power has used to be a provincial rather than a federal subject in Pakistan, therefore NEPRA comprises of nominees from the bureaucracy of the four provincial governments and now, a former military person is the chairman. All are appointed by the government. None of the members has the requisite professional background and relevant experience in a power sector regulatory framework. They are mostly retired bureaucrats, and serve only for a short period in NEPRA.²⁰ By the time, the regulator (member) may develop some understanding of the complexities of the sector his tenure is over. The selection for a new regulator often involves long delays. That's why sometimes NEPRA is without Chairman (in 2002-03), and sometimes without members (in 2005).²¹ This affects the smooth and effective functioning of the authority. NEPRA has not been able to develop expertise in relevant areas that could have facilitated effective interventions in the future. In addition, NEPRA has also not acquired the services of a professional support staff in a transparent manner that could establish a proper regulatory framework for the benefit of the consumers and producers alike. Most of the existing professional staff of NEPRA are ex-WAPDA employees with no exposure to regulatory concepts and functions or are drawn from the sectors, which have no relevance to the operational requirements of a power utility [Nizam (2003)]. There are no energy economists in NEPRA,²² therefore optimal tariff calculation, a complicated area, remains unexplored [Bari (2006)]. This may be the reason that the government has turned down a number of NEPRA's regulatory decisions, or simply not being implemented by the entities being regulated (WAPDA and KESC). There are occasions where WAPDA and KESC are not satisfied with NEPRA on the subject of tariff determination [Chaudhry (2002)]. But on the other hand, NEPRA is also found obliging WAPDA without any justification under Government pressure [Humayun and Anjum (2000)].

4.3. Accountability

Independence of the regulator needs to be compliant with measures to ensure that the regulator is accountable for its action. For accountability of the regulator, legislation should ensure *transparency* of the decision-making process; detailed justifications of decisions; opportunities for all interested parties to take part in public hearings; and provisions for the removal of regulators in case of the proven misconduct or incapacity. Proper checks and

²⁰The retirement age in bureaucracy is 60 years, while in NEPRA it is 65 years.

²¹To date NEPRA is without member from Sindh.

²²Nor in WAPDA [Bari (2006)].

balances can ensure that the regulator does not drift away from its mandate, engage in corrupt practices or become grossly inefficient. It is often argued that the IPPs controversy could have been avoided in Pakistan provided the procedures were followed in a transparent manner and by making all the relevant information available to the media and citizens. As the deals were kept secret, there were speculations of bribes; a crisis was thus created in the power sector with significant implications for the national economy and consumers. Accountability depends upon access to information and when information is denied to the public no accountability can be expected. The regulators are feared to have the tendency to come under the influence of corporate interests; therefore, their proceedings should be held in a transparent manner by involving all the stakeholders, particularly, the consumers in a meaningful way.

4.4. Participation

As far as public participation is concerned, public hearings do take place in NEPRA (institutional arrangements are in place) but from the consumer point of view, little emphasis is given to ensure the quality of these hearings. Consumers are not allowed enough time to make their point or to examine the matter independently. Sometimes, they are not provided necessary documents, reports and data. Moreover, laws in NEPRA allow for a complete grievance redress mechanism, but it is meant for industrial consumers only while the domestic consumers are not properly entertained [Humayun and Anjum (2000)].

4.5. Credibility

In the optimal design of any regulatory institution, there is always a risk of organisational failure unless credibility and transparency in regulatory decisions are in place to counter organisational failures. *Independence, accountability and proficiency* of the energy regulators are crucial for credibility. Direct involvement by ministers in pricing and licensing decisions can undermine regulatory credibility, and hence investment. Smith (1997) notes the crucial importance of utility services in politics, e.g., electricity consumers as voters. For short-term political goals, politicians or parliamentarians turn down the justified increase in tariff²³ (as in the case of Pakistan separate tariff determinations for all DISCOs have been reserved) at the expense of long-term benefits of consumers and investments. Investors being aware of organisational risks associated with their investments will demand high tariffs (as what happened in the case of IPPs in Pakistan) to compensate for increased risk or they will invest in industries with independent regulatory agencies (with no government involvement).

²³Because politicians are aware supply failures and sharply higher prices can provoke social unrest and their political future may get jeopardised.

4.6. Clarity of Roles

Another issue highlighted by Jacob (2004) and Stern and Holder (1999) with reference to efficient regulatory mechanism is the clarity in the mission and roles of the regulator. In the case of Asian regulators Jacob (2004) observed many conflicting public policy missions. Government intervention and market competition go along together and are emphasised equally (so is in Pakistan). Another related issue (as discussed above) is the relevant expertise of the regulatory staff to define regulatory missions clearly and carry out the functions effectively. In the developing countries (including Pakistan) it is really difficult to find skills to staff regulatory institutions, to run new companies, and to provide for a policy capacity in the relevant ministries [Stern (2000)]. NEPRA has also realised the shortage of professional staff in the market with expertise in utility regulation.

In Pakistan like in many other Asian countries too many government entities are involved in the whole process of regulation [Appendix B (Table 1)]. Institutional simplification can improve the effectiveness of independent regulators [Jacobs (2004)].

4.7. Delays in Process

One more institutional weakness in the regulatory framework is the delay in the regulatory processes. It is found that the cumbersome bureaucratic procedure and lack of administrative efficiency cause enormous delays in the case of Pakistan. Having multiple agencies (as mentioned earlier) involved in the sector is also a certain recipe for delays as it becomes necessary to get overall commitment (or approval) to required changes. For example, delay in the transfer of responsibilities from the government to the power regulator means ministers and civil servants giving up responsibilities they have exercised for many years.²⁴ In the case of NEPRA activities, for instance, the authority is quite successful in the issuance of licenses, however the process is slow. Similarly, performance standards and codes for different segments in the power industry have been finalised to some extent but again it took quite a long time.

5. CONCLUSION

NEPRA was formed to protect consumer interests in the area of electricity provision, and to ensure an efficient and competitive environment for the electricity generators and distributors, but it has so far not been able to achieve anything. The power sector is still affected by institutional and organisational weaknesses. WAPDA and KESC are still the inefficient giants that they used to be as a result of a weak governance structure, with inefficient

²⁴Creation of PEPCO (as a separate company of WAPDA) was delayed as some senior staff in WAPDA have personal interests in the delay of restructuring.

and non-optimal tariffs, high line losses, and high level of corruption. 73 percent shares in KESC have been transferred to the private owner, but nothing significant has come out so far.

The tariff structure is not based on long run marginal cost but used as an instrument to achieve political objectives. There is no competition at the level of distribution. Unless all distribution companies are made responsible for their finances and allowed to function independently, it would not be possible to bring in efficiency in the power sector because inefficient DISCOs like Quetta, Hyderabad, Peshawar, Tribal areas and Multan are being subsidised by some profit making DISCOs like Lahore, Islamabad, Faisalabad and Gujranwala. The government is delaying the announcement of separate tariffs for all corporate distribution companies despite separate determinations made by NEPRA. The Government finds separate tariffs as being a politically difficult decision to implement (an example of political capture). They find it difficult to defend if the tariff in Islamabad and in other cities in Punjab remains at the current level but increases in Balochistan, Sindh and NWFP (where distribution companies are making losses). They also fear the negative impact of a power tariff increase on the overall growth momentum and on inflation. This is also delaying the process of corporatisation of WAPDA and the power sector reforms programme, as none of its companies could be privatised despite continued efforts unless the tariff issue is resolved. The Government on the other hand, is thinking of reducing the role of NEPRA in tariff setting, given the disagreement between NEPRA and PPIB on the tariff issues [Kiani (2006)].

Controlling state-owned enterprise is the most difficult challenge in Pakistan;²⁵ incomplete privatisation (or limited private participation), substantial state ownership and above all the same ministry interfering in regulatory matters that also oversee the performance of the state-owned enterprise. A regulator cannot resolve this conflict of roles, especially when so many government entities are involved in the regulatory process.

It is NEPRA and the government (as a facilitator) both who have to ensure that market conditions are met. The government still assumes many risks that should be borne by private firms.²⁶ These problems undermine any credible regulation of a competitive market, regardless of the regulators capacities. The main reason for the poor performance of the regulator is that the external environment of structural, policy and governance reforms remains extremely difficult. Structural problems such as market abuses and control of networks and essential facilities have damaged many liberalisation initiatives [Jacobs (2004)].

²⁵Not only in Pakistan, all post socialist countries with limited tradition of independent public institutions, limited regulatory experience and capacity.

²⁶For instance, the objective of IPPs is to make money. They are still enjoying too many concessions in Pakistan [Bari (2006)].

Weak administrative governance in NEPRA in the form of lack of autonomy has resulted in the overall institutional inability to carry out the desired functions effectively. In addition, may be NEPRA is not competent enough (in terms of professional expertise) to supervise and control the power sector and establish a rational and equitable pricing regime. Or there may be some deficiency in the overall regulatory structure as highlighted by Laffont (1996)²⁷ when infrastructure reforms were introduced in developing and transition economies, many of them had little experience to guide the design of regulatory mechanisms. Under pressure from multilateral institutions and international donors, many of these countries hastily adopted a regulatory model from the developed countries. These models were hardly modified to the political and institutional characteristics in these economies including lack of checks and balances, limited technical expertise, weak auditing, accounting and tax systems, and widespread corruption and regulatory capture. This is what seems to be happening in Pakistan.

But as Stern and Cubbin (2005), while concluding their survey of literature on the effectiveness of regulatory institutions, are of the view that regulatory institutions with good governance have the tendency to make fewer mistakes. In addition, they have the ability to identify mistakes and correct them quickly to establish a good regulatory practice. The secret of the spectacular success of Asian countries like Malaysia and South Korea and China also lies in good governance, with a proper system of checks and balances. Independent regulation in the true sense can play an important role in maximising the welfare of people and improvement in the efficiency of energy enterprises. Rigorous analysis and intellectual efforts can lead to a new paradigm of regulation and the rise of governance structures with reference to the local conditions of the developing countries [Pachauri (2001)].

In Pakistan, a regulatory agency with good governance is needed. All the governance attributes are interrelated and equally important. This is a necessary condition but not a sufficient condition for improving the overall performance of the sector. It should be accompanied by a well-designed industry and market structures. The power industry itself also needs an effective governance framework.

²⁷Cited from Jerome (2004).

APPENDIX A
REVIEW OF LITERATURE

Table A.1

Studies on Regulatory Experience

Authors	Methodology	Main Findings/Messages
Cook (1999)	Review of Case Studies from Developing Countries.	Limited government capacity to enforce regulatory rules. Encourage competition at a slow pace.
Jamas (2002)	Review of Case Studies from Developing Countries.	When designing reforms institutional capacity in the country and sector's systematic features should be taken in account. Redefined role of the state rather than a complete withdrawal from the sector.
Dubash (2005)	Review of institutional and governance structure of Regulatory bodies in India, Philippines, Thailand and Indonesia.	Governance Characteristics of regulatory agencies crucial for social policy concerns.
Estache and Romero (1999)	Used CGE to estimate the macroeconomic and distributional impact of privatisation and regulation of utilities in Argentina.	Beneficial impact of effective regulation of newly privatised utilities on all classes of society.
Zhang, <i>et al.</i> (2002)	Using panel data for 51 developing countries assessed the effects of privatisation, competition and regulation on the performance of electricity generation industry.	Effective role of competition in stimulating performance improvements, irrespective of changes in ownership or regulation.
Cubbin and Stern (2004)	Empirically assessed 28 developing countries for regulatory law and higher quality regulatory governance association with electricity outcomes.	Regulatory law and higher quality governance positively and significantly affect per capita generation capacity levels. This impact will be for at least three and probably for ten years as experience develops and regulatory reputation grows.

Continued—

Table A.1—(Continued)

Pargal (2003)	Assesses the importance of the regulatory framework for private sector investment in infrastructure.	An increase in regulatory certainty and a decrease in the perceived risk of expropriation through the establishment of independent regulatory bodies is a critical determinant of the volume of private investment.
Jalilian, <i>et al.</i> (2003)	Explores the role of regulatory governance in effecting economic outcomes using an econometric model.	Strong link between regulatory quality and economic performance. Weakness in public policy is a contributing factor to the limited impact of reforms.
Stern (2000)	Survey of evidence from Latin America, Asia and Sub Saharan Africa in telecom and electricity industries.	Sustainability and success of the reform process depends on the establishment of effective and autonomous regulatory institutions. Educational infrastructure very important for regulatory agencies.
Tsaplin (2001)	Empirically tested the Ukrainian energy regulatory system for compliance with criteria of good regulation.	Significant deficiencies in the regulatory system. Reasons being incomplete and improper specification of legislative framework of the regulatory bodies; and lack of coordination between the development of constitution, administrative and regulatory reform.
Aryeetey and Ahene (2005)	Case study of three public utilities (water, electricity and telecommunication) in Ghana.	Lack of regulatory experts; non-cooperation by some key industry actors; and lack of sufficient funding hampered the regulatory reform process.
Steiner (2000)	Empirically evaluates the impact of liberalisation and privatisation on the performance of generation in the electricity supply industry in OECD.	Significant impact of unbundling of generation, private ownership, expanded access to transmission networks, and the introduction of electricity markets on the performance measures.

Continued—

Table A.1—(Continued)

Rao (2002)	Case Study of electricity regulation in India.	Regulators have inadequate and inaccurate technical and financial information. Government is supporting utilities. Regulators and their staff tend to be people drawn from government service thus lack fresh thinking or independence from government practices. Delays in implementation of much needed changes.
Kennedy (2003)	Survey of regulations in the power sector of transition economies. Focus on two dimensions of regulations: governance and content.	Progress in regulatory reform. Regulatory independence, however, is limited. Regulatory rules are loosely specified, providing scope for political influence in tariff. In some cases well-written rules are not implemented in practice. When importing tariff mechanism from West these should be adapted to reflect the specific characteristics of transition economies.
Thomas (2001)	Reviewed the theory and practice in the British electricity industry since its reform in 1990. Key element in the UK reform process was the introduction of incentive regulation or RPI-X.	Regulatory interventions have been found necessary to prevent the abuse of market power. Ideal industry structure with separate sets of companies operating in the four component parts of the industry has partially been achieved. The generation market in UK is competitive accompanied with transformed market mechanism, but it remains to be seen whether this will be sufficient to make generation truly competitive.

APPENDIX B
GOVERNMENT AGENCIES IN THE POWER SECTOR

Table B.1

Government Agencies and Their Responsibilities

Responsibilities	
Ministry of Water and Power PPIB	Take care of the sector's affairs and manage issues of energy policy. To facilitate private investors in the power sector; provide guarantees on behalf of government; assists the regulatory authority in determining and approving tariffs; and also an implementing agency for power policy.
NEPRA AEDB	To ensure fair competition and consumer protection. To promote the exploitation of alternative energy resources such as small scale hydro plants, wind power and off grid generation plants.
Privatisation Commission	Deals with privatisation issues.

APPENDIX C
POWER SECTOR PERFORMANCE IN PAKISTAN

Table C.1

Growth (1990-91 to 2004-05)

Installed Capacity	5.4%
Generation Capacity	5.1%
Consumption	4.5%

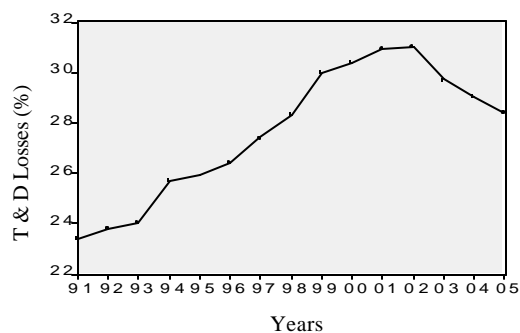
Although the growth in consumption is low as compared to its growth during the 1970s and 1980s (over 9 percent),²⁸ the state of per capita electricity consumption is even worse (grew at the rate of only 2.4 percent in this period). Per capita electricity consumption in Pakistan is extremely low as compared to other developing countries.²⁹ Almost half of the population remains without access to electricity services. In 2004-05, consumption pattern by category is: **domestic consumers (43.6 percent), commercial (6.5 percent), industrial (32.5 percent), agriculture (11 percent), public lighting (0.5 percent), and bulk supply and others (5.9 percent).**

²⁸Slow growth in consumption reflects T& D (transmission and distribution) losses.

²⁹In 2000-02, per capita consumption in Malaysia and Thailand were 2693 and 1589 respectively, while for Pakistan it was 344.

Safe and reliable transmission and distribution of electricity remains a major problem in Pakistan. The situation of huge power losses (from transmission and distribution networks and auxiliaries consumption) over the years has hardly improved. It was 23.4 percent of units generated in 1990-91, and then peaked in 1999-2000 at 30.4 percent, and is at 28.4 percent in 2004-05³⁰ (Figure 1).

Fig. 1. Transmission and Distribution (T & D) Losses³¹



These are exceptionally high compared to other Asian countries.³² These losses are also argued to be due to unreliable and old-age generation plants, low-voltage transmission and distribution lines, weak grid infrastructure as well as its inappropriate location, some commercial factors such as inaccurate metering and billing, default payments, un-metered supplies, and theft from illegal connections [AEDB (2005) and Ghafoor and Weiss (1999)]. All the commercial factors are basically due to a weak governance structure in the power sector [Shah (2002)].

Table C.2

Liabilities on the Federal Budget (Rs in Billion)³³

	2003-04	2004-05	2005-06
WAPDA's Subsidy	15.6	26.56	33.21
WAPDA's Non-recovery of Loans	21.0	21.61	6.40
WAPDA's New Loans	2.6	3.60	3.60
KESC's Equity	–	9.20	0.39
KESC's Subsidy against an Adjustment of Additional Surcharge against GST	1.5	2.20	2.66
KESC's Subsidy	9.6	6.48	9.0

³⁰Data is not consistent in different government sources, an example of information asymmetry.

³¹Source: CEE Report (2004-05)

³²In 2001-02, T&D losses of WAPDA were at 23.6 percent and KESC at 41 percent compared to 10-12 percent in Malaysia, Thailand and Indonesia.

³³Source: Pakistan Economic Survey 2005-06.

On the financial side, the sector is facing a series of problems over the last 15 years. WAPDA and KESC have been the largest drain on the budget in the form of subsidies or non-payment of loans, etc. (see Table 2). WAPDA is a significantly large company as compared to KESC, but in terms of performance it is relatively better. It has made financial losses in a number of recent years, but never exceeded 11 percent of its revenue. Significant losses in 2004-05 are attributed to increasing fuel prices and unchanged tariffs. KESC, which used to make profits until 1994-95 is facing huge financial losses every year. In 2001-02 and 2003-04, losses were more than the 50 percent of total revenues [Parish (2006)]. The reasons are technical as well as commercial and are attributed to institutional and organisational weaknesses [Shah (2002)].

Box C.1. Risk in Cross Subsidy

The risk involved in a cross subsidy policy is that industrial (or commercial) consumers will seek power supplies from elsewhere as soon as they are able to do so to reduce their costs. Therefore, government has to decide a new subsidy policy to support small domestic and agricultural consumers [Parish (2006)].

Another issue is current tariff levels and structures involving significant cross subsidies, from industrial and commercial consumers to agricultural and small (under 50 kWh per month) domestic consumers. Although tariff increase for domestic and agriculture consumers exceeded that for the CPI (consumer price index), and other consumer categories in the period from 1991 to 2005, limited progress has been made in reducing cross-subsidies. The largest percentage increase in the revenue collected per kWh occurred in the agriculture sector, followed by the domestic sector. The revenues collected in these two sectors are still considerably lower than for other consumers, and less than one-half of those for commercial users. In this period from 1991 to 2005, the rate of power tariff increase outstripped inflation (for details Table 3 below).

While tariff charged to the domestic consumers is cross-subsidised from industrial and commercial consumers, the share of electricity sold to domestic consumers has increased from 31.6 percent in 1988-89 to 43.6 percent in 2004-05. This subsidised category has created an additional burden on the financial position of public utilities. The sector also receives overall subsidies in the form of both direct subsidies (to KESC) and the provision of free capital on which no return is expected (to both KESC and WAPDA) (as shown in Table 2). These will continue to be necessary so long as the tariff structure is not developed to cover costs.³⁴

³⁴Tariffs determined by NEPRA are not notified.

Table C.3

Nominal Tariff in Paisas per KWh

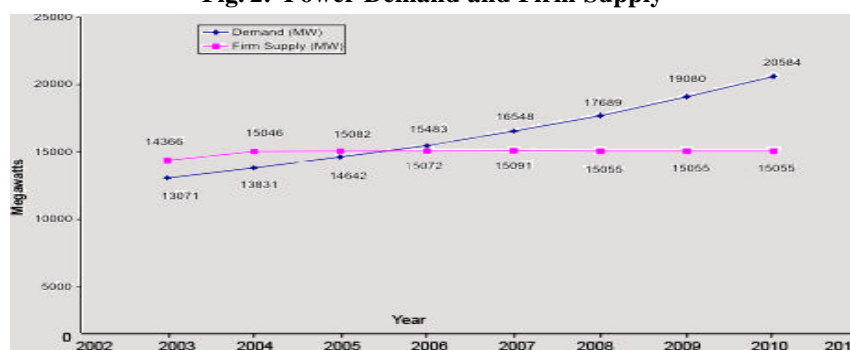
Consumer Category	1991	1996	2000	2005	Growth (%)
Domestic	63	136	233	319	11.4
Commercial	217	537	703	724	8.4
Industry	106	336	416	445	10.04
Bulk Supply	148	295	406	523	8.8
Agriculture	43	131	231	311	14.1
Average	115	287	398	393	8.5

Real Tariff in Paisas Adjusted for CPI, 2000 Base Year

Consumer Category	1991	1996	2000	2005	Growth (%)
CPI	45.5	77.8	100	128.5	7.2
Domestic	139	175	233	248	3.9
Commercial	477	690	703	563	1.1
Industry	233	432	416	346	2.7
Bulk Supply	325	379	406	407	1.5
Agriculture	95	168	231	242	6.4
Average	254	369	398	361	2.4

Source: Kojima (2006), Malhotra, *et al.* (1994), FESCO Report (2006) and *International Financial Statistics* (Various Issues).

WAPDA generates about 60 percent of the country's electricity, while KESC provides about 12 percent; the rest comes from IPP's and other sources. The losses of these companies are so huge that subsidising them each year is an enormous burden on the federal budget. There is a lot of resistance to privatising these companies. Given the lack of funds, supply is also lagging behind demand that is increasing at the rate of 7 percent per year, and the gap is going to increase in the years to come (Figure 2).

Fig. 2. Power Demand and Firm Supply³⁵

³⁵Source: Private Power and Infrastructure Board, www.ppib.gov.pk

The increase in the demand however, is an indication of the expansion in the Pakistan economy. Both demand projections as well as international experience have suggested that power demand is likely to grow faster than the economy in the years to come [Parish (2006)].

Growth in demand suggests that substantial investment will be needed to maintain continuity of supplies. Not only in generation, the most capital intensive segment in the sector, investments are also needed in the transmission and distribution sectors to overcome the huge losses the sector is suffering for the last couple of years. Providing adequate supply requires mobilising much more private investment. The quality of the regulatory environment is very important for the investor's confidence.

APPENDIX D

NEPRA MAIN FUNCTIONS AND RESPONSIBILITIES

It includes:

- Issuing of licensing for generation, transmission and distribution of electric power.
- Enforcement of quality standards and ensuring of safety in the operation and supply of electricity to consumers.
- Determine tariffs for generation, transmission and distribution of electric power.
- Approving the investment and power acquisition programmes of the utility companies.
- Setting fees for licenses and its renewal, fines for breaking the rules.
- Setting a uniform system of accounts for generation, transmission and distribution companies.
- Setting and reviewing the performance standards of all companies.
- Inform government about the activities of power companies.
- Encourage uniform industry standards and code of conduct for generation, transmission and distribution companies.
- Tender advice to public sector projects.
- Report to the federal government on all activities relating to generation, transmission and distribution.
- Perform any other function incidental or consequential of the above-mentioned responsibilities.

APPENDIX E

STANDARDS AND GUIDELINES FOR TARIFF DETERMINATIONS

According to Section 17, NEPRA Tariff Standards and Procedures Rules 1998, tariffs will be determined in accordance with the following standards:

- Tariffs should allow licensee the recovery of all costs. It may not require to assess the licensee where tariffs are set on other than cost of service basis, such as formula based tariffs that are designed to be in place for more than one year;
- Tariffs should generally be calculated by including a depreciation charge and rate of return on the capital investment of each licensee equal to that earned by other investments of comparable risk;
- Tariff should allow a rate of return which promotes continued reasonable investment in equipment and facilities for improved and efficient service;
- The mechanism of tariff should allow licensee a benefit as well as penalty in case of failure to provide the service and the quality of service;
- Tariffs should reflect marginal cost principles to the extent feasible, keeping in view the financial stability of the sector; the preference of the authority is for competition rather than regulation therefore, tariff policies should be directed towards that end;
- The tariff regime should clearly identify interclass and inter-region subsidies and provide such subsidies transparently if found essential, with a view to minimising if not eliminating them, keeping in view the need for an adequate transition period;
- Tariffs may be set below the level of cost of providing the service to consumers consuming electric power below the consumption levels determined for the purpose from time to time by the authority, as long as such tariffs are financially sustainable;
- Tariffs should reflect the full cost of service to consumers groups with similar service requirements;
- Tariffs should take into account government subsidies or the need for adjustment to finance rural electrification in accordance with the policies of the government;
- The application of the tariffs should allow reasonable transition periods for the adjustments of tariffs to meet the standards and other requirements including the performance standards, industry standards and the uniform codes of conduct;
- Tariffs should seek to provide stability and predict ability for customers; and
- Tariff should be comprehensible, free of misinterpretation and shall state explicitly each component.

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