



COMPETITION COMMISSION OF PAKISTAN

**THE ANALYSIS OF
COMPETITION AND
ECONOMIC
DEVELOPMENT IN THE
POWER SECTOR**

Date:



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FOREWORD

The power sector being an infrastructure industry plays a key role in an economy to achieve competitiveness. Pakistan, like most developing countries, is currently suffering a major power-crisis because of the demand and supply gap. The supply deficit of power interrupts the smooth running of industrial units. The country has been facing a serious power crisis since the end of the year 2007. Rising production costs of electricity, correspondingly hike up industrial manufacturing costs. The total installed capacity of electricity generation is 19,440 MW. PEPCO and Karachi Electric Supply Corporation (KESC) are the two main public sector organizations involved in power generation, transmission and distribution of electricity in Pakistan, while significant part in power generation is played by Independent Power Producers (IPPs). However, the present shortage of power makes it abundantly clear that concrete steps need to be taken to pull Pakistan's power sector out of its current state of decay. The development of a substantive nature of competition policy and competition law is a crucial first step in adequate regulation of the state of competition in the power sector. This research will contribute toward creating awareness regarding barriers to competition in the power sector, and will help chalk out strategies to improve social welfare through healthy competition and easy access to energy and power resources.

The underlying objectives of this Report are to assess the state of competition; to identify key players in the market and anti-competitive practices; to study the industry and general practices and to establish the link of all the activities, competitive or otherwise, all with respect to the economic growth and development of this sector in Pakistan. Therefore the methodology included studying published data available in the form of sector studies and statistics and also collection of data primary sources. For the purpose of the Report we conducted an overview of the present state of competition and assessed the conditions under which competition is functioning including entry requirements, licensing conditions and flexibility in the power sector.



Our aim is to ascertain the extent to which the current market structure in the power sector is likely to retard the growth of competitive markets and help economic and social development in the case of a developing economy such as ours. A thorough analysis was required before we could fully appreciate the current market structure of this sector and we looked at the policy initiatives, laws and market forces from the historical perspective including regulatory authorities and their efficacy in the power sector in Pakistan. For the purpose of this Report it was relevant to delve into the types of electricity market structures and study the state of generation, transmission and distribution of electric power. This thorough study of the market was a prerequisite to forming any conclusions about the existing under developed state of the power sector.

This Report is meant to serve as a basic reference document for identification of the state of competition in the energy sector and to be used as a milestone in future policy development and reforms by providing a framework of action for policy makers, foreign and local investors. The Report further examines the tension that exists between the application of sector-specific regulation such as rate-setting and licensing. In terms of capacity building and policy dialogue this project was designed to enhance the expertise and influence of national and regional consumer organizations and to increase networking and communication within the sector through training and informing stakeholders including consumers, manufacturers, distributors, retailers, NGOs, civil society organizations about competition policy and its importance in the development of this sector.



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CHAPTER 1: THE POWER SECTOR IN PAKISTAN

1.1 Introduction

Electricity is undoubtedly the key element in the growth of any economy. However, the energy sector, and particularly the electricity sector, are dominated traditionally by monopoly or near monopoly enterprises, typically owned or regulated by the government. This was true till the late eighties, when governments across the globe realized that better performance and management of this basic utility was imperative for the efficient functioning of the economy. Since then the nature of electricity industry is changing quite rapidly, with a widespread consensus to move towards competitive electricity markets.

1.2 The Power Sector in Pakistan and Policy Initiative

The power sector in Pakistan is undergoing a dramatic transformation; the vertically integrated market structure which had been dominating the scene only till recently, is now being exposed to the forces of market competition. The first major step towards introduction of a market structure in the power sector was adopted by the government through a strategic plan introduced in 1992. The salient features of the strategic plan were:

- Corporatization and privatization of Water and Power Development Authority (“WAPDA”) into separate generation and distribution companies.
- Develop the outline of a competitive, modern and dynamic power sector, which meets the needs of the consumers in the most affordable and efficient manner.
- Creation of an independent regulatory authority to provide a level playing field to all stake holders and to assure prospective investors that an



independent agency shall objectively decide on regulatory matters of the power sector without extraneous influence.

In line with the strategic plan, an independent regulatory body in the shape of National Electric Power Regulatory Authority (“NEPRA”) was created through a Presidential Ordinance in 1995 which was later ratified by the parliament in 1997.¹

1.3 The Infrastructure and Capacity of the Power Sector

The infrastructure and capacity of the power network of Pakistan comprises of generating stations of hydel, thermal (RFO), thermal (Gas), nuclear and coal power plants spread all across the country. Transmission lines of 500/220 kV form the transmission network. For the purpose of distribution of electricity, eight distribution companies (known as “DISCOs”) and Karachi Electric Supply Company (“KESC”) are the main providers of electricity to consumers.

Out of the total generation installed capacity of 19552MW in the country, the available capacity for dispatch for National Transmission and Dispatch Company Limited (“NTDC”) was around 13500MW, whereas for KESC, it is around 1300MW. The average maximum demand recorded on the system during the summer months of 2008 was 16500MW for NTDC and 2300MW (approx.) for KESC. This resulted in a total demand of 18800MW. In accordance with these statistics, the shortfall recorded in meeting the demand is around $18800 - 14800 = 4000$ MW.²

As per the available generation mix in Pakistan, sources of generation based on the fuel consumed are as follows:³

Type	Capacity	Percentage
<i>Hydel</i>	6550MW	33.5%
<i>Oil</i>	6900MW	35.3%
<i>Gas</i>	5600 MW	28.6%

¹ The Nepra Act XL of 1997

² Source: Daily log sheet CPPA

³ Source: Daily log sheet CPPA plus KESC Presentation



<i>Nuclear</i>	452MW	2.3%
<i>Coal</i>	50MW	0.25%
Total	19552MW	

However, the availability of generation capacity as per table 1 does not remain the same throughout the year. In fact, it is principally dependent on the availability of generation through hydel power and the seasons. During the peak hydel season, maximum hydel energy is available. In Pakistan this season generally lasts from June/July to October/November. Peak thermal season is in that time of the year when Hydel power is at its minimum that is from December/January to April/May and therefore maximum thermal plants are utilized to generate electricity. During these periods, the shortage of capacity amounting to 4000MW has been witnessed during the peak timings.

1.4 The Power Sector from a Historical Perspective

Electricity is a commodity capable of being bought and sold, however its inherent quality of being difficult to store does not leave any room for lapses in generation and distribution. At the time of its independence, Pakistan, like in any other sphere of public life, faced a dearth of power supply and the total installed capacity at the time was only 9.6 MW which was supplied through plants at Jabban in (NWFP) North West Frontier Province. The private electric supply catered to the partial needs of a few cities. However, with the creation of WAPDA in 1958, substantial addition of power plants in the public sector was achieved.

The structure of bodies that functioned to provide this basic service to the people of different social strata, of the newly created state, varied and from privately owned listed companies, such as the cosmopolitan city of Karachi, to the area electricity boards, a number of ownership models of electricity operators existed in the country.⁴

⁴ Another table by Mr. Salah-ud-din Rafai attached at Table II.



1.4.1 Laws Governing the Power Sector

The Electricity Act, 1910 (the “Electricity Act”) is amongst the legacy of laws which remain enforced in Pakistan after its independence in 1947. Progressively, the Central Government introduced a series of legislations on the subject. Noteworthy among these are the following:

- a) Punjab Electricity (Emergency Powers) Act, 1941
- b) Electricity Control Act, 1952 (Sindh)
- c) Water and Power Development Authority Act, 1958
- d) Electricity Control Ordinance, 1965
- e) Standing Power Rates Advisory Board Order, 1972
- f) Electricity Control Order (KESC), 1978

The basic reason for the introduction of above mentioned legislations was to fill in the legislative gaps of the Electricity Act of 1910. It was designed to address areas such as participation of Provincial Governments in fixation of rates for the sale of electricity, to control the ever-increasing consumption of electricity and for the creation of special bodies for the generation and distribution of electricity. Hence, Provincial Governments were empowered to assume possession and control of power supply companies and in case the supply of electricity to general public was disrupted an advisory board for recommending power rates and electricity tariffs was constituted among others. However, it is worth mentioning that special legislation in respect of electricity existed in every province or in different constituencies of the western unit of Pakistan even before 1971. Under the 1973 Constitution of Pakistan, electricity is placed on the concurrent list of legislation i.e. both the Federal Government and the Provincial Governments can legislate on the matter, with the caveat that federal law prevails only to the extent of inconsistency between the federal law and provincial laws.



Until 1995⁵, the operating law was the Electricity Act, which regulated provision of electric power services in the areas of generation, supply of power and its usage by consumers. In 1997 however, the Regulation of Generation, Transmission and Distribution of Electric Power Act of 1997 (“REPA”) replaced provisions relating to regulation of generation and supply. Moreover, the supply of electricity was also bifurcated between distribution and transmission.

1.4.2 Economic Conditions in the 90s

In order to trace the origin of the prevalent structure of the power sector, it is important to keep the economic conditions of Pakistan in the early nineties in the backdrop.⁶ The World Bank sponsored restructuring and privatization of the power sector, coupled with the introduction of private sector in the generation of electric power hitherto carried out by the public sector WAPDA in 1992⁷ and 1994⁸, also led to the birth of a national regulator for the sector, i.e. NEPRA.⁹ The experiment was not a novelty in itself, though it was first of its kind in Pakistan¹⁰. The decision makers decided to unbundle the vertically integrated WAPDA into generation, distribution and transmission companies, with a view to prepare them for privatization and as prospective players in a competitive power market. The role of a regulator was therefore of a pivotal nature, who could safeguard the interests of the stakeholders under the set rules, regulations and standards prescribed by the regulator.

⁵ The promulgation of Regulation of Generation, Transmission and Distribution of Electric Power Ordinance, 1995

⁶ The statistics show that the GDP of the country and the national budget was funding WAPDA in terms of subsidies to cater for uneconomic service to different classes of consumers, further no capacity addition was allowed to be conducted under WAPDA. A full section on the rise and fall of WAPDA is attached as Table III.

⁷ Plan for restructuring and privatization of WAPDA approved by the Government of Pakistan in 1992, also known as the Strategic Plan of the Government of Pakistan.

⁸ The 1994 Power Policy of the Government of Pakistan which invited a lot of criticism in respect of the manner of induction of private power in the Pakistan power system.

⁹<http://www.pakistan.gov.pk/cabinet-test/reg-autorities/nepra.jsp> indicates history of establishment of NEPRA as: “It was initially established under a 1995 Ordinance, which was periodically extended up to 1997 until an act was passed by the parliament called the Regulation of Generation, Transmission and Distribution of Electric Power Act XL of 1997”.

¹⁰Developments in this sector later led to the creation/reorientation of similar corporate, telecommunication, oil and gas, nuclear power usage, media and procurement sector regulatory authorities.



1.4.3 International Move Towards a Competitive Model

The introduction of the concept of privatization of electric power systems first took place in Chile in the early 1980s, which was generally perceived as successful in bringing rationality and transparency to power pricing¹¹, but it contemplated the continuing dominance of several large incumbents and suffered from the attendant structural problems.¹² Argentina improved on the Chilean model by imposing strict limits on market concentration and by improving the structure of payments to units held in reserve to assure system reliability. Similar to Pakistan, one of the principal purposes of the introducing free market concepts in Argentina was to privatize existing assets of generation companies which had fallen into disrepair under the government-owned monopoly, resulting in frequent service interruptions and to attract capital needed for rehabilitation of those assets and for system expansion.¹³

Further, the privatization of the United Kingdom Electricity Supply Industry in the 1990s catalysed the deregulation in several other Commonwealth countries, notably Australia and New Zealand. However, privatisation took place on a much smaller scale in these countries compared to the widespread privatisation that characterised the UK's move towards deregulation. Pakistan benefited from the experience of the UK by seeking aid from UK based consulting organisations while establishing NEPRA. Along with Pakistan, the main proponent of structural reform, the World Bank was active in introducing a variety of hybrid markets in other Latin American nations including Peru, Brazil and Colombia, during the 1990s, however with limited success.

¹¹ During the times when the government was planning to introduce power sector reforms, the Supreme Court of Pakistan handed down a landmark judgment on the subject of power pricing; the famous Gadoon Amzai Case – discussion in section 38 on pp. 711 of *1997 SCMR 641*.

¹² The vertically disintegrated entities carved out of WAPDA pose a similar challenge.

¹³ The power sector has been facing the problems to deal with a bulk of government bodies, political interference, and high tariffs where subsidies are imposed to keep the distribution companies in business. Similarly, the Pakistani experience of privatizing power assets in general and particularly the generation plants needs another lengthy exercise.



CHAPTER 2: RESTRUCTURING OF THE POWER SECTOR-INTRODUCING COMPETITION

2.1 Introducing Regulation

In this section we trace the existence of WAPDA as the body responsible for regulation, generation, transmission and distribution of power with all its inefficiencies and operational constraints. The initial plan was to keep the national regulator separate from government interference, which was a must in order to check for monopolist behaviour. The government was fully aware that such a request for regulation may also come about at the instance of a prospective private investor, hoping to set up its operations in the newly structured power sector.

Some of the common arguments in favour of the regulation are; the desire to control market power, facilitate competition, promote investment, system expansion and stabilization of markets. Similarly, the desire to regulate was recorded by the Supreme Court of Pakistan in the Gudoon Amazi Case; it was observed that the operator, when left to its own devices, would behave in a way that is contrary to the government's objectives. Additionally, at times governments used the state-provided utility services to pursue political agendas, as a source of cash flow for funding other government activities, or as a means of obtaining hard currency.¹⁴ These and other consequences of state provision of services often resulted in inefficiency and poor service quality. As a result, the Government of Pakistan pursued the solution of regulation and planned to provide these services on a commercial basis, often through private participation.

2.2 Legal Foundation of Electricity Regulation in Pakistan:

¹⁴ The imposition of T.V. License Fee and its recovery through electricity bills of the consumers and different development surcharges (federal revenue collection) and the electricity duty (provincial revenue collection) are specific examples of the practice.



The Constitution of Pakistan endorses the idea of regulation of trade, commerce and industry by prescribing qualifications, such as the regulation of any trade or profession by a licensing system, which is in the interest of free competition [Article 18 – Freedom of trade, business or profession]. Hence, under Article 18, freedom of trade, business or profession is guaranteed subject to such regulations as may be prescribed by law. The jurisprudence of Regulatory Laws in Pakistan is very much entrenched in the Constitution and is a flourishing field of law. The ever increasing advancement of human society in different sectors has expanded the role of law, from mere maintenance of law and order in the society to promote social and economic justice and aid smooth advancement of human civilization.

2.2.1 Gadoon Amazai Case

The history of electricity regulation in Pakistan would remain incomplete without referring to the landmark case of *M/s Gadoon Textile Mills vs. WAPDA* [1997 SCMR 641]. In August, the Supreme Court of Pakistan, while deciding constitutional issues that arose with respect to powers of WAPDA to fix rates and charges and levy surcharges upon its consumers, underscored the importance of a regulator who could take notice of public interest while fixing electricity rates. This judgement is particularly important in view of the constitutional scheme applicable for handling matters related to electricity in the country. After providing an exhaustive analysis of the right of provinces to generate and transmit electricity, WAPDA as functioning at that time under the Federal Government was allowed to charge tariff as per the provisions of the WAPDA Act though it was desired that the process should ideally involve public while determining such rates. The regulatory scheme envisaged service providers to be permitted to charge prices, which would ensure recovery of their full costs, guarantee reasonable rates of return and a reduced risk of stalling long-term competition. For example, an electric utility may be allowed to sell electricity at a price that will give it a 12% return on its capital investment. If not constrained by the



regulator, the company would likely charge a far higher price and earn an abnormal profit on its capital.¹⁵

2.3 Restructuring of WAPDA

Over time the electricity sector in Pakistan has undergone substantial changes. Previously, WAPDA was vertically integrated and provided retail and wholesale service, subject to no competitive pressures, with exclusive retail service territory that was established by the state. This structure did not allow for customer self generation, ‘fringe area’ competition and franchise competition. As a result, electricity generation, transmission, physical distribution and sales were the responsibility of one corporation.

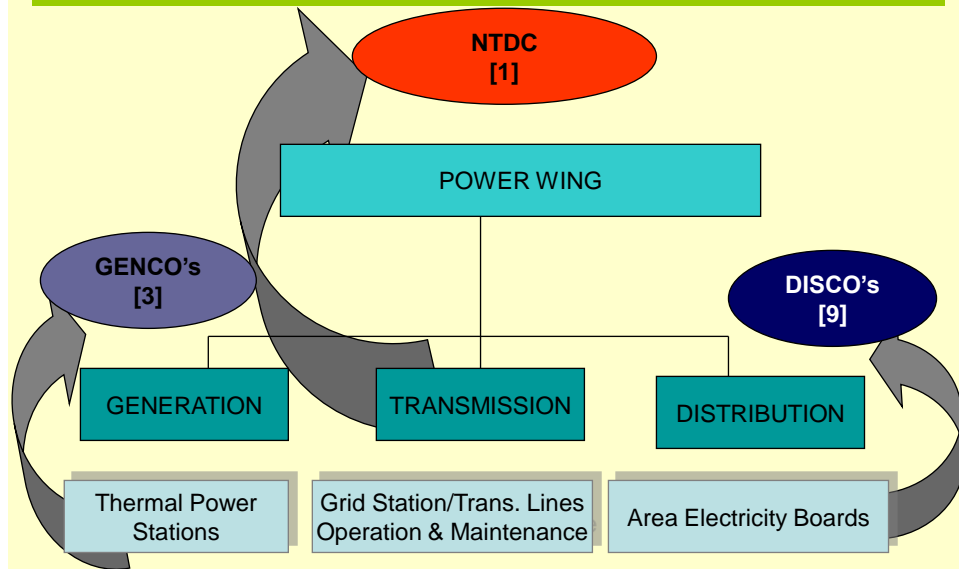
However, under the 1995 Power Policy WAPDA was vertically and horizontally unbundled. The vertical unbundling entailed the separation of generation, transmission and distribution functions, while the horizontal unbundling resulted in eight distribution companies, a National Transmission and Dispatch Company (NTDC) and state owned generation companies meant for privatization at a later stage. Despite this restructuring, WAPDA continues to have monopoly over retail service subject to some competitive pressures. Exclusive retail service territories for each of the distribution companies have been established by the regulator. As a result, large retail customers are permitted to self-generate, there is some "fringe area" and franchise competition and wholesale customers located within the service territory: not captive; can shop for electricity by buying access to the host utility's transmission system. The thermal assets of WAPDA are distributed among three generation companies. The hydel generating units and dams left behind were the residuary functions of WAPDA. Two other important functions of WAPDA, i.e. taking care of transmission and despatch of power, were left with NTDC.

Figure 1: Wapda’s Restructuring

¹⁵ The Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997(REPA) outlays a licensing regime for all generation, transmission and distribution companies and inter alia takes care of the tariffs, investments, performance issues of its licensees. Further details are under the individual sections on Generation, Transmission and Distribution.



WAPDA's RESTRUCTURING





CHAPTER 3: DEVELOPMENTS INTRODUCED BY NEPRA

3.1 NEPRA

Of the regulatory techniques employed worldwide, NEPRA, in view of its mandate under the REPA, has developed the following:-

3.1.1 Patronizing Generation Companies for Capacity Addition

Under REPA, NEPRA has been declared as the exclusive regulator for the provision of electric power services¹⁶ and, based on the same, is to award licence for generation of electric power. All decisions vis-à-vis location of plants, technology, tariff etc. is to be decided by NEPRA.¹⁷ Unfortunately, this function of NEPRA runs counter to the successive policy initiatives taken up by the Government of Pakistan under its Power Policies for setting up generation plants by IPPs.¹⁸ After restructuring, the lost harmony of WAPDA's different constituent operations¹⁹ was envisaged to be regained under this technique and specific Power Procurement (Standards and Procedure) Regulations, 2005 were also issued by NEPRA for guidance of all stakeholders. In addition, NTDC being the only transporter of electric power within the country (except for the franchised area of KESC) was mandated through its

¹⁶ Taken from Section 7(1) of the REPA.

¹⁷ Rule 3(5) of the NEPRA Licensing (Generation) Rules, 2000.1q

¹⁸ The role of the GOP after putting in place an exclusive regulator for the power sector had to be reviewed and retreat in areas relegated to statutory exercise of powers by NEPRA; instead what followed was blatant encroachment of the executive upon powers of the regulator contrary to the provisions of Section 7(6) of the REPA. Under this provision of the Act, the regulator was obligated to observe only such policy guidelines of the GOP which did not conflict with the REPA. Interestingly, there have been long drawn exchanges of correspondence between the regulator and the GOP over the interpretation of Section 7(6)., and finally in complete disregard of the legal principle that policy cannot override law, the executive succeeded to lay down its Guidelines for Determination of Tariff for Independent Power Producers in November 2005.

¹⁹ Apart from three main areas of operation of WAPDA i.e., Generation, Distribution and Transmission disintegrated under the Strategic Plan, its functions of system planning, siting of plants and system expansion in all three service areas of production and supply of electricity remained unattended for a long time and is one of the reasons of present day electricity shortages.



license to develop a least-cost generation expansion plan for capacity addition in the country.

3.1.2 Franchising and Outsourcing

All distribution companies (DISCOs) have been allotted a franchised area within which they may operate. Recently, proposals are under consideration by NEPRA for allowing bulk power purchasers (BPCs) within the franchised territory of a DISCO to undertake power supplies²⁰. Although competition within a natural monopoly market is costly, it is possible to set up competition *for* the market.

3.1.3 Common Carriage Competition

The basic consideration of electricity networks being assets, which are huge and uneconomical to be replicated, has led to the kind of approach where different firms compete to distribute goods and services via the same infrastructure - for instance, different electricity companies competing to provide services to customers over the same electricity network. The government intervened to break up the vertically integrated monopoly of WAPDA and the generation sector has been separated from distribution and transmission. Here, the key element is open access, i.e., the ability of any firm to have access to the network to supply its service, with the price the infrastructure owner is permitted to charge being regulated, also commonly known as the use of system charges developed by NEPRA.

Such a system may be considered a form of deregulation, but in fact it requires the regulator's creation of a new system of competition rather than simply removing the existing legal restrictions. The system may also require continuous fine tuning, for example, to prevent the development of long-term contracts from reducing the liquidity of the generation market too much, or to ensure that the correct incentives for long-term security of supply are present. This may be one of the reasons behind the current demand-supply gap in the power system. The possible alternatives for the

²⁰ Though it is another debate that REPA recognizes bulk power consumers only, who by definition purchase power for their own consumption and not for further sale.



introduction of a particular model are unclear; the costs of the market mechanisms itself are substantial and the required vertical de-integration introduces additional risks. It appears that NEPRA and the Government of Pakistan have been unable to visualize the inherent demands of the power system after its restructuring and the long term power contracts with the IPPs under Power Generation Policy, 2002 are a mismatch with the REPA. The Government of Pakistan perceivably kept its focus on the cost of financing new generation – which undeniably is a capital intensive industry- overlooking its own Strategic Plan²¹ which had embedded the seed of a competitive power market structure in Pakistan.

3.1.4 Corporatization

One regulatory response is the requirement of a service provider to be licensed under the REPA, which would have to be a company registered with the corporate sector regulator in the country i.e., Securities and Exchange Commission of Pakistan (“SECP”). This ensures that they are subject to certain structural transparency requirements, corporate governance and maintains the possibility of a takeover if the company is mismanaged.

3.1.5 Competitive Electricity Market in Pakistan

REPA, an agent of change for a multi-operators public-private electricity sector, shall move towards competitive operations entailing multiple generators contracting with BPCs and DISCOs for wholesale electricity competition, which may further take the shape of retail competition,²² though the draft transitional order of NEPRA does

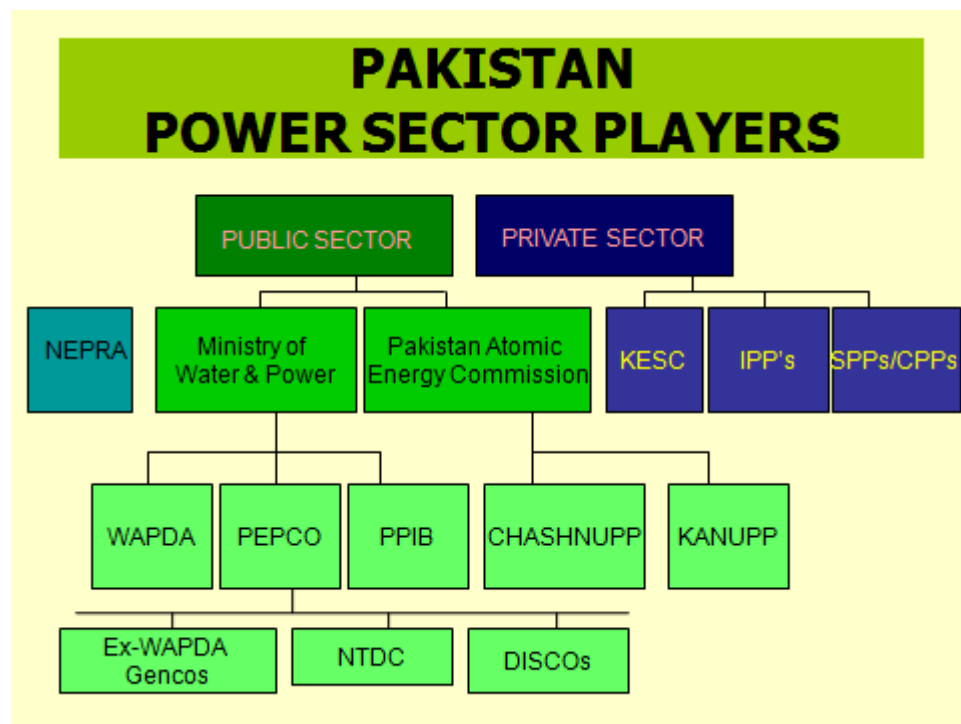
²¹ The Strategic Plan recommends corporatization and privatization of WAPDA into separate Generation and Distribution Companies, the creation of an Independent Regulatory Authority to provide a level playing field to all the stake holders and to assure prospective investors that an independent agency would be objectively deciding on regulatory matters of power sector without extraneous influence.

²² A retail electricity market exists when end-use customers can choose their supplier from competing electricity retailers; one term used in the United States for this type of consumer choice is 'energy choice'. A separate issue for electricity markets is whether or not consumers face real-time pricing (prices based on the variable wholesale price) or a price that is set in some other way, such as average annual costs. In many markets, consumers do not pay based on the real-time price; hence have no incentive to reduce demand at times of high (wholesale) prices or to shift their demand to other periods.



describe a competitive bilateral contract market. Work is underway on the development of market rules by all-in-one NTDC, which is to act under its different sections or agencies, as per the NTDC licence awarded by NEPRA in 2002, such as Contract Administrator, Registrar, System Operator and Network Operator. Under the Competitive Bilateral Contract Market, the single buyer of all power available in the system i.e., the Central Power Purchasing Agency (CPPA), also a limb of NTDC, would only purchase power from EX-WAPDA GENCOs, Hydel resources of WAPDA, IPPs having contracts with CPPA and nuclear.

Figure 2: Pakistan Power Sector Players



Demand response may use pricing mechanisms or technical solutions to reduce peak demand. NEPRA has introduced peak, off peak tariffs initially for industrial consumer's way back in 2001 and with the advancement of technology in metering gadgets, residential consumers have also now being encouraged to opt for peak and off peak billing demand under distribution companies tariffs for FY 08-⁹Generally, electricity retail reform follows from electricity wholesale reform. However, it is possible to have a single electricity generation company and still have retail competition. The Bilateral Competitive Trading Arrangement also had a phased operation from single buyer (CPPA only) to single buyer plus (CPPA, BPCs and other DISCOs to have direct contract with generation companies, before the full fledge operation of the competitive mode.



Any new generation plant is free to find its own buyer, including BPCs. As mentioned earlier, the provision for purchase of power from IPPs was envisaged by NEPRA to cater for the long term power contracts under the 1995 Power Policy and contracts for a period of more than one year were discouraged under the NTDC licence. The role of NTDC, as embodied in the REPA and further conditioned in its licence, has transformed NTDC into a separate, distinct body responsible to operate and provide safe, reliable transmission and inter-connection services on a non-discriminatory basis.²³ The legal limitations, specialization and sensitivity of its services, as envisaged under the REPA, prohibit NTDC to enter into purchase and sale of electric power. Precisely for the same reason, the national grid company has been left in the public sector and disallowed to have any beneficial interest in a generation or distribution asset. All contracts of system players are to be registered with the Contracts Registrar. The system also provides for a settlement system, to be developed by the participants, to settle real time differences.

Competition in the Power Sector is, however, perceived as a policy matter, left open tentatively²⁴ as a responsibility of NEPRA. The draft transitional order and the NTDC Licence provide for the year 2012 as the Market Operation Date or such other date as announced by the Government of Pakistan. The existing generation licence of the generation companies also provides for participation of the IPPs into a competitive trading arrangement.²⁵ For instance, Section 7 of the Generation License of Gujranwala Energy Limited provides:

Article-7

Competitive Trading Arrangement

7.1 The Licensee shall participate in such measures as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement. The Licensee shall in good faith work towards implementation and operation of the aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority. Provided that, any such participation shall be subject to any contract

²³ Section 18 of the REPA outlines responsibilities of the National Grid Company.

²⁴ A tentative date of 2012 has been indicated under the Draft Transitional Order of NEPRA.

²⁵ Participation in the Competitive Trading Arrangement. Article 7 of Gujranwala Energy Limited



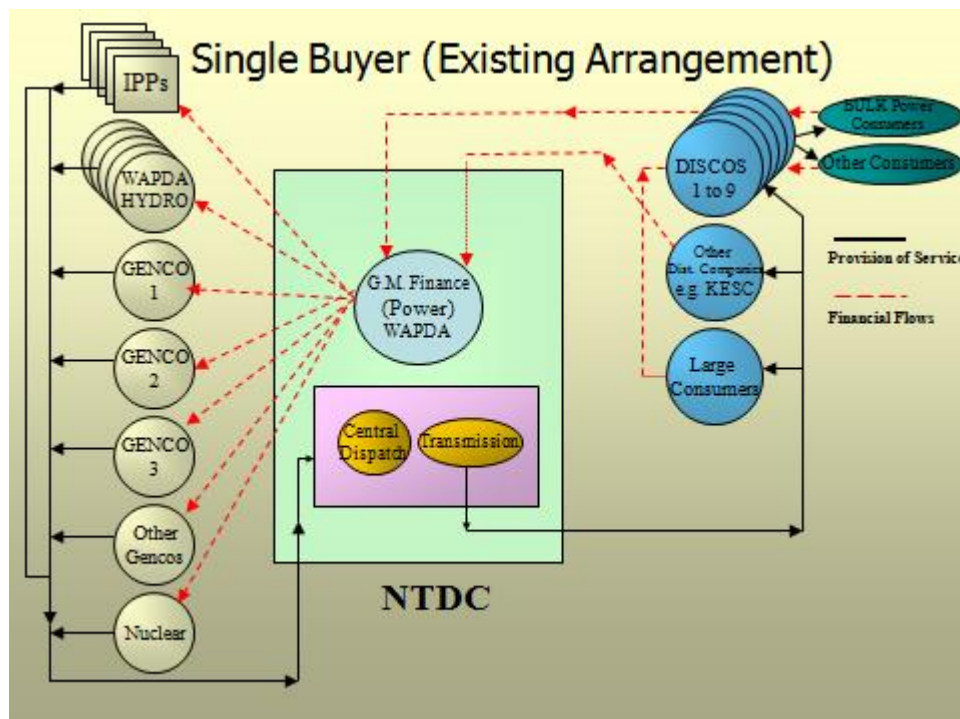
entered between the Licensee and another party with the approval of the Authority.

7.2 Any variation or modification in the above-mentioned contracts for allowing the parties thereto to participate wholly or partially in the Competitive Trading Arrangement shall be subject to mutual agreement of the parties thereto and such terms and conditions as may be approved by the Authority.

3.2 Trading Arrangements

Three types of trading arrangements can be identified namely; i) Single Buyer, ii) Single Buyer Plus Arrangement and iii) the Bilateral Contract Model. Each of these are discussed below:

Figure 3: Single Buyer (Existing Arrangement)

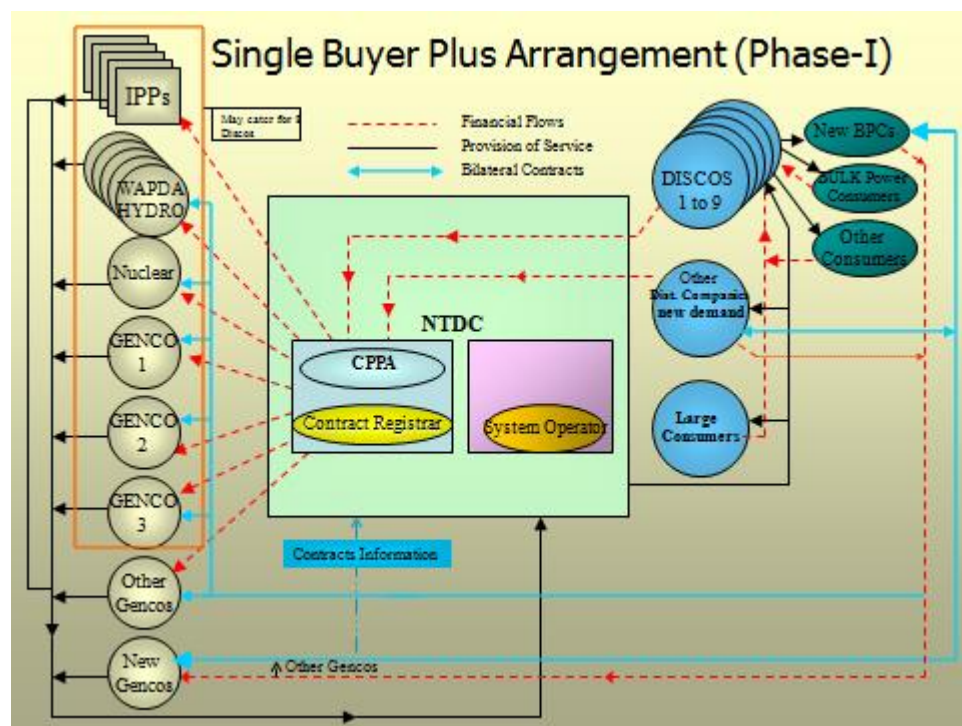


3.2.1 Single Buyer (Existing Arrangement)



As per the above arrangement, which to a larger extent continues till date, NTDC is the single buyer of capacity and energy, which is made available for dispatch at transmission voltage. It also works as the pooling and settlement agency for all contracts with all agencies. In this arrangement, NTDC through the central dispatch and transmission operator, ensures continuous flow of power, whereas the financial flows are dealt with by General Manager (Finance Power) of WAPDA/PEPCO.

Figure 4: Single Buyer Plus Arrangement



3.2.2 Single Buyer Plus Arrangement

During the Single Buyer Plus arrangement, new Bulk Power Consumers (BPCs) are allowed to have bilateral contracts between them and a generating company and NTDC's role under such an arrangement will only be to provide open access for dispatch of capacity and energy. Under this arrangement, existing Gencos, new Gencos etc. are allowed to have bilateral contracts with new BPCs and also with Discos for their excess capacities.



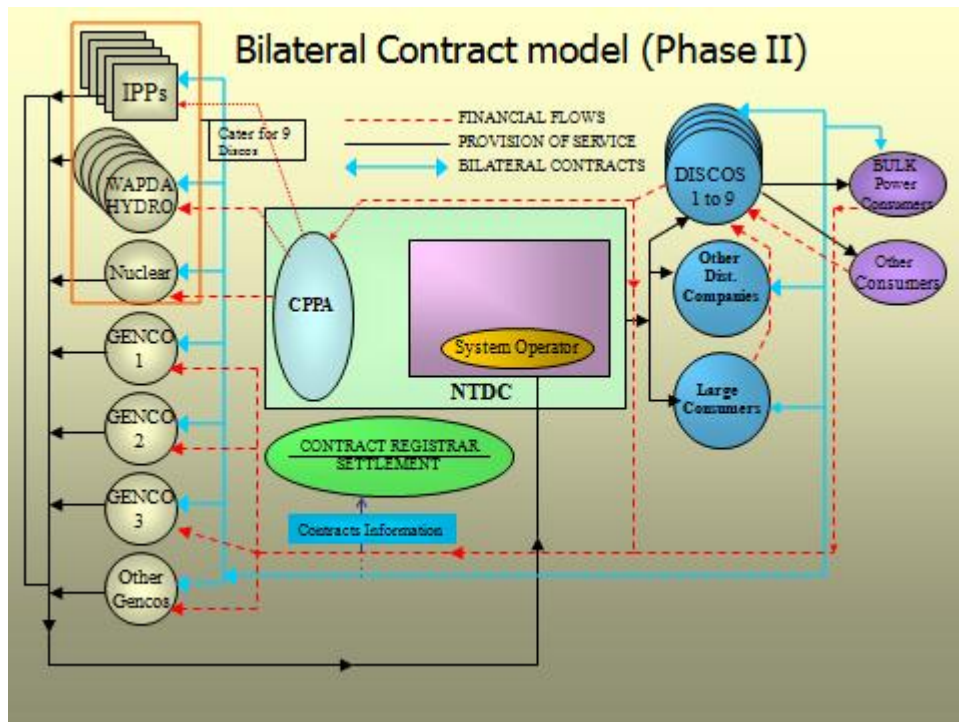
The scope of each electricity market consisting of the transmission grid or network that is available to the bulk purchasers,²⁶ retailers and the ultimate consumers in any geographic area in the day-ahead market is, in principle, determined by matching

offers from generators to bids from consumers at each node, to develop a classic supply and demand equilibrium price, usually on an hourly and half (½) hourly intervals. The price is calculated separately for sub-regions in which the system operator's load flow model indicates that constraints will bind transmission imports.

Financial risk management is often a high priority for participants of a deregulated electricity market due to the substantial price and volume risks that the markets can exhibit. A consequence of the complexity of a wholesale electricity market can be extremely high price volatility at times of peak demand and supply shortages. The particular characteristics of this price risk are highly dependent on the physical fundamentals of the market, such as the mix of types of generation plant and relationship between demand and weather patterns. Price risk can be manifest by price "spikes" which are hard to predict and price "steps" when the underlying fuel or plant position changes for long periods. These are some of the underlying known fears coupled with the scarcity of available capacity to be subjected to competition, which has marred the power sector's progress towards a competitive power market.

Figure 5: Bilateral Contract Model

²⁶ The concept of bulk purchasers is provided under the REPA, as a consumer of 1 MW or above which threshold can be further modified by NEPRA. However, it needs to be modified to include bulk power sellers or wholesalers in view of the emergent need of the system, which is equally required for certain arrangements existing prior to the REPA, such as Model Town Cooperatives Housing Society, MES etc.



3.2.3 Bilateral Contract Model

For the Bilateral Contract Model to operate it is assumed that the market has developed to such an extent that it will be open to competition. However, it totally depends upon the competitive regime that will be developed to reach this stage.

Generally, literature on electricity markets suggests that these are characterized either as Supply Driven Markets or as Demand Driven Markets. For supply driven markets, the available capacity of generation is more than the demand. For demand driven markets, it's the other way round and the total demand on the system out-passes the available capacity. It is advisable that the entry point to a competitive mode should be at the time when at least the demand meets the supply. Alternately, competition should be introduced in such a way that it should be for that period of time within twenty-four hours, when there is excess capacity for trading and meeting the demand.

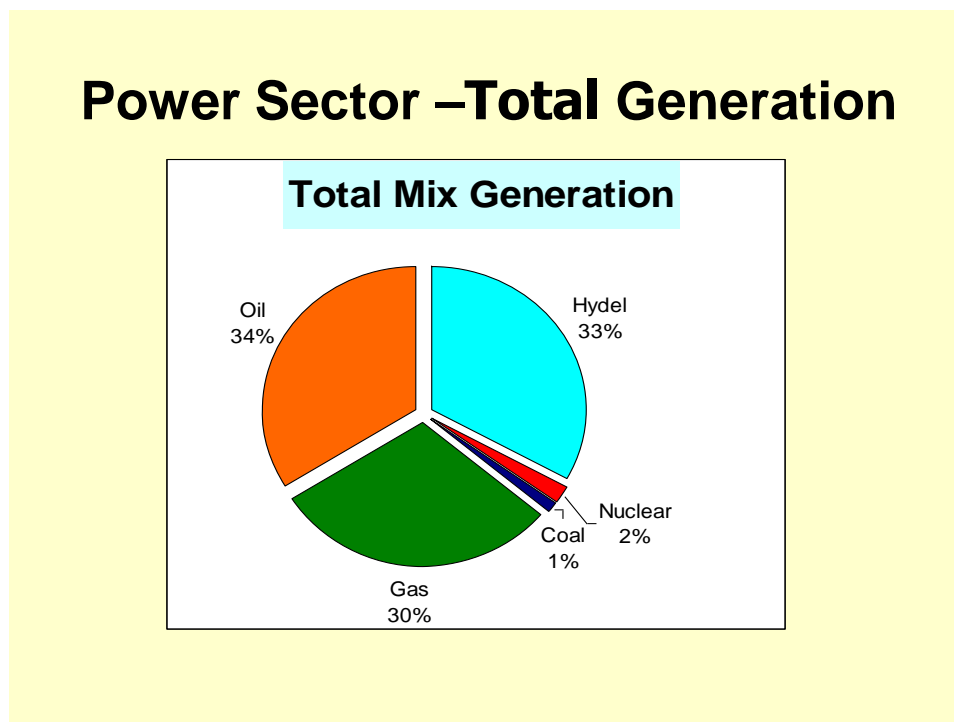


CHAPTER 4: STATE OF GENERATION, TRANSMISSION AND DISTRIBUTION OF ELECTRIC POWER

4.1 Generation & Impediments to Competition

The sources of electric power generation in Pakistan are primarily oil, hydel, gas nuclear and coal. The total contribution of each source varies over time. On average, the thermal (oil) contribution is at 34 percent followed by hydel at 33 percent, gas at 30 percent, nuclear at 2 percent and coal at 1 percent. Only a couple of years back, hydel used to contribute more than 50% of the total capacity into the system. However, due to increase in the addition of capacity through thermal power plants, the balance has shifted significantly towards thermal, which is mainly dependent upon furnace oil imported to run these plants.

Figure 6: Sources of Generation of Electric Power in Pakistan





4.1.2 Thermal Generation

As per the Government of Pakistan's policy, all thermal power generation has been restructured to form four public limited companies namely:

- a. Jamshoro Power Generation Company Limited (GENCO-1), with its head quarters at Jamshoro district Dadu near Hyderabad Sindh,
- b. Central Power Generation Company Limited (GENCO-2), with its head quarters at Guddu district Jacobabad Sindh,
- c. Northern Power Generation Company Limited (GENCO-3), with its head quarters at Muzaffargarh, and
- d. Lakhra Power Generation Company Limited (GENCO-IV) with its head quarters at Khanote (Sindh).

The structural formation of all four GENCOs is as follows:

JPCL (GENCO-1)	CPGCL (GENCO-2)	NPGL (GENCO-3)	LPGCL (GENCO-4)
TPS Jamshoro	TPS Guddu	TPS Muzaffargarh	FBC Lakhra
GTPS Kotri	TPS Quetta	NGPS Multan	
		GTPS Faisalabad	
		SPS Faisalabad	
		GTPS Shahdara	
		CGTM W/Shop F/Abad	

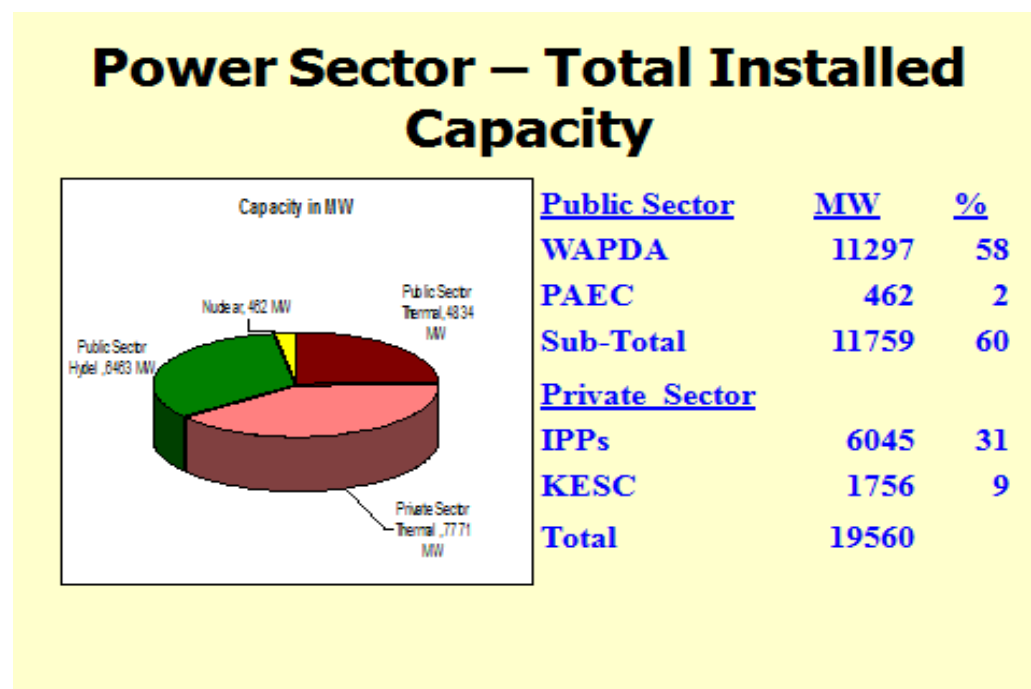
The current scenario presents public owned generation or GENCOs – 4 thermal, WAPDA Hydrel, public owned Nuclear and private IPPs producing electricity through RFO, Gas etc. All these companies have provisions in their licence to participate in measures for the introduction of a competitive trading arrangement. However, no actual steps have been undertaken in this regard. In the absence of any credible move on the part of the regulator or the government to develop a competitive power market



in the country, there are a number of issues that discourage bringing competition in the power market.

Electricity generation, being a highly capital intensive industry, is highly prone to risk. The thirteen (13) IPPs under the 1994 Power Policy of the GOP, with a total installed capacity of around 3000MW (excluding Hub power) executed long term contracts with WAPDA being managed by WPPO (WAPDA Power Privatization Organisation) in the wake of the unbundling.²⁷ All GENCOs, nuclear and hydel are also committed to CPPA (Central Power Purchasing Agency) to provide for the load demand of the DISCOs. Hence the scenario is that there is hardly any capacity left for a power market. The supply shortages or locked in generation leaves no space for competition to prove its attributes to the society in the shape of declining prices and enhanced service standards.

Figure 7: Power Sector- Total Installed Capacity



²⁷ List of IPPs under 1994 Power Policy



From the above, the total installed capacity, although is above 19000MW, yet on account of various reasons, the available capacity is couple of thousand MWs less. On an average, the available capacity is around 16000MW.

4.1.2.1 Issues with Tariff Determination

Leaving all that happened in past, the current capacity addition in the shape of setting up of new IPPs is equally devoid of any positive outlook for a competitive power market. With the regulation of power sector by NEPRA and a mandatory requirement of REPA to get tariff approved by the regulator, bulk of the consumer-end prices are decided in a manner which leaves a large margin for improvement. Unlike in most jurisdictions around the world, generation prices are determined by the regulator in Pakistan, whereas in other parts of the world they are left up to market conditions. The tariff so determined by the regulator for the new IPPs²⁸ provided for long term power purchase contracts with the CPPA, with majority of risks to have been borne by the purchaser. The tariff determinations for these IPPs accepted the prices quoted by the IPPs for various plants and equipments and allowed the same to be passed on to the consumers, with very little check upon the procurement practices of the IPPs. A classical example of the regulator's handicap, in approving tariffs due to information asymmetry, was the tariff for two rental power projects. These tariffs have been approved under GOP Power Policy of 2002 and other decisions of the Economic Coordination Committee (ECC) to determine rates through competitive bidding. Approval of tariffs under a Power Policy or ECC decision takes away the liberty and the core responsibility enjoined upon the regulatory body under its parent statute, particularly under circumstances where a policy or executive decision is in conflict with the law. Accordingly, the new generation IPPs are coming as a second edition of the 1994 IPPs, with no effort to move towards a competitive power market. The procurement practices of IPPs do not relate to the procurement of equipments only, rather they are of particular importance over the long life of the project in areas such as fuel, spare parts and land. `

²⁸ List of IPPs whose tariff has been determined under Power Policy 2002 as Annex-



Regarding approval of tariff on the basis of competitive bidding in Pakistan, there is no provision for approval of tariff of a generation company on the basis of competitive bidding and requisite amendments in REPA shall have to be made in this regard. Having said this, competitive biddings were conducted in the case of Japan Power, Kohinoor Energy, and Tapal Energy, which failed to be in conformity with any set standard, declared by a law governing the setting up of IPPs. All that we find is the policy of the GOP for Power Generation Projects, paragraph 16 thereof records that basis for the selection of successful bidder would be minimum levelized tariff through International Competitive Bidding (“ICB”). The criterion for holding an ICB is, however, missing. Further, the policy required NEPRA to provide forms to PPIB for tariff determination, which would then be made a part of the Request for Proposal (RFP). Tariff determinations by NEPRA were to follow after receipt of bids by PPIB. However, this procedure is not only alien to REPA but was never put to practice in cases where ICBs were conducted. Rather tariffs received in bids were straight away approved by ECC and a stamp of approval was sought from NEPRA, in order to get an *ex-post facto* tariff determination from NEPRA.

At table –II a comparison of NEPRA’s various tariff determinations in respect of generation projects is provided.

4.1.3 Hydel Generation

Commencing with 10.7 MW (9.6 MW - Malakand Power Station and 1.1 MW - Renala Power Station), after partition of the Indo-Pakistan Sub-Continent in 1947, Pakistan’s first water storage dam and power house was commissioned at Warsak. As a result, the country's Hydel capability increased to about 267 MW until 1963. The Irrigation System which existed at the time of partition was divided between the two countries, without any regard to irrigation boundaries, which resulted in an international water dispute that was finally resolved by signing of the Indus Water Treaty in 1960 under the aegis of the World Bank. The Treaty assigned three Eastern rivers (Ravi, Beas and Sutlej) to India and three Western rivers (Indus, Jhelum & Chenab) to Pakistan. It also provided construction of replacement works called Indus



Basin Projects (IBP) to compensate for perpetual loss of Eastern rivers' water. The works proposed under the Treaty included two multipurpose dams i.e., Mangla Dam on Jhelum river and Tarbela Dam on Indus river, having the ability to generate power. These dams were commissioned in 1967 and 1977 respectively. However, their capacities were subsequently increased over time.



4.1.3.1 Hydel Generation Capacity

The total capacity of thirteen Hydel Stations as of today is 6443.56 ~ 6444 MW, which is 37.10% of the total installed generation capacity of WAPDA. During 2007~2008, aggregate energy sharing during the year was 33.32% which later got reduced from 6463.16 MW to 6443.56 MW due to decommissioning of Jabban Hydel Power Station, after a fire incident in November, 2006. The big hydel projects, along with attention to other indigenous fuel based power generation like coal, is the only key to our current power shortages. Currently, work on the following major dams is underway apart from a few other dams in the private sector. In view of the above, it appears that the scope of competition most alive in the generation side of the business diminishes at the time of tariff determination and needs to be strengthened by affording more strength and credibility to the regulator in discharging its functions under REPA. However, realizing that generation contributes almost 65-70% of the



total tariff being charged to a consumer, one needs to take into account the issue of availability versus affordability.

Pakistan, being a developing country with a GNI per capita of around One thousand US Dollars (US\$1000/-) has to seriously consider the growth of the power sector of the country in a manner which makes the availability of the capacity also affordable. In the last couple of years, heavy investments have been made into fossil fuel based generation and also on Residuary Furnace Oil (RFO). In addition, the recent expansion in the generation capacity has been through the addition of engine based technologies. The combination of RFO with engine based technology (having less MW capacity per engine and installing a number of such plants to reach the capacity) is rather an expansive proposal; generally kept as peaking plants, i.e., to meet the peak demand. Currently, such plants are being planned to be used as base load plants or, in other words, “Must Run Plants”. NTDC, through its transmission license, was mandated to come up with the least cost generation expansion plan for the whole country. The principal constituents of this plan were the size, location, fuel and proximity to a load centre.

In addition, Pakistan has the advantage of having core resources such as hydel and coal readily available which are cost effective alternatives for power generation. Hence competition, keeping in view the affordability of the two fuels, can be most beneficial for the development and growth of Pakistan’s Power Sector on a long term basis.

4.1.3.2 Issues with Tariff Determination

Going through the various tariff petitions for companies involved in the business of determination of generation tariffs, it has been deduced that various categories have their specific requirements for determination of tariff.

The first group is of Reciprocating Engine projects. These came to NEPRA through the traditional route of tariff petition. The petitions were admitted, notices sent to stakeholders and published in newspapers, public hearings were held and finally



NEPRA issued its tariff determination. Of these, Attock, Nishat and Atlas power have already started operations, while Warda power project has been abandoned. After tariff determination, all of these projects came for review, except for Atlas. Later on, many of them also asked for some changes in tariff level due to “unforeseen” circumstances.

Then there were a couple of other companies, which accepted the Up-front tariff as determined for the technology under their use and thus they did not go through the lengthy process of tariff determination.

In the next group, companies came through competitive bidding via the fast track route, i.e. Japan Power, Kohinoor Energy and Tapal Energy. All these companies had existing plants and wanted to go for expansion. Their tariffs were approved by the ECC. NEPRA then stated that, as the tariffs had already been approved by ECC, therefore it would not determine these, but would rather approve on the basis of the ECC’s decision. As such, there is no such provision in the NEPRA Act or rules to approve tariff in this way and approval of tariff by ECC runs counter to Regulation of Electric Power Act 1997. But NEPRA, in the face of government pressure, pleaded that although tariff determination is the sole prerogative of NEPRA, but since it was competitive bidding and ECC had already approved it, therefore NEPRA is also approving it. Hence, NEPRA carefully avoided use of the term “determination” as it felt that this was not a tariff determination but rather tariff approval.

However, later on, all the aforementioned companies approached NEPRA for revisions in their tariff. NEPRA refused, saying that it had not determined this tariff but had simply reinforced ECC’s decision. Furthermore, all terms and conditions as well as assumptions in tariff determination were clearly mentioned in the bidding documents. Therefore, NEPRA directed these companies to approach ECC if they wanted any change in the tariff or its conditions as approved by the ECC.

These companies also tried to approach Ministry of Water and Power (“MoW&P” for this, but on its refusal two of the companies abandoned the projects while the third, Japan Power withdrew from the ECC approved tariff and submitted a fresh tariff



petition to NEPRA. The petition followed the normal procedure prescribed by NEPRA i.e., admission of petition, advertisement, public hearing, comments/interventions etc. Finally, NEPRA issued its tariff determination for Japan Power.

The next group of projects to be considered is; combined cycle technology projects, operating either on gas in either high British Thermal Units (BTU) or gas with low BTU. These also came through the traditional route of tariff petition and determination. Of these, the Savari Project has apparently been abandoned. The rest of the projects are under way.

Further, Orient Power, after start of its operations, had asked NEPRA that its tariff should be increased to cover the losses incurred by its equipment supplier due to variation in the dollar-euro exchange rates, even though there was no such provision in the EPC contract and the equipment had already been installed. This situation is under consideration by NEPRA.

The wind energy projects, also came through the normal tariff petition route. Wind Power had initially accepted upfront tariff but then abandoned it and took the petition route. Among these, only Zorlu Energy is partially operational till now.

Among the last group, i.e., hydel projects, SK hydro, Malakand III and Blue Star came through the route of petition and NEPRA issued its tariff determinations after due diligence.

Star-Patrand and Mira-Gulpur are Azad Jamu and Kashmir (“AJK”) projects and their tariff was approved by ECC. They came to NEPRA for formal approval. There was a question about NEPRA’s jurisdiction over AJK, therefore these were structured as CPPA’s power acquisition requests from these projects based on interim power procurement regulations. CPPA had requested for approval of negotiated tariff. NEPRA decided on these requests on the basis of a mechanism for tariff determination of Hydropower projects. Thus, NEPRA did not carry out detailed due diligence of cost and other project parameters at this stage. However, it did look at



and revise financial charges, debt servicing, cost of equity, indexations etc. The tariff thus calculated was called advance tariff as mentioned in NEPRA Generation Rules 2000.

Further, any tariff determined by NEPRA as well as those approved by ECC are not comparable, simply on the basis of the Rupee/Dollar amounts given in the tariff table. A tariff that appears to be lower may actually be based on assumptions different from those assumed in an apparently higher tariff. So, if uniform assumptions are used, the lower tariff may become higher or vice versa. Therefore, any tariff comparison is not possible until exactly the same assumptions, as well as fuel prices, are used.

4.2 Transmission and Dispatch

As per the nature of the business, electricity cannot be stored. Once generated, it has to be dispatched for consumption to households and businesses. For this purpose, the electricity may be generated at a location far away from the load centre. Transmission of electrical energy occurs through high powered transmission lines which traverse large distances from the generating stations to the load centres.

Generally, the generating voltage is low initially, it is then stepped up to high voltage, say from 615 volts to 500KV, through step up transformers and then transported to great distances. In this way, the power generated at Tarbela Dam can even be transported to Hyderabad for consumption. The advantage with high power transmission lines is that more capacity can be transported with minimum loss of energy.

The role of NTDC as the National Grid Company is very important in distribution, apart from the role that has been allocated to it under the transitional arrangement order; it is the network operator and the administrator of economic despatch of electricity. A strong and robust NTDC is also a guarantor of a successful bilateral contract market.



In Pakistan, there are transmission lines of various capacities, starting from 500KV as the maximum and 132KV being the minimum capacity of the transmission lines. Voltages below this level are generally classified as the distribution voltages. Pakistan's transmission system traverses from the North West to the South of the country, with all the generating stations pooling their capacities into this system through various transmission linkages.

The transmission business in the country was envisaged to develop into various stages of development as the power market progressed. These stages are

4.2.1 Single Buyer Stage

During this stage, NTDC being the only entity involved in the transmission and dispatch business is required to buy all power produced by GENCOs and then sells it to the DISCOs at an average pool rate generally known as the basket rate. Till the execution of this stage, NTDC will meet the demand requirements of the DISCOs.

4.2.2 Single Buyer Plus

This is the next stage in which DISCOs can contract through a bilateral agreement with GENCOs. Additionally, large BPCs also have the option to contract directly a bilateral arrangement with a generation company. NTDC, through its license, is mandated to provide open access to all such entities, subject to certain conditions of supply.

4.2.3 Open Market

This is the third and the final stage for the development of the power market, where the GENCOs will make their capacities available for dispatch depending upon the demand of the DISCOs, the capacities of the GENCOs would be traded in the market.

Pakistan is presently passing through the Single Buyer Plus stage, where some bilateral agreements have been signed between buyers and sellers. However, in order



to have true competition in the market, the third stage of open market needs to be developed. This may start on a limited scale, but is necessary for the eventual development competition.

4.3 Distribution

Within the electricity sector, the state of competition varies. The distribution business (wire business) is seen to have limited competition, owing to the fact that the business can only be run through a wire. On the other hand, there is potential for competition in the commercial sale for electricity by having a number of Bulk Power Suppliers, making their capacities available for sale and competing on various components of the tariff.

EX-WAPDA distribution companies (DISCOs) have exclusive service territories with the obligation to provide non-discriminatory services to consumers in their territories. The bulk-power consumers or the whole sale consumers have the right to choose their supplier. This excludes the provision for retail competition, but allows a bulk-power consumer to shop for the supplier of its choice. The regime under the REPA also facilitates competition by allowing the supplier and the bulk power consumer to mutually set their power tariffs.²⁹

Of all the three components of the electric power business, it is the distribution level at which the net effect becomes visible in the shape of efficiency, quality and economy of rates. Competition at the distribution level is not an easy task.

Across the globe different models have been introduced to develop a competitive market at the distribution level. Some of them are:

- Separating wire business from commercial operations;
- Running parallel distribution lines/ sharing of territories; and
- Allowing non-licensees to carry out distribution business in controlled areas.

²⁹ Rule 6 of the NEPRA Generation Rules, 2000.



4.4 Reforms Introduced by NEPRA

In order to bring in competition at the retail business level, the following reforms have been implemented by the NEPRA till date.

- Small Power Producers (SPPs), who were selling to their affiliates/non affiliates at the time of the grant of distribution license to DISCOs, have been given the option to apply for a distribution license or to hand over the distribution facility to the host DISCO.
- Bulk Power Consumers who were selling electricity at the time of the grant of License to DISCOs have also been excluded from the exclusive territory of the DISCOs. They have also been given the option to apply for a distribution license.
- Any new BPC can sign a contract with any generator. The intermediate utility will only claim the transportation charges.
- NEPRA has prescribed documents such as the Eligibility Criteria, Performance Standards and the Distribution Code, which set standards for performance. It is envisaged that with the privatization of the DISCOs competition will improve at the retail level.



CHAPTER 5: DEMAND OF ELECTRICITY AND LOAD SHEDDING – A CASE FOR THE INTRODUCTION OF COMPETITION

5.1 Introducing Competition

An adequate power supply is necessary to achieve sustainable economic growth. Presently, only 65-70% of the 162 million of the total population have access to electricity. The government has made it a priority to provide electrical access to the entire population. Electrical demand has outstripped supply of electricity in Pakistan. The country is currently facing power shortages of approximately 4000 – 3,000 MW. It is expected that the demand will exceed supply by about 6000 MW in the year 2010. The present electricity demand-supply gap, coupled with consistent growth in demand (6-7% per annum), indicates the fundamental need for enhancing the country's power generation capability.

The seasonal variations in hydel generation and consequent reduction in power output of storage type hydel projects in Pakistan influence the supply of electricity. Tarbela, with maximum head of 450 ft., experiences variation of 230 ft in water levels, while Mangla has 162 ft. variation against the maximum head of 360 ft.

The lean flow period of Tarbela reservoir is from November to June, when the reservoir's capability to produce reduces to as low as about 1350 MW against the maximum of 3692 MW during high flow period i.e., August to September. While the lean flow period of Mangla reservoir is observed from October to March, when the minimum generating capability is 500 MW. The capability rises to as high as 1150 MW during 'high head' period (15% permissible overloading). Accordingly, WAPDA's hydel generating capability swings between the two extremities of 2414 MW and 6746.0 MW over the cycle of a year.



The demand-supply gap in the power sector has badly affected our economy and the life of the common man. Despite the fact that the power sector is a highly regulated sector, the declining performance levels of related institutions call for an early introduction of a competitive market. In the absence of an atmosphere where DISCOs are free to contract to satisfy the load demand of their consumers, the CPPA or government sponsored procurements would always be less efficient and cost effective. If we examine the current efforts on the part of Private Power and Infrastructure Board (PPIB), under the GOP Policy for Power Generation Projects, 2002, approximately ten Independent Power Producers (“IPPs”) with a capacity of 2,200 MW have achieved a Financial Close status and initiated project construction after receiving tariff approval from NEPRA. These Independent Power Producers are sponsored by both local and foreign investors. The Power Policy is projected as an investor-friendly policy that offers an attractive set of fiscal and financial incentives to the private sector, claiming to provide a balanced risk profile for the investors, lenders, and government agencies.

Further, the Government of Pakistan guarantees that performance obligations are met by the power purchaser and the provinces. In addition it provides protection to sponsors and lenders should the project be terminated. Typically, a long-term tariff of twenty-five to thirty years is contracted with the power purchaser, which minimizes the IPP’s market risk in terms of output. The tariff is determined on the basis of fixed capacity payments, regardless of dispatch of power by the purchaser and variable energy payments based on the number of units dispatched and the prevalent fuel price. The projects are expected to earn a stable return on investment. All the terms and conditions are cast in the form of standardized and tested agreements – namely, the Implementation Agreement (IA), the Power Purchase Agreement (PPA), the Fuel Supply Agreement (FSA) - are known prior to final agreement, which provides for any variation in price of fuel to be passed on to the power purchaser, any additional taxation over and above the Tariff assumptions is likely to be passed on to the power purchaser, indexation for variation in the PKR and USD exchange rates and protection against any change in duties and taxes, and against specified “political risks”. This new generation of IPPs, though being commissioned after the



promulgation of REPA does not appear to appreciate the ongoing restructuring of the power sector, and another round of twenty-five to thirty year long term contracts would only delay the introduction of competition in the market for another two decades or so.

The whole argument behind the introduction of competition in the power sector is to break the monopolistic attitudes of service providers (i.e., the lack of incentives to gain efficiencies). Generating companies bound by long term supply contracts are compelled to enhance their performance and bring their costs down for the betterment of end-consumers. All their fixed costs are met with through their guaranteed capacity payments and as a result are insulated from rising fuel prices. Despite the fact that there is available capacity, the IPPs are not dispatched and the demand-supply gap is further widened due to the inability of the GOP to pay fuel costs.

The stop-gap arrangement of contracting with Rental power plants (RPPs) of the aggregate volume of 1218 MW at exorbitant rates is equally damaging for the already cash-starved sector, which is unable to pay for the fuel bills of the plants in operation. The question of affordability is therefore not only from the perspective of end-consumers rather it is very much linked to overall handling of such large induction of RPPs by the power system as a whole and the allied infrastructure, such as import of fuel, transportation etc.³⁰ Further, the contractual terms of the RPPs are such that monthly rentals, like capacity payments have to be paid regardless of the fact that these plants are being dispatched or not. Hence the much criticized RPPs have proven to be another lethal blow to an ailing sector.

Large centralized generators have been the primary method thus far. Recently, DISCOs have employed the method of buying energy from captive units.³¹ Such initiatives need to be encouraged and should be asked to purchase bulk of such power supplies on energy basis.³²

³⁰ Table of induction of new IPPs and rentals at Annex -

³¹ Pl. Cite certain examples

³² Wind Energy Plants have also take and pay on energy only contracts.



5.2 Licensing and Performance Evaluation

All the three areas of services under the REPA are regulated through respective licences issued there under.³³ Separate licensing rules were prescribed by NEPRA to provide for the terms and conditions of the licence. Salient features of the licences include the term of the licence, charging of tariff after NEPRA's approval, separate accounts in respect of other business activities, compliance with NEPRA codes of performance and operation.³⁴

NEPRA conducts the performance evaluation of its licensees through various monitoring standards and periodic reviews. They are categorized as follows:-

- i) Performance Standards Distribution Rules, 2005, whereby all DISCOs are required to compile their performance data against performance indicators, prescribed by NEPRA, such as time taken to provide a connection or the time taken to restore electricity after attending a fault etc.
- ii) Similar Performance Standards for Generation and Transmission have been put in place under which NEPRA can check the performance of generation and transmission service providers.
- iii) A Uniform System of Accounting has been prescribed by NEPRA to get a detailed report on the accounts of electric power service providers, in order to evaluate the financial management and stability of its licensees.
- iv) Costs of its licensees are approved by NEPRA at the time of grant of the respective licences.

From the above, it becomes clear that REPA under NEPRA has a broad scope for the enforcement of performance based regulation of its licensees. The performance evaluation of its licensees under different rules and codes by NEPRA is a classical

³³ Section 15 of the REPA provides for the award of a generation license, section 20 for distribution license and section 18 for transmission license.

³⁴ NEPRA Tariff (Standards and Procedure) Rules, 1998. One year later, NEPRA Licensing (Application & Modification) Regulations and NEPRA Licensing (Distribution) Rules were notified in 1999. This was followed by NEPRA Licensing (Generation) Rules, 2000. NEPRA Fees and Fines Rules, each were notified in 2002. NEPRA Uniform System of Accounts and Performance Standards Rules each for distribution, transmission and generation have also been devised by NEPRA.



example of *ex-ante* form of regulation, having tremendous role in fostering healthy competition in the sector.

5.3 Balancing between Consumers and Producers of Electric Power

One of the crucial roles of the regulator is balancing the interests of the producers and consumers of electric power. However, The 1994 and 2002 Power Policy emphasised on power generation as an attractive area of foreign direct investment rather than emphasizing real consumer interest. However, the REPA envisages that balanced decisions should undertaken by the regulator.³⁵ Accordingly, Section 2(iv) of the REPA provides a specific definition of a consumer as a person who purchases or receives electric power for consumption. Under section 39(1), ‘any interested person’ may submit a complaint, which may include an ordinary consumer. The same theme prevails under the Tariff Rules, 1998 whereby consumers have the right to file interventions before the regulator at the time of tariff determinations and participate in public hearings. Despite this, the participation of consumers is minimal, and when it does occur, due to the lack of publicly available information and the complexities associated with the electric power business, it is futile. Further, as NEPRA is solely responsible for decision making in terms of setting of tariffs and grant of licence, the scheme envisaged in REPA could not prove of much assistance to the consumers practically.³⁶

³⁵ It is a dismal fact that the few good law books which have an index do not contain an entry under the category of ‘consumer’, which is indicative of the absence of the consumer point of view from mainstream legal thinking, writing and law-making. As the consumer movement organizes and asserts itself there will then be an increased awareness and an effective incorporation of the consumer point of view. For the moment, however imperfect the present legislation, it is reassuring that a start has been made with consumer legislation and the incorporation of the consumer as an important stakeholder. An example is NEPRA, wherein the consumer is recognized as an affected party and therefore having a legitimate interest in the process of fixing the electricity tariff. Consumer Laws in Pakistan by Mohammad Sarwar Khan and Abrar Hafeez, pp. 6

³⁶ Section 7(6) clearly identifies a balancing role for NEPRA, as it states, ‘.....In performing its functions under the Act, NEPRA shall balance the interest of all stake holders including the service providers and the consumers of electric power.’ Please check the quote.?



However, strong and informed consumer interest groups in corporation with the regulator could arrive at worthier and balanced decisions. Hence, the formation of consumer bodies as watch-dogs to work for the development of a competitive power sector in the country is critical. The balancing act of the regulator is pivotal until competitive forces establish their grip in the market, which will ultimately lead to a self-regulated mechanism to check any abuses on part of the suppliers. However, even at that stage, supervision of the regulator is necessary to avert possible abuse by the service providers.

5.4 Competition and Non-discriminatory Treatment of Service Providers

While drawing a picture of the future power market, the regulator appears to have embarked upon a tough job of evaluating behaviours of its licensees. The restructuring of WAPDA has led to the emergence of state-owned generation (GENCOs) and distribution companies (DISCOs), who are in competition with the IPPs. Similarly, once the DISCOs are privatized, they too will have competition among themselves. KESC, though an integrated utility, has already been privatized.

It is important that the regulator operates independent of government influence and interventions. Regulation by way of ministerial decisions and Executive Order has the potential to compromise the Regulator's independence and introduce conflicts with the overarching policy approach regarding independent economic utility regulation.

One source of government influence over these bodies is the selection process for the personnel, including the members and chairman. In many countries, the selection process is neither properly defined nor transparent, thus leaving the system prone to be captured by people who may not function independently. There is also the issue of 'regulatory capture', where people with significant business interests or connections get into the regulatory bodies. Another source of government influence is that in many countries, government retains the power to issue policy directives to the regulatory bodies, a provision which is very often misused.



Further, a distinctive role is assigned to the regulator in the currently restructured and ever evolving power sector in Pakistan. In the following paragraphs, we underscore the importance of a regulator in light of the international regulatory best practices.

5.5 Independence of the Regulator — the Foremost Consideration in Judging its Effectiveness³⁷

Independence is subject to different interpretations used sometimes interchangeably with *autonomy*; independence for utility regulators may be considered as consisting of three elements:

- An arm's-length relationship with regulated firms, consumers, and other private interests.
- An arm's-length relationship with political authorities.
- The attributes of organizational autonomy—such as earmarked funding and exemption from restrictive civil service salary rules—necessary to foster the requisite expertise and to underpin those arm's-length relationships.

The special challenges posed by utility regulation, including the critical role of regulatory discretion, attach a high degree of importance to grant of independence to the regulators.

Utility regulation has three main aims:

- a. to protect consumers from abuse by firms with substantial market power,
- b. to support investment by protecting investors from arbitrary action by government, and
- c. To promote economic efficiency.

While there is growing recognition that competition can reduce the need for regulation in utility industries, most industries contain some areas of monopoly where the benefits of regulation potentially outweigh the costs.

³⁷ Warrick Smith, Public Policy for Private Sector, October 1997, World Bank



Regulating utilities is complicated by three related considerations. First, prices for utility services are usually political. There are no votes in raising utility prices, and history is replete with examples of justifiable price increases being withheld at the expense of investors and the long-term interests of consumers. Second, investors are aware of these pressures and of the vulnerability of their usually large, long-term and immobile investments. Unless a government has made a credible commitment to rules that ensure an opportunity to earn reasonable returns, private investment will not flow. Weak credibility will be reflected in higher capital costs and thus higher tariffs. In privatization, this translates into smaller proceeds from sales of existing enterprises and higher financing costs for new projects. Third, the long-term nature of most infrastructure investments makes creating credible commitments difficult. Highly specified rules, if considered sustainable, can provide assurance to investors and lower the cost of capital. But they make it difficult to adjust regulation to unforeseen developments, including changes in technology and market conditions. They also make it difficult to tailor responses to situations and to provide incentives for efficiency.

There is thus an important trade off between reducing the risk of expropriation, and with it the cost of capital, and retaining the flexibility to pursue efficiency and other objectives.

In quest for independence and creation of an independent agency, countries with a limited tradition of independent public institutions and limited regulatory experience and capacity have great challenges to surmount. The two main elements of independence insulation from improper influences and measures to foster the development and application of technical expertise support each other. This implies technical expertise can be a source of resistance to improper influences, and organizational autonomy helps in fostering and applying technical expertise. However, there has been consensus in respect of some of the formal safeguards required in the process such as:

- Provision of a distinct legal mandate, free of ministerial control to the regulator;
- Prescription of professional criteria for the appointment of regulators;



- Involving both the executive and the legislative branches in the appointment process;
- Appointing regulators for fixed terms and protecting them from arbitrary removal;
- Staggering terms so that they do not coincide with the election cycle, and, for a board or commission, staggering terms of the members;
- Exempting the agency from civil service salary rules that make it difficult to attract and retain well-qualified staff; and
- Providing the agency with a reliable source of funding, usually by imposing levies on regulated firms or consumers.

Formal safeguards of this kind are especially important in countries with a limited tradition of independent public institutions. However, these are not enough. Persons appointed to these positions must have personal qualities to resist improper pressures and inducements. They must exercise their authority with skill to win the respect of key stakeholders, enhance the legitimacy of their role and decisions, and build a constituency for their independence. Some argue that governance traditions in some countries make independence illusory—“If the Palace calls, the regulator will comply.” Certainly, adopting even the most sophisticated law will not magically transform the basic institutional environment. Nevertheless, for several reasons, creating such agencies is worth the effort, even in more challenging environments.

Performance of a regulator in Pakistan with the appointment of ex-civil servants as members of NEPRA has not been up to the mark and has been practically rendered to act as an attached department of the Ministry of Water and Power. The determination of tariffs, an important and the prime function of NEPRA under REPA, is fraught with legal inconsistencies and practices, like determination and endorsement of tariffs approved by the GOP, which is otherwise in the sole domain of NEPRA. The subject is further discussed in a following section on tariff determinations. NEPRA, despite having a strong and robust mandate under REPA, has been unable to gain strength and play its statutory role, being overshadowed by the GOP. All issues like induction



of expensive RPPs, revisions in tariffs or delay in their implementation show NEPRA as a superstructure only with no power to assert its expert role.

5.6 Tariff Determination

The determination of rate for generation of power, its transmission to the distribution companies and onward supply to end-consumers all fall under the mandate of NEPRA and no person undertaking any of these businesses of generation, transmission and distribution of electric power can fix rates for the respective services without the approval of NEPRA. Under section 31 of REPA, NEPRA, pursuant to its tariff rules, has to undertake a consultative process involving all stakeholders before arriving at a tariff determination. Determination of generation tariff takes care of the major portion of the consumer-end tariff and needs most attention. NEPRA Generation Rules, in expectation of the incoming competition, have also laid certain other provisions for determination of generation tariff, such as bilateral contracts between a generation company and a distribution company or transmission company according to their power acquisition programmes approved by NEPRA, advance tariff in respect of few components of tariff in case of hydel generation, where true cost estimates cannot be made at the beginning of the project due to their long gestation period. The determination of generation tariff under REPA can only be guided by policy guidelines of the GOP consistent with the law.³⁸ However, unfortunately, the GOP Power Generation Policy is more like an investment in power generation policy launched with the principal aim of attracting foreign investment in the sector. The significance of foreign investment is undeniable and essential for capital intensive projects such as thermal power plants and hydel generation. REPA, entrusting NEPRA with the task of exclusively regulating the sector, expects it to take care of the sector in each respect. Introduction of policies inconsistent with REPA has led the country to a situation where it is facing serious power shortages, which is expected to last for some time, and soaring prices of new power induction in the sector is affecting the consumer-end tariff.

³⁸ Section 7(6) of REPA.



The situation is in real chaos at the decision making level, as far as the induction of new power is concerned, and instances of politically motivated contracts, vested interests of the suppliers and sponsors of power plants are legitimate fears of the consumers having no recourse and left with the option to buy expensive power, if available. In contrast, the system envisaged under the REPA accords a pivotal position to NEPRA. As an instance, it underscores the mandatory involvement of NEPRA as an advisor to all public sector projects for supply of power to the national grid.³⁹ Had there been an independent but accountable NEPRA, implementing performance requirements of its generation licensees, distribution licensees and the transmission licensee would ensure power acquisition programmes to be in place both for the NTDC and the DISCOs, and the current panic stricken power sector would have been a lot more better.

The fixation of tariff is a political subject and REPA therefore, recognized government's role in terms of its implementation after determination by NEPRA, subject to its notification through the GOP under its section 31. Hence, the power to determine tariff, apart from rates, charges and other terms and conditions for supply of electric power services by the generation, transmission and distribution companies for intimation to the Federal Government for notification as per section 7(3) (a) of the Act, also carried the liberty to approve the tariff, which was suitable in every term for a particular utility, in accordance with the NEPRA Tariff (Standards and Procedure) Rules, 1998 ("Tariff Rules").

In July 2009, the Government introduced amendments through the NEPRA Amendment Ordinance July 31, 2009. The Ordinance inserts a provision under sub-section (1) of Section 31 of the REPA stated below:

“Provided that the Authority shall on quarterly basis, determine overall electricity tariff and intimate the same to the Federal Government for notification in the official Gazette.”

³⁹ Section 37 of REPA states, 'For the purposes coordination, in the case of any public sector project, the advice of the Authority shall be sought by the agency planning to undertake such projects'.



Accordingly, NEPRA is now required to determine all tariffs on a quarterly basis, as against the flexibility available to it under the Tariff Rules in terms of tariff standard prescribed under Rule 17 (3) thereof. Hence, the annual tariffs and multi-year tariffs have been determined by NEPRA and notified by the GOP, which are well aligned with the international best practices. Determination of all tariffs on quarterly basis is impractical, unwieldy and counter-productive to the privatization prospects of the power utilities envisaged by successive governments. Here it would be useful to analyse the language of the instant proviso further with emphasis on the words “overall electricity tariff”. It is well known that the electricity tariff is determined in all three different components, i.e., generation, transmission and distribution. Out of all these tariff determinations, the distribution tariff, unlike generation and transmission tariff, does not just determine the distribution margin allowed to a particular distribution company rather it sets the consumer-end tariff as well. Hence, if overall tariff is taken as another name for consumer-end tariff, what results is a new law for the determination of consumer-end tariff after every quarter.

The above interpretation is based on the literal understanding of the phrases used in the newly introduced amendment in section 31 under the Ordinance.

The Ordinance further adds the following phrase at the end of sub-section (4) of Section 31:-

“.... Authority within a period of fifteen days of such intimation except where the Federal Government refers the matter to the Authority for reconsideration under sub-section (4A).”

The newly inserted phrase at the end of sub-section 4 of section 31, replacing the earlier provisos, place definite limitation of fifteen (15) days upon the Federal Government for notification of the tariff intimated by the Authority, except where the Federal Government files for reconsideration of the decision by the Authority under the new provision of 4(A). In fact, earlier emphasis of prescribing a limitation for seeking reconsideration within fifteen (15) days has been moved to notification of the decision with in that period hitherto mentioned in an implied manner.



- 1) The next amendment under the Ordinance removes the following two provisos to subsection 4 of section 31,

Provided that the Federal Government may, as soon as may be, but not later than fifteen days of receipt of the Authority's intimation, require the Authority to reconsider its determination of such tariff, rates, charges and other terms and condition. Whereupon the Authority shall, within fifteen days determine these anew after reconsideration and intimate the same to the Federal Government.

Provided further that the Authority shall, on a monthly basis, review and revise the approved tariff on account of any variations in the fuel charges and policy guidelines the Federal Government may issue in this behalf and recommend the tariff so revised to Federal Government for notification in the official Gazette;: [Inserted vide Finance Bill 2008]

The following substitutes the above quoted two provisos:-

Provided further that the Authority shall, on a monthly basis and not later than a period of seven days, review the fuel charges in the approved tariff on account of any variation whatsoever and notify such revision in the official Gazette for the purposes of approved tariff applicable with effect from the aid notification;

The above amendment attempts to provide a NEPRA driven tariff adjustment mechanism, calling for a monthly tariff review on account of fuel price variations and its notification in the official Gazette by the Authority. Until now, no such power existed with NEPRA and a specifically designed automatic tariff adjustment mechanism was being implemented with the approval of the Federal Government, which would call for necessary modifications in the Tariff Rules as well. Further, the fuel price adjustment is not only required in case of distribution companies, it is also attracted in the case of generation companies. The mandatory nature of the instant provision of the Ordinance would have grave repercussion on the effectiveness of the already determined fuel price mechanisms of generation companies; though it can be



argued that the instant Ordinance would be applicable upon the next tariff determination of such generation companies, when falling due.

The Ordinance appears to address certain issues with the tariff determination process under REPA, such as the time bound tariffs which are short and not too long, notification of tariff by the Federal Government in a timely manner, swift application of fuel adjustment on monthly basis and its notification by NEPRA itself. However, the manner adopted by the Ordinance to handle some of these areas appears to have disturbed the whole scheme of tariff determinations under REPA, instead of simply addressing the above-identified concerns of certain stakeholders.

The afore-stated instance of amendment in REPA was just one instance of the state of affairs in the power sector. The generation tariffs being fixed over a period of time, particularly in the case of IPPs and RPPs, tariff reviews of consumer-end tariffs is nothing but cosmetic without adverting to trouble shooting at the generation side of the sector. The monthly adjustment of consumer-end tariff shall keep the regulator busy with hectic tariff reviews of the consumer-end tariff, thereby subjecting consumers to successive price modifications after every quarter.

5.7 Rental Power Projects (RPPs)

The report on the subject would remain incomplete if Rental Power Projects (RPPs) are not discussed. The rental power projects or (RPPs) were conceived date back in 2006 as a measure to salvage widening gap between the supply and demand of power in the country on war-footings.

19 RPPs of 2,734 MW were contracted by the government owned power generation companies (GENCOs). Out of which a number of projects are in the advanced stage of project implementation. 738MW capacity projects have been signed but their down payments have not been made. Five projects have been inked as yet. There have been serious issues in the procurement of rentals. For instance ECC initially



approved for the acquisition of this power through International Competitive Bidding and the RFP provided for 7% of the total rental payments as an advance payment alongwith a confirmed standby letter of credit to secure other responsibilities of the buyer. After payment of advance, the buyer learnt that financing costs of getting an Stand by Letter of Credit (SBLC) had arisen to 7-10%. The issue of SBLC delayed the process as against the conceived concept of RPPs and an ambitious target of December 2009 for RPPs in this region. Finally, the contracts concluded with 14% advance down payment combined with an annual renewable Sovereign guarantee of the GOP to cover buyer's obligations. Further these contracts were solely executed by the GENCOs at the instructions of the GOP without seeking formal approval of NEPRA as per its Procurement Regulations, 2005; though later *ex-post facto* approvals were sought from NEPRA. The first two RPPs were contracted in September 2006.

At the request of the GOP, ADB conducted a review of RPPs and submitted its Audit Report on RPPs dated January 10, 2010 and declared RPPs to be devoid of Least Cost option as per REPA. Defining the current power crisis mainly as a fuel crisis, ADB observes that despite the need to install new projects, wrong choice of fuel for these rentals would have direct impact in case of non-availability of Gas or price volatility of RFO.

The RPPs have a long charge sheet against them, which is mainly due to the fact that some of the sponsors of these plants have tried to make easy money in the crisis situation.



Chapter 6: CONCLUSION AND RECOMMENDATIONS

6.1 Bridging the Demand and Supply Gap

The economy of Pakistan is growing at a pace of about 7-8% per annum. Assuming the same growth rate, it is expected that by the year 2018, the demand on the system will be double of what it is today. By year 2030, the expected demand on the system will be around 75000MW (+). The table summarizes the projected demand for the next five years.

Year	Demand/Projected Demand @ 8% growth rate
2008	16,500 MW
2009	17,820 MW
2010	19,245 MW
2011	20,785 MW
2012	22,448 MW
2020	60,000+MW

In order to meet the growing demand of electricity, the country and the power sector will have to rely on indigenous resources. Pakistan is fortunate to have an abundance of resources required for generation of electric power.

Details of the potential available for generation, through indigenous resources, are shown below:

Table 3: Generation Potential of Available Resources

Fuel	Resource	Exploited
Hydel	40,000 MW	6500MW (16%)
Coal	185000(MTon), Total 3300(M.Ton) Proven 20000+ MW	50MW



Renewables	30000-50000 MW	-----
Others	10000 MW	-----

In addition to the above, a lot of captive power from resources such as Bagasse (sugar Industry) is available, which can provide an indigenous cheap power source to the national/local grid. Also available is a reasonable quantity of Captive Power from textile Mills. Although such power is generated through gas/furnace oil, however, a significant amount of fixed cost and time is saved through the inclusion of this capacity. As per the applications filed and the data made available by NEPRA around 300MW of such capacity will be added to the system.

6.2 Recommendations

The current shortfall of electric power generation has slowed down the country's economic growth in the short term and on long term basis as well, if immediate remedial steps are not taken. A steady long term policy/road map for generation through local/indigenous resources is a must for the growth of the Power Sector to facilitate economic growth. A long term Integrated Energy Plan needs to be developed for the next twenty-five (25) years, which emphasises on the use of indigenous resources to produce electricity.

6.2.1 Generation Road Map

Acknowledging the fact that Pakistan does not have a clear and precise road map for capacity addition in particular and the power sector in general, the need for an urgent and achievable capacity addition plan is paramount. In this regard, the role of NTDC as a system planner needs to be re-emphasized, coupled with an effective liaison with the regulator. NTDC as a system planner is required to come up with a least-cost expansion plan, such that the addition of new capacity is a continuous exercise to overcome the issue of load shedding and demand shortages, with the ability to perceive and plan ahead of time.



6.2.2 Regulator to be after those responsible

A system of checks and balances needs to be developed in order to ascertain as to why the people responsible for capacity addition are unable to make the desired power available. This system should be free from political pressures and the regulator should be held responsible in the situation of lapses on part of licensees. This calls for independence of the regulator and a change in the constitution of the NEPRA authority, in order to ensure that it is composed of persons that are not amenable to government pressures.

6.2.3 Standards for Procurement and Investment

In order to ensure that the sector is not left unattended and continuous investment is made to meet the ever increasing demand of electricity, the prescription of standards for procurement and investment by distribution and transmission companies is required under section 32 of REPA, an important area which is being neglected by NEPRA. An effort in the form of Interim Power Procurement Regulations, 2005 is in effect but its interim nature leaves a lot of room for improvement in this area.

6.2.4 Maximum Utilization of the Indigenous Resources to make Available Power within the Reach of the Consumers

The generation road map needs to focus on the utilization of indigenous resources, as these have comparative advantage over other means such as oil or gas which are depleting and need to be imported. Indigenous resources have played a key role in the sustainable development of many countries, such as India and China, who rely heavily on coal and hydel power. Pakistan is also gifted with similar natural reserves; AJK and Northern Areas are alone projected to have an untapped capacity of 40,000 plus MW.

6.2.5 Problems with Tariff Determination



The issue of tariff determinations needs to be resolved and rationalised. Apart from encouraging ICB on tariff determination the process needs to be made more transparent and interactive through the involvement of consumer representative bodies. Further, procurement rules relevant to the power sector should be developed, such that cost escalations before the Commercial Operation Date and over the project life are avoided or at least manageable and justifiable.

6.2.6 Competition as a mode of Bringing Efficiency and Affordability in the Sector

Having established that Pakistan is a capacity deficit market, the addition of small plants as base load plants as opposed to large plants, is going to be detrimental to the system in the long run. Further, Pakistan is dependent on the private suppliers which exploit resources such as coal at the coasts for increased mega wattages. The work on indigenous fuel needs to be done cautiously and concrete steps need to be taken to ensure efficiency and quality. Further, the pace of strategy implementation needs to be improved; only two sources of fuel are currently being worked on and only one Wind Project of 6 MW out of more than a dozen LOIs is being operationalized.

Other actions that may promote competition in the country are as follows:-

- More bilateral contracts should be encouraged, for which NEPRA should lower the threshold, as provided under REPA; and
- Open access should be available, both in distribution and transmission. There are examples in the DISCOs where everyone is not getting access, such as KESC where industrial concerns are generating power and supplying it to their sister concerns through lines of KESC

The move towards a competitive market regime should be considered. Within the available capacity, move to a market regime has been cautious thus far, as the current available capacity is unable to meet the peak requirement. Further, for competition during off-peak hours, real time studies are required. Merely because of the fact that we do not have enough capacity, the work towards the development of a competitive



industry should not be stopped, as it carries the ultimate solution, realized by other nations worldwide. Commencement of limited trading is the key to our present crisis which may allow us to unleash phased competitions, until the market is big enough to operate as a whole.

6.2.7 Strengthening the role of NTDC

An independent, efficient and effective NTDC, along with other entities as established under the NTDC licence, such as the Contract Registrar, Transmission System Operator and Transmission Network, is very essential for a competitive market to evolve in the country. Similarly, features of NTDC licence, such as provision of open access, must also be put to practice along with the above entities for the development of competition in the power market.

6.2.8 Distribution

The structure of electricity distribution, continuing from pre-REPA era, needs to be modified. The commercial operations should be separated from the technical operations. In this way, bulk power seller can operate within a DISCO. Further, more than one Bulk Power Supplier buying power from the GENCOs at bilateral or through competition at a clearing house would automatically bring commercial efficiencies in the system. Hence, such an act shall reduce losses and bring down the rates.

6.2.9 Rationalization of Subsidies

The determination of tariff for each consumer category, as tabulated under Annex-D, shows a number of distortions which discourages efficient usage of electricity and allows provision of power at a cost which is below the cost of its service. The subsidies are granted in an ad hoc manner, without assessment of their actual impact on the over all system or other consumer categories. Therefore, it is recommended that whenever the government grants subsidies it should clearly lay down the rationale for granting them and inform the regulator and other stake holders. Tariffs determined in this way would be more stable and conducive to development of the



sector. Further, the subsidy policy should be prepared after consultation with the stakeholders.

6.2.10 Independence of the Regulator

The power sector in Pakistan has been regulated by a body outside the Ministry. However, the progress so far since the promulgation of REPA, has been totally in contradiction to the restructuring policy of the Government. With members of the Authority being appointed from amongst the bureaucrats and ex-utility personnel, the authority is not able to exert its impartiality while balancing the rights of consumers and the service providers. Further, no serious interest on the part of the Government is visible in implementing its own Strategic Plan. The requisite freedom and support to unfold and implement the objectives of the REPA is not being extended by the government. All that is of concern to the Government is capacity addition. It is strongly felt that without seriousness of the Government to handle policy issues and to get them implemented as planned and an independent regulator being the most prominent feature of its plan as mere capacity addition is not going to improve the state of power sector in Pakistan

6.3 Summary & Conclusions

The economy of Pakistan has taken a fast track course through some very bold measures on the part of the Government. The present growth rate of over 6% can only be sustained if the infrastructure required to cater for this economic boost is available. At present, the electricity market is barely meeting the required capacity. It is envisaged that as per the present growth rate, the demand will double in the next ten (10) years and there onwards it will be an exponential growth. The public sector cannot alone cope with a growth rate this high. The only way to accommodate this is through Public Private Participation, which essentially calls for a market ready for such kind of an environment. The key elements to have such a market environment are:

- A plan to forecast and appreciate the future market growth,



- To exploit all the indigenous resources available. (Pakistan has only utilized about 6000MW of Hydel potential out of about 40,000MW, only around 150MW out of around 20,000MW of coal electricity potential and 0MW through the wind corridor in Sindh/ Baluchistan Area Anticipated potential again of about 20,000+MW).
- To have an independent regulatory regime in place for the confidence of all the stake holders
- A market based economy, which can give positive sustained signals for times to come.

It is believed that all the above mentioned elements are there to be exploited and implemented with a positive spirit.

In addition to the above, Pakistan and countries of the region should start thinking of establishing a regional market. A first step towards that is the trading of electricity amongst neighbouring countries. Pakistan is already buying electricity from Iran. It is also considering the construction of a multi-country transmission line for buying cheap hydro electric Power from Central Asia.



Annex A

S.No	Project Name	Commissioned IPPs	Gross Capacity (MW)
1	AES Lalpir Limited		362
2	AES Pak Gen. (Pvt) Limited		365
3	Altern Energy Limited		29
4	Attock Gen Limited		165
5	Fauji Kabirwala Power Company		157
6	Gul Ahmed Energy Ltd. (GAEL)		136.17
7	Habibullah Coastal Power (Pvt) Co.		140
8	Japan Power Generation (Pvt) Limited		120
9	Kohinoor Energy Limited		131.44
10	Liberty Power Project		235
11	Rousch (Pakistan) Power Limited		412
12	Saba Power Company Limited		114
13	Southern Electric Power Company Limited		115.2
14	Tapal Energy Limited		126
15	Uch Power Limited		586
16	Hub Power Project		1292

The IPPs at serial numbers 1 to 14 came under the 1994 power policy. In addition to these, the 1292 MW Hub Power Project was under process before the 1994 Policy and was commissioned in March 1997.

The IPPs at serial number 6 & 14 are supplying power to KESC while the remaining 12 IPPs and Hubco are supplying power to WAPDA.

[Source PPIB website](#)





Annex B

Sr.#	Name of IPP	Fuel	COD	Capacity		Energy
				Installed	Dependable	Received
				(MW)	(MW)	(Jul,09 - Jul,09)
				(MW)	(MW)	(MkWh)
1	KAPCO	FO/Gas/HSD	27-Jun-96	1,638	1,342	686
2	HUBCO	FO	31-Mar-97	1,292	1,200	655
3	KEL	FO	20-Jun-97	131	124	81
4	AES LALPIR	FO	06-Nov-97	362	348	219
5	AES PAKGEN	FO	01-Feb-98	365	348	180
6	SEPCOL	FO	10-Mar-99	117	119	1
7	HABIBULLAH COASTAL	Gas	11-Sep-99	140	129	77
8	FAUJI KABIRWALA	Gas	21-Oct-99	157	151	92
9	ROUSCH POWER	Gas	11-Dec-99	450	395	277
10	SABA POWER	FO	31-Dec-99	134	126	70



11	JAPAN POWER	FO	14-Mar-00	135	121	1
12	UCH POWER	Gas	18-Oct-00	586	551	365
13	ALTERN ENERGY	Gas	06-Jun-01	31	26	16
14	LIBERTY POWER	Gas	10-Sep-01	235	213	138
15	CHASNUPP	Nuclear	09-Jun-01	325	300	210
16	TAVANIR, IRAN	-	-	-	-	24

Last Update: 13-08-2009

Annex C

Details of New power Projects as per PEPCO Project	Type	Capacity	Status
GENCO Additional	PEPCO	300	Completed
Attock Power	IPP	165	Completed
Malakand-III	IPP	81	Completed
Atlas Sherazi	IPP	225	July
Orient Power	IPP	225	July
Sumandri Road	Rental	150	August
Nishat Power	IPP	200	September



Fauji Mari	IPP	202	October
Muridke Power	IPP	225	October
Sahiwal Power	IPP	225	October
Guddu	Rental	110	October
Soho Wala Sialkot	Rental	150	November
Satiana Road	Rental	200	November
Naudoro	Rental	51	November
Karkay	Rental	249	November
Gulf	Rental	81	December
Engro	Rental	227	December



Annex D

FUEL WISE DETAIL OF PRIVATE POWER PROJECTS CURRENTLY BEING PROCESSED BY PPIB

Sr. No.	Project	Location	Capacity (MW)	Expected COD
OIL				
1	Sheikhupura (Atlas) Power Project	Sheikhupura, Punjab	225	Jul-09
2	Nishat Power Project	Near Lahore	200	Sep-09
3	Karkey Rental Project	Mauripur, Karachi	249	Nov-09
4	Walters Power Rental Project	Korangi, Karachi	230	Dec-09
5	Reshma Power Rental Project	Near Manga-Raiwind Road, LESCO	220	Dec-09
6	Ruba Energy Rental Project	Near Batapur Grid, LESCO	170	Dec-09
7	Premier Energy Rental Power Project	Lahore Sheikhupura Road, LESCO	64	Jan-10
8	Gulf Rental Project	Eminabad, Gujranwala	81	Feb-10
9	Independent Power Rental Project	Gojra, near Faisalabad	221	Feb-10
10	Sialkot Rental Power Project	Sialkot, GEPCO Area	85	Feb-10
11	Tapal Rental Power Project	Kamoki, Gujranwala, GEPCO	74	Feb-10
12	HUBCO-Narowal Project	Narowal, Punjab	220	Mar-10
13	Nishat Chunian Power Project	Near Lahore	200	Mar-10



14	Liberty Power Tech Project	Faisalabad	200	Dec-10
15	Reshma Power Generation	Gujranwala-Lahore Road, Punjab	172	Mar-11
16	Gujranwala (Gulistan) Project	Gujranwala	200	Jun-11
17	Shahkot (Leading) Power Project	Faisalabad	200	Dec-11
18	Engro Power Generation	Near Bhikki, Punjab	627	Mar-12
19	Saba Power Generation	Near Jhang, Punjab	171	Mar-12
20	Shahpur Power Project	Shahpur, Near Sargodha	150	Dec-12
Sub Total (Oil)			3959	

PIPELINE QUALITY GAS/DUAL-FUEL

21	Orient Power Project	Balloki, Punjab	229	Jul-09
22	Muridke (Sapphire) Power project	Muridke, Punjab	225	Oct-09
23	Sahiwal (Saif) Power Project	Sahiwal, Punjab	231	Dec-09
24	Bhikki (Halmore) Power Project	Bhikki, Punjab	225	Oct-10
Sub Total (Pipeline Quality Gas/Dual-Fuel)			910	

DEDICATED GAS FIELDS

25	Fauji Mari Power Project	Daharki, Sindh	185	Sep-09
26	Engro Power Project	Qadirpur, Sindh	227	Dec-09
27	Grange Holdings Power Project	Arifwala, Punjab	180	Dec-10
28	Star Thermal Power Project	Daharki, Sindh	134	Nov-11
29	Uch II Power Project	Dera Murad Jamali, Balochistan	450	Dec-11
30	Green Power Project	Dadu, Sindh	188	Dec-11
Sub Total (Dedicated Gas Fields)			1364	

COAL



31	AES Imported Coal Project	Gadani Near Karachi	1200	Jun-13
32	Mitsui Imported Coal Project	Gadani Near Karachi	1200	Jun-13
Sub Total (Coal)			2400	

HYDEL

33	New Bong Escape Hydel Project	Near Mangla, AJK	84	Dec-12
34	Rajdhani Hydro Power Project	Near Mangla, AJK	132	Jun-13
35	Matiltan Hydro Power Project	Swat, NWFP	84	Dec-13
36	Madian Hydropower Project	Swat, NWFP	157	Dec-13
37	Kotli Hydel Project	Kotli, AJK	100	Jun-14
38	Gabral-Kalam Hydropower Project	Near Kalam, NWFP	101	Jun-14
39	Karot Hydel Project	Kotli, AJK	240	Oct-14
40	Patrind Hydropower Project	Muzaffarabad AJK	150	Nov-14
41	Gulpur Hydro Power project	Gulpur, AJK	100	Nov-14
42	Sharmai Hydropower Project	Dir, NWFP	115	Dec-14
43	Sehra Hydel Project	Kotli, AJK	65	Dec-14
44	Azad Patan Hydel Project	Sudhnoti, AJK	222	Dec-14
45	Asrit-Kedam Hydel Project	Near Kalam, NWFP	215	Jan-15
46	Kalam-Asrit Hydel Project	Swat, NWFP	197	Jan-15
47	Chakothe-Hattian Project	Muzaffarabad, AJK	139	Jun-15
48	Shogosin Hyderopower Project	Chitral, NWFP	127	Jun-15
49	Shushgai Zhendoli Hydel Project	Chitral, NWFP	102	Jun-15
50	Kaigah Hydel Project	Kohistan, NWFP	548	Jan-16
51	Suki Kinari Hydropower Project	Mansehra, NWFP	840	Apr-16
52	Kohala Hydropower Project	Kohala, AJK	1100	Jul-16
Sub Total (Hydel)			4818	



GRAND TOTAL	13451



Share of the total Consumption wise

CATEGORY	Tariff Class	% as per no of consumers	% as per consumption	Total
Domestic	0-50		2.3	
	1-100	Total	5.4	
	1-300	84.15 %	19.3	
	1-700		9.6	
	Above 700		6.3	42.9
Commercial	A-II	13.0	6.3	6.3
Industrial	B-1	1.40	4.0	
	B-11		6.5	
	B-111		11.6	
	B-1V		4.0	26.1
Bulk & other	C	0.06	12.60	12.60
Agriculture	D	1.39	12.1	12.1
		100%	100%	100%

