

Impact of Energy Consumption on Pakistan's Economic Growth

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ABSTRACT: *Shortfall in the supply of energy resources has significant impact on the economy of a country. Purpose of this paper is to investigate whether energy conservation policies affect economic activities is of great interest in the international debate on impact of energy consumption on economic growth of any country.*

The data consisting of secondary sources was collected through research journals, Internet statistical database and relevant books.

The findings revealed that Pakistan with small manufacturing market, surrounded by major emerging economies like China, India, Malaysia, Indonesia, Philippines and Bangladesh will be worst effected with the rise of energy prices. As a rule of thumb modern day manufacturing industries utilize at least 33% production cost in terms of energy prices. An increase of energy cost will affect their production cost and will force the manufacturers that either to reduce the labor cost or to remain competitive in market by improving the quality standards. Major giants China and India will benefit with this condition and smaller economies will suffer badly. Are our policy makers in Islamabad thinking for the gravity of problem which is now just standing on our door step?

Pakistan should focus on the utilization of hydroelectric resources through building of dams such as Kala Bagh Dam, Bhasha Dam etc. to produce cheap electricity. It should improve relations with international and Regional Corporation. It should activate in Thar coal project with the assistance of China to address energy crises. It should adopt new policies to overcome the problem through renewable energy resources i.e solar, wind and tidal energy.

KEYWORDS: *Energy Crisis in Pakistan, Economic Growth, Energy Consumption and GDP, Energy, Electricity, Energy Shortfall, Circular Debt*

I. BACKGROUND OF THE STUDY

Energy crisis has been defined as a great shortfall in the supply of energy resources to the economy or price rise of the energy resources Haq (2008)^[1]. It is referred to the shortage of oil, electricity and other natural resources. The crisis often has effects on the economic growth, with many recessions being caused by an energy crisis in some form or the other. The question whether energy conservation policies affect economic activities is of great interest in the international debate on impact of energy consumption on economic growth of any country. The causal relationship between energy consumption and economic growth has been widely studied, no consensus regarding relationship between energy consumption and economic growth has yet been reached Fatai (2010)^[2].

The importance of energy has been widely recognized in relation to the traditional factors of production. With modernization, production processes have become heavily dependent on energy, and sustainable economic growth cannot be achieved without sufficient and uninterrupted supply of energy. Therefore, it is imperative for a developing country to unequivocally admit the importance of energy in pursuit of sustainable growth. Industrial sector of a country is an engine to economic growth, a sustained and uninterrupted supply of energy is an important determinant of industrial sector performance, which further contributes to better growth of economic indicators.

1.1 Purpose & Objectives of the study

Pakistan is presently passing through an extraordinary energy crisis. According to the Annual Report 2010-2011 of State Bank of Pakistan^[3] growth potential seems to have hit a ceiling imposed by insufficient energy supply. Whereas energy demand has increased significantly during the last ten year period, supply has failed to match this growth due to policy failures with respect to:

- a) setting up viable new power projects to supplement supply line;
- b) increasing exploration of natural gas, crude oil and coal;
- c) tapping regional markets and setting up infrastructure for energy imports; and
- d) incentivizing development of renewable energy sources

1.2 Electricity

The demand of electricity exceeds supply and hence load-shedding is a common phenomenon through frequent power shutdowns. During 2008-09 peak demand of electricity was 19080 MW against firm supply of 15055 Mega Watt (MW) thus a shortfall of 4025 MW during 2008-09. Similarly during 2009-10, Pakistan needs about 20584 MW whereas the firm supply was 15055 MW, resulting in a shortfall of 5529 MW. This shortage is badly affecting industry, commerce and daily life of people. The demand for natural gas and oil has increased manifold, likely to burden the economy further.

According to the Economic Survey of Pakistan (2010-11)^[4] the total installed capacity of Pakistan Electric Power Company (Private) Limited (PEPCO) system is 20,681 MW as of March 2010. Out of 20,681 MW, the hydro production is 6,555 MW and the thermal production is 14,126 MW. The hydropower capacity accounts for 31.7 percent and thermal 68.3 percent.

1.3 Oil

Pakistan has a huge demand to generate power through oil but we can meet only 20% of our requirement through indigenous production and remaining oil is imported from Gulf States and other countries of the world. No major oil field so far has been discovered in last three decades. Oil demand is expected to double by 2015 and quadruple by 2025. This would lead to a staggering trade deficit, and rising of general prices. Government of Pakistan estimated that, there is a need to enhance the generation capacity by more than 50% to meet the increasing demand Ellahi (2010)^[5]. This high demand prevailing in the market is not met by electricity generated in country, lagging behind the supply, which is responsible for high level of load shedding.

1.4 Energy Mix

According to the Economic Survey of Pakistan 2010-11 Pakistan's total energy consumption stood at 63.1 Million Tons of Oil Equivalent (MTOE) in 2009-10. During 2009-10 the energy mix comprised of gas, oil, electricity, coal and Liquid Petroleum Gas (LPG) with different levels of shares. The share of gas consumption stood at 43.7 % in total energy mix of country followed by oil 29 %, electricity 15.3 %, coal 10.4% and LPG 1.5 %. Furthermore, this energy consumption mix has witnessed significant transformation since 2003-04. Resultantly, the major consumption source of natural gas witnessed an increase of 9 % during 2009-10 compared to 2003-04 while share of oil consumption declined by 9.5 % during the same period. These changes in consumption of gas and oil mainly owed to shift from imported expensive fuel (oil) to relatively cheaper source of gas. The share of coal and LPG consumption increased slightly and that of electricity remains the same as it was in 2003-04.

According to the Economic Survey of Pakistan (2011-12)^[6], the energy mix of Pakistan during 2010-11 comprises of major sources with share of 43.7% of gas, followed by oil 29%, electricity 15.3%, LPG 1.5% and coal 10.4%, which changed in 2010-11 slightly in gas 43.2%, LPG 1.3%, and electricity 16.2% while other remain unchanged. Consequently Pakistan has to import energy to overcome the problem and maintain standard of living of people. The major shortfall is expected in natural gas supplies. Pakistan had 26.62 trillion cubic feet reserves of natural gas at the end of 2010-11 but due to increase in its demand it is expected to be depleted in next two decades.

1.5 Circular Debit

According to Economic Survey of Pakistan 2011-12 the main hurdle in the supply of energy is accumulation of the massive circular debt. The major problems which cause accumulation of circular debt is the partial transfer of tariff as determined by National Electric Power Regulatory Authority (NEPRA), heavy line losses (present level of line losses are almost 20 percent), incomplete corporatization, weak governance and costly fuel mix putting an extra financial burden on meeting the cost of fuel oil due to constant increase in the oil prices, etc. The government has transferred bank loan liabilities of Rs 216.0 billion (as of 30-06-2009) and Rs. 85.114 billion from the books of power companies and placed these amounts with the Power Holding (Pvt) Ltd (PHPL) in November, 2011. The government has repaid these loans to the bank along with markup.

II. LITERATURE REVIEW

Energy is considered to be the life line of an economy, the most vital instrument of socioeconomic development and has been recognized as one of the most important strategic commodities Sahir and Qureshi (2007)^[7]. Erol and Yu (1987)^[8] examined the relationship between energy consumption and Gross Domestic Product (GDP) for England, France, Italy, Germany, Canada and Japan for the period 1952-1982. They found bidirectional causality for Japan, unidirectional causality from energy consumption to GDP for Canada and unidirectional causality from GDP to energy consumption for Germany and Italy and no causality for France and England. In the context of developing countries Masih and Masih (1996)^[9] found evidence of Granger causality running from income to energy for Indonesia.

The direction of causality is very much relevant for policy makers. For instance, if causality runs from energy consumption to economic growth, energy conservation policies that have the aim of reducing energy consumption may have a negative impact on an economic growth. The literature review suggests four different hypotheses regarding the possible outcomes of causality Apergis and Payne (2009)^[10].

1. The growth hypothesis proposes that energy consumption is an important component in growth, directly or indirectly as a complement to capital and labour as input factors of production. A decrease in energy consumption will have an effect of a decrease in real GDP. In this case, the economy is called 'energy dependent' and energy conservation policies, if implemented will have negative effects on economic growth.
2. The conservation hypothesis suggests that policies directed towards lower energy consumption will have little or no negative effect on economic growth. This hypothesis is based on a unidirectional causality relationship running from economic growth to energy consumption.
3. In case of feedback hypothesis is based on bidirectional causality, which states that energy consumption and economic growth affect each other simultaneously. In this case, policy makers will have to take into account the feedback effect of economic growth on energy consumption by implementing regulations to reduce energy use. In addition, economic growth should be decoupled from energy consumption to avoid adverse effect on economic growth resulting from a reduction of energy policy.
4. The neutrality hypothesis suggests that reducing energy consumption does not affect economic growth or vice versa. Hence, energy conservation policies do not have any impact on economic growth.

Imran and Siddiqui (2010)^[11] found that electric consumption is found to Granger cause GDP in the long run, but not in short run. No any causal relationship exists running from GDP to electric consumption or electric consumption to GDP in short run, but exists in long run running from electric consumption to economic growth. Author is of the view that high electric consumption tends to come with high GDP, but not the reverse. In the light of above discussion it is reflecting that energy serves as an engine of economic growth and economic activity will be affected in the result of changes in electric consumption. This means that continuous energy use does produce a continuous increase in output.

Pakistan is facing severe energy crisis. In spite of economic growth during the past few years resulting rise in demand for energy, no substantial steps have been taken to install new capacity for generation of the required energy sources. Now, the demand exceeds supply and hence "load-shedding" is a common phenomenon through frequent power shutdowns. Pakistan needs about 14000-15000MW electricity per day, and the demand is likely to rise to approximately 20,000 MW per day. Presently, it can produce about 11, 500 MW per day and thus there is a shortfall of about 3000-4000MW per day. This shortage is badly affecting industry, commerce and daily life of people Haq (2008). The Gross Domestic Product (GDP) of Pakistan has been growing for the last few years and has increased 8.40% which is the highest in the 60 years history of the country Economic Indicator of Pakistan (2007)^[12]. With the rapid growth of economy and population, the energy requirements are also increasing at the same pace. Pakistan fulfills its energy requirements by exploring different energy sources for example, electricity, gas, petroleum, and coal.

III. METHODOLOGY

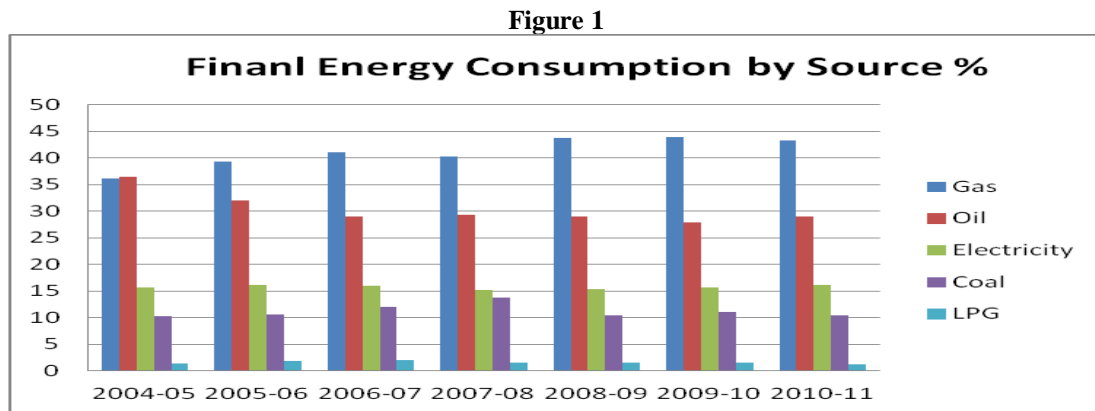
This study is an exploratory study. In this present study, we collected relevant past studies from computer-based published empirical studies. The search was conducted using key words such as: energy consumption, electricity consumption, economic growth, GDP, developed and developing countries etc. Manual search was also conducted for the articles references identified through the online database search. Published studies conducted during 1996 to 2011 were included in this study.

The data for this study was collected through secondary sources. The data consisting of secondary sources was collected through research journals, Internet statistical database and relevant books. The paper is arranged into sections: Background, Objectives, Literature Review, Methodology, Findings, Conclusion, Limitations and Recommendations.

IV. FINDINGS OF THE STUDY

The study found that Pakistan's total energy consumption stood at 63.1 Million Tons of Oil Equivalent (MTOE) in 2009-10. The energy mix comprised of gas, oil, electricity, coal and Liquid Petroleum Gas (LPG) with different levels of shares. The share of gas consumption stood at 43.9 percent in total energy mix of country followed by oil 27.9 percent, electricity 15.6 percent, coal 11 percent and LPG 1.5 percent. Pakistan's total energy consumption during 2010-11 stood at 38.8 MTOE [Energy Supply (64.5 MTOE) by Share of Sources Transformation (-17.8 MTOE) Diversions (-7.4 MTOE) Statistical Differ (-0.5 MTOE) Energy Consumption (38.8 MTOE) by Share of Sectors]. The relative importance of the various sources of energy

consumption of Liquid Petroleum Gas (LPG), electricity and coal has been broadly similar since 2005-06. The share of gas consumption stood at the highest equal to 43.2 percent of the total energy mix of the country, followed by oil (29.0 percent). The major consumption source of natural gas witnessed an increase in share by almost 4 percent during 2010-11 compared to 2005-06. This is due to the substitution effect to a cheaper source from an expensive source. Since oil is the more expensive fuel because of Pakistan's imports at the high international prices the share of oil consumption declined by 3.0 percentage points during 2010-11 (see Figure 1).



Source: Hydrocarbon Development Institute of Pakistan. (Economic Survey of Pakistan 2009-10 and 2011-12)

Furthermore, this energy consumption mix has witnessed significant transformation since 2004-05. Resultantly, the major consumption source of natural gas witnessed an increase of 7.7 percentage points during 2009-10 compared to 2004-05 while share of oil consumption declined by 8.6 percentage points during the same period. These changes in consumption of gas and oil mainly owed to shift from imported expensive fuel (oil) to relatively cheaper source of gas. Furthermore, the share of coal and LPG consumption increased slightly and that of electricity remains the same as it was in 2004-05. The energy requirements are increasing rapidly, especially electricity consumption therefore energy must be a high priority for the public and private sector in near future and in long term.

4.1 Energy Consumption

The consumption of petroleum products showed continuous declining trend since 2001-02. However due to positive changes in years 2004-05, 2007-08 and 2009-10, the overall average for last ten years became positive 1.1 percent per annum. The longer term trend suggests that composition of annual energy consumption is shifting from petroleum products to other energy sources due to volatile prices of oil. Thus consumption of gas, electricity and coal has increased at an average of 5.1 percent, 4.8 percent and 7.7 percent per annum for last ten years (see Table 1 and Figure 2 to Figure 5 which shows the consumption of Petroleum Products, Gas, Electricity and Coal respectively).

Annual Energy Consumption

Table 1

Fiscal Year	Petroleum Products		Gas		Electricity		Coal	
	Tones (000)	Change%	mmcft	Change%	Gwh	Change%	M.T (000)	Change%
2001-02	16960	-3.9	827604	7.4	50622	4.2	4409	9.0
2002-03	16452	-3.0	872264	5.8	52656	4.0	4890	10.9
2003-04	13421	-18.4	1051418	20.5	57491	9.2	6065	24.0
2004-05	14671	9.3	1161043	10.4	61327	6.7	7894	30.2
2005-06	14627	-0.3	1223385	5.4	67603	10.2	7714	-2.3
2006-07	16847	15.2	1221994	-0.1	72712	7.6	7894	2.3
2007-08	18080	7.3	1275212	4.4	73400	0.9	10111	28.1
2008-09	17911	-0.9	1269433	-0.5	70371	-4.1	8390	-17.0
2009-10	19132	6.8	1277821	0.66	74348	5.7	8139	-3.0
2010-11	18887	-1.3	1240671	-2.91	77099	3.7	7717	-5.2
Average		1.1		5.1		4.8		7.7

Source: Hydrocarbon Development Institute of Pakistan, (HDIP), Economic Survey of Pakistan 2011-12
M.T= Million Tone bcf=Billion Cubic Feet Gwh=Giga Watt Hour mmcft=Million Cubic Feet

figure 2

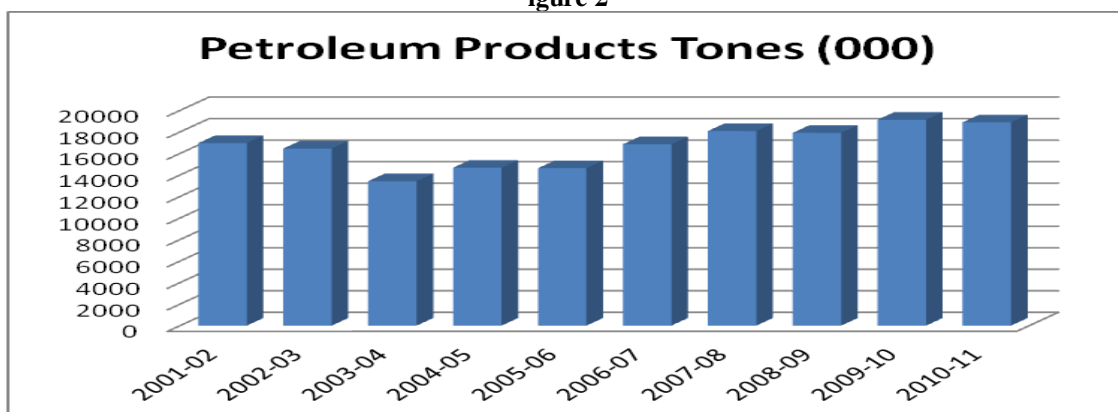


Figure 3

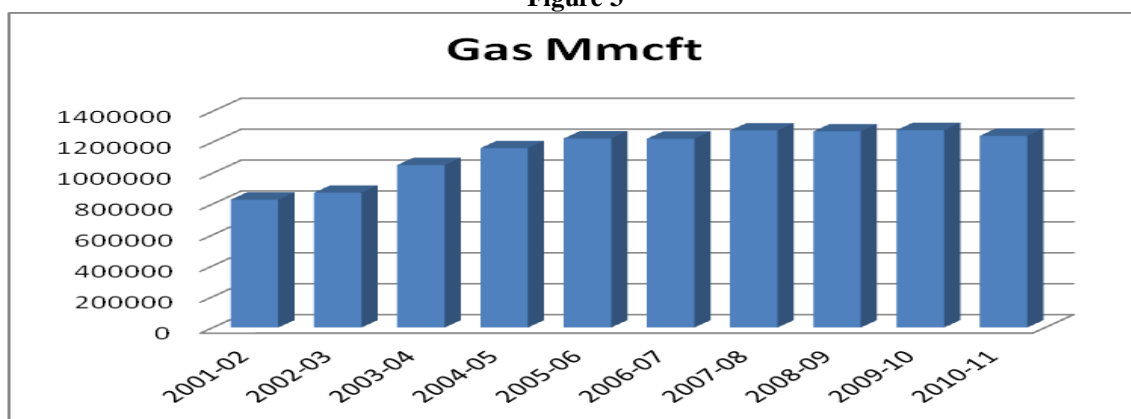


Figure 4

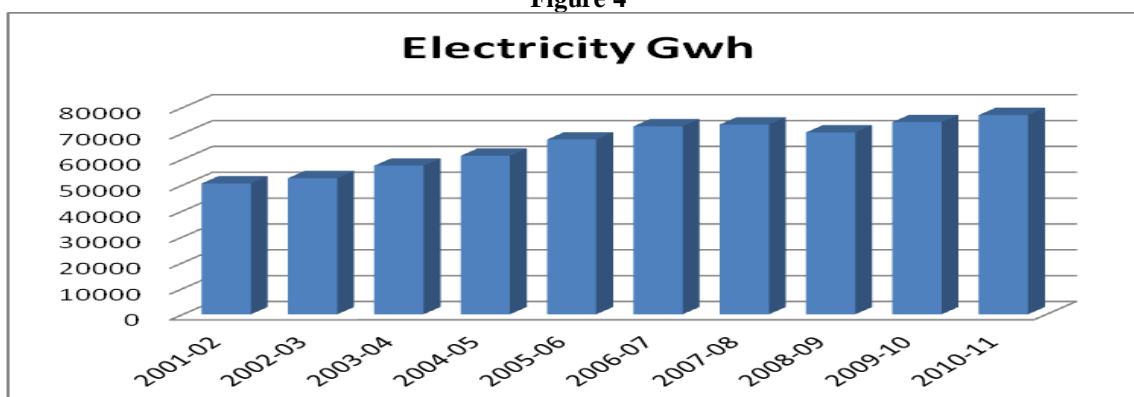
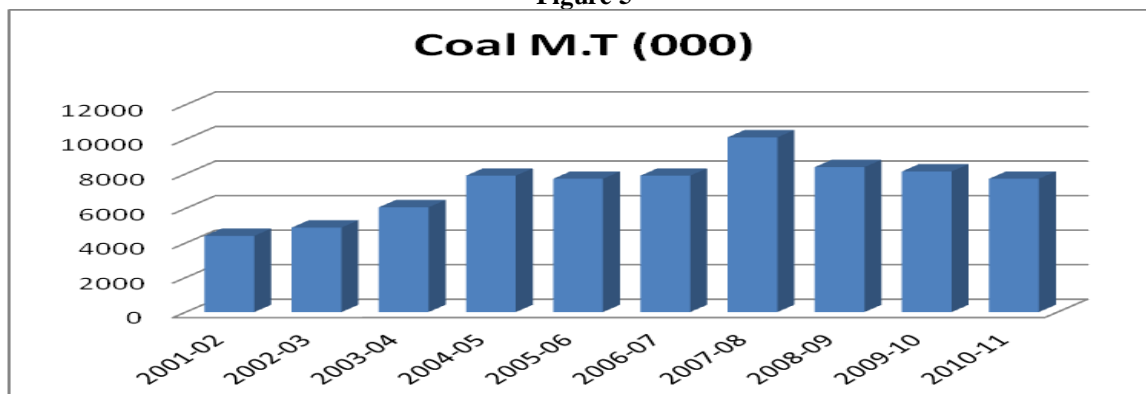


Figure 5



4.2 Supply of Energy

Primary energy supply has increased by 2.3 percent during 2010-11 when compared with last year. The availability of energy per capita in 2011 remained 0.372 TOE compared to 0.371 TOE in 2010 posting a positive growth rate of 0.16 percent. Due to population growth rate of almost 2 percent, the balance between energy supply and emerging needs was outset. Although the energy supply has been increased by 60 percent since 1997-98 to 2010-11 yet availability of energy per capita only increased by 16 percent (see Table 2 and Figure 6 and 7).

Primary Energy Supply and Per Capita Availability

Table 2

Year	Energy Supply		Per Capita	
	Million TOE	% Change	Availability TOE	% Change
1997-98	40.40		0.31	
1998-99	41.72	3.26	0.31	2.62
1999-00	43.19	3.51	0.32	1.28
2000-01	44.40	2.82	0.32	0.63
2001-02	45.07	1.5	0.32	-1.25
2002-03	47.06	4.4	0.32	2.86
2003-04	50.85	8.1	0.34	6.25
2004-05	55.58	9.3	0.36	5.88
2005-06	58.06	4.5	0.37	2.78
2006-07	60.62	4.4	0.38	2.70
2007-08	62.92	3.8	0.39	2.63
2008-09	62.55	-0.6	0.38	-2.56
2009-10	63.09	0.9	0.36	-5.26
2010-11	64.52	2.3	0.36	0.00

Source: Hydrocarbon Development Institute of Pakistan. (Economic Survey of Pakistan 2009-10 and 2011-12)

Figure 6

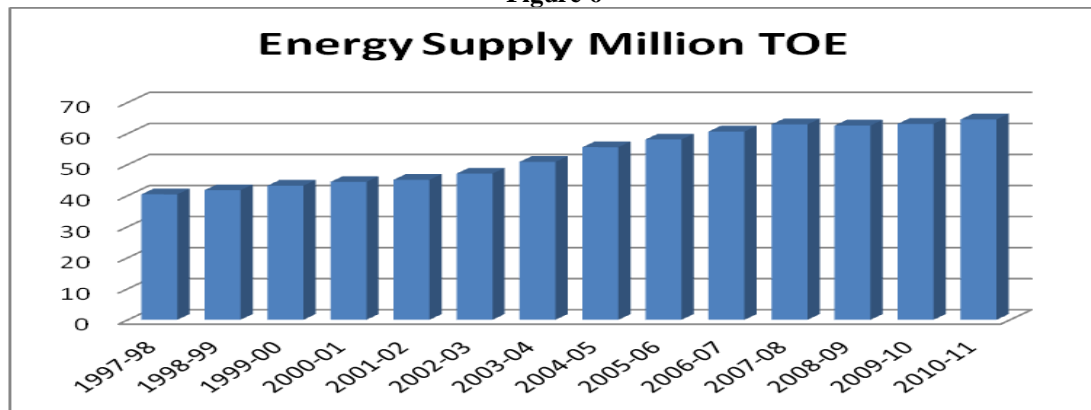


Figure 7



4.2.1 Comparison of World Energy Consumption and per capita availability

A comparison of the world energy consumption and per capital availability shows that Pakistan far behind. However the per capita energy availability for India is almost the same as the Pakistan but Bangladesh is still behind Pakistan in the region. China an emerged a giant economic power is near world energy per capita availability. Whereas the Islamic republic Iran is exceeding the per capita energy availability (see Table 3 and Figure 8).

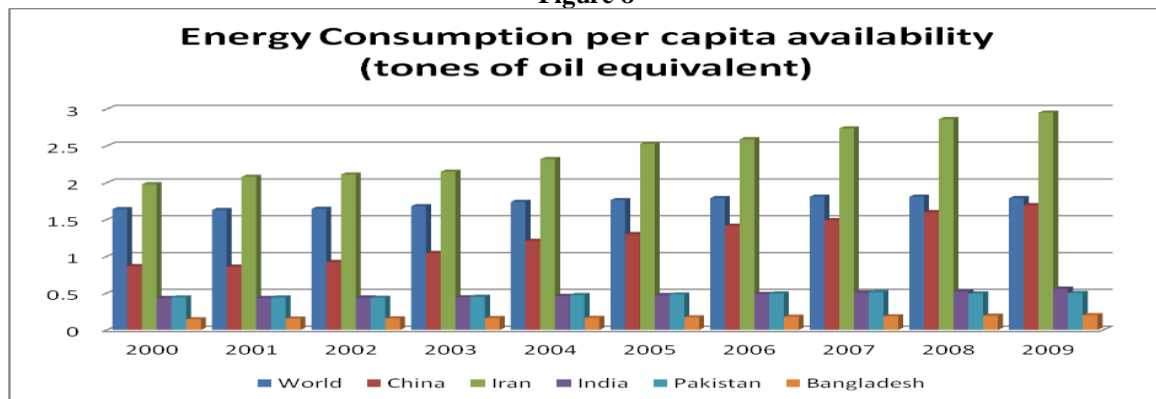
Energy Consumption per capita availability (tones of oil equivalent)

Table 3

Year	World	China	Iran	India	Pakistan	Bangladesh
2000	1.640	0.867	1.978	0.434	0.440	0.144
2001	1.629	0.858	2.080	0.434	0.439	0.153
2002	1.644	0.923	2.111	0.439	0.436	0.155
2003	1.681	1.044	2.149	0.443	0.449	0.159
2004	1.740	1.210	2.320	0.462	0.472	0.163
2005	1.763	1.301	2.525	0.472	0.480	0.170
2006	1.790	1.414	2.590	0.488	0.493	0.178
2007	1.810	1.490	2.737	0.508	0.512	0.184
2008	1.810	1.599	2.893	0.520	0.494	0.192
2009	1.790	1.695	2.951	0.560	0.502	0.201

Source: World Development Indicators (WDI) & Global Development Finance (GDF)

Figure 8



Source: World Development Indicators (WDI) & Global Development Finance (GDF)

According to the Economic Survey of Pakistan 2011-12, the composition of final energy supplies in the country suggests that the supply of coal during last ten years grew at an average rate of 7.5 percent per annum followed by gas, electricity, petroleum products and crude oil with average growth rates of 5.7 percent, 3.4 percent, 2.1 percent and 0.4 percent, respectively (see Table 4).

Composition of Final Energy Supplies

Table 4

Fiscal Year	Crude Oil		Petroleum Products		Gas		Electricity		Coal	
	Million Barrels	Change %	M.T	Change %	Bcf	Change %	Gwh (000)	Change %	M.T (000)	Change %
2001-02	75.2	2.1	18.1	1.6	923.8	7.7	72.4	6.3	4.4	7.3
2002-03	76.0	1.1	17.5	-2.9	992.6	7.4	75.7	4.6	4.9	11.4
2003-04	80.3	5.7	14.9	-14.9	1202.7	21.2	80.9	6.9	6.0	22.4
2004-05	85.3	6.2	16.2	8.3	1344.9	11.8	85.7	5.9	7.9	31.7
2005-06	87.5	2.6	16.5	2.2	1400.0	4.1	93.8	9.5	7.7	-2.5
2006-07	85.3	-2.5	18.6	12.9	1413.6	1.0	98.4	4.9	7.9	2.6
2007-08	90.5	6.1	19.8	6.1	1454.2	2.9	95.9	-2.5	10.1	27.8
2008-09	86.1	-4.8	19.8	0.1	1460.7	0.4	91.8	-4.3	8.4	-16.8
2009-10	76.8	-10.9	20.2	1.9	1482.8	1.5	95.6	4.1	8.2	-2.4
2010-11	75.3	-1.9	21.3	5.5	1471.6	-0.8	94.7	-0.9	7.7	-6.1
Average		0.4		2.1		5.7		3.4		7.5

Source: Hydrocarbon Development Institute of Pakistan, (HDIP), Economic Survey of Pakistan 2011-12
M.T= Million Tone bcf=Billion Cubic Feet Gwh=Giga Watt Hour TOE=Tone of Oil Equivalent

4.3 Electric Generation by Source

According to Economic Survey of Pakistan 2011-12, the installed capacity in the PEPCO system is 20,986 MW as of June 2011; with hydro 6627 MW and thermal 14,359 MW. The hydropower capacity accounts for 31.6 percent, thermal 65.3 percent and Nuclear 3.1 percent. Of this 4829 MW is owned by ex-WAPDA GENCOs, 448 MW by rental, 650 by PAEC and rest by IPPs. There is 55-MW of isolated generation capacity in Pasni and Punjgoor areas. WAPDA is executing, on priority basis, the projects such as 969 MW-Neelum Jhelum, 1410 MW-Tarbela 4th Extension, 7100 MW-Bunji, 4320 MW-Dasu, 740-MW Munda Dam and most mentionable 4500 MW-Diamer Bhasha Dam projects, to cope with the increasing demand of power. Almost 96 percent work on the main dam at Mangla, spillway and allied facilities had been completed. Likewise 99.7 percent work on Satpara and 72.1 percent on Gomal Zam dam had been completed (see Table 5).

Electricity Generation

Table 5

Year	Hydro (Gwh)	% age	Thermal (Gwh)	%age	Total	% Change
2006-07	31,942	36.4	55,895	63.6	87,837	6.8
2007-08	28,667	33.2	57,602	66.8	86,269	-1.8
2008-09	27,763	32.9	56,614	67.1	84,377	-2.2
2009-10	28,492	31.9	60,746	68.1	89,238	5.8
2010-11	32,259	35.6	58,316	64.4	90,575	1.5
July-March						
2010-11	24,105	36.0	42,823	64.0	66,928	
2011-12	22,411	33.0	45,534	67.0	67,945	1.5

Source: Pakistan Electric Power Company (Pvt) Limited (PEPCO), National Transmission & Distribution Company

Limited (NTDC), Total energy includes import from Iran, Gwh=Giga watt hours

4.4 Growth in Consumers

The number of consumers has been increasing due to rapid expansion of electric network to villages and other un-electrified areas. During July-March 2011-12 the number of consumers has been increased to 20.85 million as compared to 20.12 million in the comparable period of last year. The trend of increase in number of consumers during the last five years is given in the Table 6.

Number of Consumers

Table 6

Year	Domestic	Commercial	Industrial	Agriculture	Others	Total
2006-07	14,354,368	2,151,971	233,162	236,255	10,798	16,986,554
2007-08	15,226,711	2,229,403	242,401	245,640	11,211	17,955,366
2008-09	15,481,738	2,256,837	250,593	254,891	11,504	18,255,559
2009-10	16,673,015	2,362,312	263,507	271,268	12,122	19,582,224
2010-11	17,322,140	2,421,221	273,067	280,603	12,452	20,309,483
July-March						
2010-11	17,157,541	2,404,136	270,445	279,021	12,354	20,123,497
2011-12	17,808,962	2,466,049	284,049	282,639	12,745	20,854,444

Source: National Transmission & Dispatch Company Ltd, Water & Power Development Authority (Economic Survey of Pakistan, 2011-12)

4.5 Circular Debit

According to Economic Survey of Pakistan 2011-12 the main hurdle in the supply of energy is accumulation of the massive circular debt. The major problems which cause accumulation of circular debt is the partial transfer of tariff as determined by National Electric Power Regulatory Authority (NEPRA), heavy line losses (present level of line losses are almost 20 percent), incomplete corporatization, weak governance and costly fuel mix putting an extra financial burden on meeting the cost of fuel oil due to constant increase in the oil prices, etc. The government has transferred bank loan liabilities of Rs 216.0 billion (as of 30-06-2009) and Rs. 85.114 billion from the books of power companies and placed these amounts with the Power Holding (Pvt) Ltd in November, 2011. The government has repaid these loans to the bank along with markup (see Table 7).

- During 2010-11 the Finance Division released Rs. 65 billion as well as Rs. 120 billion as tariff subsidy to Pakistan Electric Power Company (Pvt) Ltd (PEPCO) to overcome its operational shortfall and relax the Circular Debt.
- Funds amounting to Rs. 142.0 billion have been raised from the banks in March 2012 and paid to Independent Power Producers (IPPs) by PEPCO. Another transaction for raising funds of Rs. 20 billion is in process for payment of overdue of Independent Power Producers (IPPs) / Gas Companies/ Pakistan State Oil (PSO) reduce the Circular Debt.
- The power sector was allowed to transfer the cost of power to the consumers through the tariff increases of 6%, 12% and 6% at the start of the three quarters 2010.
- To enable the Power Sector to meet its cash shortfall, the following Tariff Differential Subsidies have been released during the period:

Tariff Differential Subsidies (Rs. in billions)

Table 7

2008-09	2009-10	2010-11	2011-12 (upto Mar-12)
109.173	178.841	346.096	93.250

Source: Corporate Finance Wing (Economic Survey of Pakistan 2011-12)

Because of the policy implementation by the government inter circular debt has shown a declining trend over the period July-Mar 2011-12.

V. CONCLUSION

The study finds empirically the relationship among electricity supply, industrialization and economic growth for Pakistan over the period 1980 to 2009. This quantitative analysis followed the endogenous growth theory which is more appropriate to explain the situation of developing countries. Industrial sector's contribution to economic growth is found to be low this performance can be due to poor electricity supply and poor infrastructure facilities. The author further concludes that continuous electricity supply and healthy industrial sector of a country are important determinant for the economic growth.

Presently Pakistan is pursuing a multi pro-longed strategy to ensure adequate and uninterrupted oil and gas supply and other energy resources to sustain the present pattern of energy for the rapid national economic growth. Greater reliance on gas, aggressive pursuit of hydroelectric power generation, and enhancing nuclear power generation capacity are some of the key elements of this strategy. Pakistan is also seeking to expand its primary energy supply base by encouraging oil exploration and power generation companies to undertake energy project in Pakistan. The regional gas pipe line projects in which Pakistan is actively pursuing to meet its expanding domestic energy demands. These are the pre-requisite for resolving energy crises that, unless resolved promptly, would cast a long shadow on the short and medium term objectives of economic growth and development.

Pakistan with small manufacturing market, surrounded by major emerging economies like China, India, Malaysia, Indonesia, Philippines and Bangladesh will be worst effected with the rise of energy prices. As a rule of thumb modern day manufacturing industries utilize at least 33% production cost in terms of energy prices. An increase of energy cost will affect their production cost and will force the manufacturers that either to reduce the labor cost or to remain competitive in market by improving the quality standards. Major giants China and India will benefit with this condition and smaller economies will suffer badly. Are our policy makers in Islamabad thinking for the gravity of problem which is now just standing on our door step?

The issue of energy supply and demand is very important not only for the economic prosperity of the current generations but also for the future generations. Its shortage can retard economic growth. However, in order to achieve high economic growth rates, multidimensional policies are required and these policies should not ignore the energy sector. In order to improve availability of energy and balance of payment position, alternative sources of energy should also be developed.

Energy needs are indelibly linked to Pakistan's economic and sustainable growth capabilities. Pakistan has been in increasing in demand across the various areas of energy sources. With a growing economy and the desire for vast production and consumption across the country, the energy demands remain high. Given the need for energy, the Government of Pakistan is doing the utmost to promote renewable energies, various energy sources and energy efficiency.

VI. LIMITATIONS

Due to limited time and lack of resources the through study of the issue could not be done. Further researches are needed to prove empirically the hypotheses and the gaps need to be filled by further researching to find out the relationship of energy consumption to the economic growth of Pakistan.

VII. RECOMMENDATIONS

Pakistan should focus on the utilization of hydroelectric resources through building of dams such as Kala Bagh Dam, Bhasha Dam etc. to produce cheap electricity. It should improve relations with international and Regional Corporation. It should activate in Thar coal project with the assistance of China to address energy crises. It should adopt new policies to overcome the problem through renewable energy resources i.e solar, wind and tidal energy. It should take positive steps to finalize international gas pipe line projects i.e. IPI (India, Pakistan, Iran) Gas pipe line project which meet the needs of gas demands of Pakistan and possibly India. It should make effort to fulfill the project with Turkmanistan and Afghanistan gas pipe line which was floated by Turkemanistan in 1991 to meet the demands of gas for Pakistan.

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