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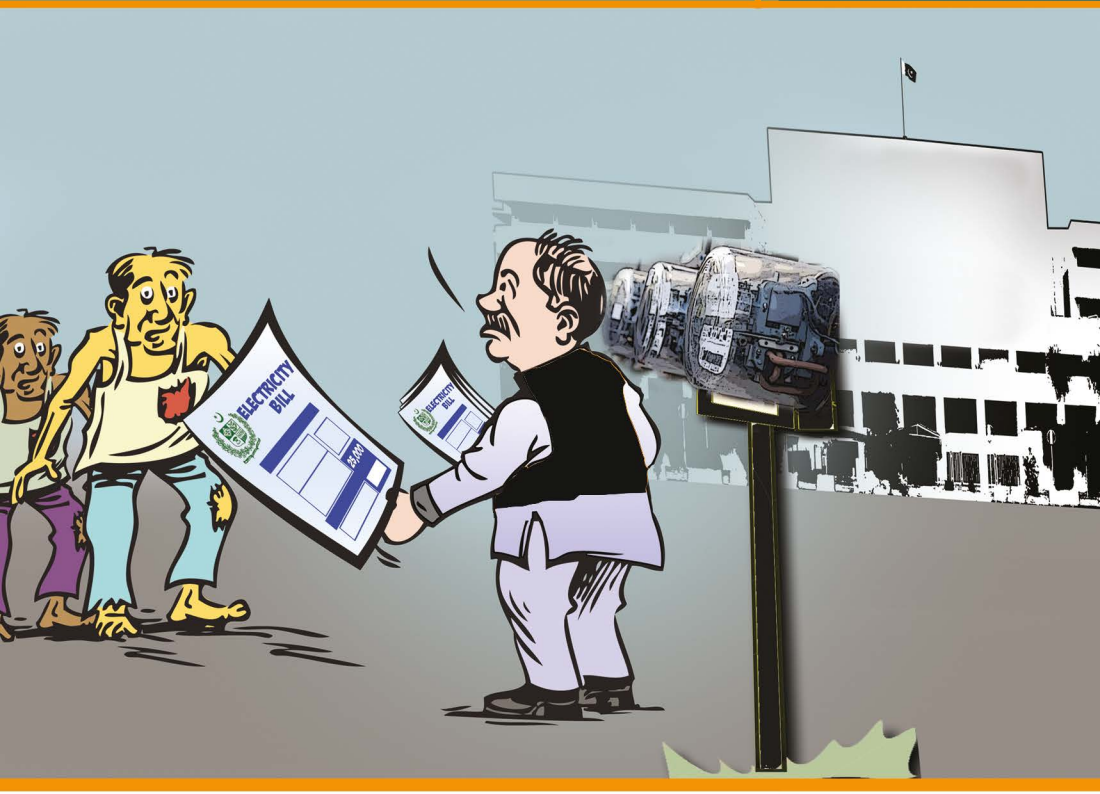
State-Led Pilferage: The Case of Electricity Provision in Pakistan

Shahid Mehmood



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State-Led Pilferage:

The Case of Electricity Provision in Pakistan

PRIME is an economic policy think tank working for an open, free and prosperous Pakistan by creating and expanding a constituency for protective function of the state and freedom of the market.

The study titled "State-Led Pilferage: The Case of Electricity Provision in Pakistan" by Shahid Mehmood analyzes the state led provision of electricity in Pakistan. It examines different aspects of the debate over public provision of this utility, process of tariff determination and the substantial costs associated with the entire system.

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Foreword

A political appendage to the Study

[This Foreword is in lieu of a political appendage to the study "State-Led Pilferage: The Case of Electricity Provision in Pakistan".]

Especially in least developed countries, price controls are justified in the name of security and welfare. Hence, prices of most of the food items are controlled by the state, such as flour, sugar, meat; if not the retail price, then support price. Now and then the government intervenes to control the retail prices of wheat, sugar, meet; and it is for the government to determine support price such as of wheat, sugarcane also. In addition, the government is a permanent buyer, among others, in food market; it purchases wheat, sugar, etc, and stores for the rainy days, it says. That leaves the food market essentially controlled and at the same time distorted in Pakistan. In this regard, the argument goes like this: Shortages of essential food items may create general unrest that is why government must act as a future storehouse! So this is how the private goods are socialized and/or nationalized, and are turned into public goods.

Here it's no place to counter the above-mentioned argument; however, it's evident that there is no justification to extend this argument to other private goods, and especially, electricity. But that has happened and taken quiet a toll on the pockets of ordinary citizens. No qualms that in the beginning generation, transmission and distribution of electricity was monopolized by the state. Why it remained a state monopoly is unforgivable? It's a state crime of the highest order since at the end of the day that monopoly proved to be a perennial way of robbing the ordinary citizens. As the legendary failure of the state in managing a monopoly unfolded in ever increasing darker nights and days without power to live and work on the one hand, and on the other hand ever sky-rocketing prices of electricity, half-hearted attempts at de-monopolizing ensued and private entrepreneurship was invited to share the burden and lighten it: Initiatives such as bifurcation of Water and Power Development Authority (WAPDA); contracting with Independent Power

Producers; diversification of fuels (gas, gas, coal, other than water) to generate electricity; tapping of solar and wind power; etc, were taken. However, it was too late; and the 'scatter in Pakistan was already too great,' i.e. vested interests had already acquired the role of active players, and the state as always was and is the accomplice, a criminal at best!

Thus over the years, the good of electricity passed through various phases: first, it was a monopolized good; then it became a mismanaged good. Actually the case of electricity being in the hands of state proved to be a case of neither a public good nor a private good; it gave birth to a new type of goods, and that is in contrast to the type of economic goods: it is Political Goods. Electricity is a Political Good!

As the economic goods are explained in terms of their scarcity and usability to the consumers; public goods are those which are provided to all citizens without any profit; and private goods are such goods which are purchased and accrue profit to their producers; whereas political goods may be explained in terms of political connections: they are highly in demand; they are not scarce as far as their production and productivity is concerned; apparently they accrue political benefits to politicians; they empower politicians to make money and distributing rents to others; they defy and deny markets in respect of their production and distribution, and significantly in determining prices; and, they help the state (especially politicians) to determine its (political goods') cost arbitrarily, as much as it pleases to fix it. Read at the website of National Electric Power Regulatory Authority (NEPRA) how they, i.e. DISCOs, NEPRA, the government determine the electricity tariff! Finally, political goods are such goods the cost of which is not determined in market; hence their prices are never an indicator of rising or falling demand. Also, in the case of political goods, scarce supply creates its crushed demand. In other words, as increased supply implies lowering prices, in order to maintain higher prices, the supply will always be kept reduced. That's the rationale of the political economy of electricity pricing in Pakistan!

Shahid Mehmood's study "State-Led Pilferage: The Case of Electricity Provision in Pakistan" from the standpoint of an economist lays bare those areas in the management of generation, transmission and

distribution of electricity in Pakistan where through sale and purchase of various fuels, such as in GENCOs, in assigning contracts, such as in generation, transmission and distribution, in determining various tariffs, in structuring subsidies, rents are created, manipulated, distributed; and it shows how and why these rents are not eliminated, and maintained and increased instead. Also, it tells how the mix of state and private entrepreneurs, whom the state has corrupted like itself, is proving fatal to the ordinary citizens' economic survival. In an ordinary household, the amount of its monthly electricity bill has surpassed the usual amount of the bill of its kitchen, especially during summers.

As one realizes the magnitude of the brazen robbery being committed by the state, and in fact by the politicians who rule, one shudders what's happening in Pakistan! Also, that explains how a private good when transformed into a political good may play havoc with the survival of the ordinary citizens on the one hand, and on the other how it empowers the state, i.e. politicians who rule, to rob the citizens at its will. Not only is determined the tariff of electricity arbitrarily, the costs of mismanagement, inefficiency, corruption, and new projects and then in case of delays of these projects their increased cost also come to the share of the consumers.

The political message of this study "State-Led Pilferage: The Case of Electricity Provision in Pakistan" is loud and clear: Stop the State Robbery!

In order to stop the robbery, the state of Pakistan must move in such policy directions transparently and accountably: for instance, it should confine itself to the role of a supervisor, and that too in the form of autonomous regulatory institutions, where there is no intervention from any quarter of the state or government or political elements; let there be created a whole-sale market of electricity; let there come and flourish private initiatives, at local or national level, be it in generation, transmission, or distribution; trust market, trust market, trust market, and let it make the decisions essential for its working, i.e. in determining prices. In other words, let the electricity regain its status of an economic and private good!

Khalil Ahmad

December 9, 2014

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Besides FNF and Mr. Ali Salman, I acknowledge my gratitude to Dr. Khalil Ahmad, Executive Director Alternate Solutions Institute. The idea of research along the lines done in this research paper was basically his, and he lent tremendous intellectual support in this regard. During the course of this research paper, he kept forwarding me related material and exchanged ideas that definitely made my job relatively easier. I would also like to take this opportunity to thank my kids, who despite their very young age, somehow realized that their father is up to something important. They spared me their enjoyable mischief's for some time while remaining patient, and are all ready to let loose once this research effort is over.

Last, but not the least, a bundle of thanks to something that helps most research efforts today but whose contribution is rarely acknowledged, and to those who contribute to it generously. That thing is the unlimited treasure trove of information commonly known as the internet. Without the internet, I at least cannot imagine this kind of research effort taking place at all. There are no words to describe the ease that it brings to the research effort. It will be suffice to say that without its presence, many research efforts would not even reach the conceptual stage.

Summary

- Electricity load shedding in Pakistan is not a new phenomenon. But it has worsened in the last decade or so. There is persistent shortfall in supply of electricity. What is even more discouraging is that there is no solution in sight for ameliorating the present state of affairs.

- The electricity setup in Pakistan, both at the production and the distribution level, is a mix of the government and the private sector entities. About two decades ago, the sector was totally dominated by the government run institutions. But facing up to ground realities and its own shortcomings, government decided to bring in the private sector. The experience of the private sector has not been a happy one, and it is still the government that calls the shots when it comes to important decisions with regards to electricity.

- The idea of a service like electricity being turned into a pure public good, administered by a central government, is a Marxian idea that gained currency over time as Marxian economics became gradually respectable. Before WWI, most services like transport and telegraph had been nationalized. In Pakistan, the service of electricity has remained in the hands of the Federal government since its inception, with WAPDA's birth in 1958 cementing this relation between a central government and electricity provision.

- The establishment of huge, state run institutions like WAPDA is based on the economics of a natural monopoly. The idea posits that there are substantial economies of scale in this case, and that inducing competition will only enhance the costs rather than decrease it. But this theory has failed to hold ground over time, as elements like technology and globalization have rendered this argument obsolete.

- Much of the problems in this sector stem from the government's overwhelming influence, lack of market or price in-

centives, and government's methodology of tariff and pricing that not only demonstrate inefficiency, but indirectly also constitute a theft upon people's hard earned earnings. Certain clauses of tariff methodology are vague and defy any logic, while electricity pricing results in exacerbating income inequalities.

- By forcing the IPP's to procure from a government run monopoly (mainly to keep it profitable and to earn some tax revenue), government caused the users a loss in terms of forgone savings due to lower oil prices. Ironically, government dug a hole for itself in the process by finding itself short of the financial resources to buy the expensive electricity.

- After several attempts at bifurcating the whole electricity setup for making its performance better, the reality still remains that it is the government and related ministries that call the shots when it comes to electricity generation, transmission and distribution.

- Generally, under the present kind of pricing system, the cost of production is passed on to the consumer and he ends up paying what he consumes. But despite the official proclamations of moving toward a market oriented pricing goal, the reality is that the power pricing is done on 'cap and freeze' basis, i.e., the cost of production is rarely passed to the end user in full.

- There is a huge cost involved in maintaining this system and the status quo. These costs come in many forms, from lower levels of economic growth to subsidizing an inefficient sector. The brunt of all these costs falls upon the consumer in the end, who has to bear its burden. Billions of rupees are wasted every year in terms of costs of this system, yet reforms are nowhere in sight.

- The substantial cost of this setup comes in the form of provisions of billions of rupees in yearly subsidies. There are various types of subsidies within this overall subsidy. For example, there is an Inter-DISCO subsidy, Tariff Differen-

tial Subsidy (TDS) and subsidy by slabs used for various consumer groups. In FY 11-12, of the total subsidy paid by the government, TDS alone amounted to Rs. 464 billion/-.

- Higher courts within the country have adjudged this system to be corrupt, inefficient and non-transparent. Moreover, the centralized scheme of things would seem to run counter to the constitutional realities. Constitution calls for letting subjects like electricity be dealt with by the province, not the centre or the federal government.

- Government's main strategy in dealing with the chronic problem of electricity shortages is to plan for large hydel power projects (like dams) and other stop gap measures. But given the history of the working of the central government setup, it is doubtful whether these plans will ever see maturity. For a start, there is the major problem of finances. It is not clear that from where will the central government garner the financial resources to carry out such massive projects? The estimated requirement for replacing the outdated infrastructure alone is more than $35 billion/-.

- The reasons for persisting with government control lies not in sound economics and or any intention for welfare enhancements, but rather in rent seeking and using institutions as instruments for gaining specific favors. In the theory of regulation, there is always a certain group or groups that stand to gain through governments enacting certain policies (like redistribution of resources by the government). These groups seek to enhance their power and increase their opportunities for rent seeking.

- The future projects of the government carry risks that have not been addressed properly. They are likely to result in future problems.

1. Introduction

There is little doubt that economic growth and energy consumption go hand in hand. Accordingly, the highest per capita consumption of electricity is found in the countries that have the highest per capita income.[1] There is considerable evidence to suggest that, of the various variables that are part of the growth of a nation's economy, power consumption plays a critical role.[2] Further disaggregation by source confirms electricity to be the most vital component of this positive correlation between economic growth and energy consumption. The demand for electricity usually outpaces growth, and is followed by other sources in the energy mix (coal, natural gas, petroleum, etc).[3] The strength of this relationship, though, varies from country to country. Above all, it is dependent upon the structure of production that is prevalent in an economy.

Pakistan economy is not immune to the above stated relation between economic growth and electricity consumption. This has been confirmed through various studies on Pakistan's economy. It has been found that with the growth of the economy over time, the demand and consumption for energy has grown more than the

[1] According to IMF's estimates and analysis, this relationship between economic growth and electricity consumption especially holds true for low and middle income countries, whose per capita electricity consumption closely follows its growth patterns. Refer to IMF's *World Economic Outlook (2011)*, Figure 3.3.

[2] For example, see *International Energy Agency (IEA), Annual report 2005*.

[3] Stern, D. I. and Cleveland, J. C. (2004), "*Energy and Economic Growth*", and Akinlo, A. E. (2008), "*Energy Consumption and Economic Growth: Evidence from 11 Sub-Sahara African Countries*"

growth of the economy.[4] Research further suggests that in general, the rate of household appliances ownership that use electricity increases as the real incomes increase as a result of economic growth.[5] The resulting increase in pressure on the national grid in lieu of increase in demand is thus predictable. The challenge, therefore, is to keep up with the increase in demand when there are growth spurts. Unfortunately, it's a challenge that various dispensations in Pakistan over the decades (and especially the last ten years) have failed to respond adequately.

Today, Pakistan faces the specter of some of the worst electricity load shedding in its history. There is a substantial gap between demand and supply, reaching a whopping 6000MW in peak electricity demand months.[6] This is in sharp contrast to 2003-04, when Pakistan had thirty percent standby electricity and was willing to export it.[7] Per capita consumption in Pakistan, at an estimated 479 kWh is one of the lowest in the region and the world[8], and only a slight improvement over 1998 when per capita consumption was 339 kWh. This gap started to widen in the time period after 2003, when the economy experienced high growth rates for a number of years. There is unanimous agreement that the largest portion of the growth in the real GDP (about 80 percent) during the high growth years can be attributed to consumption alone. The energy intensive products from cars to air conditioners saw a quantum jump in their demand with the rise in per capita income during this time. Not surprisingly, with the increase in their production and ownership, there was a resultant increase in electricity demand. It was the failure of the government of that time and the government after that (2008-2013) to tackle this issue that has led to the present abysmal state of electricity provision. The problems that gave rise to such a wide gap between demand and supply can be traced to govern-

[4] For example, see Javed, Attiya. Awan, Zahid and Javed, Muhammad (2013), "*Electricity Consumption and Economic Growth: Evidence from Pakistan*"; plus Siddiqui, R. and R. Haq (1999), "*Demand for Energy and the Revenue Impact of Changes in Energy Prices*".

[5] Bhutto, A and Yasin, Muhammad (2011), "*Overcoming Energy Efficiency Gap in Pakistan's Household Sector*"

[6] This is the number for 2013. In 2012, the gap was an estimated 7,500MW. Source: Economist, *Pakistan's Energy Crisis* (May 2012).

[7] '*Pakistan Power Sector' (2011)*, Swiss Consulate General of Karachi.

[8] For example, per capita electricity consumption in India is 684, 2,649 in Iran, 2,708 in Malaysia & 6,775 kWh in Singapore(Source: *World Bank Databank on Electricity consumption/kwh around the world*)

ment's policies.

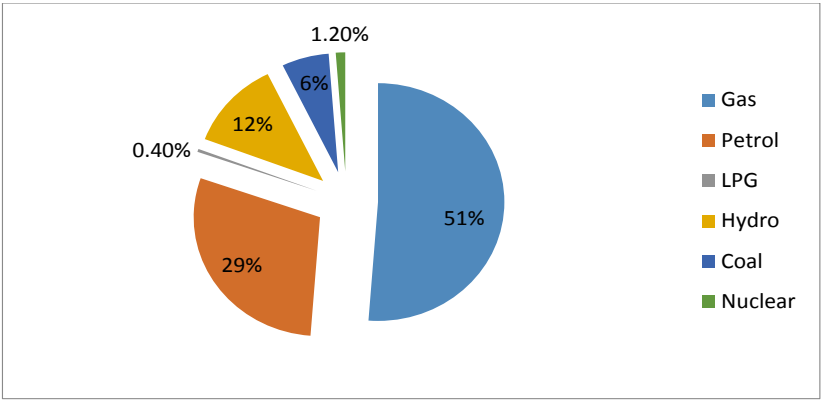
This paper's main aim is to highlight the monetary damages that are being inflicted upon the consumer by the presence of this highly inefficient electricity setup. A large part of these damages, which indirectly constitute a theft upon income of the consumer, come from the way the tariff system is designed and implemented. Add to this the uniform rates of electricity across Pakistan (approved by the government's regulating arm), and the inefficiencies and losses in this system increase further. The continued presence of this highly inefficient setup owes solely to government's non-willingness to let go of the decision making regarding electricity production and distribution. Also, the argument for maintaining huge government entities like Water and Power Development Authority (WAPDA) will be critically analyzed in terms of the natural monopoly argument.

First, the paper will take a short overview of the power generation and power consumption, and electricity's place in it. The second chapter looks at the historical evolution of goods like electricity as public goods, and a brief history of this good in Pakistan through various power policies. The third chapter deals with the question of performance of the government's electricity setup, specifically focusing on National Electrici Power Regulatory Authority (NEPRA). The fourth chapter deals with the overall costs of the present system, including methodology of tariff determination, pricing and other costs of maintaining this system. The final chapter comes up with conclusions regarding the research carried out in this paper.

1.1 Power Generation: An Overview

As of 2013, the total installed power generation capacity was around 23,000MW, of which electricity generation is the most substantial part. But the actual generation of electricity was nowhere near the potential capacity[9], thus resulting in long hours of electricity blackouts. The energy production mix in Pakistan is graphically depicted in the following figure:

[9] If the official shortage figure of 6,000 MW in 2013 is taken to be true, then it implies that peak production was only 17,000 MW.



As is clear from the graph, oil now constitutes about thirty percent of the total energy mix and more so in the production of electricity (where its share is around sixty three percent). This is quite a contrast to the preceding years, when oil constituted a much smaller share of the total energy mix.[10]

In terms of electricity production, the increased use of furnace oil has had a substantial impact on various aspects. For example, it now constitutes a heavy portion of the foreign exchange payments. Out of our total import bill in FY 12-13, only petrol/oil and related imports cost the nation a total of $14.5 billion[11], majority of which went to the production of electricity.

This trend is likely to continue in the short term since the projects involving the substitute sources of energy production will take time to complete and become operational. Coal, water (hydro), solar, wind and nuclear power are the sources which are slated to replace oil as major sources of energy production in the future. Natural gas is a viable substitute, but the fast dwindling reserves and increase in its price make it seem unlikely that it will remain the major focus of policymakers in the future. Although the proposed gas pipelines from Iran and central Asian states will ease the pressures on domestic gas supply, its price is substantially more than that of domestic gas which makes it an expensive source of energy.

The most promising source of cheap energy for the future in terms

[10] For example, in 2005 oil constituted only 16 percent of the total energy mix.
[11] *Economic Survey 12-13*.

of electricity production is hydro power. It is estimated that the total generation capacity from hydro sources is up to 120,000 MW.[12] Most of the government sector investment in terms of power generation in the future is also concentrated on small, medium and large scale hydro power projects.[13] By 2020, WAPDA intends to add an additional 25,000 MW into the national grid through various hydro power projects.

Coal is another promising component of the energy mix for the future. Its percentage in global electricity production is the largest (around forty percent). Relative to Pakistan's requirements, its attraction owes to two reasons: per kWh electricity production through coal is cheap, and large deposits of coal are located in Pakistan (especially Thar). At one time when the power crisis started to spiral into a major crisis, it was the official belief that the mega reserves at Thar will come to the rescue. Further, it was believed that enough electricity will be produced through it to cover not only the domestic demand and supply gap, but that Pakistan will also be able to export electricity. Unfortunately, these projections turned out to be wrong and overoptimistic.

Alternate energy sources like solar and wind power present another option to the policymakers. The Alternate Energy Development Board (AEDB), another government entity established in 2003, looks after this aspect of the electricity. At present, the total production by alternate sources is 40 MW, which is only 0.21 percent of the total energy production. However, there is thought to be considerable potential for energy production through these sources. The Economic Survey 2012-13 predicts 1000-1200 MW electricity production by 2015 from wind energy alone, which seems to be on the optimistic side. One major impeding factor in this regard is the very high cost (mainly in terms of fixed costs) of installing, operating and maintaining these sources of energy, plus the lack of a price incentive since the government sets fixed tariffs instead of the producer.

Overall, it appears abundantly clear that the concentration of deci-

[12] Refer to '*Pakistan Power Sector' (2011)*, Swiss Consulate General of Karachi, and Bhutta, S.M. "*Electrical Energy: Remedial Measures*".

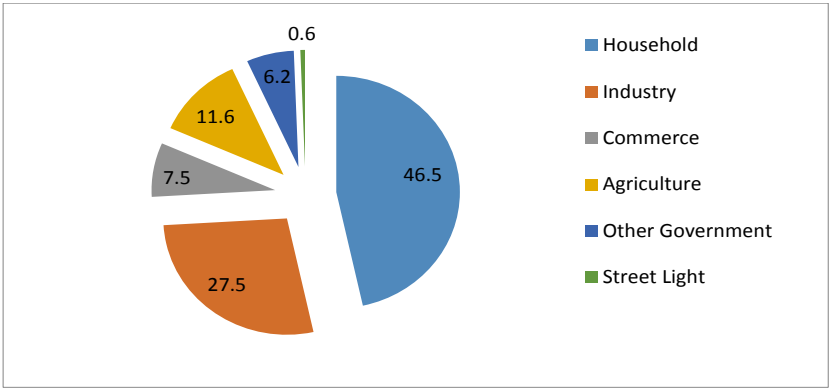
[13] A complete description of all of these projects with their proposed timelines, estimated cost, location, etc., is given in *WAPDA Vision 2025*.

sion makers is on hydel power as the go-to source for the future and the largest component of energy mix.

1.2 Power Consumption

As stated in the introduction to this chapter, studies indicate that there is a positive correlation between the economic growth, rise in incomes and the demand for electricity. Same holds true for Pakistan, as has been found by various studies.[14] The consumption of electricity is usually greater than the GDP growth of the economy. Aside from income as a factor in the demand for electricity, there is the important consideration that energy is viewed as a '*need*' (whose consumption may or may not depend upon the increase in income) rather than a '*luxury*' (whose consumption is directly dependent upon income). An implication of this observation is that even for those parts of a country that do not experience the fruits of economic growth, demand for electricity does not diminish. The added income only tends to reinforce the demand.

The composition of electricity consumption by source is depicted in the following pie chart.



Household category represents the largest user of electricity, followed by industry and agriculture. The number of households/ electricity consumers has consistently increased over time, and continues to increase. From 17,955,366 consumers in 2007-08, the

14 See Khan, Muhammad Arshad and Ahmad, Usman (2010),"*Energy Demand in Pakistan: A disaggregate Analysis*".

2012-13 number is 21,703,092 (an increase of 20.90 percent).[15] Over the same time period, the number of villages that were connected with the national grid also witnessed an increase of 43.7 percent.[16] Interestingly, the provincial patterns of electricity consumption closely reflect their relative contribution to Pakistan's overall GDP, which again seems to confirm the link between growth, GDP and electricity consumption.

[15] Economic Survey 2012-13, chapter on Energy. Note that the growth rate of economy between the periods of 2008-2013 was low compared to 2002-2007. Yet that did not stop the increase in electricity consumers.

[16] From 127,897 villages in 07-08 to 183,795 villages in 12-13.

2. Utilities as public goods: A short history

2.1 Utilities as Public Goods

Modern policies of nationalizing services like electricity and communications trace their origin to the economic ideas of Karl Marx. Marxian ideas, in short, were heavily reliant on his assertion that it is the labor that is the sole creator of economic value, and thus the one that deserves the rewards (in terms of wages or financial gain) of that value creation. But, according to Marx, it was the capitalist (the entrepreneur, financier, bourgeoisie, etc) that unfairly stole that deserved reward form the labor and the labor was left with only pittance. Thus, it had to be labor that had to unite for its cause, and only a government that could ensure the provision of the deserved reward to the labor was an acceptable and a just government. Most of Marx's demands found expression in the form of the *Communist Manifesto* (1848), which was his manifesto to right the wrongs against the labor. One of the central themes of that communist manifesto was the centralization of the services like communication and transport in the hands of the government so that they could be fairly distributed among all rather than a select group of people.

Although the discussion of Marxian ideas is outside the scope of this paper, it is fair to mention that Marx's ideas had a profound

impact on the policy making in European nations, especially concerning the centralization (nationalization) of services like transport and electricity. Marxism had become respectable politics in Europe by the late 19th century, and made its presence felt through parties like Social Democrats (in Germany) and Socialists (in France). The implementation of Marxian policies and his ideas became easy as these parties gained a stronghold in the Parliaments of their respective countries. In Germany, alongside the centralization of utilities, other measures such as a nationalized health insurance and a progressive income tax (aimed squarely at the wealthy and well-off people) were implemented by Bismarck before the 20th century. The process of nationalizing railroads and the railway network in Europe began the last quarter of the 19th century, and was completed by 1914. Postal services and Telegraph had been nationalized before the First World War, and the nationalization of radio soon followed after the beginning of the war.

Given these, how could electricity (another utility of importance) be left behind? Therefore, it should come as no surprise that the electricity sector and its related issues also came under the ambit of the centralized scheme of things.

Besides the Marxist argument, perhaps the most cited argument cited in favor of centralizing/nationalizing electricity was (and still is) the argument of economies of scale through working of a natural monopoly. Let us examine this argument to see whether it is true in case of WAPDA?

2.2 Is the Natural Monopoly argument still valid?

The arguments for existence of a natural monopoly are economic in nature. The existence of a natural monopoly solely owes to the fact that economies of scale are so substantial that it does not make any sense to induce competition through many firms or production units. The reason is *costs, both variable and fixed*. The simple logic used in this case is that once the fixed costs are incurred, the revenues through increasing the number of users will easily cover the variable plus fixed costs in the coming years. Put another way, natural monopoly situation arises when there are large fixed costs and small marginal costs. Thus, the theory goes that within a few

years of its establishment, a natural monopoly will become a cash minting machine for the owner. The falling long-run average costs of production renders the argument for the existence of another firm useless since it will only lead to doubling of the cost. For example, two separate suppliers of electricity will have its own power source, power lines, own energy mix, etc, thus doubling the cost as compared to a natural monopoly. Therefore, allowing a natural monopoly to operate makes sense.

But the existence of a natural monopoly also poses a dilemma: how to organize production so as to gain the advantages of production by a single firm, while minimizing the damage (in terms of deadweight loss) resulting from the presence of a monopoly. The normal way of dealing with this dilemma has been either to regulate private enterprises or nationalize a natural monopoly. Pakistan, in case of electricity production, chose the latter path in the form of WAPDA which was established in 1958.

Does the basis for maintaining a natural monopoly still holds true? The simple answer is no. One can cite many economic arguments in this regard, but the two most valid ones are *the improvements in technology* and *the existence of markets beyond national boundaries (or globalized markets)*. In short, the natural monopoly argument (as implied to nationalize services like electricity) did not take into account the possibility of such technological improvements that would render the cost advantage redundant or of little consequence. It was simply based on the notion of increasing the number of users. Moreover, the application at the time of initial nationalization of services like electricity was concerned only with limited market within geographical boundaries. Both of these assumptions don't hold anymore. Technology has improved at a breathtaking pace, and the electricity sector is not immune to it. It has made the cost argument less important since the improvements in technology imply that even small scale firms could reap economies of scale through improved use of technology. For example, combined cycle turbine generators ensure a low capital to cost source of power, allowing generation of economies of scale at smaller establishments and making void any argument that electricity generation should remain a natural monopoly. Second, in a globalized world, the physical limitations of borders have become increasingly less ap-

plicable as new markets beckon for producers. In Pakistan's case, the attempts at exporting electricity (when there was a surplus in 2002-03) and at importing electricity (from Iran or central Asian countries) points to this practical reality.

In addition, the numbers related to WAPDA disprove this natural monopoly argument convincingly. Budget documents can be gleaned to verify that a substantial cost is still incurred in terms of maintaining and running plants and equipment (that are part of fixed costs). And these costs are not met through revenues of WAPDA (as per the argument and logic for natural monopoly) but through government tax revenue. This is despite the fact that the number of consumers have steadily been increasing over time, which should have made WAPDA a profit earning institution.[17] Yet the reality is completely opposite, as it is the consumers (through taxation by the government) who have to bear the burden of maintaining this monopoly. In FY 2013-14, the budgeted amount for WAPDA's current expenditures was stated as Rs. 426/- million, which by the fiscal year's end had to be revised to Rs. 646 million/-.[18] And this has been happening for a long time. Like all other fiscal white elephants that the government maintains, WAPDA also runs on generous financial help of the federal government (mainly through subsidies, and seconded by grants, low interest loans, etc). For a monopoly that, atleast theoretically, was supposed to pay for itself and earn revenue for the government, it has failed miserably. Therefore, the logic of maintaining a natural monopoly fails comprehensively in terms of WAPDA.

2.3 Electricity as Public utility in Pakistan

Although electricity related matters have been dealt with by the federal government since its inception, the process of converting electricity into a pure public good in Pakistan was initiated with the advent of Water and Power Development Authority (WAPDA) Act in 1958. Since then, matters related to electricity have largely been dictated by this organization despite attempts at privatization and

[17] In 1998, the number of electricity users was 10.36/- million. The number for 2013 is 21.7/- million, which amounts to a growth of 100.9% in users. WAPDA's revenue in all these years (if any, in percentage terms) has been nowhere near this number. In fact, it has been a loss making entity since long.

[18] Federal Budget 2013-14, available on Finance Division's website.

bifurcation. In between, there have been various energy policies being announced by the various governments. These policies were a reflection of the evolution of thinking of policymakers in terms of electricity related issues, and showed a desire for effectively dealing with these matters. Yet, when it came to practical implementation, decision making remained (and still remains) with the government setup. For this paper, we will start with the 1994 Power Policy and then discuss the present one. The reason is that much of what is happening today in the electricity sector traces its origins to the said policy and its repercussions.

2.3.1 Power Policy 1994

Power Policy 1994 was the result of a process started in 1985 for restructuring electricity sector. The aim of this process was to bring in the private sector in power generation, to generate additional financial resources and organizational capabilities to solve the chronic problem of power load shedding. After almost a decade, the consultation process resulted in the said policy. The comprehensive discussion of the policy is beyond the scope of this paper[19], but some results are worth mentioning. The policy succeeded in attracting considerable foreign investment and the electricity production also increased to cover a substantial gap between the demand and supply of electricity.[20] The government, overall, was successful in attracting investment and the private sector to this area. Moreover, three new entities namely the Private Power and Infrastructure Board (PPIB), WAPDA Private Power Organization (WPPO) and the Private Energy Division (PED) were created out of WAPDA. The stated aim was to bring in much needed efficiency in the electricity sector through bifurcation and decentralization. Thus, the bifurcation of WAPDA in early 2000's was not the first attempt at improving the efficiency of the system through creation of sub-units.

However, there were certain aspects of the policy that reflected the government's resolve to keep decision making in its own hand, and

[19] Interested readers may want to read *Power Sector Development in Pakistan and Economic Policy Issues (1998),* by Muhammad Iqbal Khan, *IPP's: The Real Issues* (1998) by Anjum Siddique, and the excellent review by Julia Fraser (2005) in *Lessons from the Independent Power Experience in Pakistan*.

[20] In fact, the excess electricity available to Pakistan in 02-03 was largely the result of that policy.

to use the policy to its own goals and advantage. For example, the option of importing fuel through international sellers by the private investor was not permitted. The issue of supplying fuel for electricity production remained the sole preserve of Pakistan State Oil (PSO), thus giving it monopoly power in this regard. Also, in this way, the government ensured that it realized all the revenue levied on oil imports. In essence, if the government wanted, it could choke off production of Independent Power Producers (IPP's) since their production was dependent upon furnace oil supplied by PSO. Moreover, IPP's were restricted in that they could only sell the produced electricity to WAPDA only, which would then sell it to the consumers. Again, the intention was to maintain WAPDA's monopoly over electricity provision.

There were other clauses that were simply unrealistic. A major one was that WAPDA would buy atleast sixty percent of the electricity produced (which WAPDA later failed to do). Surely, WAPDA and the government overestimated their capacity to buy electricity from IPP's at their rates despite the fact that the main motive of bringing in the IPP's in this sector was the weak financial position of the government (and WAPDA) in the first place. If they did not have the financial capacity to buy electricity, why did the government decide to buy electricity in the first place? Why not let the power producers sell it to the consumers directly? It is here that the motive to control a service or a resource to use it for political gains becomes most apparent. Electricity is not just a service (turned into a public good), but it's a *necessity* too. Aware of this fact, governing dispensations in Pakistan have tried to build political capital by promising provision of electricity despite lacking the financial resources to manufacture or buy it, and yet continuing with its agenda of electrification of additional areas despite the system having no capacity to do so.

2.3.2 End Results

Despite the relative success in attracting foreign investment, expertise and private sector to this field, the end result was not a happy one for the private sector. Unable to buy the electricity from IPP's, the government reneged upon its promises and contractual obligations. Through arm twisting tactics, the government ultimately

hounded the IPP's into submission and got their desired reduction in tariffs charged by IPP's.[21] Since that time, the less than cordial experience of the IPP's has kept away new producers and new investment in this sector. More problems were in store for the already existing IPP's when, despite producing electricity at a high rate (due to increase in fuel prices), they were not allowed to pass on that increase by NEPRA. This state of affairs continues till this day, with the genie of circular debt largely a result of this policy.[22] Private sector producers, given their adverse experience of 1994 policy, are still reluctant to invest in this sector. Not surprisingly, all of government's hopes are now fixed on a single source (China) to fill this gap, even if it implies setting aside already established laws (like the Public Procurement Regulatory Authority or PPRA Rul es).

2.3.3 New Power Policy: Will it work?

At present, the government has come up with the 2013-18 energy policy. With the aim of alleviating the substantial gap between demand and supply of electricity, its vision states that:

> "*Pakistan will develop the most efficient and consumer centric power generation, transmission, and distribution system that meets the needs of its population and boosts its economy in a sustainable and affordable manner*. "

In order to achieve the objectives stated in the vision statement, three policy principles (Efficiency, Competition and Sustainability) have been earmarked as the basis for future implementation. Some of the basic features of this policy are the decentralization of power governance, devolution of related matters to provinces, the aim of completely closing the gap between demand and supply of electricity by 2018, and complete elimination of subsidies, etc.[23] However,

[21] Comprehensive detail of the travails of the private power producers at the hands of the government can be found in Fraser, Julia (2005), *Lessons from the Independent Power Experience in Pakistan;* World Bank (WB).

[22] The refusal to pass on the production cost to the end consumer is not the only factor in the circular debt problem but a major one. For a comprehensive study of this problem, readers may refer to USAID's 2013 study titled The *Causes and Impacts of Power Sector Circular Debt in Pakistan*.

[23] Refer to official document titled "*National Power Policy 2013*". For a short review of the policy, see "*National Energy Policy 2013-18: A Critical Review*" Mehmood Ul Hassan Khan and TRIBUNE's editorial titled "*Pakistan's new Energy Policy*".

there is little in the new policy that has already not been reiterated in the previous power policies by various governments. A short reading of those reveals that the kinds of goals envisaged in the latest policy document have been more or less addressed in the previous issues too. For example, all of these policies have the themes of privatization, infrastructure development, transparency and good governance as their basis.[24]

The targets envisaged in those policies could not be achieved due to various reasons. Also, the aim of decentralization is nothing new. As stated above, WAPDA was bifurcated into smaller units with the same aim of bringing in efficiency in the electricity setup. A decade after that action, many people regard it as a failure in terms of meeting any of the envisaged goals of that time.[25] And the reasons for the failure or below par performance of the sector after that decision are the same. Importantly, despite the mantra of decentralization, administrative and financial decision making power still remained centralized (with WAPDA and Finance Division respectively). There should remain little doubt, given the history and the fact that important decision making still remains centralized, that this policy will likely meet the same fate as before. Also, the estimated financial requirement for setting up all the proposed projects for electricity generation suggest that if the goal of getting rid of load shedding is to be achieved by 2018-19, there will have to be an investment of above $35 billion/- by that time in the power sector.[26] For a country that is hardly attracting any worthwhile Foreign Direct Investment (FDI) and whose imports have historically been more than its exports (implying more reserve currency flows out of Pakistan than coming in), it is hard to imagine how this ambitious plan will be achieved? Government cannot go on borrowing[27] and

[24] A short description of the 1994 and 2002 policies is provided in *"Pakistan Infrastructure Task Force Report" (2010)*, SBP.

[25] For example, in a recent interview with *NEWS* (16th November Sunday edition), Tahir Basharat Cheema (former MD PEPCO) termed the said bifurcation as a failure and a waste of resources.

[26] Kazim Saeed, a consultant in WB Pakistan Energy Team, estimated the total financial requirement to be $33.5 billion in 2011. Reference may be made to his study titled "*Financing Pakistan's Power Sector after the Global Financial Crisis*" (2011). Since this estimate is of 2011 and given the year wise spiraling cost of completing these projects, it can easily be stated that the cost will come above $35 billion at present if he were to conduct the same analysis now.

[27] International lenders are mostly unwilling to finance Pakistan's fiscal deficits at the moment. Even the much touted Euro bonds that garnered the government much needed short term foreign capital, had to be offered at a very high rate of above 6 percent. This simply implies even

it is highly unlikely that the required investment in this sector will materialize in the near future given the overall security situation. Therefore, in all likelihood, the aims stated in the latest policy will also remain unrealized.

As this section demonstrated, there is a deep disconnect between he aims and realities of the announced power policies of the government. Unless this gap is filled and the ground realities are properly taken care of, private sector is highly unlikely to come to this sector in the future and there will be little hope of improvement.

more debt burden in the long run for a short term gain since a heavy payment of interest will have to be made besides the principal amount.

3. The performance of government's electricity setup

3.1 Is NEPRA independent?

There are over twenty organizations that are involved in the power sector in one way or the other, and there are no two views regarding the fact that government and its setup calls the shots. Two organizations, NEPRA and Oil and Gas Regulatory Authority (OGRA), were specifically established to run the affairs of this sector in a way that could attract increased private sector participation. But the performance of both of these has been disappointing to say the least, with the not so surprising result that government's involvement is still substantial. NEPRA, established in a bid to regulate the electricity sector, is still seen as government's instrument in its quest to set prices according to its own terms and aspirations. In short, the kind of independence envisaged at the start of its establishment has failed to materialize. It is still seen by independent observers as subservient to WAPDA and the ruling dispensation.[28] Moreover, for an entity that was created to take independent decisions regarding power tariff and related issues, it is quite a pre-

[28] NEPRA's legal standing was thrown into question by a recent Peshawar High Court (PHC) verdict in Working Petition (*W.P) No. 456-P/2012*, p.50 and p.59. This verdict is a landmark verdict in the electricity related issues, and looks extensively at issues surrounding electricity setup in Pakistan. The court declared that NEPRA did not have authority to do what it was doing, and all its present, past and future actions were illegal. Moreover, it declared NEPRA rules as confiscatory.

dicament that its chairman and members are appointed mostly on political and provincial basis rather than merit and qualification. As an example of this, the original draft of NEPRA Act called for appointment of a chairman who is an engineer by background and has extensive experience in the field of electricity. Yet this condition has been violated many times. For a start, there is an urgent need to appoint chairman NEPRA and members strictly on merit rather than using the provincial criteria. Commonly held view is that the root cause of bad governance in electricity sector is the poor performance of NEPRA.[29]

3.2 NEPRA's priorities

Other lopsided priorities also speak volumes about NEPRA's performance over the years. For example, NEPRA's financial statement for FY 2008-9 and 2009-10 showed that it made investments amounting to Rs. 855 million/- and Rs1.30 billion/- respectively in banking entities.[30] For an entity that was created to regulate the electricity sector and make it attractive for investors (both domestic and foreign), what kind of message this conveys about NEPRA's intentions to the would-be investor's is anybody's guess. Other studies regarding regulation of electricity and NEPRA's performance have come to the same conclusion more or less.[31]

3.3 Infrastructure Issues

In terms of issues of infrastructure, the fact that the power sector infrastructure is in a bad shape and needs considerable investment for

[29] Abbasi, Arshad H; "*Pakistan Power Outlook" (2012)*, *SDPI*, and "*Reformation of NEPRA must to end power crisis*" by Amir Sial in *Pakistan Today* on 7th October 2011.

[30] Ibid.

[31] For example, reference may be made to Malik, Afia, "*Effectiveness of Regulatory Structure in the Power Sector of Pakistan*" (2007), Pakistan Institute of Development Economics (PIDE). Her research concludes that "*The power sector (dominated by WAPDA and KESC) is still affected by institutional and organizational weaknesses, with inefficient and non-optimal tariffs, high line losses, and high level of corruption. It has been found weak administrative governance in NEPRA in the form of lack of autonomy, resulting in the overall institutional inability to carry out the desired functions effectively. In addition, NEPRA is lacked in professional expertise to supervise and control the power sector and establish a rational and equitable pricing regime*".

its upgradation, maintenance and additions is undeniable. Various issues plague the infrastructure, from a poor governance structure to line losses during transmission of electricity.[32] Yet policymakers have tended to ignore this very important aspect of this particular sector. For example, out of the total of $18 billion/- received by Pakistan's government in various forms (aid under war on terror and FDI) between 2002 and 2008, only $0.75 billion/- (four percent) went to the power sector. This gives us a hint about the priorities of those who govern and their seriousness in resolving such a critical issue. Due to governance and other related issues, foreign investors avoided the power sector but were willing to invest in telecom, banking, IT, etc.[33] One revealing report in this regard[34] revealed that sixty five percent of the PESCO staff, a company heavily under the influence of government, is illiterate.

3.4 Financing the infrastructure

The next challenge comes in the form of financing the infrastructure. As has been mentioned above, the financial requirement is substantial and increasing with the passage of time due to increase in the year wise cost. Key challenges include the fiscal deficits (difficult to set money aside for power sector reforms and related issues[35]), monetary policy (high rate of interest that discourages borrowing for the purpose of investment), preference for consumption over investment (largely due to prevalent situation in the country) and a banking sector that heavily invests in T-Bills rather than other avenues like the power sector. Also, sovereign guarantees are necessary to attract investment. Yet Pakistan's falling credit ratings over time have led to difficulty as far as this particular option is concerned. If the intended goal of generating 20,000 MW of electric-

[32] To get an idea of how inefficient the production infrastructure (plants,, machinery, lines, etc.) is, consider the fact that out of the total available 64,727,000/- TOE (ton of oil equivalent) in FY 12-13, only 40,026,000/- (62 percent approximately) TOE's were used. Around 3 percent was lost in distribution. Source: *Economic Survey 2012-13*, chapter on Energy.

[33] Kazim Saeed, "*Financing Pakistan's Power Sector after the Global Financial Crisis*" (2011), WB.

[34] Ullah, Raza, "*A performance review of electricity utility companies in Pakistan*"(2014); p.11 PRIME Institute. The study concludes that KESC, a privatized entity, has performed relatively well amongst all the DISCO's. PESCO, heavily influenced by government and stuffed with government officials, came out the worst.

[35] More than half of the budget expenditures cater to repayment of debt, interest accrued on debt and defense. As stated above, by issuing bonds for short term foreign reserve accumulation, we are only adding to the already substantial debt burden.

ity by 2020 is to be achieved, the corresponding requirement is of an investment is of $33 to35 billion. But the reality is that FDI has reached a minimum in the last few years. Given Pakistan's precarious fiscal position and its low credit ratings, it is difficult to imagine how this goal will be achieved? Just recently, the association of IPP's advertised the impending sovereign default of the government in the leading newspapers of the country.[36]

3.5 Administrative Bottlenecks

State Bank of Pakistan (SBP)'s report[37] mentions that since the unveiling of the Power Policy in 2002, not a single project could be packaged by the government to a point of tendering it (the situation remained the same at least up till 2010 when the report was published). All projects were individually submitted and evaluated on case to case basis. In each case, the investor gave his proposal and showed his cost calculations but the regulator (NEPRA) reduced the proposed tariff. This case to case based approach is time consuming and has often resulted in disagreements between the investor and the regulator at various points. These kinds of regulations (like pricing below the total cost of production) later led to the problem of circular debt. Further, there is a cap on price increase (to protect the consumer), but no provision for a floor on price decrease (to protect the producer). Indirectly, this translates into an incentive to consume and a disincentive to produce or increase supply.

Coming to the consumer side, despite the increase in numbers of electricity consumers there is still a considerable percentage of population that does not have access to power sources (like electricity and gas). According to a USAID study[38], around thirty percent of the population does not have access to electricity while almost seventy percent does not have access to gas. Given this, the continuous increase in population and the increasing electrification of areas that are without electricity, there should remain little doubt that the demand for power sources will see a continuous rise over time. It is estimated that the demand will exceed 100,000 MW by 2025.[39]

[36] '*Government on verge of sovereign default*'; advertised by Independent Power Producers Association Committee (IPPAC), The NEWS, Dec 8 2014.
[37] *"Pakistan Infrastructure Task Force Report" (2010)*, SBP.
[38] '*Provision of Energy Services in Pakistan and Rights of the Consumers*' (January 2013), *USAID*.
[39] For example, see Bhutta, S.M. "*Electrical Energy: Remedial Measures*". He postulates the

The patterns of consumption of power, however, are expected to remain the same.

The above stated issues should make it abundantly clear the reasons behind Pakistan's unsuccessful efforts at attracting FDI for its power sector, and with it the chance to improve the overall infrastructure in the power sector. The record and performance of the government sector in this regard has remained dismal.

2025 demand to be around 101,478 MW.

4. The Determination of Electricity Tariff, Pricing and overall costs of the system- How Consumers get Robbed

In Pakistan, the setting of power tariffs and methodology of arriving at a rate for electricity have remained the sole preserve of the government. This is despite the fact that in the previously announced policies as well as the latest one, a major policy overhaul revolved around the determination of power prices in line with market pricing mechanism. Generally, under this kind of pricing system, the cost of production is passed on to the consumer and he ends up paying what he consumes. But despite the official proclamations of moving toward a market oriented pricing goal, the reality is that the power pricing is done on 'cap and freeze' basis, i-e, the cost of production is rarely passed to the end user in full. The difference between the cost of production and price is filled by a state subsidy. The implications of this scheme of things are drastic, ranging from the critical issue of circular debt to the inefficient use of electricity. The cost of all of this has to be borne by the consumer, and it runs into billions of rupees every year.

4.1 Tariff Determination

The nature of tariff determination by National Electricity Power Regulatory Authority (NEPRA) leaves little doubt that the govern-

ment has left the consumer with little choice but to bear the burden of an inefficient and lopsided system. The following discussion about the clauses in NEPRA's tariff determination methodology demonstrates this amply.[40]

(a) Clause:*"Base Year" means the year on which the annual or multiyear tariff projection is being made. It may be a historical financial year, for which the actual results/audited accounts are available. It may be a combination of actual results and projected results for the same financial year or it may be a pure projection of a future financial year*.[41]

We can clearly see that there is no clear indication of the year on which the projections will be based, which itself invites uncertainty and potential abuse by the authority determining tariffs. For example, the authorities, facing a shortfall in revenues or not wanting to pass on any relief, can base their projections on a year when production costs were higher. This was proven recently when the FY 2011-12 was used instead of the recent one in order to defer passing of advantages to the end user of low production costs (due to lower fuel costs in FY 2013-14).[42] There exists no official mechanism to check these kinds of abuses and willful change of base years to avoid passing on accrued benefits to the consumer.

(b) Clause: *"Consumer-end Tariff" means a tariff to be charged to the end-consumer comprising of Power Purchase Price, and Distribution Margin adjusted for permissible Transmission and Distribution Losses, Cross-Subsidy (if any) and Inter-Region Subsidy (if any).*

It is baffling to think as to why the consumers have to pay for a bad infrastructure (transmission or distribution losses) or for other consumers who do not pay their electricity dues? This is simply a negative externality associated with a public good. End consumers should never be made the scapegoats for mismanagement of the government or private companies. This principle applies to consumers by geographical and provincial divide. One set of consumers in one locality should not be made to pay for other consumers

[40] These are taken from *Draft NEPRA guidelines for determining consumer end Tariff* (July 2014), NEPRA.

[41] Ibid, Page 3

[42] *Rs. 39 billion extra collected from electricity consumers*", Sohail Iqbal Bhatti, Dawn, 16th November 2014.

in another locality (or for mismanagement by officials in another locality). This is completely unjustified and against the norms of justice and logic. What is interesting to note here is that years before the establishment of NEPRA, these kinds of cross-subsidies and inter-region subsidies had been deemed un-constitutional by a government committee in 1986, set up under the directives of Economic Coordination Council (ECC).[43] The findings of the report also stated that there was no constitutional provision for charging a loss to provinces, and the loss of one station cannot be adjusted against the loss of the other. But despite the findings, these subsidies continued unabated.

> (c) Clause: *"Distribution Margin"(DM) means the component of revenue requirement comprising of operations & maintenance cost, return on rate base, depreciation, taxes, other regulatory cost including other income determined or approved by the Authority for running the distribution business.*

One can again see the vagueness in the interpretation of various components of this particular clause. What is understood here is that this DM can be used by the Electricity Generation Company (GENCO) in its calculation of its required electricity tariff to be charged to the consumer. But provisions like '*other regulatory costs*' and '*other income determined or approved by authority*' are rarely understood and only create an environment of uncertainty that leaves the system open to potential abuse. One such abuse was mentioned above in the form of shifting of base years to avoid passing on benefits to end consumers. Since there exists little (if any) mechanism to check the validity and justification of these kinds of charges, the decision makers or tariff setters can always insert a particular cost in calculations under these heads for retrieving more money from the consumer. One recent example comes in the form of levying 'Debt Servicing' surcharge' and 'Universal Obligation Fund' surcharge in the current electricity bills. But the Lahore High Court (LHC) struck it down, terming it illegal and without any justification.[44]

The other issue/term of note here relate to depreciation, which is

[43] Refer to p.36 of the PHC verdict in *Working Petition (W.P) No. 456-P/2012*, heard on 17th December 2013.

[44] "*LHC suspends surcharge on power bills*"; The NEWS, 14th December 2014. The Loan or Debt repayment surcharge was authorized to be levied from October 2014 onwards.

allowed in the computation of DM. The technical discussion of this concept and its application is out of the scope of this paper. It is suffice to mention here that adding depreciation charges to operating expenses and claiming it as part of charged tariff is the norm around the world. But there is a reason that this practice is allowed. Depreciation expenses are justified, in general, on the ground that the system of electricity production and distribution will be continually updated and old, depreciated equipment will be phased out, to be replaced by newer one. The overall objective is to keep the system running smoothly.[45] But the reality, as related to equipment and infrastructure in Pakistan, is at odds with this logic and justification of charging depreciation as part of expense for tariff determination. Most of the equipment, infrastructure and machinery used in electricity production and distribution is outdated and has been found to be unproductive, resulting in heavy production, transmission and distribution losses.[46] Therefore, there is no justification for including depreciation charges in the tariff determination given the current state of equipment and machinery.[47] These charges have to be ultimately borne by the consumer without any sign of improvement in terms of productivity, introduction of new equipment or moving towards comparatively better infrastructure.

(d) Federal and provincial taxes have also to be borne by the consumers as they are part of distribution company's DM. The end result is that the end consumer is charged multiple taxes/charges for the use of electricity. These come both from the GENCO side (in terms of billing consumers for operation and maintenance costs,

[45] Reference may be made to the earliest cases related to depreciation like *Smith vs Amyss (1898)*, *City of Knoxville vs. Knoxville Water Company (1909)* and *Lindheimer vs. Illinois Bell Telephone Company (1910)*, all heard and adjudged upon by the US Supreme Court. In all these cases, the court allowed for charging depreciation as an expense under the condition that depreciated machinery/equipment will be replaced on time. For a summary of these cases and the argument concerning depreciation charges, refer to Harrop Freeman's Public Utility Depreciation (1946), *Cornell Law Review, Volume 32*.

[46] For example, reference may be made to 'Pakistan's Energy Crisis' by Shabbir Kazmi, 31st August 2013, published in The DIPLOMAT, and "The Causes and Impacts of Power Sector Circular Debt in Pakistan" (2013), p.41, USAID.

[47] *W.P No. 456-P/2012*, p.33, PHC. The Committee constituted under ECC directives had recommended that no depreciation charges should be levied on consumers once the equipment is past its use date. On p.43 and 44 of the same verdict, WAPDA was found to have charged consumers exaggerated depreciation charges. Also refer to p.58, where it was found by the court that the equipment being used by WAPDA was many decades old and past its useful life. Thus, there arose no question of charging depreciation rates.

for example) and from the Government side (both federal and provincial level). For example, the consumers are charged a certain amount by the federal government in terms of using Pakistan Television (a government entity) without taking into account whether the end users use make use of this service at all.[48]

> (e) Clause: *Only actual or estimated cost of technical losses, as deemed proper by NEPRA, shall be included in the revenue requirement of a petition company for either an annual or multi-year tariff.*

Doing the calculation on the base of estimated cost is risky. What if the estimated cost is inflated? As stated above, there is no mechanism to check the validity of these kinds of decisions. Nor is there any mechanism to reimburse inflated costs once the real ones are known. It has happened on countless occasions that inflated prices were passed on to the consumer for filing the gap between operations and expenses of institutions (private and public). Examples of overbilling and charging of depreciation costs in final calculations despite little or no replacement of equipment amply demonstrate this. Also, in the PHC case cited above, it was found that NEPRA lacked the capacity to determine whether the furnace oil used for electricity production was of the old stock or from the new one? The straightforward implication was that it was in the dark when it came to determining adjustment costs related to use of fuel for use electricity production (this is commonly referred to as Fuel Adjustment Cost or FAC). Resultantly, the court declared FAC as illegal.[49] Moreover, when the court asked NEPRA and Peshawar Electric Supply Corporation (PESCO) to show the methodology of calculating FAC claims, both of them were unable to provide any satisfactory answer to the court.[50]

(f) Salaries and Benefits, Travel Expenses and Vehicle Expenses are also allowed as part of calculation of costs that can be charged to the consumer. Under what logic are these expenses allowed to be a part of tariff determination is not known. Interestingly, the calculation of salaries and vehicle expenses has been based on '*Prudence*'. There is no explanation of what exactly prudence implies in terms

[48] The advent of private channels has taken the state TV's viewership to an all time low. Yet every household still gets charged for it in their electricity bills.
[49] Refer to p. 48 and p.52 of PHC verdict in *W.P No. 456-P/2012*.
[50] Ibid, p.65.

of costs and the methodology of its calculation. We are only told that the government's regulatory arm will decide upon the prudent amount. This again leaves the system open to abuse, and the end user is always at the receiving end of this kind of abuse at the hands of the decision makers. This fact is undeniable and has been demonstrated repeatedly over time.

The above statements clearly demonstrate the lopsided nature of tariff determination, which is squarely pitted against the interests of the end consumer. But the miseries of the consumer do not end with tariff determination only. In the following lines, it will be illustrated how the pricing mechanism leaves poor and lower middle class consumers worst off, and further exacerbates incomes inequalities.

4.2 Pricing electricity inefficiently

The pricing of services in the power sector resides in the hand of federal government, carried out through its regulatory bodies like NEPRA and OGRA. This runs counter to the Article 157, 2(d) of the Constitution of Pakistan, which gives the right of determining electricity tariffs to the province. However, the practice of pricing electricity has been carried out by the federal government in contravention of the said article.

Usually, the announced tariff/price of electricity is less than the one requested by the producers. Even in circumstances when NEPRA has determined prices in line with market pricing principles, its decision is overruled by the ruling dispensations that are very sensitive to public anger in terms of higher electricity prices.[51]Moreover, as clearly demonstrated above, NEPRA's Act regarding electricity pricing contains clauses that defy logic. After analyzing electricity pricing practice, it becomes clear that the pricing of electricity is done more on the basis of political goals and public sentiments rather than any sound, market oriented methodology.

[51] The link between an increase in energy prices and overall inflation tends to be very strong in Pakistan. The rise in energy prices are immediately reflected in the overall prices. In technical terms, the overall Consumer Price Index (CPI) has shown a tendency to be highly elastic with a rise in energy prices and somewhat inelastic in case of reduction in energy prices. The lag in former case tends to very small, while it has been observed to be comparatively longer in the latter case.

This pricing practice is inefficient and stands in contrast to the fairly well established and successful pricing principles, as practiced around the world. The inefficiency comes from wrongly subsidizing the power sector for the wrong consumer and using the wrong methodology for pricing. The basic motive of any form of subsidy is to keep the prices low so that the poor section of the society is least affected. The same is true when it comes to electricity subsidies. Their main aim is to keep electricity prices low so that the poor people are shielded from the effects of inflation due to higher electricity prices. Yet they end up subsidizing the middle income and wealthy rather than the poor, and promote inefficient use of electricity. This simply owes to the fact that the appliances that exert the most pressure on electricity grid (like air conditioners) are rarely in the poor people's possession. When electricity rates are artificially kept low through subsidies, it incentivizes the groups that own these appliances to increase their use of electricity. The consumption of electricity by the poor people barely increases (as a proportion of the total increase).[52] Thus a policy aimed at helping them ends up hurting them more in the long run since the continued increase in demand means increase in future electricity rates. Although there is a willingness to move from general subsidy to a targeted one in this regard, this has yet to materialize.[53]

Efficient pricing of power, as experience from around the world suggests, is based more on the marginal pricing principle in a decentralized operating environment. The standard prescription for achieving an efficient outcome in this context is to use a multi-part tariff. For example, with a basic two-part tariff, the regulator requires the company to set per-unit charges equal to marginal cost, yielding the efficient level of consumption and eliminating the deadweight loss associated with the electricity use. The company can then recoup its fixed costs by charging fixed monthly fees.[54] Re-

[52] Increase in their consumption requires increase in quantity of electrical appliances bought, something that poor people can barely afford.

[53] The fact that this kind of subsidy ends up benefitting the upper classes was recently confirmed by another study carried out by the World Bank. Refer to "*Addressing Inequality in South Asia*"; WB, December 2014.

[54] Taken from *National Bureau of Economic Research (NBER), Reporter number 1 of 2014*, titled "*Pricing Energy Efficiently*". It is an updated point of view regarding pricing in the energy sector and its outcomes. The standard two-part tariff model can be found in intermediate microeconomics texts like Hal Varian's *MICROECONOMICS*.

search supports the view that deviations from market pricing and reliance on subsidies can have substantial costs.[55] But in Pakistan, the prices of electricity are set on a uniform basis for different consumer groups. Thus they do not take into account differences like geography, differing transmission costs, differences in technology used for producing electricity, etc. The true cost in terms of this inefficient pricing mechanism in Pakistan is not known, but is undoubtedly substantial. Not only have these kinds of policies failed to promote efficiency and stabilize electricity prices, but have led to wastage of billions of rupees of precious financial resources of the national exchequer. These financial resources, not surprisingly, are garnered by taxing the people. Therefore, the financial loss to the exchequer is their loss too.

If there were any benefits in terms of stabilizing electricity prices, an argument could have been made for maintaining the present state of affairs. But prices of electricity have gone up over the time. These can easily be gauged from officially published statistics of core inflation (that is based solely on energy prices) like the Bureau of Statistics (FBS) and State Bank of Pakistan (SBP) monthly inflation monitor that demonstrate a considerable increase over time.[56]

The above stated arguments demonstrate that the pricing and tariff setting policies ultimately end up costing consumers billions of rupees annually. The end result of these policies is a system whose costs are substantial (besides the cost of electricity). These also have to be borne by the end consumer, and are discussed in the following section.

4.3 The cost of maintaining the system

4.3.1 Cost in terms of forgone economic growth

The inherent danger in the services provided by a nationalized natural monopoly becoming an important part of a nation's infrastructure is rarely considered by decision makers, especially in

[55] Davis, L (Dec 2013), "*The Economic Cost of Global Fuel Subsidies*", *NBER working paper number 19736*. His estimates suggest that deviations from efficient pricing cost an annual $44 billion besides the externalities (like pollution, which is difficult to quantify).

[56] Reference may be made to Abdul Rasheed Azad,"*2008 to 2013: Average Fuel Prices rose by 100 percent*". This article breaks down the pricing by various energy product categories, plus contains relevant observations/commentary on issues surrounding the subject of energy.

countries like Pakistan where decision making is based on political goals and ambitions rather than economic considerations. The danger mainly comes from sub optimal provision of the service that can become an impediment to growth. As services like electricity become an important part of a nation's infrastructure, they complement the overall growth. In the process, the infrastructure comes to depend upon their continuous and uninterrupted services. For example, as discussed above, the importance of electricity for economic growth is well established for the world and Pakistan also. Not surprisingly, the uneven supply of electricity has hurt Pakistan's growth prospects badly. Estimates of the forgone growth of Pakistan's economy due to electricity shortages are considerable. This fact is accepted both in the government and non-government circles, although the figures may not be the same. For example, the inspector general of USA in its quarterly report (spring 2012) suggests that between 2010 and 2012, Pakistan's loss in terms of GDP was 3 to 4 percent annually.[57] And the sole responsibility of this lies on the shoulders of the government and its electricity related setup whose below par performance has ensured that this critical input of economic growth remains below the required levels.

4.3.2 Cost in terms of subsidies

The other substantial cost of this setup comes in the form of provisions of billions of rupees in yearly subsidies. There are various types of subsidies within this overall subsidy. For example, there is an Inter-Distribution Company (DISCO) subsidy, Tariff Differential Subsidy (TDS) and subsidy by slabs used for various consumer groups.[58] In FY 11-12, of the total subsidy paid by the government, TDS alone amounted to Rs. 464 billion/-.[59] For an idea of what Pakistani's have to pay for maintaining this system, the 2012-13 budget speech of the former finance minister (Mr. Abdul Hafeez Shaikh)

[57] "*Progress and oversight report of the Office of Inspector General of the US (OIG"*, The Asian Development Bank arrived at a similar figure.

[58] The profile of various types of subsides can be found in majority of publications related to these issues. For example, "The *Causes and Impacts of Power Sector Circular Debt in Pakistan*" (2013) by USAID and "*Rethinking electricity tariffs and subsidies in Pakistan*" by WB contains short commentary on these.

[59] Fatima, Umbreen and Anjum, Nasim; "*Inter-provincial differences in power sector subsidies and implications for the NFC award*"; (2012), p.1. The study contains calculation of total and per customer subsidy by slabs during various fiscal years.

is an eye opener in this regard. In his speech, he revealed that the government had to pay a staggering amount of more than Rs. 1000 billion/- in last three years as subsidy just to keep the system running. Even more ironic is the fact that there is little (if any) improvement to show despite such huge expenditures. The subsidies come from tax revenue, and tax revenue comes from taxing people. Thus, the burden of subsidies again falls on the already burdened consumers. Early this year, the Economic Coordination Council (ECC) announced ending all kinds of subsidies except the ones for lifeline consumers. Yet it also decided to maintain the inter-DISCO subsidy (for equalization of tariffs) which would cost the government Rs. 145 billion/-. Overall, consumers would have to bear an extra burden of Rs. 295 billion/- in this fiscal due to continuation of this subsidy. [60] Thus, despite the official proclamation of phasing out subsidies, they are still a part and parcel of the system.

4.3.3 Costs in terms of mismanagement

The cost of mismanagement is another cost, and these have to be borne by the consumer in the end in the form of overbilling and various 'charges' that they have to pay. Some examples were given in the tariff determination section, and there are countless examples like these. Recently, it was reported that consumers will be overcharged a whopping Rs. 117 billion/- owing to two new charges included in the electricity bill.[61] The government's resolve at cheating people out of their hard earned income through various techniques continues unabated. Just recently, it was revealed that NEPRA used FY12-13 prices for FY 13-14 and 14-15 in order to avoid passing on the benefits of low fuel prices in international market.[62] This kind of statistical skullduggery is common, and new methods are always in the offing to collect as much money as possible from the hapless consumers.

[60] "*ECC ends subsidy for power users*", The Nation, Feb 3 2014.

[61] "*Power consumers to pay Rs. 117 billion more due to govt's mismanagement*"; Ahmed Faraz Khan, reported in DAWN, November 30 2014.

[62] "*Rs. 39 billion extra collected from electricity consumers*", Sohail Iqbal Bhatti, Dawn, 16th November 2014. Also see *Increasing Burden: Consumers to pay for line losses and circular debt*, Shahbaz Rana, Express Tribune, 29th May 2014.

4.3.4 Cost in terms of substantial budgetary provisions

The budgetary amount of maintaining WAPDA and NEPRA like institutions has already been stated to some extent in the above paragraphs.[63] Its trajectory over the years has always been upward. It's a sad predicament of the policies and the direction of these and the government which maintains its power over them. The former was instituted as an organization that would reap rich financial rewards for being a natural monopoly, while the latter was supposed to regulate the sector in a way that would not only attract investment, but would lead to such an environment where electricity production in Pakistan becomes a boon for investors. Unfortunately, both have been a story of failure but still keep being maintained. It is the government dole that keeps them afloat.

4.3.5 Cost in terms of delays

It is also pertinent to mention here that the government designed programs and projects for electricity production almost always face a delay, resulting in cost overruns whose burden falls upon the end users of electricity. The Neelum Jehlum surcharge, a charge that is included in the final calculation of electricity bills, is a clear example of this practice. The following table presents a short description of government run designed projects and the delays associated with them. These all resulted in huge cost overruns.

Project	Type	MW	Approval Date	Revised/Original Completion Date	Intended Completion	Current Status
Gomal Zam	Hydro	17.4	1963	2006	2013	Started production on test basis in January 2014
Matiltan Project	Hydro	19	1996	Early 2000	2017/18	Once considered cancelled, it is now being pursued again. Work has yet to commence.
Neelum Jehlum	Hydro	969	1989	2006/07	2016/17	As of March 2014, 63% work had been completed.
Kohala	Hydro	1100	2007	2010	2020	Construction yet to start

[63] Refer to footnote 18.

The table clearly demonstrates that the government run projects suffer from time delays. With these time delays come all the cost overruns and other costs associated with these kinds of projects.

Where does all the money for such wasteful expenditures come from? These all have to beared by the people of Pakistan, who pay for these through many indirect taxation schemes (like surcharges, various adjustments, etc) that the government levies upon them in order to keep the system running. In essence, Pakistan's people have been paying for a non-working and non-maintainable system for long without any hope or evidence of any improvement. And the cost of maintaining that system increases every year. The losses in terms of just the inefficiency of this system exceed Rs. 9 billion/- per year, complemented by a loss of almost five percent generation capacity.[64]

4.3.6 The argument of expensive private sector electricity

The government's main argument for maintaining the matters related to electricity production in its own hands is that the private sector led production will be costly. For example, one oft-repeated assertion in government circles is that the electricity production by the IPP's led to an increase in electricity prices between 1994 and 1998. In reality, it was government's enforcement of the clause on the IPP's that they will buy fuel only from PSO that mostly led to this escalation in electricity prices. Anjum Siddique, in his excellent research paper[65], calculated that 48% of that increase was due to fuel charges (charged by PSO) and 31 % was due to rupee devaluation.[66] Now compare this to the fact that in international market, the average yearly rate per barrel of oil was $15.66 in 1994 and $16.55 in 1999. This means a change of only 5.68%. Therefore, one can easily see that if the IPP's had been allowed to interact directly with the international oil suppliers, a large chunk of the 48% increase in tariff would probably have been wiped out. Yet by forcing the IPP's to procure from a government run monopoly (mainly to keep it profitable and to earn some tax revenue), government

[64] Malik, Afia (2012) "*Power crisis in Pakistan: A crisis in Governance?*", p.32
[65] Siddique, Anjum (1998); *IPP's: The Real Issues*;
[66] Ibid, Table 1.

caused the users a loss in terms of forgone savings due to lower oil prices. Ironically, government dug a hole for itself in the process by finding itself short of the financial resources to buy the expensive electricity.[67] Further, rupee devaluation has nothing to do with IPP's; it's solely due to government's fiscal and monetary policies. In short, the government's efforts at maintaining state run monopolies like PSO resulted in substantial monetary losses. Yet this fact is hardly acknowledged.

The same author calculated that since Hubco's per unit cost of production was cheaper compared to WAPDA, therefore if Hubco had produced the same amount of electricity instead of WAPDA, the total combined savings would have been $4.65/- billion for the year 1997-98 alone.[68] If such quantified figures over time from 1998 till now had been available, it would have revealed that the losses per year are of the same amount (or more) year as in 1998. For example, one recent research paper[69] estimated that the total losses exceeded Rs. 391.6/- billion per year during recent times. 1500 MW of generation capacity has been lost forever, which translates into a monetary loss of Rs. 135/- billion.

In short, the intention of the stating the above all was to clearly demonstrate it is the consumer that has to pay for the inefficiency, mismanagement and lopsided decision making of the prevalent system of electricity production and distribution. There should remain little doubt about the tremendous costs of maintaining this status quo.

[67] Under the 1994 agreements, WAPDA was obligated to buy atleast 60 percent of the electricity produced by IPP's.
[68] Siddique, Anjum (1998); *IPP's: The Real Issues*;, Table 5.
[69] Malik, Afia (2012) "*Power crisis in Pakistan: A crisis in Governance?*", p.32.

5. Conclusion: Why persist with status quo?

Lack of creating a decentralized system of governance is at the heart of the problem. Efficient power sector reform cannot be pursued with this centralized system that is run by a ministry. The question of uniform tariffs should be done away with through careful planning and research", Dr. Nadeem Ul Haque, former Deputy Chairman Planning Commission of Pakistan.[70]

5.1 Have official decentralization attempts worked?

After several attempts at bifurcating the whole electricity setup for making its performance better, the reality still remains that it is the government and related ministries that call the shots when it comes to electricity generation, transmission and distribution. New organizations and institutions like NEPRA were created in the process without getting rid of or reforming the old ones, and whose operating expenditures in the end fall upon the users of electricity. In fact, NEPRA's powers have been declared as excessive, and without any check and balance.[71] Moreover, Dr. Nadeem's statement about the uniform tariffs was also validated by a court decision which

[70] Foreword to USAID's study titled "*The causes and impacts of power sector circular debt in Pakistan*", USAID.
[71] PHC verdict in *W.P No. 456-P/2012*, p.53.

deemed uniform rate fixing as highly discriminatory and illegal.[72] It was amply demonstrated in the section related to tariff determination that people are being cheated out of their money in order to maintain a status quo. The PHC verdict[73] served to show how the electricity users of an entire province (KPK) have been duped by charging them excessive amounts despite the fact that much cheaper per unit hydel electricity is being produced there.[74] Yet they are being forced into buying expensive electricity because they have to buy it from DISCO's, who buy it from the central purchasing authority, which itself buys it from GENCO's. By creating this lengthy chain of middlemen, the only thing that the government has done is that it made transaction costs of supplying electricity substantial. In a similar manner, DISCO's are obligated to surrender their earnings through electricity bills to the government, which makes all the adjustments and deductions and then returns whatever is left to the DISCO.[75]

The aim of these kinds of actions is simple: to keep decision making in government's hands whatever the situation, whether it be in terms of the final decision maker for determining tariff, or for deciding that from where would GENCO's buy fuel for electricity production? This aim has been successful till date, but the cost that is being paid for maintaining this scheme of things is forbidding. It runs into billions every year, and there seems little hope of improvement. Even if lopsided subsidies and pricing decisions are curtailed, the presence of institutions like WAPDA and NEPRA leaves little room for market oriented decision making. This is despite the fact that institutions like WAPDA end up causing billions of rupees per year without showing much (if any) hint of improvement.[76]

[72] Ibid, p.66.

[73] Ibid.

[74] Under Article 158 of the Constitution of Pakistan, the province where the natural resource is found will have the first right to use it.

[75] Foreword to Ullah, Raza, "*A performance review of electricity utility companies in Pakistan*"(2014); PRIME Institute.

[76] This fact is validated by various Supreme Court (SC) judgments. For example, in constitutional petition number 30 of 2013, SC declared NEPRA and PEPCO (besides a plethora of other government organizations) as causing loss of billions of rupees to the public and national exchequer.

5.2 Likely outcome of the new policy

The new power policy unveiled in 2013 aims at addressing the critical issues surrounding the working of the power sector. A reading of this policy has to be combined with WAPDA's own *Vision 2025* in order to get an idea of what the government intends to do about the said issues and what projects are in the pipeline.[77] With an ever increasing population, a slow but gradual rise in per capita income and an increased drive towards electrification of the remaining parts of the country, there is surely going to be increase in demand for electricity in the future. For a power system that is inefficient, has a deteriorating infrastructure, a flawed pricing policy, lacks transparency and good governance, and experiences persistent interference by the governing circles in its working, it would be extremely difficult (if not impossible) to meet this challenge and exceed expectations. The lessons from the previous power policies and their outcomes do not augur well for the future.

5.3 Will energy mix formula be effective?

There are other reasons to doubt that the intended targets will be achieved. One can start with the aim of changing the energy mix in the future, from fossil fuels like petrol and gas to hydro and coal based energy. The government's main logic for doing so revolves around the calculations that hydro and coal based energy is the cheapest sources of energy in Pakistan. But the practice of producing electricity with a mix of fossil fuels is nothing new and government run generation plants have been doing that since long. Yet their productivity relative to electricity being produced from furnace oil is not well established.[78] The problem in this case, as in almost all other aspects of electricity production, is the overwhelming footprint of the government (that leads to mismanagement) and the outdated/old equipment being used for electricity production.

While hydel energy may be the cheapest source of energy, its weak-

[77] Planning Commission is in the process of preparing its Vision 2025, which will shed further light on the way forward as far as the power sector is concerned.

[78] Refer to Siddique, Anjum (1998); *IPP's: The Real Issues*; table 2, p.817. Also see Table 1 and Table 4. The calculations showed that despite having the advantage of cheaper fuel mix (in contrast to IPP plants that only produced electricity through furnace oil), the per unit production cost of government sector electricity production were relatively higher.

ness is that production through it is critically dependent upon the availability of water. There are wide fluctuations in hydel power generation in any given year from a 1000 MW in winter (when water availability is low) to 6000 MW in the summer (when water availability is high). If the intended shift towards hydel power does materialize, then it opens up the possibility of even more wider fluctuations in electricity availability when that hydel power becomes the major source of electricity production in the country.[79] The government's solution for lower hydel electricity production in winter is to introduce 'backup generators'. This is circular reasoning at best since the backup generators also require electricity for running. Also add to this confusion the fact that the water availability is decreasing every year[80] and that most of the intended hydel power is to come through large projects (like mega dams) whose gestation period is long. As stated above (table on page 18), these kinds of projects are never completed on time and there are always cost overruns associated with them.

Coal and alternate energy sources (wind and solar) are touted as viable substitutes, but questions and problems regarding their use will have to be addressed properly before they become a larger part of the energy mix. Coal is a natural candidate and an obvious choice given its availability in Pakistan. Thar contains one of the largest reserves of coal in the world, and government has banked on this reserve to power Pakistan's energy needs in the future. But the use of coal in energy production is fraught with risks. The reality about Thar's coal is that most of it is lignite coal, which is not suitable for production of electricity.[81]Moreover, the financials of

[79] In fact, one major reason for the decision to bring in the private sector (and introducing furnace oil in the energy mix) was the fluctuations in electricity generation due to water availability. At that time, winter months were the worst hit by electricity load shedding due to lower water availability.

[80] The dwindling water supply numbers are easily available through official and independent sources.

[81] The *Economic Survey 12-13* takes the rather ambitious view that that the indigenous coal reserves, though of inferior quality, can be used to generate electricity given new technologies like boilers. However, reality is a bit different. One can gauge this by the IRR of 16 percent offered by NEPRA on imported coal used in electricity production. If the domestic coal reserves were satisfactory for domestic requirements, then NEPRA wouldn't have offered this bait. Recently, NEPRA revised its upfront tariff. For imported coal powered plants, it is 8.46 cents/KWh and for domestic ones, it is 9.67 cents/KWh. It's an indication of an incentive to use imported coal which is of better quality and can produce electricity at cheaper rates.

this particular project do not stack up well against reality.[82] It will be pertinent to mention here that billions of rupees have already been wasted on this project without the realization of any positive result.[83]

Besides the financial aspects, the important consideration of environmental pollution does not seem to figure in this debate at all. Although coal is the largest source of power generation around the world, it is also the worst in terms of air pollution. According to estimates by environmental agencies in Pakistan, amongst the worst polluters of atmosphere in Pakistan are brick kilns and the cement industry. Both of them use coal for power.[84] If coal is to be used extensively for power generation in the future, it will surely come with environmental consequences that the policymakers have yet to address.[85]

Wind and solar power offer viable alternatives, especially solar power given the extensive availability of sunshine all around the year. Their only drawback, as far as their future implementation goes, is the substantially high startup costs and low efficiency. Although the market for solar power and its associated products has grown exponentially over the last decade or so, most of the leading countries (in terms of manufacturing solar equipment) are heavily reliant on government subsidies to stay afloat. As stated, the startup costs are high and majority of manufacturers are unwilling to invest on their own. Therefore, government's subsidies act as a cushion and an incentive to go ahead with its development.

In Pakistan, where the government already intends to phase out subsidies for the power sector, it is not clear how much will private firms/investors be willing to invest in solar or wind energy by themselves? Previous experiences in Pakistan's power sector point to a likely probability that government will have to subsidize these

[82] Reference may be made to Fouad Khan "*Chasing a pipe dream: Three reasons why Thar coal will not save Pakistan*", Express Tribune 23rd January 2012.

[83] Refer to Sumaira Khan "*Controversy Deepens: Nuclear Scientists at odds over Thar coal project*", *Express Tribune* 27th August 2012; and Muhammad Jamil, "*Thar Coal Scam*", Pak Observer, 23rd January 2013. Only recently (January 2014), the PM inaugurated a 660 MW electricity plant at Thar but production and transmission of electricity is yet to start.

[84] *Economic Survey 2012-13*, chapter on Energy.

[85] In 2012, the WB withdrew its pledge for $30 million in financing Thar coal project mainly due to environment concerns related to producing electricity through coal.

alternate energy sectors if they are to take hold in the future power production mix.[86] Moreover, another quandary in this regard concerns the efficiency of the solar cells. The most efficient solar cells till date are the ones used by space exploration agencies like NASA for space based applications, which offer efficiency of around 45 percent. These are not for residential purposes. The solar cells that can be used for electricity in residences offer efficiency of 16 to 20 percent at best.[87]

5.4 The challenge of financing and removing uncertainty

The realization of Pakistan's future plans vis a vis energy production critically hinge on the prospects of foreign investment in the projects tailored towards this purpose. Mega projects like Diamir-Bhasha dam cannot be completed without foreign assistance. As has been stated above in the Infrastructure section of this paper, a conservative estimate is of foreign funding to the tune of above $35 billion. However, any chance of this kind of funding to materialize rests critically on governance reforms (especially the pricing in power sector) and the removal of uncertainty related to power generation projects. This uncertainty comes in the form of non-continuity in policies. Normally when the government changes hands in Pakistan, projects of the previous regime are discontinued. This should be avoided and beneficial projects should be continued without considering which dispensation comes to power. In short, there is lack of continuity that deters long run investments in power sector projects to take place.

5.5 Why persist with government control?

The above stated arguments make it amply clear that the present scheme of things only results in the wastage of billions of rupees annually. And the burden of all these ultimately fall upon the con-

[86] In fact, this is precisely what seems to be happening at the moment. A substantial number of villages in Sindh and Baluchistan have got solar panel installed under the PM's 'Solar Electrification Program'. Refer to *Economic Survey 2012-13*, chapter on Energy.

[87] Cleantechnica, "*Which Solar Panels are the most Efficient*?" If solar and wind power are to become prominent in Pakistan's future energy mix, an implication of this will be the increase in imports of these technologies and products since domestic manufacturers only offer low quality stuff.

sumers of electricity who have to pay for a mismanaged, non-transparent, non-productive and inefficient system of electricity production and distribution. And there seems little in terms of willingness by the government to change all this. The attempts at privatization brought in the private sector, but the real control remained in the hands of the federal government and its ministries. This is despite the fact that services like electricity and their pricing are deemed provincial subjects under the clauses of the constitution. Above all, various unjustified charges are levied and collected from the end consumer.

The reasons for persisting with government control lies not in sound economics and or any intention for welfare enhancements, but rather in rent seeking and using institutions as instruments for gaining specific favors. An implication of the theory of regulation is that there is always a certain group or groups that stand to gain through governments enacting certain policies (like redistribution of resources). These groups seek to enhance their power and increase their opportunities for rent seeking.[88]

In Pakistan, there is no shortage of such groups. Wheat support price lobby is a prominent one. The real beneficiaries of this policy are large landlords, who form a powerful political group. Politicians and military dictators have used existing and new government organizations solely for the purpose of employing their voters. [89]Similarly, bureaucracy and other such interest groups use institutions like NEPRA to cater to their own demands. NEPRA, since its establishment, has served as a dumping ground for retired bureaucrats who enjoy all the same perks and privileges as during years of regular service. Moreover, the financial incentives are also attractive. Members of boards in government dominated institutions like National Bank of Pakistan (NBP) and Pak Oman Holding pocket thousands of rupees for participating in a single meeting. Thus, there is a financial incentive in persisting with the status quo. And in all likelihood, it will persist in the future. An example of this is reflected in the government's decision to establish a 'company' to

[88] For a rudimentary introduction to this topic, see chapter on 'Economy and the State' (p.330 to 332) in George Stigler, Theory of Price.

[89] This is a well known fact. Organizations like Pakistan International Airlines (PIA), Pak Steel and Railway have long been used for this purpose. Similarly, there seems little logic in creating ministries like ministry of 'National Harmony' other than employing favored people and creating more space for bureaucracy.

handle the matters related to Turkmenistan Afghanistan Pakistan and India (TAPI) gas pipeline. There should be little doubt that its board and its structure will be represented by the same powerful interest groups rather than professionals selected on merit.

Another major reason for persisting with these kinds of organizations is that they serve as instruments for filling the gap between government's revenues and expenditures. It is relatively easy to indirectly tax consumers through using these organizations rather than taxing people's income. Since Pakistan's tax-to-GDP ratio is one of the lowest in the world, the government can always resort to the use of organizations like NEPRA and WAPDA to tax people indirectly. Examples of various sorts of taxes levied in electricity bills through NEPRA have been stated above. In essence, these organizations exist in order to cover up the government's dismal efforts when it comes to tax collection.

Last, but not the least, there is no solution in the offing for the crisis faced by the electricity sector. The kinds of challenges faced by the electricity sector require innovative and bold strategies. Faced with the persistent problem of circular debt, the present government came up with the 'innovative' solution of keeping electricity production to a level which does not give rise to circular debt[90]. In the process, a large portion of production capacity remains unutilized. This particular step of trying to avoid circular debt was taken at a time when more debt is being piled up by the government's electricity setup. Around a billion dollar or more worth of loans was approved for Pakistan's power sector (mostly for electricity related matters) only in this year.[91] Given the historical experience, one should not expect much to come out of this. But one thing is for sure: it will again be the electricity consumers who will end up bearing the burden of these loans when the time for repayment comes.

From a consumer's point of view, there is absolutely no justification in persisting with the present scheme of things and government's control over this sector. But from the point of view of interest groups (both in government and out of government), there are many incentives (financial and otherwise) for holding on to this status quo.

[90] "*Power regulator to weigh permitting generation of new tariffs*', The NEWS, 11th November 2014.

[91] The latest agreement for$248 million/- loan was signed on 12th December 2014.

Bibliography

Akinlo, A. E. (2008), "*Energy Consumption and Economic Growth: Evidence from 11 Sub-Sahara African Countries*"; Journal of Energy Economics.

Abbasi, Arshad H (2012). "*Pakistan Power Outlook";* Sustainable Development Policy Institute (SDPI), Islamabad.

Ah,adani, Ahmed. : "*ECC ends subsidy for power users*"; In: The NATION, 3rd February 2014.

Azad, Abdul Rasheed.: "*2008 to 2013: Average Fuel Prices rose by 100 percent*"; In: Business Recorder, 19th March 2013.

Bhatti, Sohail Iqbal. : "39 billion extra collected from electricity consumers". In: Dawn, 16th November 2014.

Bhutta, S.M (2011), "*Electrical Energy: Remedial Measures*"; Workshop on Energy Engineering, Islamabad.

Chaudhry, Muhammad Bashir (2002). : "*An Overview of Pakistan's Electricity Pricing Issues*"; Pakistan and Gulf Economist.

Davis, L. (2013) "*The Economic Cost of Global Fuel Subsidies*", NBER.

Finance Division, *Economic Survey 2012-13*; Government of Pakistan.

Fatima, Umbreen and Anjum, Nasim (2012); "*Inter-provincial differences in power sector subsidies and implications for the NFC award"*; PIDE Working paper.

Fraser, Julia (2005), "*Lessons from the Independent Power Experience in Pakistan";* World Bank (WB).

International Monetary Fund, *World Economic Outlook* (2011)

International Energy Agency, *Annual Report* (2005)

Jamil, Muhammad. : "*Thar Coal Scam*"; In: Pak Observer, 23rd January 2013.

Javed, Attiya. Awan, Zahid and Javed, Muhammad (2013), "*Electricity Consumption and Economic Growth: Evidence from Pakistan*"; Economics and Business Letters Economics Journal, Vol. 2, No. 1.

Kazmi, Shabbir. : "*Pakistan's Energy Crisis*". In: The DIPLOMAT, 31st August 2013.

Killian, Lutz (2011), "*The Allocative Cost of Price Ceilings in the U.S. Residential Market for Natural Gas";* Journal of Political Economy, 119(2), 212-241.

Khan, Ahmed Faraz. *: "Power consumers to pay Rs. 117 billion more due to govt's mismanagement*". In: DAWN, November 30 2014.

Khan, Fouad. : "*Chasing a pipe dream: Three reasons why Thar coal will not save Pakistan*". In: Express Tribune, 23rd January 2012.

Khan, Muhammad Arshad and Ahmad, Usman (2010), "*Energy Demand in Pakistan: A disaggregate Analysis*"; Pakistan Development Review, Pakistan Institute of Development Economics (PIDE).

Khan, Mehmood Ul Hassan (2013). : "National Energy Policy 2013-18: A Critical Review", In: Economic Affairs, 30th August 2013.

Khan, Muhammad Iqbal(1998); *"Power Sector Development in Pakistan and Economic Policy Issues"*, PIDE research paper series.

Malik, Afia (2007), "*Effectiveness of Regulatory Structure in the Power Sector of Pakistan*"; (PIDE) Working paper.

Malik, Afia (2012) "*Power crisis in Pakistan: A crisis in Governance?*"; PIDE Monograph Series.

Mirza, Javed. : *"Power regulator to weigh permitting generation of new tariffs"*. In: The NEWS, 11th November 2014

National Bureau of Economic Research (NBER) Reporter number 1(2014); "*Pricing Energy Efficiently*".

NEPRA, "*Draft NEPRA guidelines for determining consumer end Tariff",* (July 2014).

Peshawar High Court, *Working Petition Number 456-P/2012*; Judgment delivered in 2012.

Private Power and Infrastructure Board (PPIB), Government of Pakistan; "*National Power Policy 2013*".

Rana, Shehbaz. : "*Increasing Burden: Consumers to pay for line losses and circular debt"*. In: Express Tribune, 29th May 2014.

Saeed, Kazim (2011), "*Financing Pakistan's Power Sector after the Global Financial Crisis*"; World Bank.

Sial, Amir. : "*Reformation of NEPRA must to end power crisis*". In: Pakistan Today, 7th October 2011.

Siddique, Anjum (1998); *"IPP's: The Real Issues";* Pakistan Development Review (PDR), Winter 1998.

Siddiqui, R. and R. Haq (1999), "*Demand for Energy and the Revenue Impact of Changes in Energy Prices*"; *PIDE* Research Report # 174.

State Bank of Pakistan (SBP), "*Pakistan Infrastructure Task Force Report*" (2010).

Stern, D. I. and J. C. Cleveland (2004), "*Energy and Economic Growth*"; Rennselear Working Papers in Economics.

Stigler, George (1986), *The Theory of Price,* Printice Hall of India, New Delhi.

Swiss Consulate General of Karachi; "*Pakistan Power Sector*" (2011).

Ullah, Raza (2014), "*A performance review of electricity utility companies in Pakistan*"; PRIME Institute, Islamabad.

USAID (2013); "*The causes and impacts of power sector circular debt in Pakistan*"; USAID, Islamabad.

Water and Power Development Authority; *Vision 2025*.

World Bank; *Addressing Inequality in South Asia* (2014).

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"The reasons for persisting with government control lies not in sound economics and or any intention for welfare enhancements, but rather in rent seeking and using institutions as instruments for gaining specific favors. In the theory of regulation, there is always a certain group or groups that stand to gain through governments enacting certain policies (like redistribution of resources by the government). These groups seek to enhance their power and increase their opportunities for rent seeking."

Conditional Cash Transfers: Safety Net or Welfare Trap?

This study proposed that government may take short-term measures to achieve poverty alleviation but poverty cannot be eradicated by cash transfers, conditional or unconditional. The long-term and permanent solutions are required through which human capital is enhanced like vocational trainings and educational programmes so that the allocated budget can be utilized in the best possible manner. It is authored by Fizza Behzad.

State Coercion and the Fledgling Enterprises in Sharaqpur Bazaar

This study demonstrates that by simplifying regulations, debottlenecking procedures, lowering tax rates and making it easier for them to own their business premises, a lot more businesses can be brought into the formal sector, than coercion, penalties, punitive taxes, heavy fines and demolition of buildings with earth moving machinery can collectively bring because no amount of coercion can outsmart the acumen and ambition of an entrepreneur. It is authored by Asad Ullah.

SUCCUMBING TO THE TEMPORAL

PML-N Economic Agenda
3rd Tracking Report (April-June 2014)
This report is the result of a project, "PML-N Economic Agenda: Tracking Report" which aims at initiating and informing policy dialogue and public debate on the implementation of the economic agenda of PML-N central government that sworn into the power at federal level in Pakistan in May 2013.

Export Development Fund

"Export Development Fund: A Critical Analysis and Roadmap for Restructuring", highlights various factors which have led to misallocation and misappropriation of funds instead of boosting exports. It is authored by Sara Javed.

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