
STATUS OF PETROLEUM SECTOR IN PAKISTAN - A REVIEW

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Abstract

Pakistan economy is growing steadily. This growth demands higher energy consumption and consequently putting high pressure on countries economy. This report is based on the research of the Petroleum Sector in Pakistan. The current facts and figures of the market situation show that the country's indigenous resources of oil are not enough to support the economy. Further development of the oil sector in the country is essential to curb the imports of large quantities of oil and oil-related products. The current demand and supply chain in the country needs further optimal management of efficient utilization of oil resources along-with the major oil consumers in Pakistan. In the end, some short step strategy is proposed to the policy makers, so as to minimize the burden of a heavy foreign exchange on the country that is paid against the import bill of the oil.

Key Words

POL Pakistan oil field LTD
BP British Petroleum
BOPD barrels of oil per day
PARCO Pak-Arab Refinery Limited
ARL Attock Refinery Limited
PRL Pakistan Refinery limited
DRL Dhodak Refinery Limited
LDO Light Diesel oil
LSDO Low speed diesel oil
CNG Compressed natural gas
JP Jet propellant (jet Fuel)
MS Motor Spirit
HOBC High octane blending component
SKO Superior kerosene oil
FO Furnace oil
TCF Trillion cubic feet

Introduction

Pakistan mainly depends upon oil and gas resources to fulfill energy requirements. Indigenous resources of oil are not enough to quench energy thirst of the growing economy. As a result Pakistan has to import large quantity of oil and oil based products from Middle East countries. Gas reserves in the country are enough for current gas requirements. So natural gas is playing a key role in power sector. Currently in oil upstream and downstream sector there are some local and international companies involved and government of Pakistan is establishing such policies that it can attract more international investors in this sector but the rapid pace of change, high degree of uncertainty and unstable political situation of the country present significant challenges and risk to foreign investment. The objective of this paper is to highlight the present status of petroleum industry in Pakistan and its future prospects keeping in view the internal fluid situation and geopolitical condition of the region.

Pakistan's economy is growing at a very steady rate and this growth is demanding higher energy consumption and thus putting a huge pressure over country's limited energy resources. Oil, natural gas and hydro are the three primary energy resources of the country which are being exploited for fulfilling energy demands of the economy. But due to the limited reserves of oil and gas within the country and political nature of the development of indigenous hydroelectricity energy resources, have resultantly forced the country to import large quantity of oil and oil related products from Middle East especially from Saudi Arabia. Share of the natural gas in country's energy use (energy mix) is the largest, at about 50 percent of the total energy consumption. Furthermore, in the coming years, without higher production, the situation of current gas reserves of the country will become critical and Pakistan will have to look towards imported gas from some neighboring countries to fulfill its increasing gas requirements. Although country is blessed with a huge potential of hydroelectricity energy source yet due to local political situation this is not being exploited to its full extent. The total primary energy supply of 58 MTOE (2006-2007) has been shown in terms of the share of major five sources of energy (energy mix) in Fig. 1.

**Total Primary Energy supply
58 MTOE**

Figure 1. Pakistan energy balance 2006-07
Source: Pakistan energy year book 2006-97

Reserves to production ratio of Pakistan's energy resources are described in table 1. Depletion of oil and gas resources are expected to be within 14 and 21 years respectively while Pakistan has huge quantity of low grade coal which contains high content of Sulphur due to which it has to import coal from neighboring countries while 16 percent of hydro power is yet to be realized.

Energy reserves of Pakistan

Fuel	Annual production	Reserve to production ratio
Oil	2194 Mbbl	14
Gas	1.40 Tcf	21
Coal	4.59 M tons	678
Hydro	16% realized	

Table 1: Reserve to annual production ratio for energy reserves of Pakistan.

Pakistan's Oil Sector

According to Oil and Gas Journal (OGJ), Pakistan had proven oil reserves of 300 million barrels as of January 2006. The majority of produced oil comes from proven reserves located in the southern half of the country, with the three largest oil producing fields located in the Southern Indus Basin. Additional producing fields are located in the Middle and Upper Indus Basin.

Pakistan has been considered a petroleum province. First well was drilled in 1866 at Kundal in the upper region of Indus valley. Shallow wells were drilled in the following years, and from 1886, small scale production of oil started in Khattan (Balochistan). In 1915, the first series of commercial oil discovery was made in the Potwar basin (Punjab). In 1960's Oil and Gas Development Company Limited (OGDCL) was created by the Government of Pakistan, which provided successful track in discovery of oil and gas reserves with in the country. After the oil crisis in 1973, a number of impressive discoveries were made both by the private sector and OGDCL. In June, 2006, initial recoverable gas reserves estimated at 52 TCF of which 33 TCF remain to be produced; oil reserves are much more modest with initial recoverable reserves of 844 million bbl and a remaining balance of 309 million bbl.

Current Supply and Demand Situation of Oil Sector

Since the late 1980s, Pakistan has not been able to add many new oil fields coming online. As a result, oil production has remained fairly flat, at around 60,000 barrels per day (bbl/d). During the first eleven months of 2006, Pakistan produced an average of 58,000 bbl/d of crude oil. However, Pakistan has ambitious plans to increase its current output to 100,000 bbl/d by 2010. Due to Pakistan's modest oil production, the country is dependent on oil imports to satisfy domestic oil demand. As of November 2006, Pakistan had consumed approximately 350 thousand barrels of oil and various petroleum products, of which, more than 80 percent was imported. The majority of oil imports come from the Middle East, with Saudi Arabia as the lead country to import from [EIA, 2006], [World Bank Report].

Pakistan oil consumption production and net imports

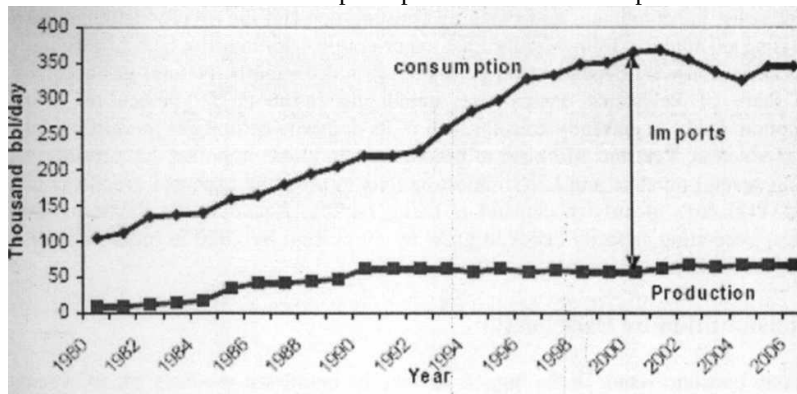


Figure 2, Supply, demand and import of oil
Source: Pakistan mergy year book 2006-07

Pakistan's Oil sector overview

Potential (expected)	Discoveries	Produced	Untapped potential	Refinery Capacity	2004-05 Crude Oil Production	2004-05 Crude Oil Import	Upto 30th June 2005 Oil & Gas Wells
27 billion barrels 100 %	844 million barrels 3%	535 million barrels	26.222 billion barrels. 97%	12.82 million tone* / year	24.12 million barrel (18% of demand)	8.28 million tones (82% of demand)	620 Explored 180 Discovered

Source: Ministry of Petroleum and natural resources Pakistan

Fig: 3: Natural Resources of Pakistan

In recent years, the combination of rising oil consumption and flat oil production in Pakistan has led to rising oil imports from Middle East exporters. In addition, the lack of refining capacity leaves Pakistan heavily dependent on petroleum product imports. Natural gas accounts for the largest share of Pakistan's energy use, amounting to about 50 percent of total energy consumption. Pakistan currently consumes all of its domestic natural gas production, but without higher production, Pakistan will need to become a natural gas importer. As a result, Pakistan is exploring several pipeline and LNG import options to meet the expected growth in natural gas demand. Pakistan's electricity demand is rising rapidly. According to Pakistani government estimates, generating capacity needs to grow by 50 percent by 2010 in order to meet expected demand [World Bank Report].

Oil Consumption by User Sector

In Pakistan transport sector is the biggest user of the petroleum products which accounts about 48 percent followed by power generation which uses about 36 percent, and industrial sector which has a share of 12 percent while remaining is shared by the residential sector.

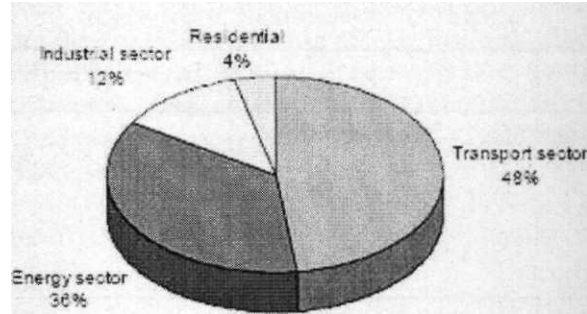


Fig 4: Major Oil Consumers
Source: Pakistan Energy Year Book 2006-07

Pakistan Oil Sector Organization

Oil sector of the country is organized and regulated by ministry of petroleum and natural resources created in 1977. Ministry offers oil concession through open tendering systems and by private negotiations. To boost the oil sector and to encourage it, ministry offers various taxes and royalties payment incentives to oil companies working in the country. There are almost four major national oil companies currently involved in the sector, namely Oil and Gas development corporation limited (OGDCL), Pakistan petroleum limited (PPL), and Pakistan state oil company limited and Pakistan oilfields limited (POL). All these four companies are joint ventures and partnership between different international companies and some domestic firms. Major international oil companies currently involved in the business in country are BP (UK), ENI (Italy) OMV (Austria) and Orient petroleum (Canada) Share of government in upstream, downstream and oil marketing companies is explained below in table [OCAC, World Bank Report].

Share of Government in Oil Sector

Name	Business	Direct & indirect Share holding
Oil & Gas Development Co Ltd	Exploration & Production	100%
Pakistan Petroleum Ltd.		93.4
Man Gas Co. Ltd.		40.00%
Pakistan Oilfields Ltd.**		11.00%
National Refinery Ltd.	Oil Refining	55.00%
Attock Refinery Ltd.**		26.00%
Pak-Arab Refinery Co. Ltd.		60.00%
Pakistan State Oil Co. Ltd.	Oil Marketing And Distribution	55.22%

Source: Ministry of Petroleum and mineral resources Pakistan

In total Pakistan has three older hydro skimming refineries and one mid country refinery named Pak-Arab Refinery (PARCO) which started its operation in year 2000 and a Bosticor Pakistan Limited which started its operation in 2003. Together, the major five refineries have a total capacity of 12.82 million tones per annum, and processed 11.33 MMT of crude in the year 2004-05. Share of each refinery in country's refinery capacity is explained below with total capacity of 12.8 MTOE per year. According to figures from ministry of petroleum, in the year 2004-05 refineries have processed about 26 percent local crude oil and 76 percent imported crude oil as shown in figure 5. [World Bank Report].

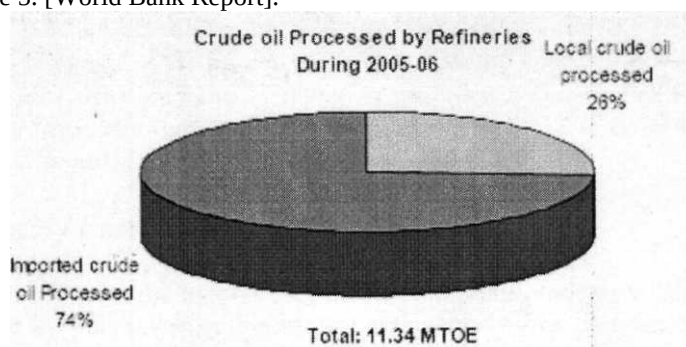


Figure 5. Crude Oil processed by refineries during 2005-06

Source: Oil Companies Advisory Committee Pakistan

Major Refineries and Their Capacity

Currently there are about five major refineries operating in Pakistan, which are listed below:

- Pak. Arab Refinery (PARCO) with refining capacity of 4.50 MTO (2005-06);
- Attock Refinery (ARL) with refining capacity of 1.80 MTO (2005-06);
- National Refinery (NRL) with refining capacity of 2.70 MTO (2005-06);
- Josicor Pakistan Limited (BPL) with refining capacity of 1.50 MTO (2005-06);
- Pakistan Refinery Limited (PRL) with refining capacity of 2.20 MTO (2005-06);
- Dhodak Refinery Limited (DRL) with refining capacity of 0.12 MTO (2005-06).

Figure 6. Capacity of major refineries
Source: Oil Companies Advisory Committee Pakistan

The refineries produce a full range of products, including lube base oils and asphalt. However, only 60 percent of their production is HSD and FO, resulting in a significant mismatch between refined product output and market profile. Pakistan exports surplus gasoline and naphtha, and is self-sufficient in other petroleum products, such as kerosene and aviation fuels [Ministry of Petroleum Pakistan].

Share of Each Refinery in refining capacity of the country

Figure 7 Share of each Refinery in current production

Source: Oil Companies Advisory Committee Pakistan

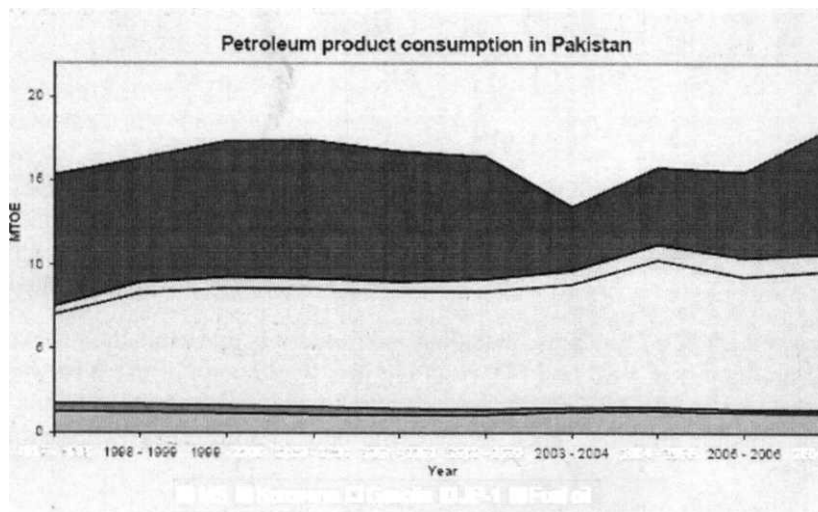


Figure 8 Product wise consumption in Pakistan

Source: Oil Companies Advisory Committee Pakistan

Summary

Import of the crude oil and oil based product put a lot of burden on the country's economy. There are currently five major oil refineries operating in the country which are not able to fulfill the demand requirements, hence the government should take some vital steps in policy matters so that it can attract more foreign investors not only in downstream sector but also in upstream sector. Indigenous resources of gas, coal and hydro should be properly utilized for power

generation. These resources should be actively promoted to reduce dependence on imported crude oil, and to reduce heavy burden on foreign exchange resources. In addition if the government takes bold and firm steps to improve hydro power generation, then it not only adds higher value to power sector, but also shows its impact on oil import budget. This will also help in supplying the power at cheaper rate for both industrial and residential sectors. Consumption of HSD in the country has grown dramatically due to lower prices and lower taxes while gasoline experiences higher taxes and higher prices. Promotion of CNG has also affected the motor gasoline market in recent years. The government should rationalize taxes and prices of transport fuels to reduce the differential between motor gasoline and diesel prices and to rationalize price of CNG and motor gasoline.

Conclusion

The research work carried out in this research paper was based on the current scenarios & facts and figures of the market situation of the country. With reference to the history and the development of the oil sector, the role of the policy-making institutions of the country governing the sector was appropriately emphasized. The role of major oil refineries was also emphasized so as to grasp the limitations and other constraints of the oil sector in the country. In the end, a strategy was proposed to the concerned authorities to ensure such positive steps, which would be beneficial for the foreign reserves of the country, by seeking alternating fuel resources and minimizing the need on the crude oil.

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