

**FOREIGN DIRECT INVESTMENT IN PAKISTAN:  
THE CASE OF ENERGY SECTOR IN THE PERSPECTIVE OF  
IMBALANCE IN DEMAND AND SUPPLY**

**By**

**ALEEM, Muhammad**

**THESIS**

Submitted to  
KDI School of Public Policy and Management  
in partial fulfillment of the requirements  
for the degree of

Master of Business Administration

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## **ABSTRACT**

### **Foreign Direct Investment in Pakistan: The Case of Energy Sector in the Perspective of Imbalance in Demand and Supply**

**By**

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Since the beginning of the 1990s foreign direct investment (FDI) has become the main source of foreign capital move from developed countries or Multinational Enterprises MNE's to the developing countries. The FDI not only brings finance for host country but it moves associated with the number of other advantages for the recipient like efficient management techniques, advanced technologies and jobs for the people as a whole. The FDI is a kind of long term commitment on behalf of foreign countries and MNE's together significant benefits for the hosting countries in the shape of economic growth and reduction of external vulnerability. Pakistan has tremendous GDP growth and notable FDI flow during last few years. This industrial growth and increasing demand of energy from the consumers has disturbed the supply and demand of energy. The country is facing shortage of Power 4000-5000MW recently, prices of oil and gas shooting because of international prices and more and more demand from the consumer. The country has potential abundant sources of energy and power and GOP is trying to attract the private investor to made contribution to meet the future energy needs. My thesis report highlights the some historical and recent Foreign Investment flow and policies related to FDI. The focus of this report is particularly related to potential investment opportunities in energy sector with the evidence of projected future energy needs and required investment.

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*Dedicated to someone  
Whom I can't meet in my life*

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## ACRONYMS AND ABBREVIATIONS

AEDB	Alternative Energy Development Board
ASEAN	Association of Southeast Asians Nations
BOOT	Build Own Operate Transfer
BOI	Board of Investment
Btu	British thermal unit
CNG	Compressed natural gas
EDB	Engineering Development Board
EPZ	Export Processing Zone
EOI	Expression of Interest
E&P	Exploration and production
FATA	Federally Administered Tribal Areas
FDI	Foreign direct investment
FESCO	Faisalabad Electric Supply Company
FY	Fiscal year
GNP	Gross National Product
GDP	Gross domestic product
GDR	Global depository Receipts
GOP	Government of Pakistan
GWh	Gigawatt hour
Hydel	hydroelectric
ICT	Islamabad Capital Territory
IMF	International Monetary Fund
IPB	Investment Promotion Bureau
IPPs	Independent power producers
JPC	Jamshoro Power Company Limited
KANUPP	Karachi Nuclear Power Plant
KAPCO	Kot Addu Power Copmpany
KESC	Karachi Electric Supply Corporation
KWh	Kilowatt-hour
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
M&A	Merger & Acquisition
MIGA	Multilateral Investment Guarantee Agency
MNC	Multinational Corporation
MMcf	Million cubic feet

MOU	Memorandum of Understanding
MTOE	Million tons of oil equivalents
mtpa	Million tons per annum
MW	Megawatt
NEPRA	National Electric Power Regulatory Authority
NPCC	National Power Construction Corporation
NWFP	Northwest Frontier Province
OECD	organization for Economic Co-operation and development
OGDC	Oil and Gas Development Corporation
O&M	Operation and Maintenance
PAEC	Pakistan Atomic Energy Commission
PARCO	Pak Arab Refinery Corporation
PESCO	Peshawar Electric supply corporation
PIIB	Private Power and Infrastructure Board
PPP	Purchasing power parity
PPL	Pakistan Petroleum Limited
PR	Pakistan Rupee
PTC	Pakistan Telecommunications Corporation
PSO	Public Sector Organization
RE	Renewable energy
SIZ	Special industrial zones
SBP	State Bank of Pakistan
SSGC	Sui Southern Gas Corporation
SNGPL	Sui Northern Gas Pipe Lines Limited
TCF	Trillion cubic feet
T&D	Transmission and Distribution
TNC	Trans-National Corporation
TOE	Tons of oil equivalents
WAPDA	Water and Power Development Authority
WTO	World Trade Organization

## **PART 1: INTRODUCTION**

We are living in a global village; the distance has been squeezed because of high speed transportation and efficient communication system. One can move from a country to another country just in few hours and can deliver his message from a corner to another corner of the world just in few seconds. In the same way business can move from one place to another place without any delay of time. The one of the best example of business movement is foreign direct investment (FDI).

FDI is a vibrant instrument for an accelerated socio-economic development of any host country. The tremendous growth in FDI is a clearest sign of globalization the past few decades. The average growth rate of FDI around the world is twice as much as from the international trade in past two decades. FDI is not only viewed as a major stimulus to economic growth in all countries but also perceived ability to deal with major obstacles such shortages of financial resources, technology, and skills. This has made it the center of attention for policy makers in developing countries such as Africa and South Asia. FDI can take place into two major forms “Greenfield investment”<sup>2</sup> or merger and acquisition (M&A), depending on whether the investment involves mainly newly created assets or just a transfer from local to foreign company.

The objectives to invite the foreign companies may be summarized; as trying to

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<sup>2</sup> The term used for foreign investment established assets in host country, also called “mortar and bricks” investment.

overcome scarcities of resources such as capital, entrepreneurship, access to foreign markets, efficient managerial techniques, technological transfer, innovation and employment creation. FDI is an efficient source of capital formation particularly when the capital base is low. Capital inflow is also a simple and important way of creating a surplus in the capital account of the balance of payments or to make up for the deficit on the current account. There is a controversy in term of employment creation during FDI, some of International experiences shows that foreign direct investment is not always accompanied jobs opportunities but in some cases lead to job losses during privatization of public companies.

### **1.1: Country's Profile Overview**

**Location:** Located in the heart of Asia, Pakistan is the gateway to the rich energy resources Central Asian countries, the financially liquid Gulf States and the economically advanced far Eastern tigers. This strategic advantage alone makes Pakistan a marketplace teeming with possibilities, bordering the Arabian Sea, India on the east, Iran and Afghanistan on the west and China in the north<sup>3</sup>.

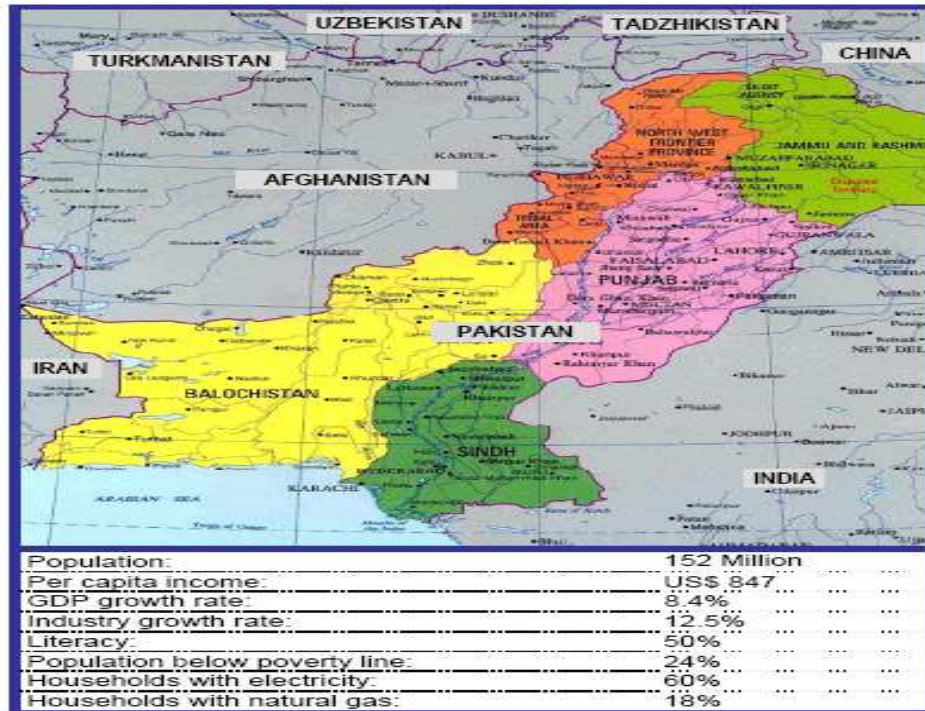
**Total Land Area:** 796,096 square kilometers

**Land Boundaries:** Total 7,266 km ( Afghanistan 2,430 km, China 580 km, India 2,240 km, Iran 909 km).

#### ***Figure # 1 Geographical location of Pakistan***

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<sup>3</sup> For further details, see the figure # 1:Geographical map of Pakistan



Source: Pakistan Economic Survey 2004-05

Latest GoP estimates for per capita income and population below poverty line

**Administrative Divisions:** 4 provinces (Punjab, Sindh, NWFP, Balochistan)

Islamabad Capital Territory (ICT) Federally Administered Tribal Areas (FATA)

Disputed Jammu & Kashmir region includes Azad Kashmir and the Northern Areas

## 1.2: Historical FDI Policies in Pakistan

The FDI policy of host country plays a great role to influence on foreign investment decision. Any country can adopt friendly policies to stimulating foreign investment or can make sanctions on foreign participation in their economies in various ways. These policies have pronouncements affect the perception of political risk by (TNCs) transnational corporations and also can be used as an instrumental in channeling investment flows towards some particular sectors considered to be important for

country's development.

Pakistan considered being an agricultural economy upon its independence in 1947.

The local industry was unable to process agricultural raw material. This situation imperative for succeeding governments to improve the manufacturing capacity of the industry. In order to improve this situation, industrial policies have been implemented with different focus on either private or public sector. During 1960s policies were focused on private sector while in 1970s the public sector had dominant role. In 1980s to 90s, the private sector again assigned a leading role especially in 1990s, Pakistan government (GOP) adopted a liberal, market oriented policy and declared the private sector the engine of economic growth for the country. In addition, Pakistan offered some attractive packages and incentives to foreign investors. The poor performance of the industrial sector following the 1972 nationalization, GOP changed the approach towards the public and private sectors and restricted the further investment in the public sector. According to 1984 policy statement, GOP decided to pursue a pattern of mixed economy, with the private and public sector partnership to reinforce each other. The already existed industry like steel, fertilizer, cement, petroleum, refining and petrochemicals, and automotive equipment engineering were still in the realm of the public sector. The private sector, however, permitted to participate in these fields as these were not an exclusive preserve of the public sector anymore. This policy



encouraged the private sector to come forward, In the result of this policy Pakistan might have attracted considerable amount of FDI but public sector retained its role in major industrial areas, which discourage the large flow of FDI.

In order to encourage FDI in export oriented industry, EPZ (export processing zone) was set up in Karachi and not only foreign investor but overseas Pakistanis were also encouraged to invest in EPZ. The number of concessions offered by the EPZ included duty free import and export of goods and tax holidays. New industrial package was introduced in 1989 for the recognition of the private sector to improve the business environment and attract FDI in particular.

In 1991 GOP announced same rules and regulations for foreign and domestic investors. The approval of GOP also removed except few industries like Arms and Ammunition, security printing, currency and mint, high explosive, radioactive substance and alcoholic beverages, these industries were also closed for domestic investors. GOP also allowed for foreign investor equity participation of up to 100%. The most prominent step taken by the GOP was about the foreign currency regime. Any domestic and foreigner are allowed to bring in, and take out, open accounts and hold certificates on foreign currency. The GOP also enacted extensive set of investment incentives including credit facilities, fiscal incentives and visa related issues. The many of fiscal incentives including a three-year tax holiday to all industries

throughout Pakistan set up from 1 Dec. 1990 and 30 June 1995. Investments in defined rural areas, industrial zones, and less developed areas could enjoy 5 to 8 years tax holiday respectively, with some special custom free duty and sales tax reductions. The import policy becomes more investor friendly and the maximum tariff rate has been decreased from 225% in 1986/1987 to 45% in 1996/1997. A huge number of quantitative sanctions and nontariff barriers have been released<sup>4</sup>. The new duty drawbacks policy had announced according to that 80% of duty drawback is paid within three days to the company, and remaining 20% should be paid within one week after inquiry. The visa related issues also has been changed and foreign investors with fairly large amount of investment are allowed to have three years multiple visa. There is no any restriction for work permit of foreign manager and technical staff for gainful employment in private companies in Pakistan. Special industrial zones (SIZs) have been built to attract foreign investor in Export oriented industries. Overseas Pakistanis were also eligible to invest in SIZs. The GOP had fully responsibility for providing the basic infrastructure and utilities in the SIZs. In November 1997, the GOP issued New Policy and took some major policy initiatives. In previous policies FDI was restricted mainly to manufacturing sector but in new policy FDI was allowed in sectors like agriculture and services, which considered 3/4 % of GNP. The main

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<sup>4</sup> For detailed discussion on Pakistan's trade and tariff policy, see M.Z. Khan (1996)

motivation of this policy was to increase the level of FDI in the fields of industrial base expansion, infrastructure, software development, electronics, engineering and technology, agriculture, food, textile, tourism, and construction industries<sup>5</sup>.

### **1.3: Legal Protection of FDI in Pakistan**

There are number of laws and rules those strongly protect the FDI in Pakistan through the Constitution<sup>6</sup> (Article 24). The not only these protections, the Multilateral Investment Guarantee Agency (MIGA) also provides a number of ways of obtaining insurance cover against noncommercial risks. Pakistan is one of the top beneficiaries of the MIGA insurance investment cover. MIGA has provided 9.4% of investment insurance, the highest among all developing countries.

### **1.4: Recent Economic Growth in Pakistan**

Pakistan's economy has recovered from crisis with growth experienced in the agriculture, manufacturing industry and especially in service sectors. In fiscal year (FY) 2004/2005 (ending in June), Pakistan achieved gross domestic product (GDP) growth of 8.4 percent and in 2005/2006 the country had GDP growth of 6.6 percent (See table 1). High inflation (9.3 percent) in 2004/2005 was attributed to increasing oil prices, housing rents and daily food item shortages. In order to reduce the inflation

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<sup>5</sup> FDI in nonindustrial sectors is not necessarily subject to the same treatment as domestic investment (see UNCTAD 1994).

<sup>6</sup> Refer to Article 24, section 8 of the Protection of Economic Reforms Act 1992 for legal protection of FDI

factor, the central bank of Pakistan announced that it would raise interest rates. This strategy worked, and inflation decreased to 8.0 %from 9.3% by the end of FY 2005/2006<sup>7</sup>. The International Monetary Fund (IMF) and the World Bank both have acknowledged the favorable performance in financial and economic growth and progress in Pakistan’s structural reforms.

**Table 1: Economic Indicators (2007-2008)**

Indicators	2001-02	2002-03	2003-04	2004-05	2005-06	2006-2007	2007-08
							(Jul-Jan)
Exports (Billion \$)	9.13	11.16	12.31	14.39	16.47	17.01	10.15
Imports (Billion \$)	10.34	12.22	15.59	20.6	28.58	30.54	20.48
Trade Balance (Billion \$)	-1.2	-1.06	-3.28	-6.21	-12.11	-13.53	10.33
FDI (Million \$)	484.7	798	949.4	1524	3,521	5,125	2.262
Foreign Investment (Million \$)							
(FDI+Public&Private Portfolio)	475	820	922	1677	3,872	8,417	2.623
Workers Remittances (Billion \$)	2.39	4.24	3.872	4.17	4.6	5.49	3.62
Forex Reserves (Billion \$)	6.43	10.72	12.33	12.61	13.14	15.18	14.13 (As on 28th Feb)
Exchange Rate (Rs./ US\$)	61	57.7	57.92	59.66	60.16	60.5	62.6
Stock Exchange Index	1520	3402	5279	7450	9,989	13,772	14934.3 ( Feb)
GDP Growth	3.60%	5.10%	6.40%	8.40%	6.60%	7.00%	-
Inflation	3.40%	3.30%	3.90%	9.30%	8%	7.90%	-

*Source: State Bank of Pakistan (SBP)*

Another tremendous growth is a stock exchange index that has been raised from 1520 to 14939 in last five to six year. This rapid growth of stock index is not less than from any emerging economies like India and China.

The Heritage Foundation and the Wall Street Journal, has put Pakistan at the 89<sup>th</sup> place<sup>8</sup>, ahead of India (104) and China (119) out of 161 countries and Moody’s has

<sup>7</sup> For more details, see the financial reports, State bank of Pakistan (Economic indicator 2007-08)

<sup>8</sup> See the 2007 Index of Economic Freedom jointly conducted by the Heritage Foundation and the Wall Street

changed the credit rating of Pakistan from B-1 to B-2<sup>9</sup>. Pakistan was top reformer country in 2006 and the second reformer in 2007. These reforms have resulted drop in the number of days required to import in Pakistan from 39 to 19 days. The country has also reformed positively in the area of taxation by gradually reducing corporate tax rate, from 39% in 2004 to 35% in 2006. Pakistan scores well on the indicators related to starting a business (54th out of 175) and protecting investors (19th out of 175)<sup>10</sup>.

### **1.5: Current Foreign Direct Investment (FDI) Situation in Pakistan**

In today's world, all countries have interactions with each other. No country, irrespective of ideological differences, stands isolated today.

FDI has played a glorious and profit oriented role in several countries of the world.

FDI is a strong and vibrant instrument for an accelerated socio-economic development. Most of the FDI took place within the OECD area. However, until the Asian financial crisis 1997, the share of FDI hosted by countries in the developing countries increased. In term of GDP of host country, FDI flow to developing countries typically greater than those to the developed world. In the recent past ASEAN countries have been big beneficiaries. Now some of these countries are contributing abroad through the investment of FDI. Some people believe the

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<sup>9</sup> See the Moody's Investors Service annual report on Pakistan (2007)

<sup>10</sup> See the Doing Business report issued by the World Bank (2007)

presence of MNEs in poor and developing countries as a threat the economic development on the other hand some people see FDI as a potential source of economic growth in term of MNEs in the market. It is right time that Pakistan learned from the success stories of use of FDI, and also gear up positive efforts to create a conducive atmosphere to attract FDI in Pakistan. This challenge has to be met by all stakeholders in Pakistan. Sincere and sustained efforts will produce productive results. Foreign direct investment (FDI) in Pakistan soared by 180.6 per cent year on year to US\$2.22 billion and portfolio investment by 276 per cent to \$407.4 million during the first nine months of fiscal year 2006. During July March 2005-06, FDI year on year increased to \$2.224 billion from only \$792.6 million and portfolio investment to \$407.4 million, whereas it was \$108.1 million in the corresponding period last year<sup>11</sup>.

**Table 2: Foreign Investment inflows in Pakistan (Million \$)**

Year	Greenfield Investment	Privatization Proceeds	Total FDI	Private Portfolio Investment	Public Portfolio Investment	Total Foreign Investment
2001-02	357	128	485	-10	-483	-8.4
2002-03	622	176	798	22	-261	559.1
2003-04	750	199	949	-28	339	1,260.70
2004-05	1,161	363	1524	153	458	2,134.60
2005-06	1,981	1,540	3521	351	613	4,485.00
2006-07	4,859	266	5125	1,820	1,471	8,416.60
2007-08(Jul-Jan)	2,129.40	133	2262.4	-21.1	21.5	2,262.80
Total	11,859.40	2,805.00	14,664.40	2,433.70	2,114.50	19,017.30

*Source: State Bank of Pakistan, SBP (January 2008)*

The above mentioned table issued by the State Bank of Pakistan at the end of

<sup>11</sup> See the annual economic and financial reports issued by State Bank of Pakistan (2005-06)

January 2008 shows clearly the tremendous growth of FDI inflow in Pakistan and trust of foreign investor on growing economy of Pakistan as a whole. The State Bank of Pakistan categories the FDI investment into four different major sectors like Greenfield Investment, privatization, private portfolio and public portfolio investment. The inflows of FDI in Pakistan from last 7-8 years have remarkable progress because of friendly policies of GOP towards the foreign investors and open the market especially in the area of privatization. The financial sector is providing a number of financial products to the consumer including credits, loans and credit cards. There are dozens of foreign banks are working in Pakistan from all around the world. According to recent figures issued by the State Bank of Pakistan, the number of cards holders have been exceeded from 6.7 Million and demand is still increasing day by day as more and more banks are offering online banking and ATM facilities.

The most prominent sectors for FDI inflow in Pakistan were oil and gas and communication from last couple of years. The communication has very rapid growth in FDI because of open market and privatization of GOP monopolized telecommunication (PTCL) Pakistan Telecom Corporation Limited. The number of prestigious telecom groups and companies moved to towards Pakistan in recent years like Wateen Telecom, Itsalat, from UAE, Telenor from Norway, Mobilink from Orascom group. Some of other Multinational companies also acquired some local

companies, e.g China Mobile acquired Paktel and SK telecom from South Korea has been acquired Insta phone (The only CDMA service providing company).

**Table 3: Sector wise FDI inflows (Million \$)**

Sector	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	Jul-Jan 2007-08
<b>Oil &amp; Gas</b>	80.7	268.2	186.8	202.4	193.8	312.7	545.1	366.5
<b>Financial Business</b>	-34.9	3.6	207.4	242.1	269.4	329.2	930.3	395.1
<b>Textiles</b>	4.6	18.5	26.1	35.4	39.3	47	59.4	17.1
<b>Trade</b>	13.2	34.2	39.1	35.6	52.1	118	172.1	107.4
<b>Construction</b>	12.5	12.8	17.6	32	42.7	89.5	157.1	44.5
<b>Power</b>	39.9	36.4	32.8	-14.2	73.4	320.6	193.4	36.1
<b>Chemical</b>	20.3	10.6	86.1	15.3	51	62.9	46.1	52.8
<b>Transport</b>	45.2	21.4	87.4	8.8	10.6	18.4	30.2	44.7
<b>Communication</b>	NA	12.8	24.3	221.9	517.6	1937.7	1898.7	750.3
<b>Others</b>	140.9	66.2	90.4	170.1	274	285	1092.5	447.9
Total	322.4	484.7	798	949.4	1,523.9	3,521.0	5,124.9	2,262.4

*Source: State Bank of Pakistan (SBP)*

The FDI inflow in communication sector has increase from 0 to 1898 Million\$ highest level from 2001 to 2006<sup>12</sup>. The number of mobile subscriber has been exceeded 70 Million in Pakistan that is more than from the total population of many countries around the world. The fast depletion and more demand of energy have made oil and gas sector more lucrative and competitive. Pakistan has large amount of abundant energy resources especially gas, coal and somehow crude oil as well. So that many Multinational National oil and gas exploration and production companies like Shell, ENI, MOL, GE, Nuricon, and etc are eager to explore the abundant energy resources of Pakistan these days.

<sup>12</sup> See the FDI flow figures issued by the State Bank of Pakistan in Table # 3



## **PART 2: THE CASE OF ENERGY SECTOR**

### **2.1: The Recent Energy Crisis in Pakistan**

The energy crisis is considered to any shortage in the supply of energy resources, either in term of oil and gas, electricity or other natural resources. The energy crisis of any country usually affects the rest of the economy of the country with a lot of recessions, rise of production cost of electricity itself and goods manufacturing cost. The increase of petroleum products reduced the consumer confidence and they spent more for transportation and other general products.

The energy resources have been depleted around the world and available resources are very expensive and acquired by the powerful countries. The countries those are rich with resources are not supplying required amount anymore. All means of transportation are seems to stand still like Airplanes, trains, cars, buses, trucks and etc. The industry in Pakistan has reached to critical stage due to lack of power supply. Oil prices have shoot from the buying power of consumer. The alternate energy sources are being tried for survival like solar, biogas, and wind etc. This is a scenario of Pakistan in these days and in near future due to rapid growth of population and open the market for overseas investors. This is a right time for

leadership and policy maker of the country to work out on this issue without any further delay. The GDP of Pakistan is growing with exception rate within last few years and has touched to 8.40% (See table # 1) in the history of 60 years of the country. There are only few years in the economic history of the country, when GDP grew above 7% and officials are expecting growth rate 6-7% in coming years. With the rapid growth of economy, the energy requirements are also increasing with the same pace. The Pakistan fulfills energy needs with the different sources of energy like power, natural gas, petroleum, and coal. According to 2003-04 reports, total energy supply was 50.8 (MTOE) (see Table # 4). The energy demands are increasing rapidly slightly greater rate than GDP especially electricity consumption that's why energy would be a high priority for public and private sector in near and long term future and GOP is trying to offer some incentives for private investor in this sector.

The consumption of energy mix always fluctuating as shown in the (Table # 4). The consumption of petroleum products decreased to 6.5% while gas, electricity and coal have increased at the rate of 10.4%, 6.0% and 14.6 % respectively (See Table #4).

**Table 4: Primary Energy Supply and Per Capita Availability**

This fluctuation is because of encouraging policy of GOP to use natural gas and coal

YEAR	ENERGY SUPPLY		PER CAPITA	
	Million TOE	% Change	Availability (TOE)	% Change
1990-91	28.469		0.253	
1991-92	30.475	7.0	0.264	4.4
1992-93	32.953	8.1	0.278	5.4
1993-94	34.778	5.5	0.286	2.9
1994-95	36.062	3.7	0.290	1.2
1995-96	38.746	7.4	0.304	4.9
1996-97	38.515	(0.6)	0.295	(3.0)
1997-98	40.403	4.9	0.305	3.3
1998-99	41.721	3.3	0.313	2.7
1999-00	43.223	3.6	0.317	1.2
2000-01	44.456	2.9	0.319	0.6
2001-02	45.237	1.8	0.318	(0.4)
2002-03	47.061	4.0	0.321	0.9
2003-04	50.820	8.0	0.340	5.9
2004-05	55.533	9.3	0.371	9.1

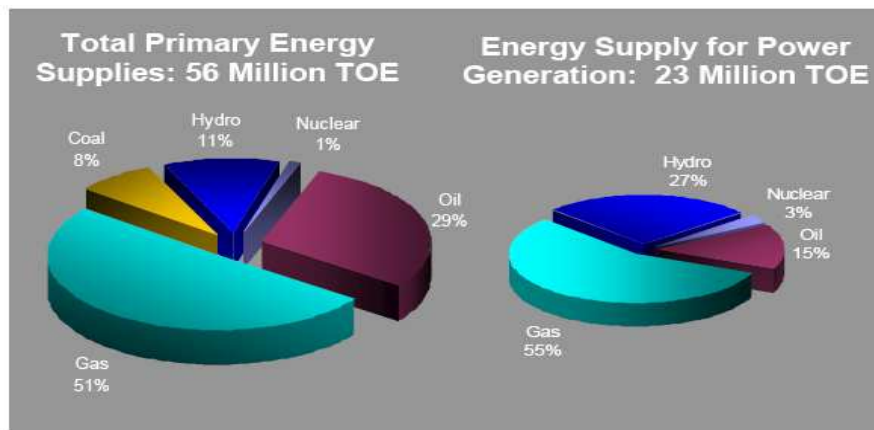
*Source: Government of Pakistan, chap. 15 in Pakistan Economic Survey, 2004-05 (Islamabad: Ministry of Finance, 2005), Table 15.8, p. 224.*

as fuel for power generation and transport as people realized that these two fuels are major domestic sources of energy. The GOP also introduced some new fuels for transportation like compressed natural gas (CNG) and liquid petroleum gas (LPG). According to report of GOP “Pakistan has become leading country in Asia and 3<sup>rd</sup> largest user of CNG in the world after Argentina and Brazil.”

## 2.2: The Primary Energy Requirements of Country

So far, Pakistan has a well developed infrastructure for energy transmission and distribution. The gas transmission lines connect to 4.26 Million households, bulk of industries and thermal power plants in the country. It also has 9,060 km of high pressure transmission lines and more than 225,000 HP compression capacities. The power network serves over 16.3 Million residential and commercial and 0.23 Million industrial customers, having 40,500 km of high voltage transmission lines. The country also has oil pipelines for transport of crude oil and petroleum products inside the country as well as well equipped Karachi port facilities for import of oil and coal. In fiscal year 2005 the total energy supply were 56 MTOE with annual domestic production of 28 MTOE. The energy mix accounts for 51% gas, 29% oil, hydel 11% and coal 8%. The power sector needs accounts for 55% gas, 27% hydel, 15% oil and 3% of nuclear.(the details see in *Exhibit 1*)

**Exhibit # 1: The energy mix details charts**

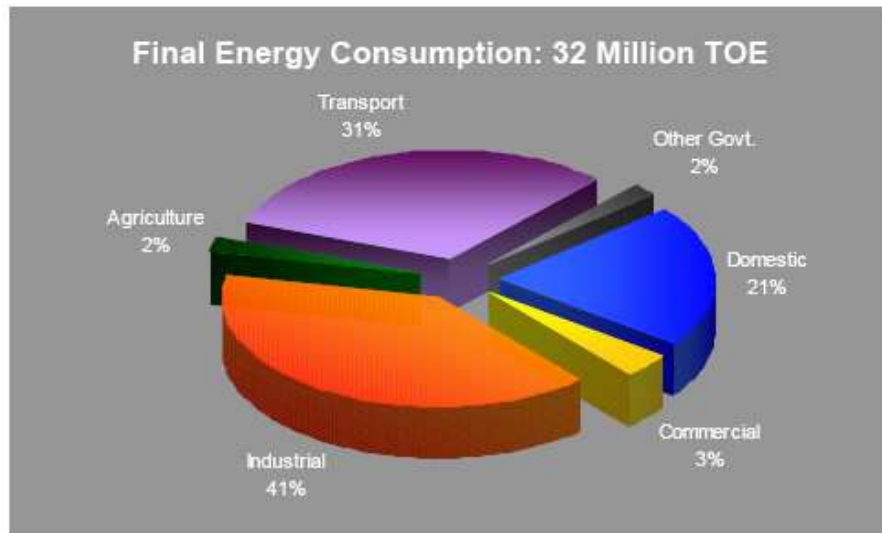


Source: Pakistan Energy Yearbook 2005

Unfortunately, Pakistan fulfills only 20% of consumption of oil from indigenous sources. The industrial sector is the biggest sector for energy consumption with 41%

of demand, transport sector is 31% and residential is only 21% of total energy demand as per 2005 energy reports<sup>13</sup> .

***Exhibit # 2: Final energy consumptions details chart***



Source: Pakistan Energy Yearbook 2005

### **2.3: Projected Future Energy Demands**

Significantly, 80% of Pakistan's total energy supply came from outside the country in the form of fuel oil and crude oil as fuel for electricity generation, industry and transportation means. This creates a great burden for the economy of the country in term of foreign reserves and trade deficit. The large number of imports was neither feasible nor prudent decision for the economy of the country. The GDP of the country is growing with the rate of 6.5% which demands rapid increase of energy in near future. The summary if projected energy demands assuming the growth of 6.5% GDP

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<sup>13</sup> For more details, see Pakistan energy year book report 2005

given in the Exhibit # 3.

### Exhibit 3: Projected Energy Demand

	FY05	FY15	FY25	FY05	FY15	FY25
	Million TOE			% Share		
Oil	16	29	47	30	27	24
Gas	28	56	93	48	50	47
Coal	4	9	17	8	8	8
Hydel	7	13	29	12	12	15
Renewable	-	1	5	0	1	2
Nuclear	1	2	7	1	2	4
<b>TOTAL</b>	<b>56</b>	<b>110</b>	<b>198</b>	<b>100</b>	<b>100</b>	<b>100</b>

*Source: Medium-Term Development Framework: 2005–10, Planning Commission*

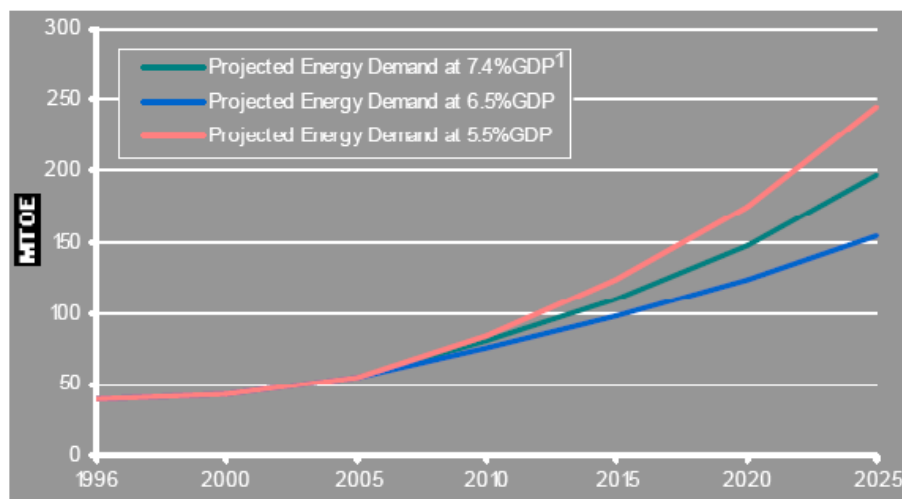
*Note: Government of Pakistan adjusted to GDP growth rate of 6.5% and updated for power generation plans*

Expected increase of energy demands for next 20 years would be 198 MTOE from current 56 MTOE by the factor of 3.5, if the economy of the country grows with the same pace. To meet the future requirements of energy GOP needs to plan a long term and friendly policy to develop indigenous resources of energy and diversify the energy mix. The share of oil should be drop because of higher oil prices in the international market and great demands. The GOP policy should also switch to low cost alternatives of power generation like development of coal, hydel, aggressive program of nuclear power and renewable energy sources.

Alternative scenarios should be considered as per the fluctuation of economic growth from recent 6.5 % figure. The optimistic approach of economic growth rate assumed to be 7.4% while the reasonably conservative outlook for growth of economy as per

historic average is 5.5% in the future. In any case, under these two scenarios demand can varies by more than 25%, dropping 155 MTOE corresponding to 5.5% of economic growth and shot up to 246 MOTE corresponding to 7.4% of economic growth rate. The sensitivity for energy demands projections as per fluctuation of economic growth is illustrated in *Exhibit # 4*

***Exhibit # 4: Projected demand with different rate of GDP growth***



<sup>1</sup> The Medium Term Development Framework, 2005-10. Planning Division assumed a GDP growth rate of 7.4%

## **2.4: Projected Future Energy Deficit**

The exploration and production of oil and gas is expected to improve slightly because of assigning the license of public and private exploration companies and their onshore and offshore activities. Of course, the availability of energy from oil and gas will not be enough to meet the rapid growing demands of energy in the country. The GOP should in line the availability of coal, hydel, nuclear and renewable energy sources in

the energy development plans for the future requirements. The energy deficit will increase from 15 MTOE (28%) of the energy demands presently to 122 MTOE (62%) of the demand until 2025<sup>14</sup>. This outlook of deficit shows that GOP need to place developments of indigenous resources on high priority as well as arrangements to acquire affordable and reliable energy from external sources.

The future projected indigenous energy supply and deficit as per GDP growth rate of 6.5% is summarized in *Exhibit # 5*

**Exhibit 5: Projected Energy Deficits (Million TOE)**

	FY05	FY15	FY25
Oil	3	4	2
Gas	26	34	19
Coal	2	5	13
Hydel	7	13	29
Renewable and Nuclear	1	3	12
<b>Total Indigenous Supply</b>	39	61	75
<b>Total Energy Requirement</b>	54	110	198
<b>Deficit</b>	15	50	122
<b>Deficit as % of Energy Requirement</b>	28	45	62

*Source: Medium-Term Development Framework: 2005–10, Planning Commission*  
*Note: Government of Pakistan adjusted to GDP growth rate of 6.5% and updated for power generation plans*

## 2.5: The Country’s Energy Resources, Potentials and Risks

The Pakistan has a tremendous amount of abundant domestic resources from which only minor amount is on production stage. The production to reserve ratios is listed in *Exhibit # 6*. The large amounts of unexploited coal reserves are located inside the

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<sup>14</sup> See the details in midterm development report framework 2005-10, Planning commission of Pakistan



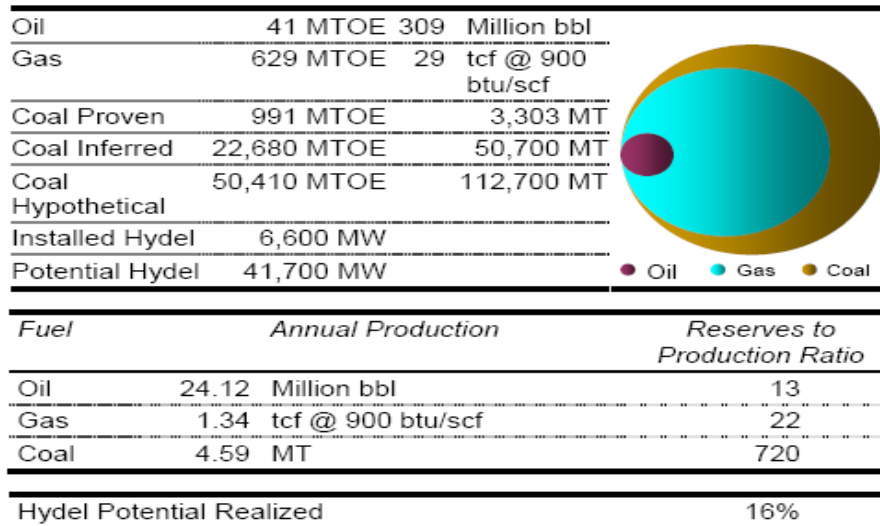
Thar<sup>15</sup>. Of course, the development of these reserve needs a huge amount of investments because of soft burden of desert area and deeply located coal seams around 175-230 m. There are some other constraints as well, like commercial developments including roads, infrastructure and availability of basic needs and fresh water but it doesn't mean that the project is not feasible, some of Chinese companies are eagerly looking forward to get some contracts for mining these reserves and used for the production of power generation.

The North West Frontier Pakistan province has a great potential of hydel projects because of steep gradient and high current of available flowing water in the rivers. All these sites has been identified and recognized by the GOP for the benefits of power generation and storage of water for agriculture usage. These projects require a large initial cost because of mountainous region, expensive technical studies and cost of resettlement of effected people but the return of investment is obviously great in the long run. The installed and potential hydel generation is shown by the *Exhibit # 6*.

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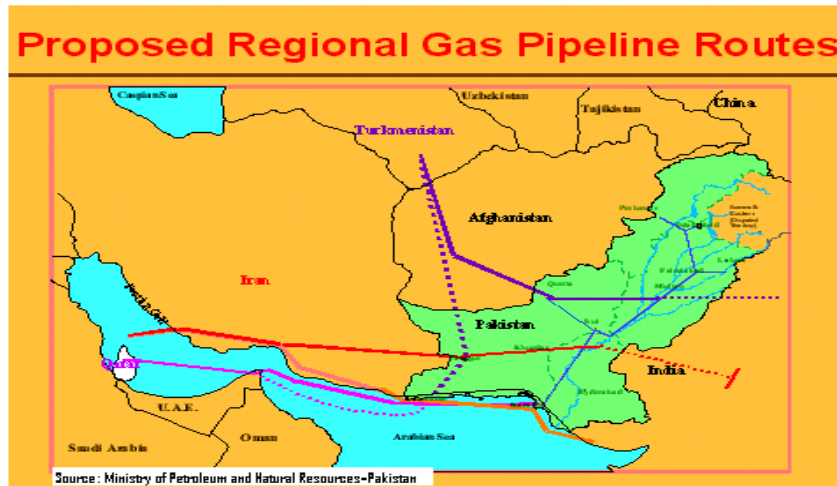
<sup>15</sup> This is the name of place in desert area at Sindh Province, Southern part of Pakistan

**Exhibit # 6: The production to reserve ratios**



The involvement of serious constraints and risks for the exploitation of domestic energy resources GOP has been given the priority for import of energy from nearby energy rich countries from Middle East and Central Asia especially import of natural gas and electricity. The many big energy projects have received the attention of governments of regional countries and private investors as well. The recently GOP is working on the project of gas import by pipeline from Turkmenistan, Iran and Qatar and electricity from Tajikistan and Kyrgyzstan which are rich in hydel resources. All these projects are very healthy for Pakistan as well as integration of Regional Corporation in term of economic development between Central Asia, Middle East and South East Asia. The risks and constraints associated with these projects are regional security situation, operating arrangements and inter-country agreements.

*Figure # 2: proposed Regional Gas Pipe Line Routes*



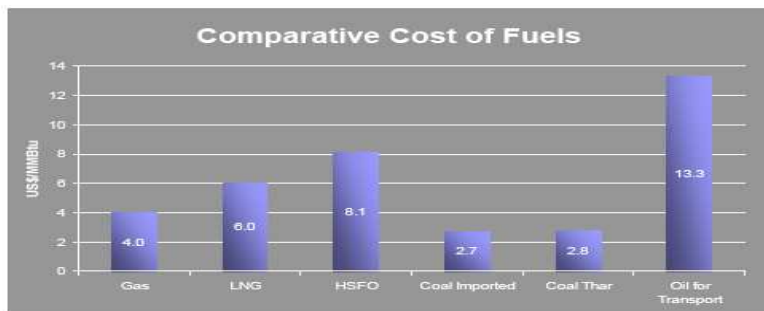
## **2.6: Economic and Financial Considerations in Energy Planning**

The GOP has different options to fulfill the energy needs of the country with different means of fuels. The GOP should consider all feasible options and their impact on economy as a whole. The comparative costs of different fuels are illustrated in *Exhibit # 7* by assuming prevailing prices in the international market. The assuming price of crude oil is \$60/bbl, local and imported coal is under \$3/MMBtu, natural gas \$4 and LPG \$6/MMBtu respectively. The delivered costs of petroleum products are substantially higher than from coal and natural gas.

The economic cost of energy supplied for Pakistan is increasing rapidly with the demand of energy. According to estimation of Ministry of Finance, GOP spent \$15.3 Billion every year which has been increased substantially today. The major attribute of this money goes to oil which is 48% excluding power, 8% to HSFO mainly for

power generation, 17% to gas for commercial purpose, 12% gas for power generation and remaining 12% shared to hydel, coal and nuclear energy. The division of attributes is listed in *Exhibit # 7*

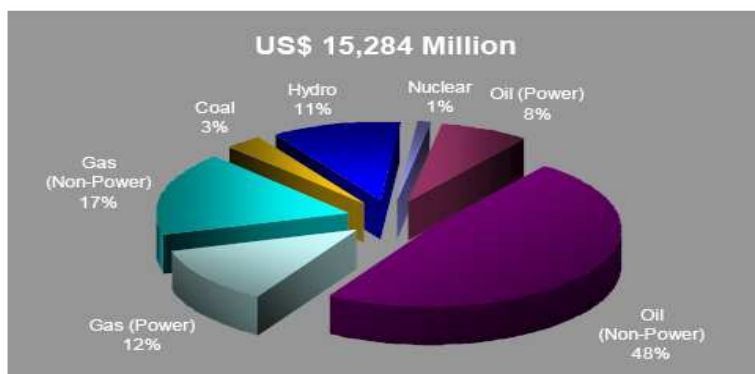
***Exhibit # 7: The comparative costs of different fuels***



Note: HSFO price corresponding to US\$ 60/bbl crude. Delivered price of imported coal assumed at US\$ 75/tonne

The distribution of energy costs and sectors need special attention during energy planning including switching cost of one fuel to other and their impacts on economy in the long term basis. The GOP should choose best feasible fuel and most sophisticated technologies for power generation to reduce the overall cost of energy mix in the country.

***Exhibit # 8 comparative cost for electricity generation from alternative fuels***

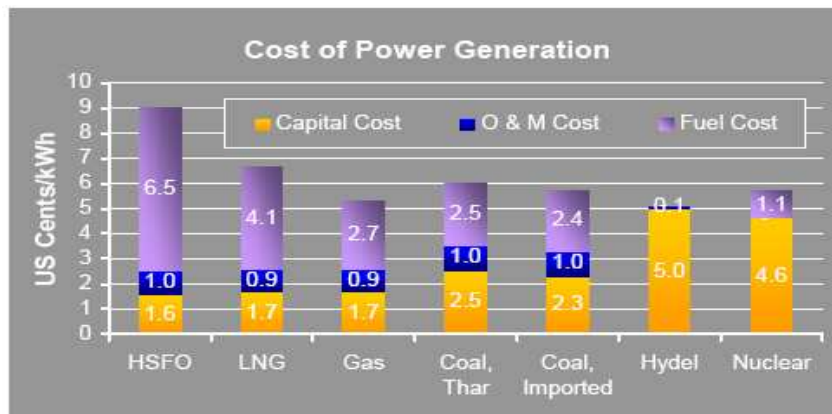


Source: Assumed prices of energy: Oil (power) 8.13 US\$/MMBtu, Oil (non-power) 13.30 US\$/MMBtu, Gas 4.00 US\$/MMBtu

Note: Coal 2.70 US\$/MMBtu, Hydro and Nuclear 5.73 cents/kWh (equivalent to electricity generated from imported coal)

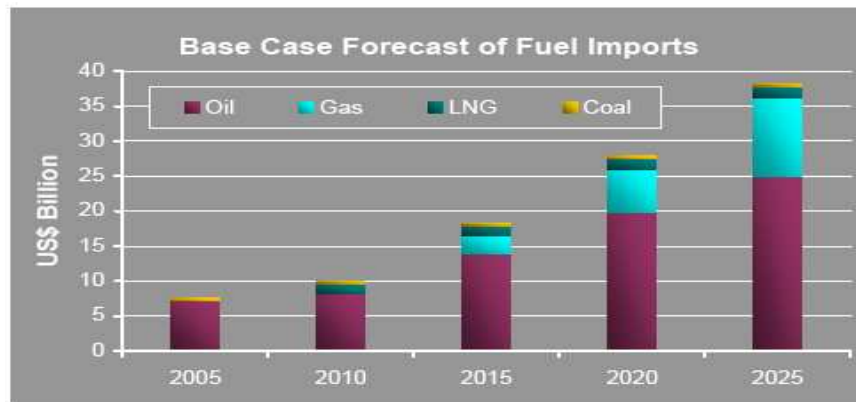
To meet the future power requirements, GOP should consider the different alternatives of technologies and fuels mix assuming prevailing initial capital and operating costs and economic cost of energy as well. Obviously the cost of electricity produced from coal, natural gas, hydel and nuclear is far less than the cost of oil and HSFO. The country cannot afford the installation and operation of power generation plants on imported LNG and HSFO in future. The most proper way is to generate electricity from indigenous and imported coal, gas and development of hydel and nuclear sources. The *Exhibit # 8* refers the cost of comparison for electricity generation from different alternative fuels.

***Exhibit # 9: Cost of Power Generation***



The economic cost of imported under the base case are projected to increase at \$38.3 Billion in 2025 that was only \$7.5 Billion in the year 2005 with the share of oil contribution 65 % and gas 30% import respectively. The *Exhibit #10* explains the projection of growth of base case forecast of fuel imports for 2025.

*Exhibit #10: Base Case Forecast of fuel Import*



### **PART 3: OPPORTUNITIES FOR PRIVATE INVESTMENT IN ENERGY SECTOR**

#### **3.1: The Contribution of Private Sector**

The energy sector of Pakistan has undergone many fundamental structural changes during last couple of years. The participation of private sector has increased significantly which was very limited until the early 1990's. The GOP is still trying to encourage the private sector companies to enter in the market and also offering privatization of existing public sector entities. The number of esteemed foreign MNC's are operating in Pakistan including Shell, BP, GE, Lasmo, BHP Billiton, OMV and etc. the participation of private sector is expected to accelerate further by the continuation of deregulation of energy sector and privatization of state owned companies.

Pakistan had oil reserves of 309 Mbbl with reserve to production ratio (R/P) 13%<sup>16</sup>.

The 50% of those reserves accompanied by the two public companies, Oil and Gas Development Corporation<sup>17</sup> (OGDC) and Pakistan Petroleum Limited (PPL) and remaining 50% is owned by the private sector including BP, Pakistan Oil Limited (POL) owned by the Pharaon Group, BHP, MOL, ENI,OMV and Petronas etc.

Pakistan had 33 Trillion cubic feet (TCF) recoverable reserves which is owned by the nearly 50-50% between public and private companies. The largest gas reserves holding company is OGDC with 66% public sector recoverable reserves. The GOP has been sold nearly around 10-15% share of PPL and OGDC by the public offering and has also planned to offer more privatization of these companies in near future by Global depository Receipts (GDRs) and domestic public offering. The oil refining capacity in Pakistan has almost doubled from FY 2000 to FY 2005 with the amount of 12.8 MTPA. This increase is because of the establishment of two new refineries, Pak Arab Refinery (PARCO), a joint venture between GOP and UAE having a capacity of 4.5 MTPA and Boscior Refinery by private sector with capacity of 1.5 MTPA. There are other many refineries are operating by the private sectors Attock Refinery Limited (ARL), Pakistan Refinery Limited (PRL), National Refinery

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<sup>16</sup> For details, see the financial year report of 2005-06, Ministry of petroleum and mineral resources, Government of Pakistan.

<sup>17</sup> The first and largest state owned public exploration and Production Company with highest share of oil and gas reserves.

Limited (NRL). The GOP inviting the more foreign and domestic private investors to built more facilities for refining and recently Kuwait agreed to built a new refinery in Pakistan. The recent operation of Gawadar<sup>18</sup> Port opened a new horizon for private sector in oil import export and refining facility. Pakistan has state of the art oil and gas handling, storage, transmission, distribution and marketing facilities with the collaboration of both public and private sectors. Pakistan has a network of three oil transportation pipelines around the country for more than 1000km and well developed pipe lines for gas supply to consumers with more than 70,000 km. the private sector built a LPG plant at Jamshoro three years with the production capacity of 500 Ton/day. The Pakistan State Oil (PSO), Shell, Caltex, Total, Attock, Admore and PARCO are the leader of oil transmission and marketing while Sui Southern Gas Corporation SSGC and Sui Northern Gas PipeLines Limited SNGPL is major player in handling the gas distribution and market.

Currently Pakistan is facing a huge shortfall of power because of imbalance of supply and demand of power. The electricity supply companies overcoming this problem by load shading (switching off the electricity for certain time) but this is not the solution of this problem at all.

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<sup>18</sup> The newly established deep sea port in the city of Gawadhar at south west part of Pakistan nearly located to energy rich Central Asians Countries.



### 3.2: Future Energy Demand and Supply scenario

The reason for this shortcoming is rapid GDP growth, more demand from industry, commercial and household consumers and the non serious behavior of past government. The GOP should be considered to enhance the capacity of power generation as GDP was growing up to fulfill the requirements of the expected future consumer demands.

The condition of supply and demand is getting worst day by day. Pakistan is facing a deficit of more than 4000 MW power today and it will increase about 5529 MW

#### Projection for Demand and Supply

S. No	Year	Firm Supply (MW)	Peak Demand (MW)	Surplus/(Deficit) (MW)
1	1999-2000	13445	11296	2149
2	2000-2001	13716	11852	1864
3	2001-2002	13693	12443	1250
4	2002-2003	14336	13071	1265
5	2003-2004	15046	13831	1215
6	2004-2005	15082	14642	440
7	2005-2006	15072	15483	(441)
8	2006-2007	15091	16548	(1457)
9	2007-2008	15055	17689	(2634)
10	2008-2009	15055	19080	(4025)
11	2009-2010	15055	20584	(5529)

*Source: Water and Power Development Authority*

within next two years as shown by the projected supply and demand *Table # 5* The power generation in Pakistan was entirely under the control of public sector until the 1990's. The GOP invited the private sector for power generation in 1992, when dozens of Independent power plants (IPPs) started their installation and operation to produce thermal power.

The first step of GOP was the WAPDA's strategic plan of privatization for the contribution of private sector in the electricity generation and distribution in 1992. The WAPDA has been divided into number of generation and distribution companies and these distribution and generation companies also have been privatized for certain extent these days except hydel and nuclear power stations. In November 2005, the Karachi electric Supply Company (KESC), the country's largest distribution company, supplied electricity to biggest city Karachi was privatized. The KESC owns the 14% of generation capacity. The public sector owns 40% of thermal capacity while IPP's account for 46% of thermal generation.

### **3.3: The Investment Policies for Power and Energy Sector**

The GOP has offered friendly investment policy for foreign and domestic investors with same treatment for both investors. There is no restricted sector for foreign direct investment and no government sanction required. The GOP had bilateral agreements with many countries around the world for investment protection with 47 countries and avoidance of double taxation with 52 different countries. The GOP also allowed 100% foreign equity, remittance of royalty, technical or franchise fee and transaction of foreign currency.

### **3.4: Features of Power Policy 2002**

According to 2002 power policy, GOP exempted all income tax, turnover tax and withholding tax on import for the project based on indigenous fuel but no exemption

of income tax oil fired power plant. The only 5% of custom duty on the import of machinery, equipments and plant for gas, coal and hydel projects not manufactured locally. There is no levy of sales tax on plant, machinery and equipments.

The hydel generation projects can be implemented on Build Own Operate Transfer (BOOT) basis and thermal generation projects can either be construct on BOOT or Build Own operate (BOO) basis. The GOP will offer complete security, guarantee regarding political risk, change in taxes, duties, transfer of money, and contracts with other stake holders like WAPDA, KESC, Provincial and Azad Jammu Kashmir (AJK) governments. There is no up-front fixed capacity charge for thermal power plants. The GOP will offer special incentives for coal and gas fired power projects. Integrated coal mining and power generation projects secured return of investment and integrated projects to be recovered from tariff under coal and gas projects. All the hydrological risk will be borne by WAPDA. The major sponsor must have to contain 20% in equity and have experience in development, implementation, ownership, operation and demonstration for financing and main sponsor not to own more than 25% of total generation.

### 3.5: Petroleum Policy 2001

*Table # 5: Salient Features of petroleum policy*

Foreign Equity	100 %
Investment	No Minimum Limit
Custom Duty	5% PME (not manufactured locally)
Income tax	40% Onshore: Royalty treated as expense. 40% Offshore: Royalty treated as advance tax.
Royalty	12.5% Onshore 12.5% Offshore: (with holiday for four years and reduced rate for next two years)
Pre-commercial discovery	<i>Onshore</i> : No obligatory “carry” for GOP or government holding company.
Post-commercial discovery	<i>Offshore</i> : Sliding scale production sharing arrangements (shallow, deep, and ultra-deep grid)
Production Bonus	Where recoverable reserves are less than 5-10 MMBOE, first production bonus would not be payable on commencement of production.
Deep Drilling	Offshore divided into shallow, deep and ultra-deep grid; GOP share based on a sliding scale for each of the three zones.
Pipeline Construction and Operation	E&P entities allowed to construct/operate pipelines to uplift production

*Source: Ministry of Petroleum and Natural Resources*

The GOP has taken the initiatives to develop the infrastructure for the import of LNG by the contribution of private sector. The expression of interest (EOI) submission date was set June 30, 2006. The firm will supply 3.5 mtpa until 2010 and in second phase another 3.5 mtpa will be completed until 2012. This project covers complete procurement, marine transportation, construction, operation and maintenance (O&M) of LNG import terminal, ownership, and re-gasification facility. The 20 year

agreement of sale and purchase has been signed between project developers. The all investment for this project will be made by private sector and GOP's role will be limited to off take guarantees by SSGC. The GOP is also encouraging both domestic and foreign investors to set up coastal refineries. This sector has become more attractive after the completion and working of deep sea port of Gawadar. A memorandum of understanding (MOU) has signed between Pakistan and Kuwait for this project. The GOP is seeking active participation from private investors in all type of power generation including thermal, hydel, renewable and coal based power plant with the exception of nuclear plant and storage based power generation.

### **3.6: Potentials in Hydel and Renewable Energy Projects**

The Pakistan has great hydel potential of approximately 42,000 MW capacity as per report of June 30, 2005 due to world biggest river system and current installed capacity is only less than 6,500 MW. The GOP is also trying to attract the investors to invest in number of potential projects of hydel generation. Currently WAPDA is working on 39 only hydel project with generation capacity of 26718 MW. The technical experts are working on the feasibility and technical studies of these projects as mentioned in (*Exhibit # 11*)

***Exhibit # 11 future hydel projects***

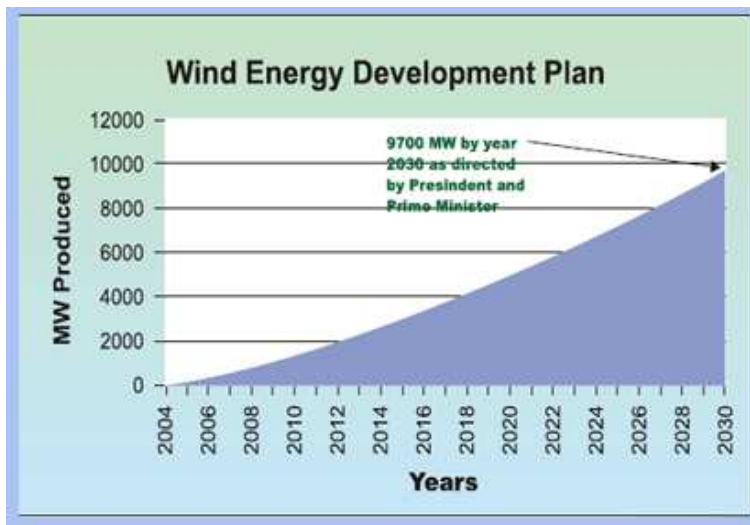
S.No.	Projects	Capacity	Status
1	21-Projects	6035 MW	Feasibility completed.
2	08-Projects	7569 MW	Feasibility under completion
3	10-Projects	13114 MW	Identified Projects
Total	26718 MW		

*Source: Water and Power Development Authority (WAPDA)*

The Private Power and Infrastructure Board (PPIB) is working as facilitator for investors and processing the number of potential projects around 50 at total estimated cost of more than \$11 Billion. These projects are mix of energy generating projects including, dual fuel, oil, gas, hydel and coal etc. the commissioning of these projects are expecting between 2007-2014. Pakistan has about 185 Billion Tons of coal reserves from which the only one largest reserve mounting to 176 BT lies in Thar Desert. These reserves were discovered in 1991 but still are undeveloped exception few by the GOP. The GOP has been inviting to private domestic and overseas companies for further exploration and establishment of coal fired power generation plants. The MOU's have been signed between GOP and some Chinese and Australian groups for establishing the generation capacity of 1,800 MW. There are number of other opportunities available near to other coal fields for power generation. Alternative Energy Development Board (AEDB) has been established by the GOP for the promotion and generation of environmentally friendly, renewable energy. The

GOP pursuing the private sector for partnership and has achieved the commitment of private investment of \$5 Billion. The AEDB has been assigned the target by the GOP to produce 700 MW of wind power by the year of 2010 and increased it up to 9700 MW until 2030. The long term AEDB plan illustrated by the *Exhibit # 12*.

***Exhibit # 12: Wind energy development plan***



**Source:** Alternative Energy Development Board

To achieve these targets GOP offering number of exemption from sales tax, income tax, custom duty on all kind of plant, machinery and equipments import and lot of other investment benefits risk coverage like facilitation for procurement, lease of land for wind farm at extremely cheap price (Euro 7/acre per year), attractive tariff offered. The GOP has decided to completely deregulate the energy market and for the privatization of state owned public companies, after completely implementation of this plan energy market of Pakistan including oil and gas E&P, oil marketing, distribution, power generation and distribution will fall in the private sector in the real sense. Currently Privatization commission is offering the opportunities in the

privatization of PSO, PARCO, National Power Construction Corporation (NPCC), Faisalabad Electric Supply Company (FESCO), Peshawar Electric supply corporation (PESCO), Jamshoro Power Company Limited (JPC), Kot Addu Power Company (KAPCO) in the energy sector.

#### **PART 4: RECOMMENDATIONS AND CONSIDERATIONS**

Regardless all the potential Pakistan has, there are number of other hurdles and problems that not only foreign and domestic investors but also GOP have to be considered and addressed them nicely. The Western province of Pakistan “Balochistan” supposed to contain huge abandoned reserves of oil and gas. The oil and gas exploration and production companies failed to exploit this basin because of poor law and order situation. To acquire the well established public companies through privatization offers is seems to be very lucrative and easy way for foreign investment but because of the hurdles by the bureaucratic procedure, postponement of privatization due to resistance by the community and civil society of the country creates hesitation for private sector. The many potentially identified and studied hydel projects have been politicized among the different provinces. The GOP should address this issue and tried to achieve the consensus among the provinces before the implementation of these projects. The role of government agencies also has questioned marks on their coordination with the private investors. The procedures of tax departments are still complex and cumbersome in Pakistan. The separate



collections taxes at the federal, provincial, and local levels have forced enterprises to face unnecessary, cumbersome and costly administrative procedures with many collecting agencies at all three levels of government. The GOP also needs to facilitate the private investor regarding credit facilities labor laws and infrastructure issues. The GOP should step up mutual forum for confidence building measures by close partnership between private and public sectors. The restructuring of PPIB, privatization commission, investment board and WAPDA can be encouraged the private sector generally and accelerate the foreign direct investment particularly in the energy sector.

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