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Pakistan's Economy

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Oil Prices & Inflation

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X-Factor

Slogan : Factor To Illustrate The Truth

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DEDICATION

*We dedicate is assignment to
my beloved parents and my
respectable teacher*

Sir Karim Bux Shah

*Without there patience,
understanding and support the
completion of this work would
not have been possible.*



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INTRODUCTION

Pakistan is an oil based economy, the domestic production of oil is low. Pakistan fulfills its energy demands by importing oil, due to uncertain oil prices and unstable currency, economy is facing various challenges like : inflation, balance of payment deficit, trade deficit and much more...

The problems of Pakistan's economy are discussed in this project and there is also an statistical analysis of oil prices to measure the uncertainty.

In this project we have also proposed some planes to cut down oil imports and also to fulfill future energy demands.

OIL PRICES AND INFLATION

Crude Oil :

Crude oil is a naturally-occurring substance found in certain rock formations in the earth. It is a dark, sticky liquid which, scientifically speaking, is classified as a hydrocarbon. This means, it is a compound containing carbon and hydrogen, with or without non-metallic elements such as oxygen and sulfur. Crude oil is highly flammable and can be burned to create energy. Along with its sister hydrocarbon, natural gas, derivatives from crude oil make an excellent fuel.

After crude oil is removed from the ground, it is sent to a refinery by pipeline, ship, or barge. At a refinery, different parts of the crude oil are separated into useable petroleum products. Crude oil is measured in barrels (abbreviated "bbls").

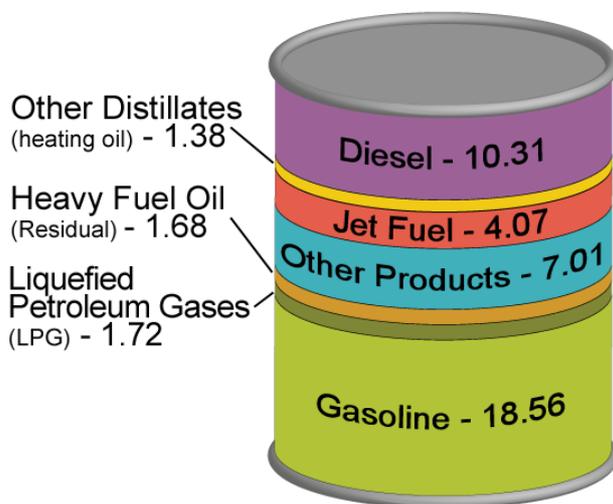
A 42-U.S. gallon barrel of crude oil provides slightly more than 44 gallons of petroleum products. This gain from processing the crude oil is similar to what happens to popcorn, which gets bigger after it's popped. The gain from processing is more than 5%.

One barrel of crude oil, when refined, produces about 19 gallons of finished motor gasoline, and 10 gallons of diesel, as well as other petroleum products. Most petroleum products are used to produce energy.[R-1]

Note : References (e.g. [R-1]) are available on the last page of the project file.

Other products made from petroleum include:

Products Made from a Barrel of Crude Oil (Gallons)



- * Ink
- * Crayons
- * Bubble gum
- * Dishwashing liquids
- * Deodorant
- * Eyeglasses
- * CDs and DVDs
- * Tires
- * Ammonia
- * Heart valves, etc..

Oil Prices :

Crude oil prices have a powerful influence on the global economy. Fluctuations in the prices of crude oil can send tremors through global stock markets and influence the fortunes of crude oil investors. Crude oil price hikes have an adverse effect not only on the business and industrial sectors, but also on common people. It causes inflation, a rise in crime rates, unemployment, and economic imbalance. [R-2]

Benchmark Pricing :

Crude oil is priced on the basis of several factors such as the grade of the oil, its specific gravity, the place where it is produced, the amount of sulfur in it, and so on. The mechanism used to price crude oil is called benchmark pricing. This means that the price of crude oil is actually the price of certain varieties of crude oil commonly considered as benchmarks. The most prominent benchmarks are Brent, OPEC (Organization of Petroleum Exporting Countries) Basket Price, Tapis (Malaysian), West Texas Intermediate (WTI), Dubai Crude, and Minas (Indonesian). Benchmark prices are also known as price markers.

Brent and WTI :

These are important benchmark crude oils in the United States. Around two-thirds of the crude oil supplies of the world are priced on the basis of Brent.

OPEC Basket Price :

OPEC uses its basket price to monitor the situation of the global oil market. OPEC basket is the average of all the prices of the crude oil produced in the countries that form part of the OPEC. Currently, these crude oils are Saharan Blend produced in Algeria, Girassol produced in Angola, Oriente produced in Ecuador, Iran Heavy produced in Islamic Republic of Iran, Basra Light produced in Iraq, Kuwait Export from Kuwait, Es Sider from Libya, Bonny Light from Nigeria, Qatar Marine from Qatar, Arab Light from Saudi Arabia, Murban from UAE, and Merey from Venezuela.

Who Sets Oil Prices ?

Contrary to popular belief, the companies or the countries that produce benchmark crude oils do not set crude oil or base oil prices. The agents responsible for crude oil pricing are 3 prominent international petroleum exchanges. Usually, the prices quoted for transactions on these exchanges form the basis for the prices that people throughout the United States and other countries pay for various commodities, including crude oil. [R-3]

These 3 petroleum exchanges, along with their website addresses, are:

- New York Mercantile Exchange® (NYMEX): <http://www.nymex.com>.
- The International Petroleum Exchange in London (IPE).
- Singapore International Monetary Exchange® (SIMEX): <http://www.simex.com.sg>.

Factors Responsible for Crude Oil Prices :

A number of factors are responsible for fluctuations in crude oil prices. For example, crude oil pricing depends on high global oil demand, limited oil production, and political instability in major oil-producing countries. Other factors include tax policies, political issues, technological developments, crude oil storage, and many more. [R-4]

Rising Demand for Oil :

Owing to global economic growth, there is a rising demand for crude oil, although the supply level has remained the same in the past decade. Moreover, there are few refineries to refine crude oil. Therefore, the difference between the prices of crude oil and the refined products is quite huge.

OPEC :

Since the OPEC produces the major portion of the crude oil on this planet, major OPEC decisions with regard to crude oil pricing or production have a huge impact on global crude oil prices.

Nature :

Unforeseen natural calamities can cause major upheavals in the price of crude oil. For instance, if a hurricane hits the major oil-producing countries, one could expect a steep hike in crude oil prices.

Inventories :

Oil producers and consumers construct huge crude oil storage tanks for immediate or future use. These inventories are created in order to either meet future sales opportunities or future demands for crude oil. When there are changes in the levels of these inventories, crude oil prices fluctuate. This, in turn, has an impact on the stock market.

Summer :

During warm summer months, crude oil prices drop because the supply exceeds demand. People do not need energy for heating purposes in summer.

Winter :

During winter, people require a lot of energy for heating. This rise in demand forces nations to dip into their inventories. Since the demand exceeds the supply, crude oil prices rise.

Impact of oil prices :

In economics, inflation is a rise in the general level of prices of goods and services in an economy over a period of time. When the price level rises, each unit of currency buys fewer goods and services; consequently, inflation is also an erosion in the purchasing power of money, a loss of real value in the internal medium of exchange and unit of account in the economy. A chief measure of price inflation is the inflation rate, the annualized percentage change in a general price index (normally the Consumer Price Index) over time.

Inflation can have positive and negative effects on an economy. Negative effects of inflation include loss in stability in the real value of money and other monetary items over time; uncertainty about future inflation may discourage investment and saving, and high inflation may lead to shortages of goods if consumers begin hoarding out of concern that prices will increase in the future. Positive effects include a mitigation of economic recessions, and debt relief by reducing the real level of debt. [R-5]

Relationship between Oil prices and Inflation :

The price of oil and inflation are often seen as being connected in a cause and effect relationship. As oil prices move up or down, inflation follows in the same direction. The reason why this happens is that oil is a major input in the economy - it is used in critical activities such as fueling transportation and heating homes - and if input costs rise, so should the cost of end products. For example, if the price of oil rises, then it will cost more to make plastic, and a plastics company will then pass on some or all of this cost to the consumer, which raises prices and thus inflation. [R-6]

Impacts of High Oil Prices :

Demand for crude oil arises from demand for the products that are made from it, especially gasoline, diesel fuel, heating oil, and jet fuel; and changes in crude oil prices are passed on to consumers in the prices of the final petroleum products. Increases in crude oil prices affect the economy in five ways:

1. When the prices of petroleum products increase, consumers use more of their income to pay for oil-derived products, and their spending on other goods and services declines. The extra amounts spent on those products go to foreign and domestic oil producers and, if wholesale margins increase, to refiners. Domestic producers may pay higher dividends and/or spend more on oil

discovery, production, and distribution. Foreign producers may spend some or all of their extra revenues on goods and services, but the types of goods and services they buy will be different from those that domestic consumers would buy. How quickly and how much domestic and foreign oil producers spend on goods and services and financial and real assets will be critical in determining the effects of higher oil prices on the aggregate economy.

2. Oil is also a vital input for the production of a wide range of goods and services, because it is used for transportation in businesses of all types. Higher oil prices thus increase the cost of inputs; and if the cost increases cannot be passed on to consumers, economic inputs such as labor and capital stock may be reallocated. Higher oil prices can cause worker layoffs and the idling of plants, reducing economic output in the short term.
3. The economies which are net importer of oil, higher oil prices affect the purchasing power of national income through their impact on the international terms of trade. The increased price of imported oil forces businesses to devote more of their production to exports, as opposed to satisfying domestic demand for goods and services, even if there is no change in the quantity of foreign oil consumed.
4. Changes in oil prices can also cause economic losses when macroeconomic frictions prevent rapid changes in nominal prices for final goods (due to the costs of changing “menu” prices) or for key inputs, such as wages. Because there is resistance on the part of workers to real declines in wages, oil price increases typically lead to upward pressure on nominal wage levels. Moreover, nominal price “stickiness” is asymmetric, in that firms, unions, and other organizations are much more reluctant to lower nominal prices and the wages they receive than they are to raise them. When a nominal increase in oil prices threatens purchasing power, the adjustment process is slowed, with multiplier effects throughout the economy.
5. Finally, higher oil prices cause, to varying degrees, increases in other energy prices. Depending on the ability to substitute other energy sources for petroleum, the price increases can be large and can cause macroeconomic effects similar to the effects of oil price increases. [R-7]

Pakistan's Economy :

Pakistan is amongst the major developing economies of the world. With a population of over 150 million, it is also one of the most populous countries in the world. Pakistan is a major trading partner to all developed nations of the world, including the U.S., U.K., France, Germany, U.A.E., and Saudi Arabia. Political uncertainty, social issues, and corrupt governance have delayed steady economic growth in the 61 years of Pakistan's existence. This has not necessarily been the case for the past 7 years- as the following indicators suggest- a prosperous economic future was in sight, but the current global dilemma of increasing oil prices has turned the tables quickly.

The economy of Pakistan has experienced some unprecedented levels of economic growth in the past 6 years. The growth has remained above 6% per annum Year over Year (YoY) since 2003 to 2007. The foreign workers' remittances have grown at an exponential rate, showing signs of confidence in the economy, by Pakistani expatriates. Inward foreign investment both Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI) have grown substantially. The foreign exchange reserves have steadily grown from \$2 Billion in 2001, to over \$14.5 billion in 2007. Pakistan's largest stock exchange index, Karachi Stock Exchange-100 Index (KSE-100) has steadily grown from 890 points in 1998, to over 15,000 points (Jan-2008). Inflation has stood steady at approximately 9% per annum from 2000-2007. All of these factors combined have fueled the largest ever economic expansion in Pakistan's history.

The picture is not as perfect as it seems, because all these numbers show the growth rate till the end of 2007. This year the scenario is much different. The economic growth rate has slid into negative territory in real terms. Inflation has risen to double digits, and the trade deficit has steadily risen to the highest level in Pakistan's history. High oil prices have led the government to reset the subsidies on oil that the previous administration had levied. This has led to an increase in the retail prices of petroleum products by over 49% since Jan/2008. The increased prices have translated into higher prices in the broad economy. The Average (YoY) CPI has jumped up to 17%. The largest increase within the CPI was the increase in prices of food and energy, which have risen by 34.91% and 24.51% respectively. The rupee has depreciated versus the US Dollar by more than 14% since Jan-2008, leading to a capital flight, as more and more investors pull money out of the Pakistani economy, fearing further deterioration of the financial stability. The KSE-100 index has slid from a high of over 15,000 points, to a low of 10,000 points (Jun-2008).

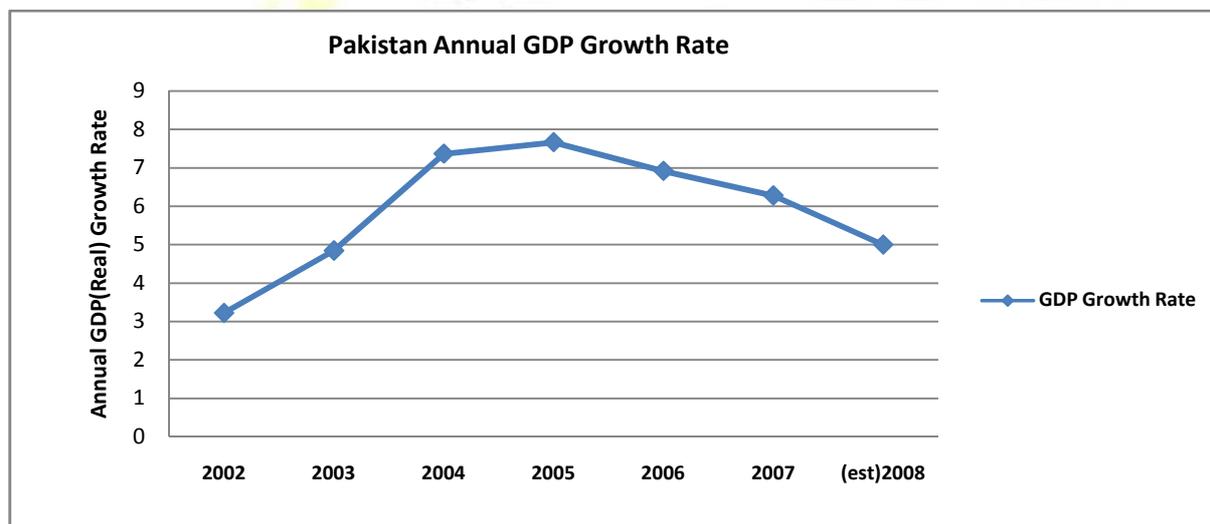
What consequences do rising prices of oil fueling economic instability have on the economic future of Pakistan? First, this rise in oil prices is leading to huge increase in the PPI, and CPI, leading to higher levels of inflation. Second the rising trade deficit is growing and adding to an already hefty import bill which is being financed by national exchequer. The current trade deficit is greater than 12% of total GDP. [R-8]

High Oil Prices and Economic Growth :

A) Macroeconomic Issues :

The energy sector of Pakistan is comprised of a unique mix of resources. In my review of the literature for this research, I came across these facts regarding the energy sector in Pakistan and its sensitivity to the rising prices of crude oil. According to Malik (2008), the growth in demand for petroleum products in Pakistan has been growing at a negative rate. The current volume of imported oil has been steadily increasing at a negative rate, but the dramatic increase in the price of oil has led the value of those imports to rise exponentially. The study further shows that as the rise in the price of oil started in early 2003, Pakistan's economy steadily grew at a rate of over 6%. This negates the conventional direction of the economic growth when price of oil rises. An upward trend in the price of oil usually squeezes income, and demand, leading to less consumption, and lower corporate earnings, leading to lower economic growth. The scenario of rising oil prices, and economic growth were fueled by the monetary expansion that took place in most nations across the world between 2002 and 2006.

The following illustration shows the negative impact when the monetary expansion measures had cooled down (2006-present), squeezing the amount of money in circulation; the GDP growth rate slid. Beginning in 2005, the economic growth rate has grown at a decreasing rate, citing the effects of the rise in prices of imported oil as a primary cause.



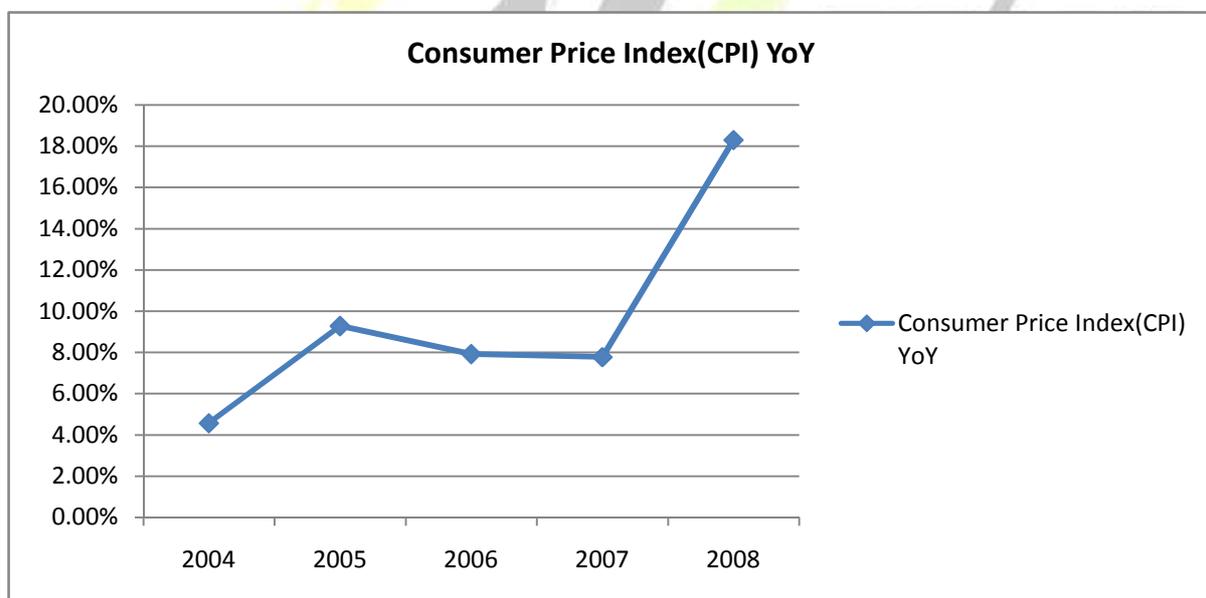
Source: Federal Bureau of Statistics, Pakistan www.statpak.gov.pk

Rising prices of imported oil have increased the amount of foreign exchange reserves required to finance the purchase of the oil. As the price goes up, the foreign exchange reserves go down, and the value of debits rise on the current account of the nation's trade balance, leading to a trade deficit. A very large trade deficit can cause the value

of the domestic currency to drop as a measure to increase the competitiveness of local exporters to offset the growing trade deficit. Depreciation in the local currency has its own negative effects, as it results in lower returns, and net capital outflows, as investing in a country where the currency is falling in value leads to higher foreign exchange risks. Lower capital means lower investment spending, thus weakening the local economy further. [R-8]

B) Monetary Policy for an Inflationary environment :

In a study by Khan and Schimmelpfennig (2005), the correlation between an expansionary monetary policy and rising inflation are very strong. Meaning if the government tries to expand the money supply it will surely meet inflation as a primary consequence. The significance of this study for our purposes is that in the period preceding the current oil price crisis, we had the largest credit expansion all over the globe. The economy of Pakistan experienced an average of a 22% increase in broad money and 30% increase in credit growth between 2004 and 2006. Although expansionary monetary policy does aid inflation, the effects of a growing money supply between 2004- 2006 have been minimal in raising inflationary pressures in Pakistan. As the following illustration suggests, expansionary monetary policy had been implanted as early as 2002, but CPI did not start rising till as late as early 2008. This picture looks very similar to the illustration depicting the rise in the price of oil. Beginning 2007, the rise in the price of oil resulted in higher inflation rates in Pakistan. [R-8]



Source: Federal Bureau of Statistics, Pakistan www.statpak.gov.pk

The Dynamics of the Current Economic problems of Pakistan :

Looking at the table below, the industrial sector and the transportation sector are the two largest components of total energy consumption in Pakistan. A rise in the Price

of Oil, by 100%, led to an increase in demand for oil by 19% over the period between 2003 and 2007. This denotes a low price elasticity – the percent change in quantity demanded/consumed, divided by the percent change in price- meaning the demand for oil in Pakistan is relatively inelastic to changes in Price.

Price Elasticity = 19%/100%= .19 ; Relatively inelastic.

Change in Oil Consumption with Change in Price

	2003-2004	2006-2007	Change	Percent Change
Oil Consumption(TOE)	15,221,024	18,120,837	+2,899,813	+19%
Price of Oil (\$) (annual average)	\$32.00	\$64.00	+\$32.00	+100%

Source: Hydrocarbon Development Institute of Pakistan.

Total Energy Consumption by Sector (metric Tonne)

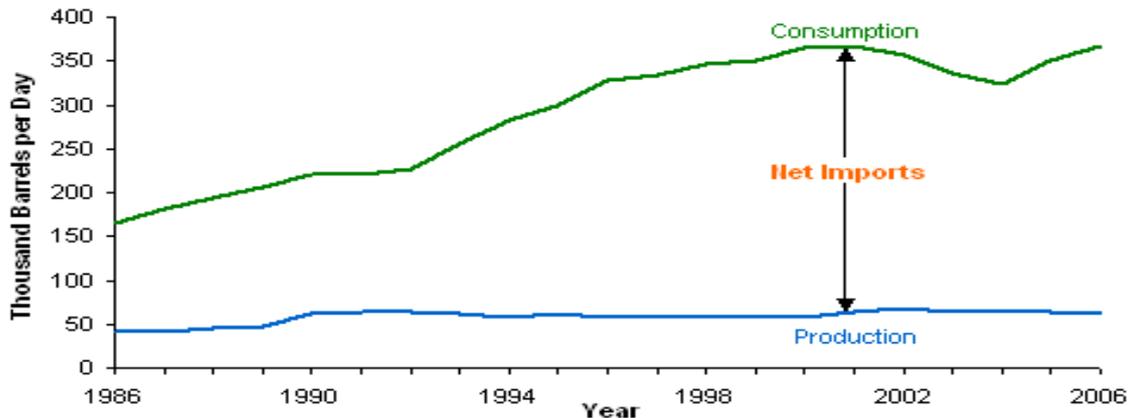
Total Energy Consumption by Sector (metric Tonne)	2003-2004	2006-2007	Change	Percent Change
Domestic	6,278,918	7,605,145	+1326227	+21.1%
Commercial	851,857	1,377,247	+525390	+61.7%
Industrial	11,098,642	15,792,049	+4693407	+42.3%
Agriculture	734,202	767,266	+33064	+4.5%
Transportation	8,771,365	9,721,183	+949818	+10.8%
Total	27,734,984	35,262,891	+7527907	+27.1%

Source: Hydrocarbon Development Institute of Pakistan www.hdip.gov.pk

The low price elasticity tells us that as prices rise there is limited or no effect on demand, thereby increasing the Dollar amount of quantity consumed. This means the total effect on the nations import bill consists of the 100% increase in price of oil, in addition to the 19% increase in oil consumed.

Looking at the picture below, the domestic production of oil is very limited in Pakistan, and more than 85% of oil is imported today. This picture shows changes in amount of oil consumed, but the issue here is the price of oil, although the barrels of oil consumed each day have increased at a marginal rate between 2002- and 2006, the price has gone up by more than 100% as shown earlier. The numbers today are even higher (est. 2008). The difference between the consumption and the domestic production of oil is adding to the import bill of Pakistan leading to a growing trade deficit.

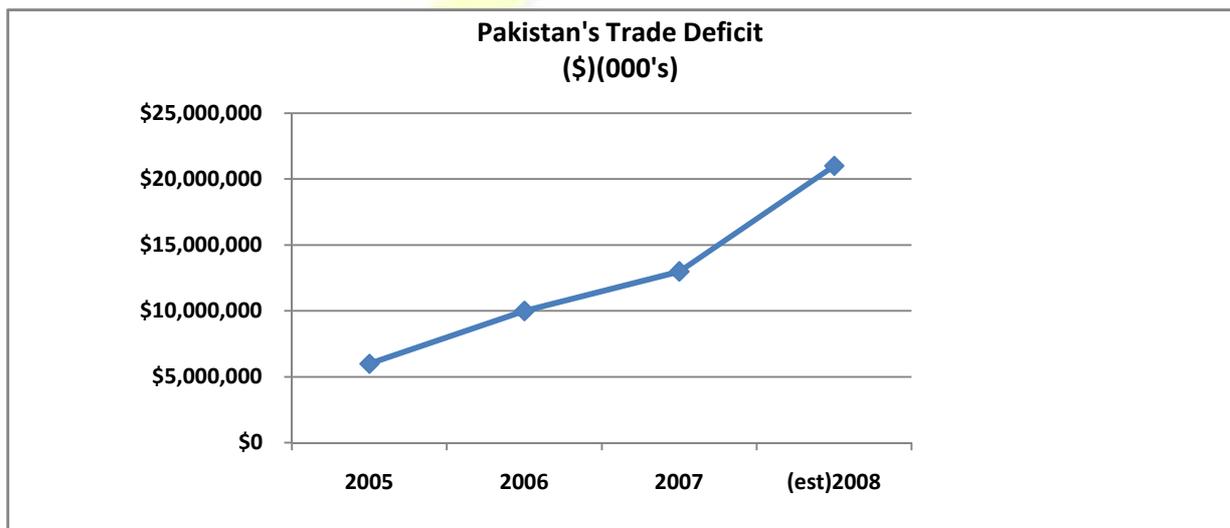
Pakistan's Oil Production and Consumption, 1986-2006*



Source: EIA, *International Energy Annual 2004*;
Short Term Energy Outlook November 2006

*2006 is forecast

The Balance of Payments of Pakistan has shown a growing trade deficit for the past 6 years. Looking at the picture below the trade deficit stood at approximately \$5 Billion in 2005, and has grown to over 20 Billion as of 2008. This rise is further deteriorating the macroeconomic fundamentals of the nation. [R-8]



Source: Federal Bureau of Statistics, Pakistan www.statpak.gov.pk

Oil Prices and Inflation & Oil prices and Trade Deficit-Introduction to the Macroeconomic Model :

Finally, economic model that explains the effects of rising oil prices on the economy of Pakistan is as follows, as the price of oil goes up, the value of imports rise, causing a negative impact on the trade deficit. The other more significant effect of rising oil prices is increased inflation due to the rise in costs of imported oil, leading to the rise on production, transportation, and all other energy costs faced by producers, and consumers. Higher Consumer Inflation leads to lower discretionary income left with consumers to buy

other goods and services which decreases total consumption in an economy leading to slower economic growth. When inflation gets out of control central banks usually tighten the money supply which can contract the economy even further.

The main issue is the effect of rising prices on the national economy and the changes it brings within the economic model. Rising prices of oil are causing increased unanticipated inflation, and lower economic growth hence impacting the economy negatively. This can be shown through a simple macroeconomic model of:

$$\text{GDP} = Y = C + I + G + (x-m), \text{ where}$$

C= consumption,

I= investment spending,

G= Government Spending,

x= exports, and

m = imports.

As price of oil goes up, inflation kicks in as price of every item in the basket of goods rises (virtually all items need some form of transportation or storage exposing them to the costs of energy). The increased prices lead to lower discretionary incomes leading to less C (consumption), decreasing the total amount of Y(GDP).

The other effect of rising oil prices is that as oil prices go up, an economy importing majority of its oil, will see a rapid increase in the value of m(imports), leading to an increased trade deficit, hence lowering the trade balance, or creating a trade deficit which will result in lower Y (GDP). Both these cases will be further developed in section 4, using actual statistics.

Real Negative Affect of Rising Oil Prices on Pakistan :

So the rising price of oil has had 2 major affects on the economy of Pakistan.

Effect 1: Increased value of imports (m), have led to decreased GDP growth rate.

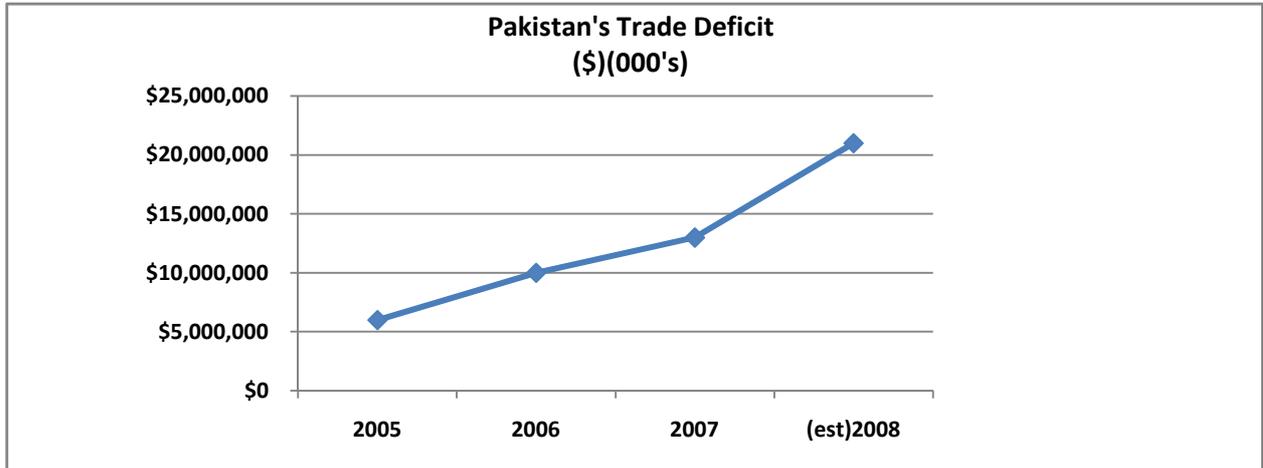
Increased prices of imported oil have also brought Inflation which has decreased buying power of money, and increased the energy costs of consumers and producers resulting in lower discretionary spending.

Effect 2: Lower discretionary spending has contributed to the declining rate of consumption growth (C) lowering GDP growth rate further

Illustration of Effect 1 & Effect 2

Effect 1 :

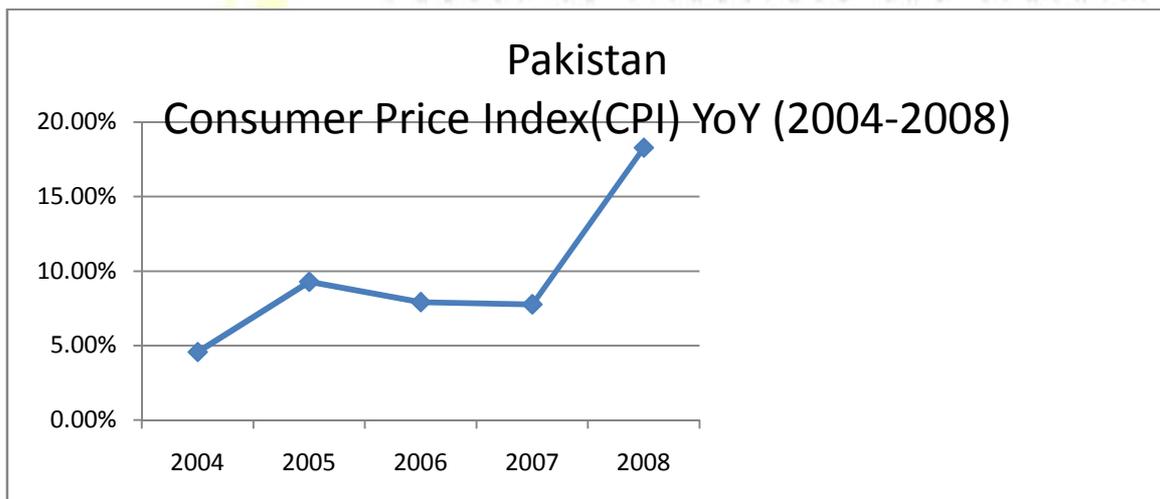
Increased Imports have led to a decreased trade balance or an increased trade deficit as follows.



Source: Federal Bureau of Statistics, Pakistan www.statpak.gov.pk

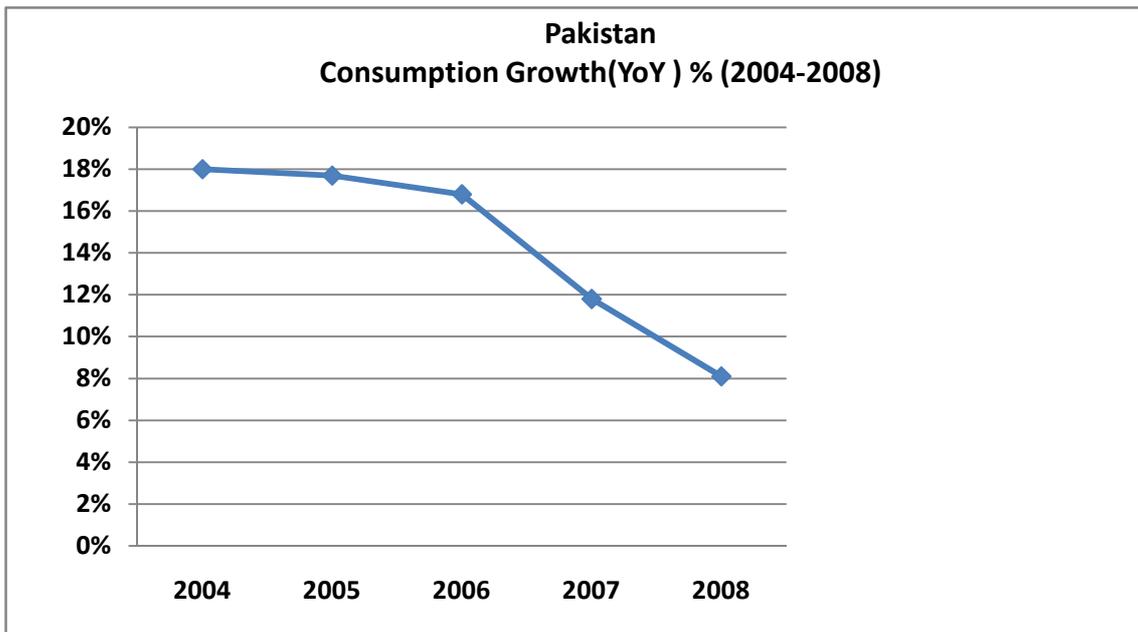
Effect 2

Increased imported energy prices have led to increased prices at home leading to increased inflation. Increased inflation has decreased the discretionary income of households, leading to decreased discretionary spending. Decreased discretionary spending has resulted in slower consumption growth. [R-8]



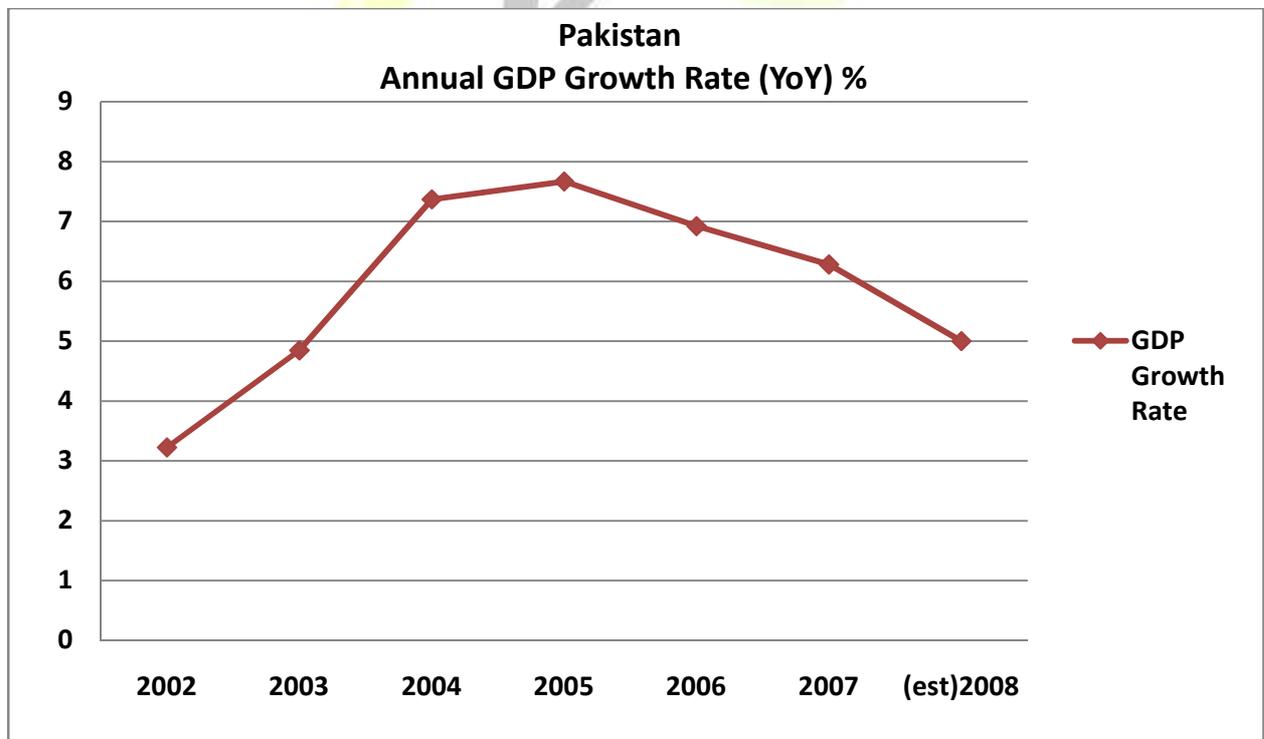
Source: Federal Bureau of Statistics, Pakistan www.statpak.gov.pk

Higher Inflation = Lower Consumption Growth as follows :



Source: Federal Bureau of Statistics, Pakistan www.statpak.gov.pk

Lower Consumption growth, and higher trade balance result in decreasing economic growth depicted as follows :



Source: Federal Bureau of Statistics, Pakistan www.statpak.gov.pk

Unstable Pakistani Currency :

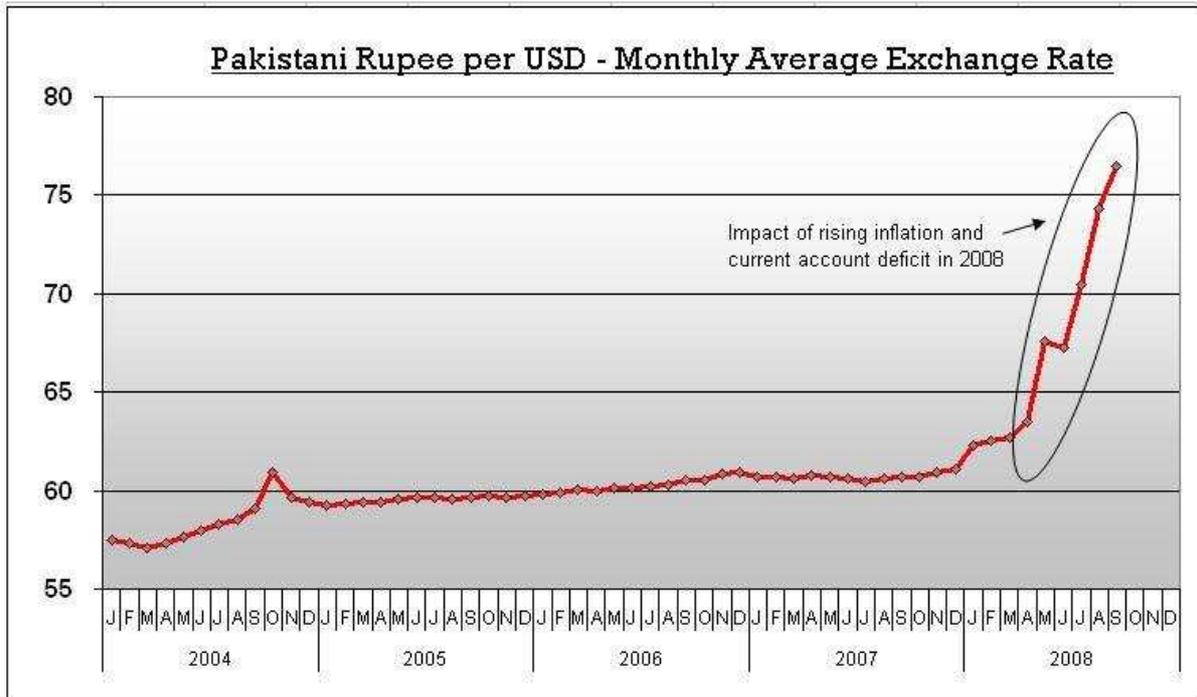
The rupee (sign: Rs; code: PKR) is the currency of Pakistan. The issuance of the currency is controlled by the State Bank of Pakistan, the central bank of the country. The most commonly used symbol for the rupee is Rs. [R-9]

The Rupee was pegged to the US Dollar until 1982, when the government of General Zia-ul-Haq changed it to managed float. This has been regarded as the best decision by Zia. As a result, the rupee devalued by 38.5% between 1982/83 and 1987/88 and the anti-export bias in the economy was reduced. The Pakistani rupee depreciated against the US dollar until the turn of the century, when Pakistan's large current-account surplus pushed the value of the rupee up versus the dollar. Pakistan's central bank then stabilized by lowering interest rates and buying dollars, in order to preserve the country's export competitiveness. The year 2008 has been termed as disastrous year for the rupee as so far (up to August 2008) it has lost 23% of its value since December, 2007 to a record low of 79.2 against US Dollar. The currency of Pakistan is unstable, with the passage of time Pakistani currency is losing its worth[R-9], as illustrated below :

Pakistan's Rupee per US dollar 1995-2008

Year	Highest ↑		Lowest ↓	
	Date	Rate (PKR)	Date	Rate (PKR)
1995		30.930		
1996				35.266
1997		40.185		
1998		44.550		
1999		51.90		
2000		53.6482		
2001		61.9272		
2002		59.7238		
2003		57.752		
2004		58.000		
2007	5-Aug	60.75	1-Nov	60.50
2008	10-Oct	80.00	1-Apr	63.50

Source: http://en.wikipedia.org/wiki/Economy_of_Pakistan



As the Pakistani currency loses its value, it means we have to pay more and more money for imports as compared to previous time. Pakistan imports more than 80% of oil to fulfill its energy demands, if the currency's value decreases we have to pay more money for our oil imports, in a result our foreign exchange reserves decrease and the economy faces high inflation. By considering the reality of an unstable currency it is very risky to rely on oil imports so the government must take some fruitful steps to break the vicious circle of oil imports and inflation. [R-9]

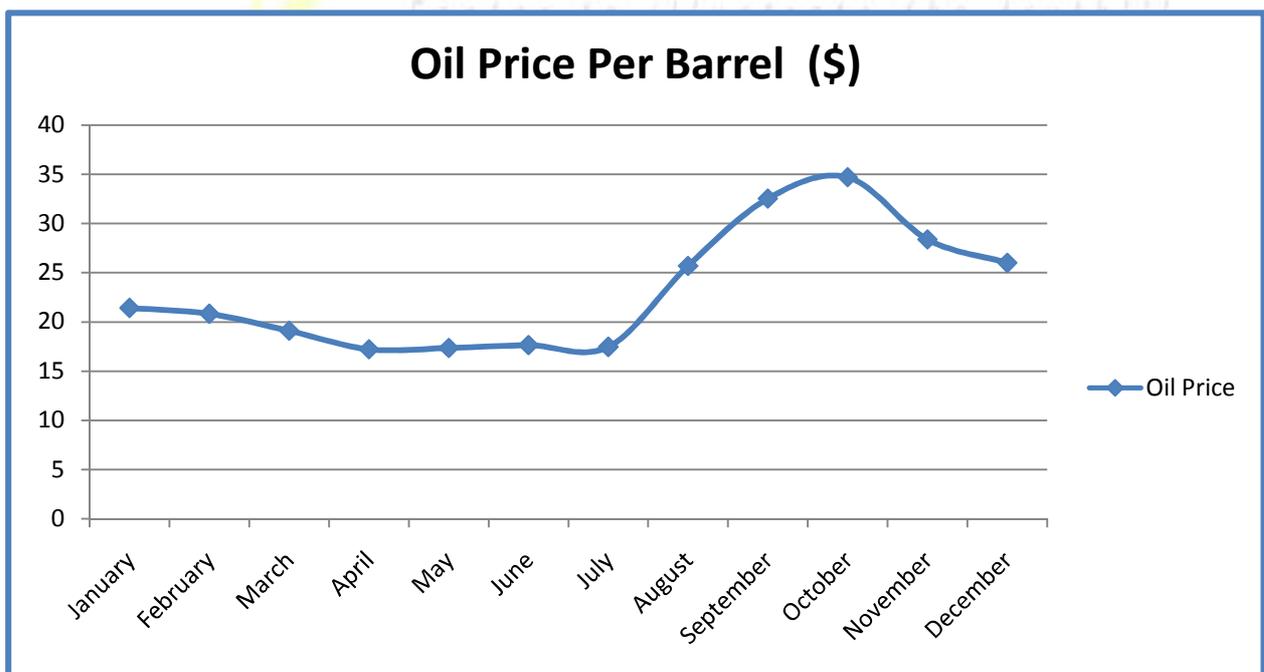
X-Factor
Factor to illustrate the truth!!!

Oil Prices track record & behavior :

Following is the 19 years record of oil prices (per barrel) in international market[R-10]:

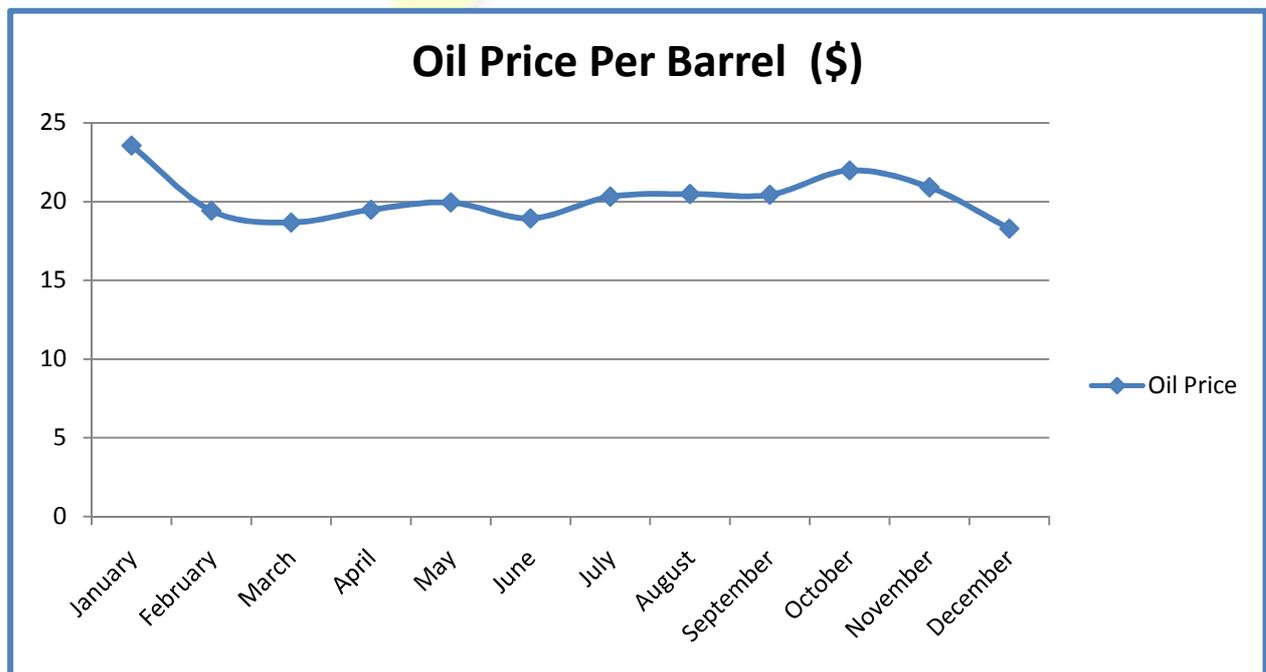
CRUDE OIL PRICES

Year - 1990			
January	\$21.42	July	\$17.74
February	\$20.83	August	\$25.69
March	\$19.10	September	\$32.52
April	\$17.23	October	\$34.69
May	\$17.36	November	\$28.38
June	\$17.64	December	\$26.00
Yearly Average			\$23.19



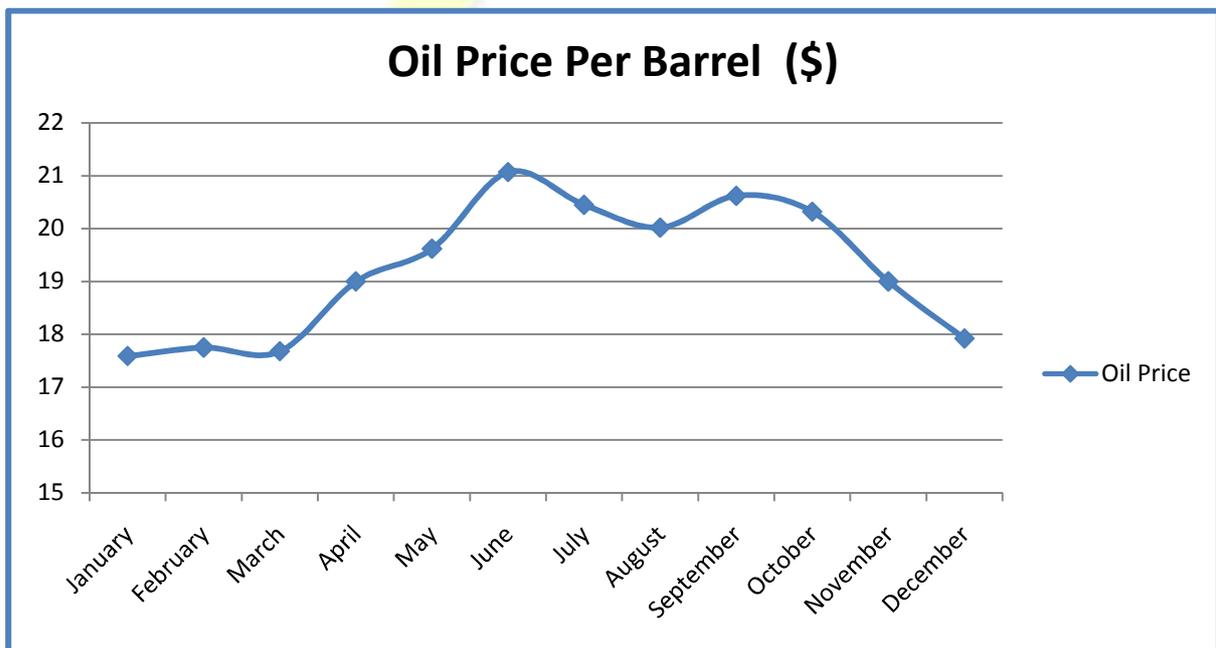
Standard deviation : 6.15

Year - 1991			
January	\$23.56	July	\$20.31
February	\$19.42	August	\$20.48
March	\$18.67	September	\$20.43
April	\$19.48	October	\$21.98
May	\$19.94	November	\$20.91
June	\$18.93	December	\$18.28
		Yearly Average	\$20.19



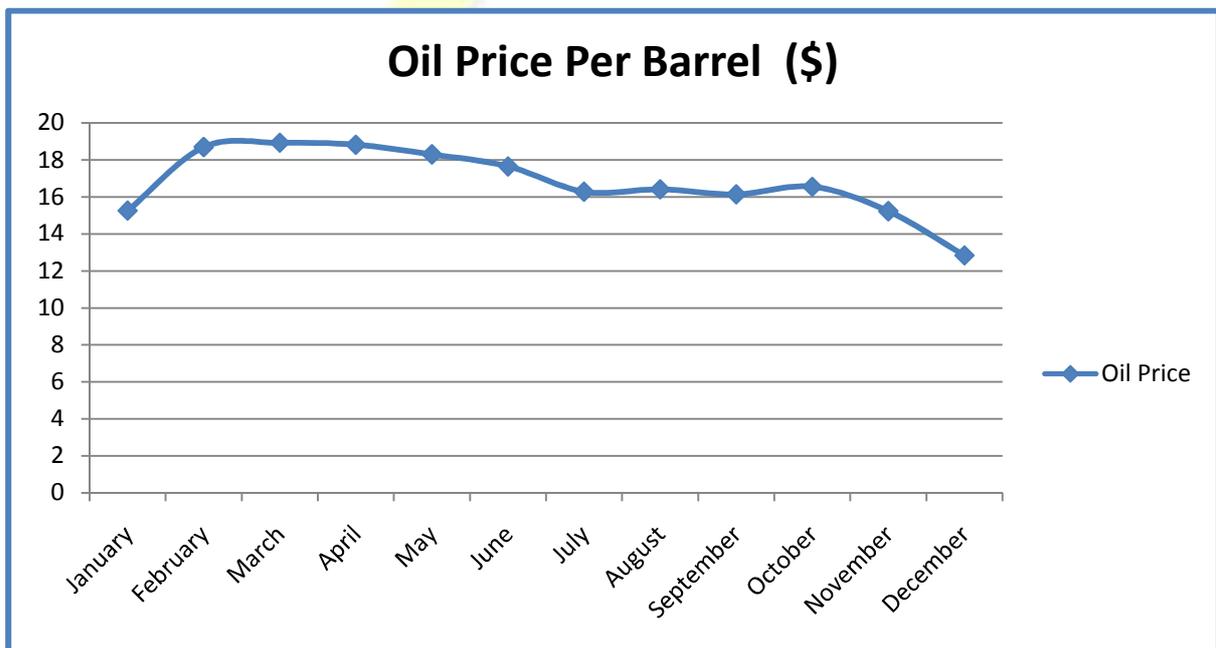
Standard deviation : 1.47

Year - 1992			
January	\$17.59	July	\$20.45
February	\$17.75	August	\$20.02
March	\$17.68	September	\$20.62
April	\$19.00	October	\$20.32
May	\$19.62	November	\$19.00
June	\$21.07	December	\$17.92
		Yearly Average	\$19.25



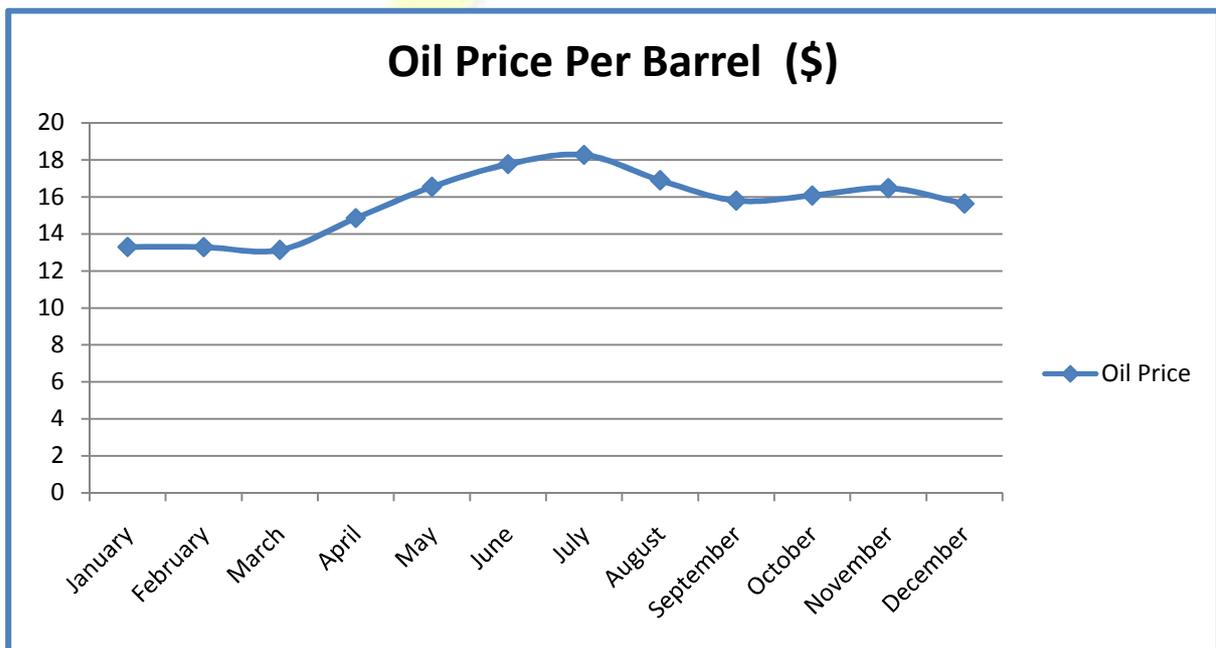
Standard deviation : 1.27

Year - 1993			
January	\$15.25	July	\$16.27
February	\$18.69	August	\$16.40
March	\$18.92	September	\$16.13
April	\$18.81	October	\$16.54
May	\$18.29	November	\$15.22
June	\$17.64	December	\$12.83
		Yearly Average	\$16.74



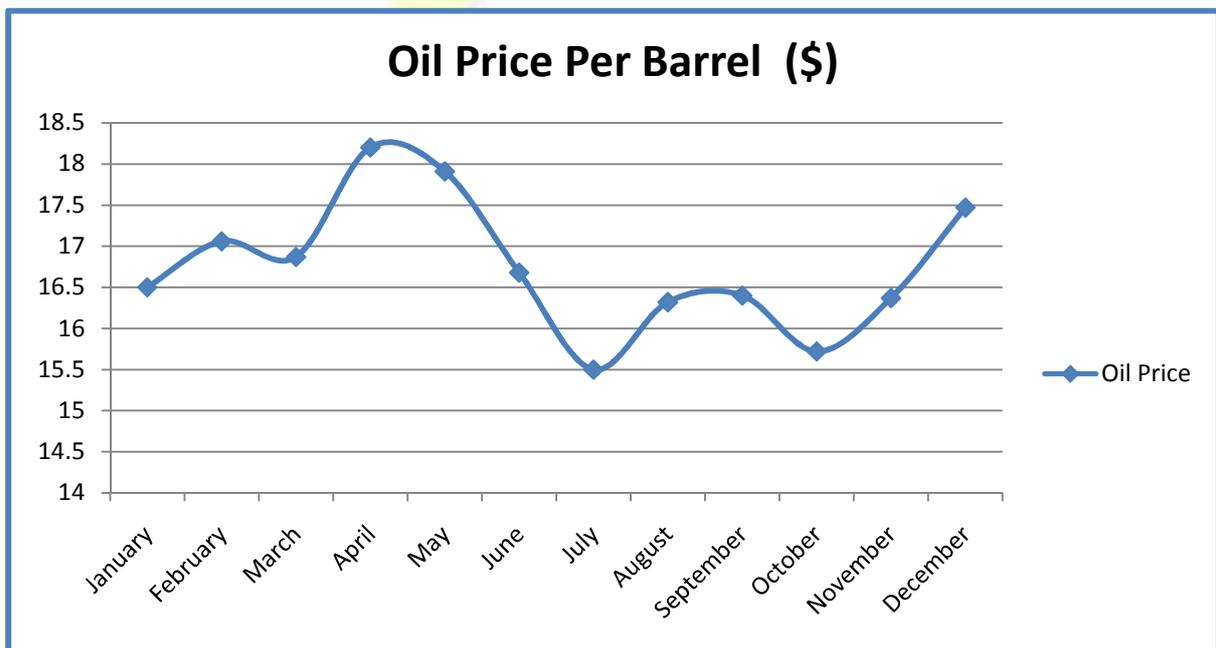
Standard deviation : 1.82

Year - 1994			
January	\$13.29	July	\$18.26
February	\$13.28	August	\$16.89
March	\$13.13	September	\$15.79
April	\$14.85	October	\$16.07
May	\$16.54	November	\$16.47
June	\$17.76	December	\$15.63
		Yearly Average	\$15.66



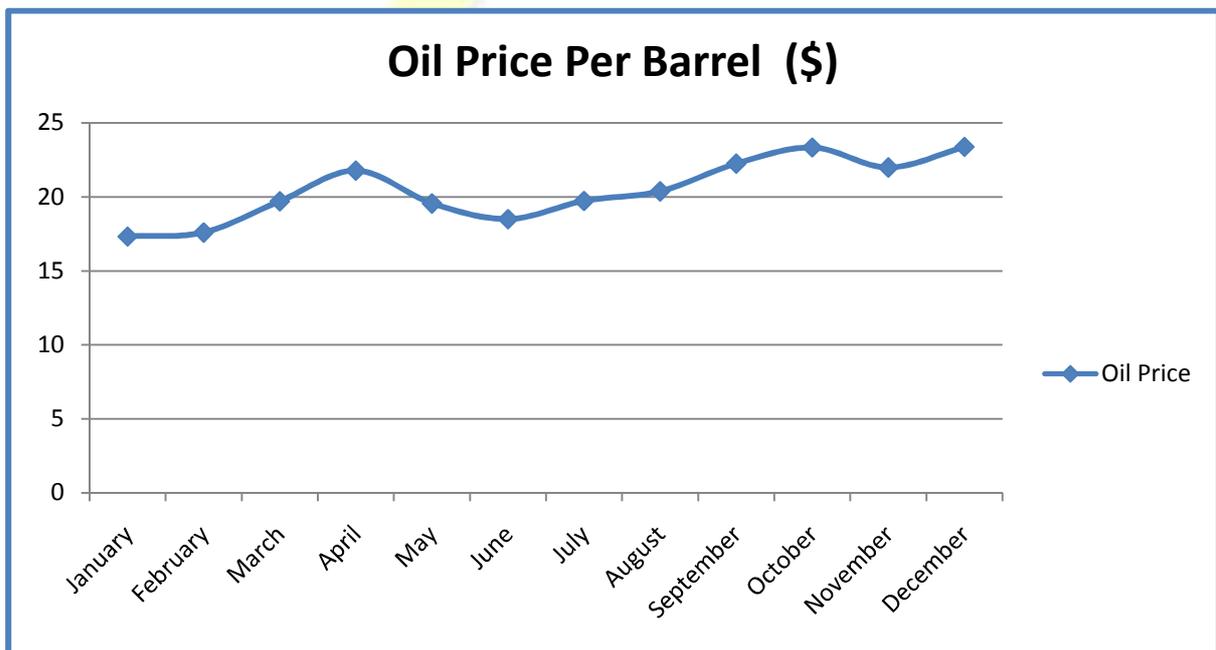
Standard deviation : 1.72

Year - 1995			
January	\$16.50	July	\$15.50
February	\$17.06	August	\$16.32
March	\$16.87	September	\$16.40
April	\$18.20	October	\$15.72
May	\$17.91	November	\$16.37
June	\$16.68	December	\$17.47
		Yearly Average	\$16.75



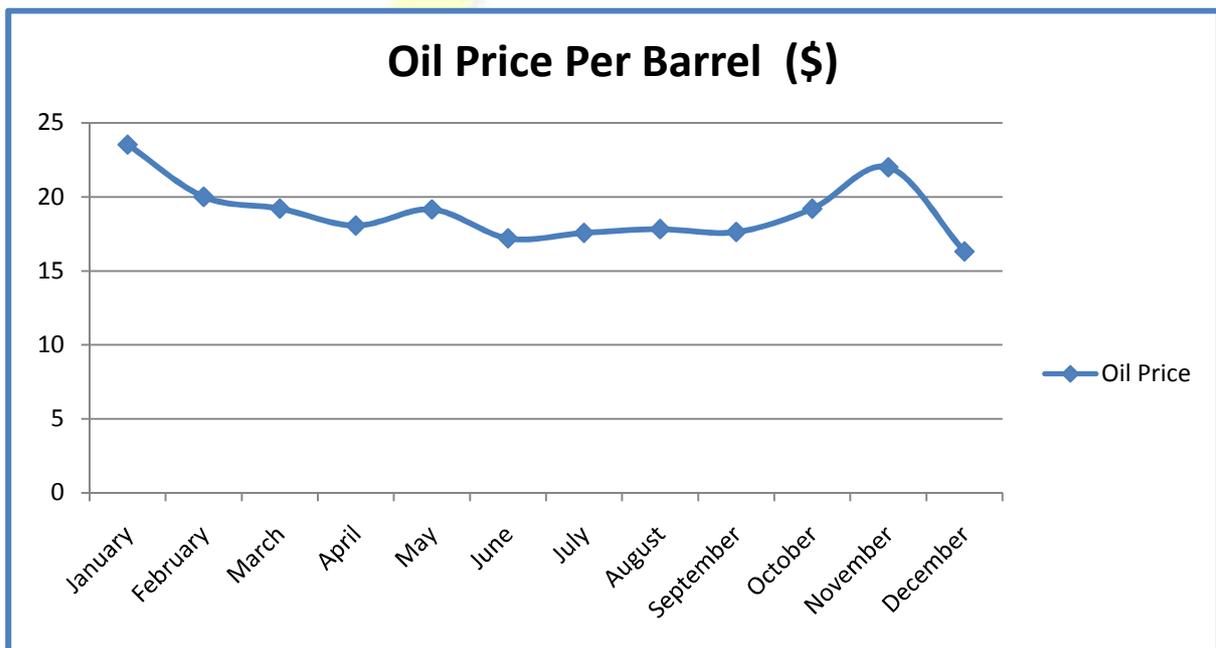
Standard deviation : 0.81

Year - 1996			
January	\$17.33	July	\$19.73
February	\$17.60	August	\$20.38
March	\$19.71	September	\$22.25
April	\$21.78	October	\$23.34
May	\$19.56	November	\$21.99
June	\$18.50	December	\$23.38
		Yearly Average	\$20.46



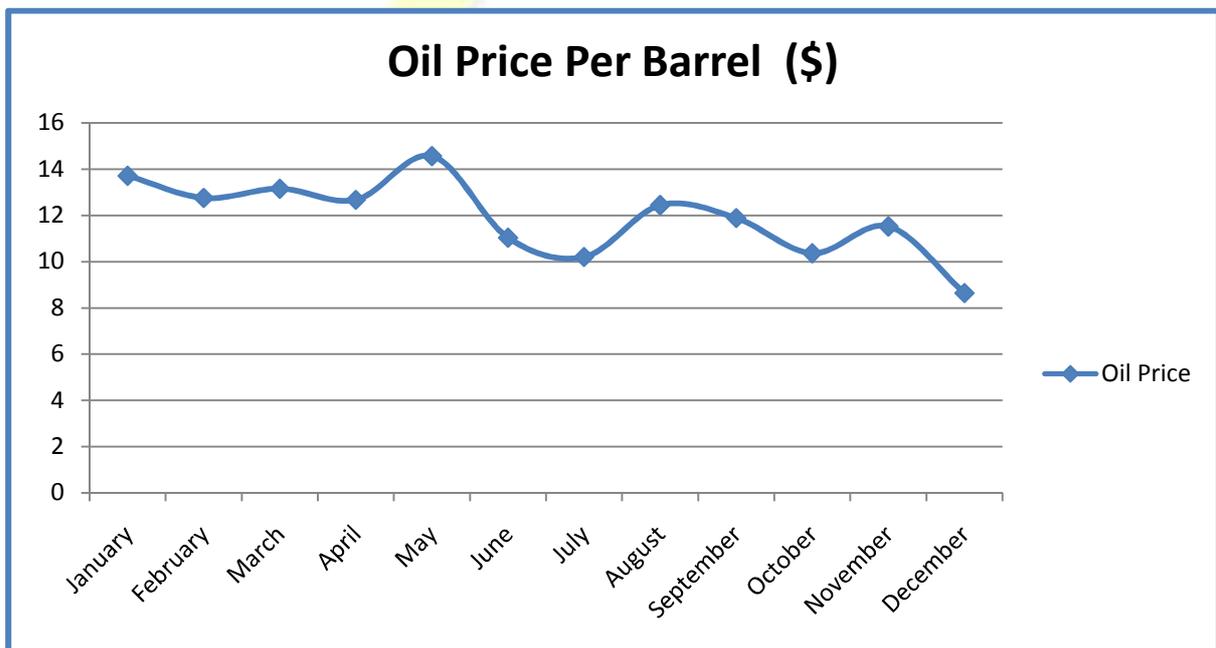
Standard deviation : 2.08

Year - 1997			
January	\$23.52	July	\$17.57
February	\$20.00	August	\$17.82
March	\$19.21	September	\$17.63
April	\$18.06	October	\$19.20
May	\$19.15	November	\$21.99
June	\$17.20	December	\$16.31
		Yearly Average	\$18.97



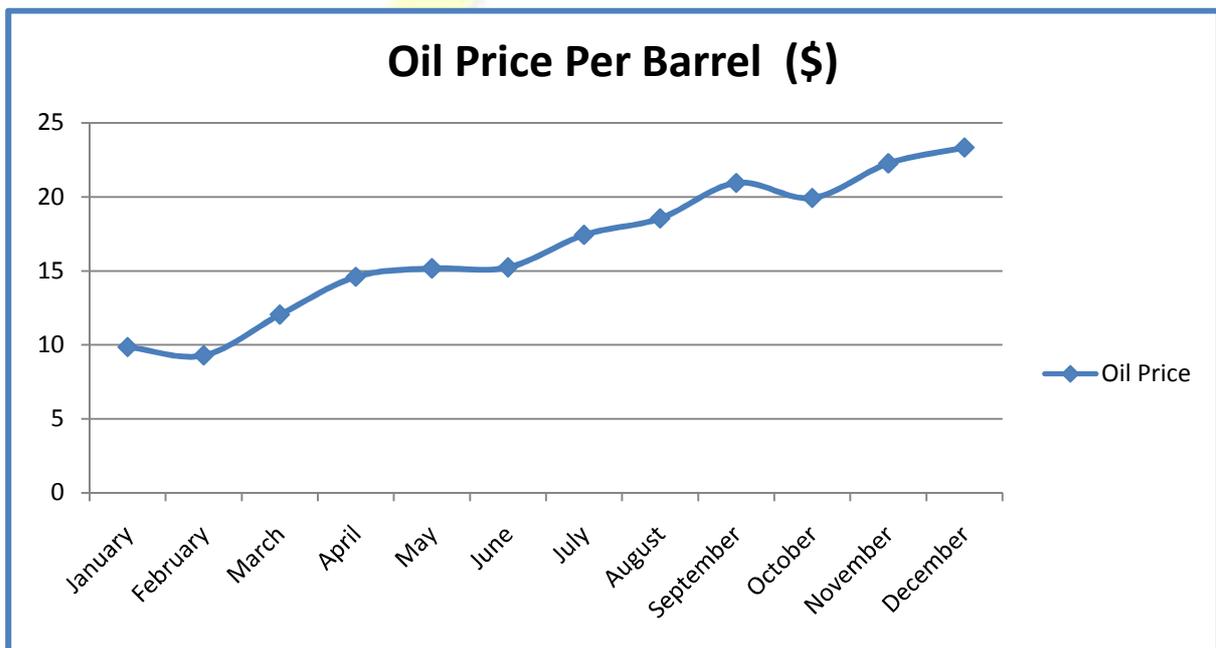
Standard deviation : 2.07

Year - 1998			
January	\$13.71	July	\$10.20
February	\$12.75	August	\$12.44
March	\$13.15	September	\$11.88
April	\$12.67	October	\$10.36
May	\$14.56	November	\$11.52
June	\$11.03	December	\$8.64
		Yearly Average	\$11.91



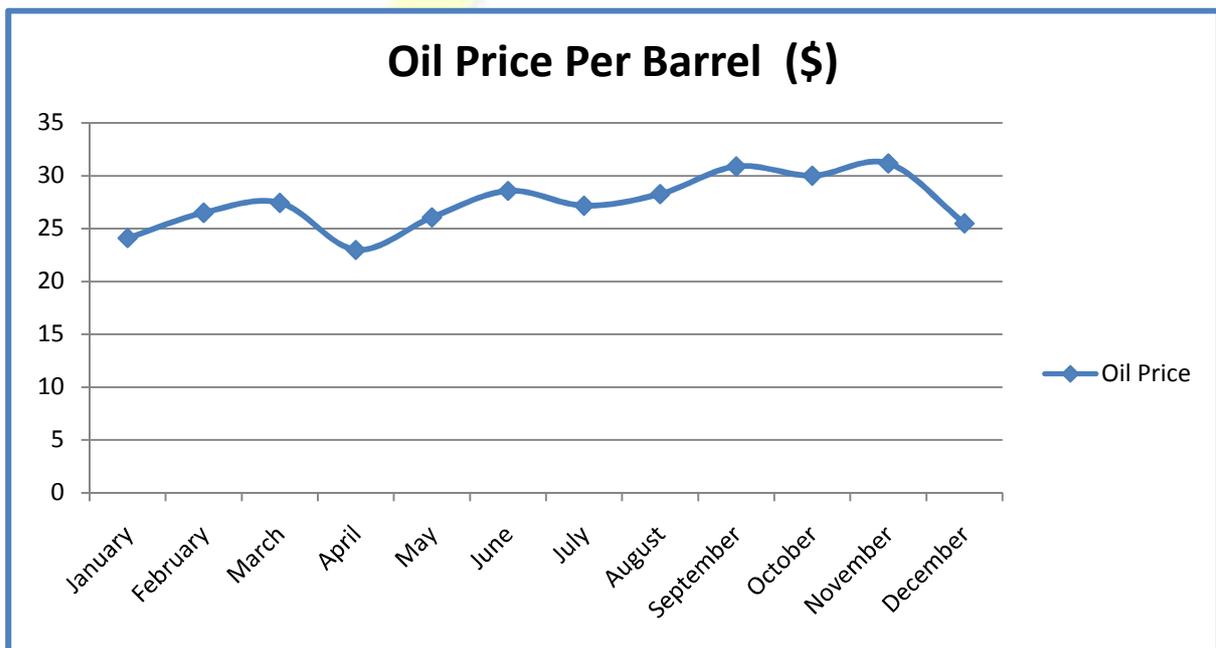
Standard deviation : 1.65

Year - 1999			
January	\$9.86	July	\$17.43
February	\$9.30	August	\$18.55
March	\$12.05	September	\$20.94
April	\$14.60	October	\$19.93
May	\$15.17	November	\$22.26
June	\$15.24	December	\$23.33
		Yearly Average	\$16.55



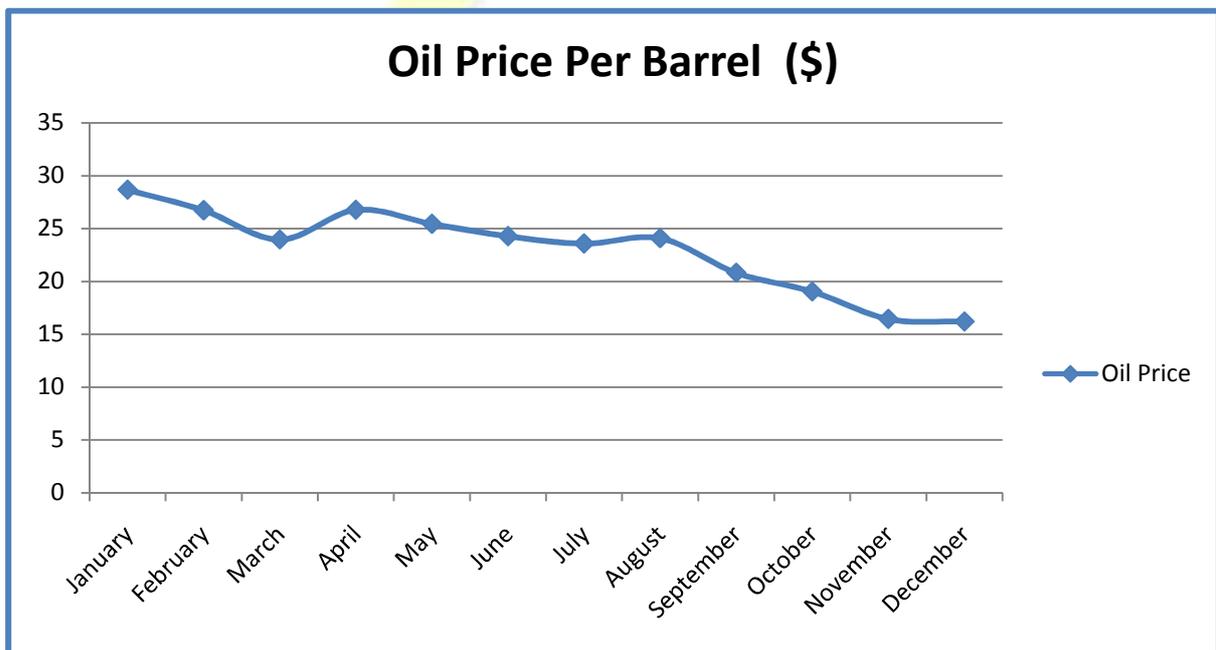
Standard deviation : 4.68

Year - 2000			
January	\$24.11	July	\$27.17
February	\$26.50	August	\$28.27
March	\$27.44	September	\$30.88
April	\$22.99	October	\$30.01
May	\$26.06	November	\$31.16
June	\$28.57	December	\$25.50
		Yearly Average	\$27.40



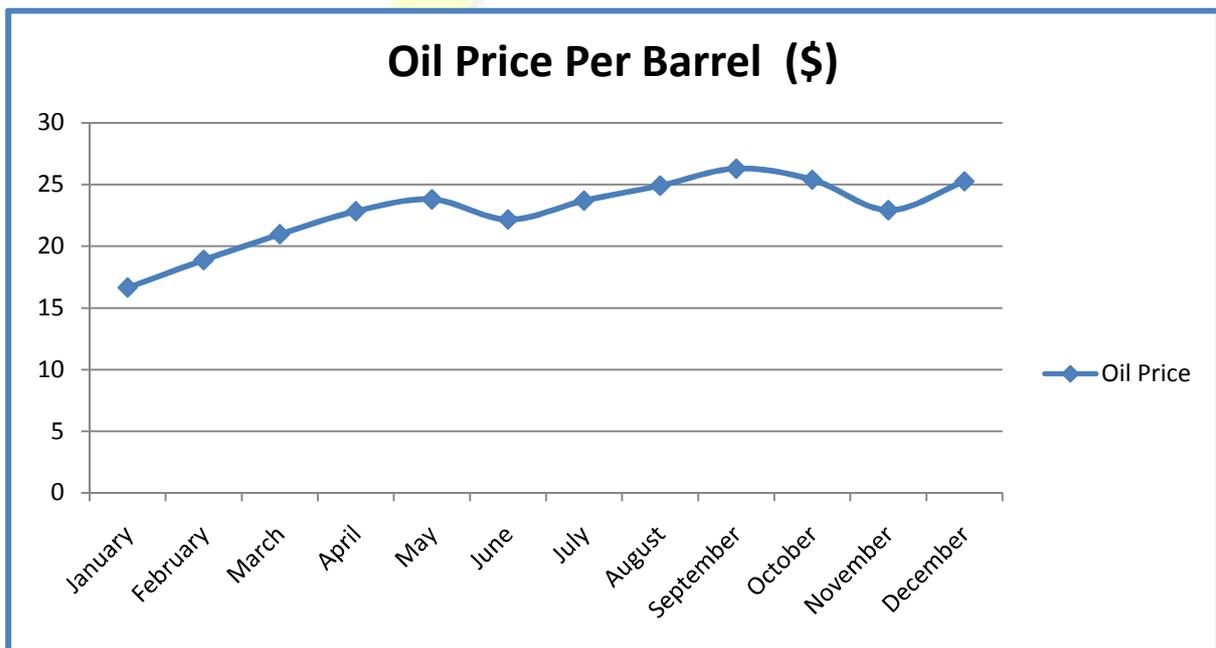
Standard deviation : 2.55

Year - 2001			
January	\$28.66	July	\$23.58
February	\$26.72	August	\$24.08
March	\$23.96	September	\$20.82
April	\$26.77	October	\$19.04
May	\$25.44	November	\$16.45
June	\$24.27	December	\$16.21
		Yearly Average	\$23.00



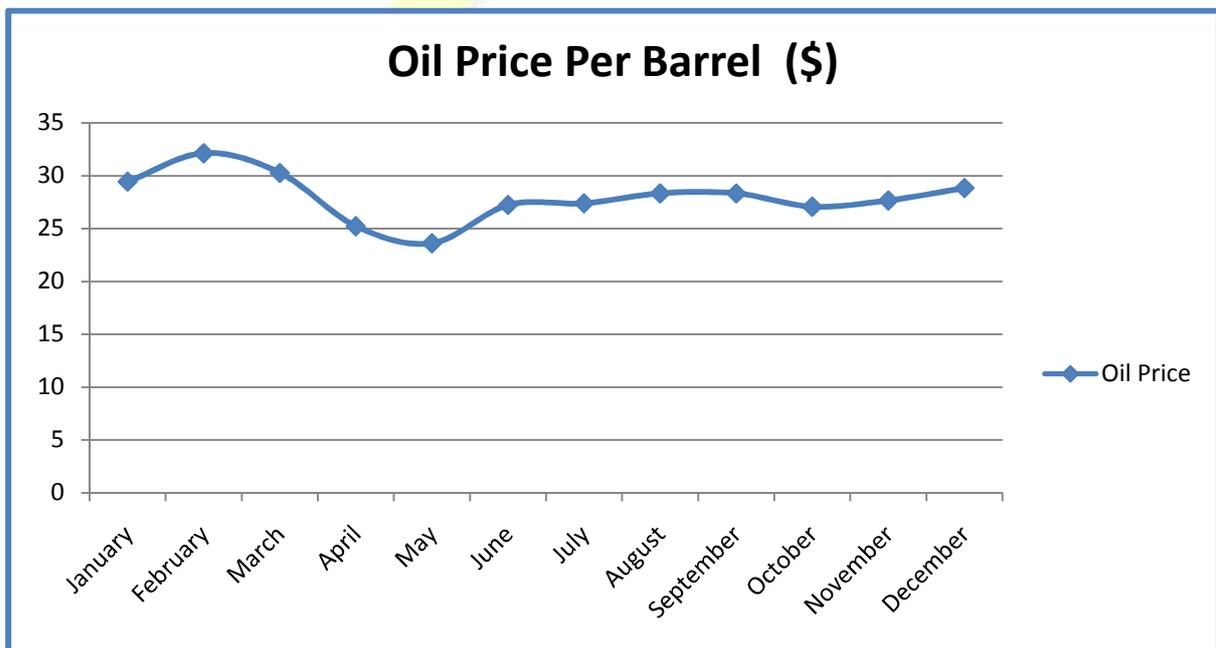
Standard deviation : 4.03

Year - 2002			
January	\$16.65	July	\$23.69
February	\$18.88	August	\$24.90
March	\$20.97	September	\$26.28
April	\$22.83	October	\$25.38
May	\$23.79	November	\$22.92
June	\$22.16	December	\$25.25
		Yearly Average	\$22.81



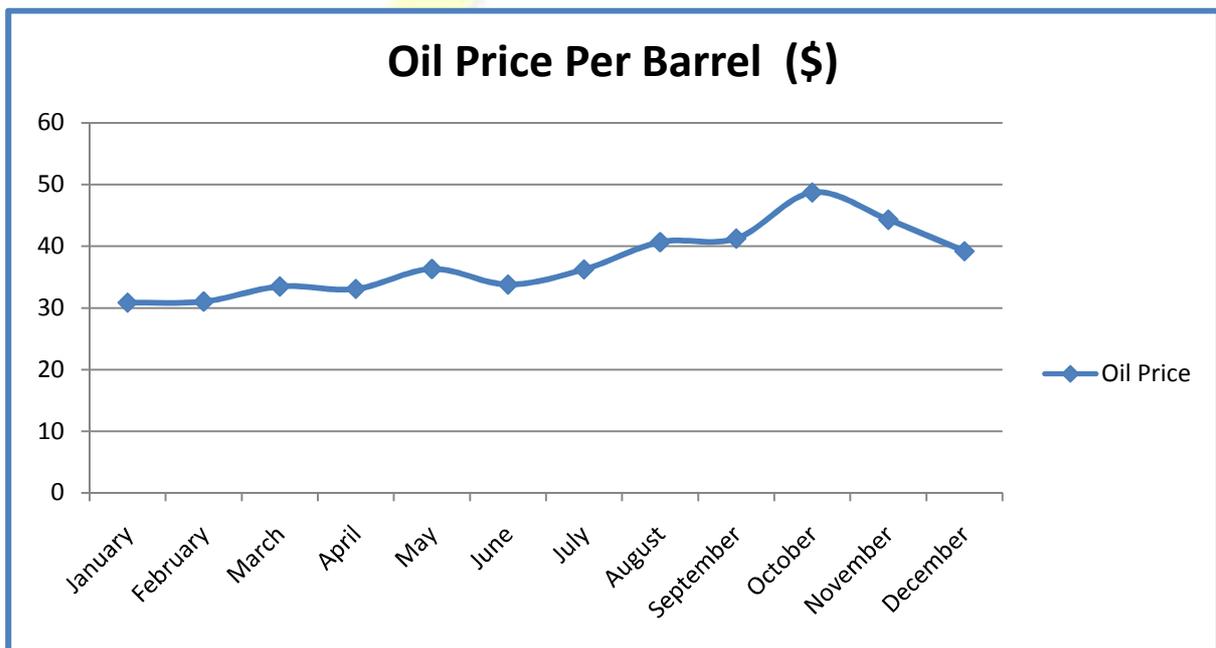
Standard deviation : 2.82

Year - 2003			
January	\$29.44	July	\$27.39
February	\$32.13	August	\$28.33
March	\$30.26	September	\$28.33
April	\$25.22	October	\$27.07
May	\$23.61	November	\$27.66
June	\$27.23	December	\$28.83
		Yearly Average	\$27.69



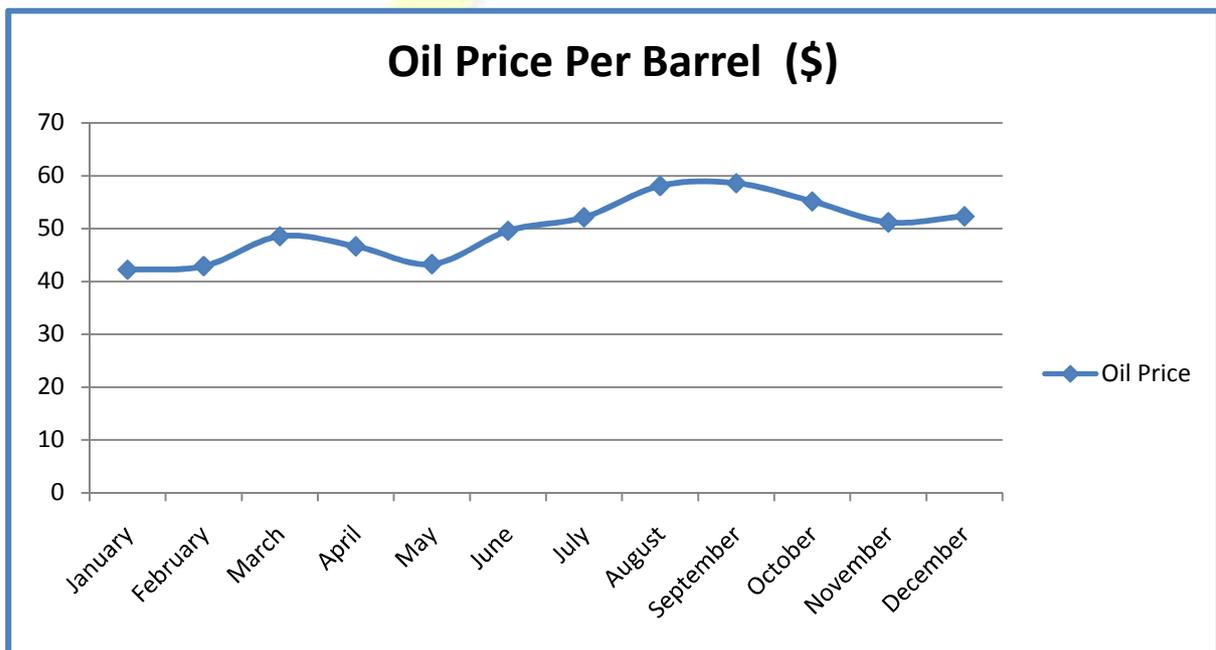
Standard deviation : 2.21

Year - 2004			
January	\$30.87	July	\$36.25
February	\$31.03	August	\$40.67
March	\$33.48	September	\$41.25
April	\$33.08	October	\$48.71
May	\$36.31	November	\$44.30
June	\$33.80	December	\$39.20
		Yearly Average	\$37.41



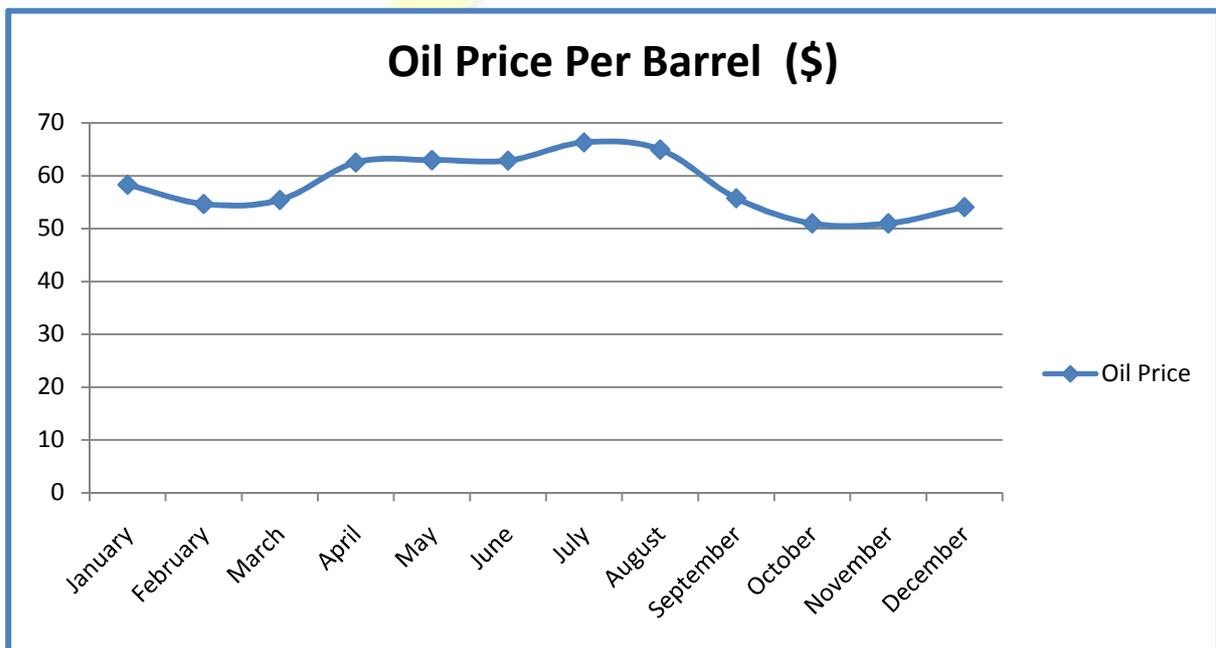
Standard deviation : 5.53

Year - 2005			
January	\$42.21	July	\$52.13
February	\$42.91	August	\$58.07
March	\$48.55	September	\$58.56
April	\$46.63	October	\$55.12
May	\$43.27	November	\$51.18
June	\$49.56	December	\$52.31
		Yearly Average	\$50.04



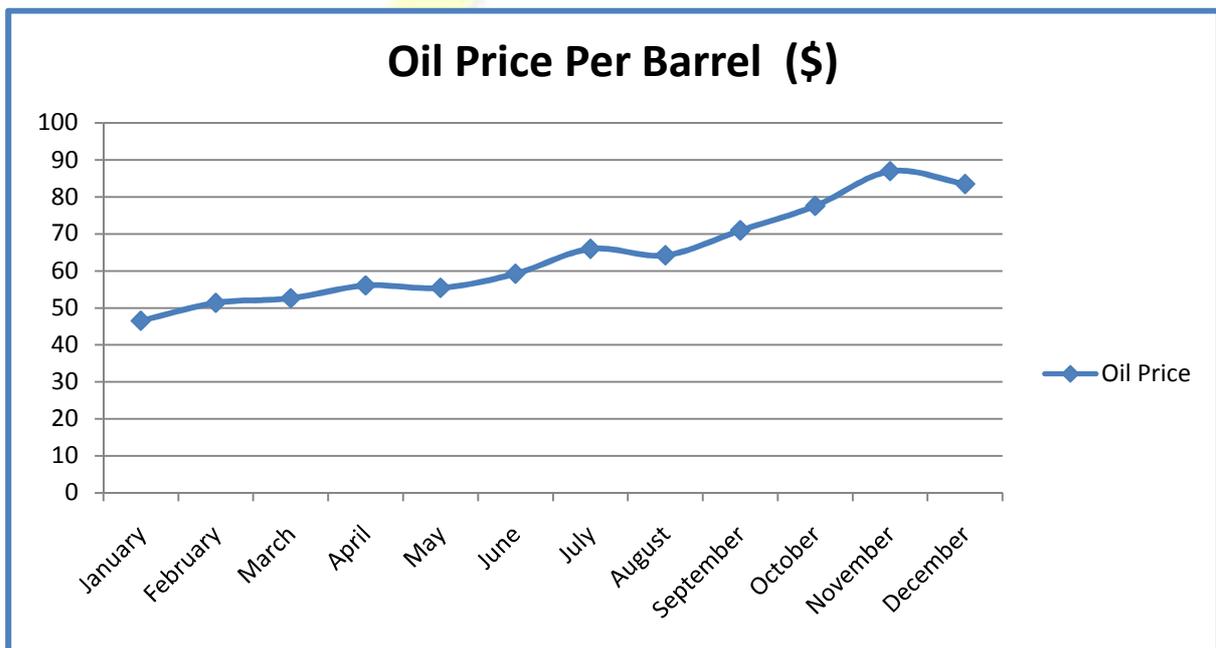
Standard deviation : 5.60

Year - 2006			
January	\$58.30	July	\$66.28
February	\$54.65	August	\$64.93
March	\$55.42	September	\$55.73
April	\$62.50	October	\$50.98
May	\$62.94	November	\$50.98
June	\$62.85	December	\$54.06
		Yearly Average	\$58.30



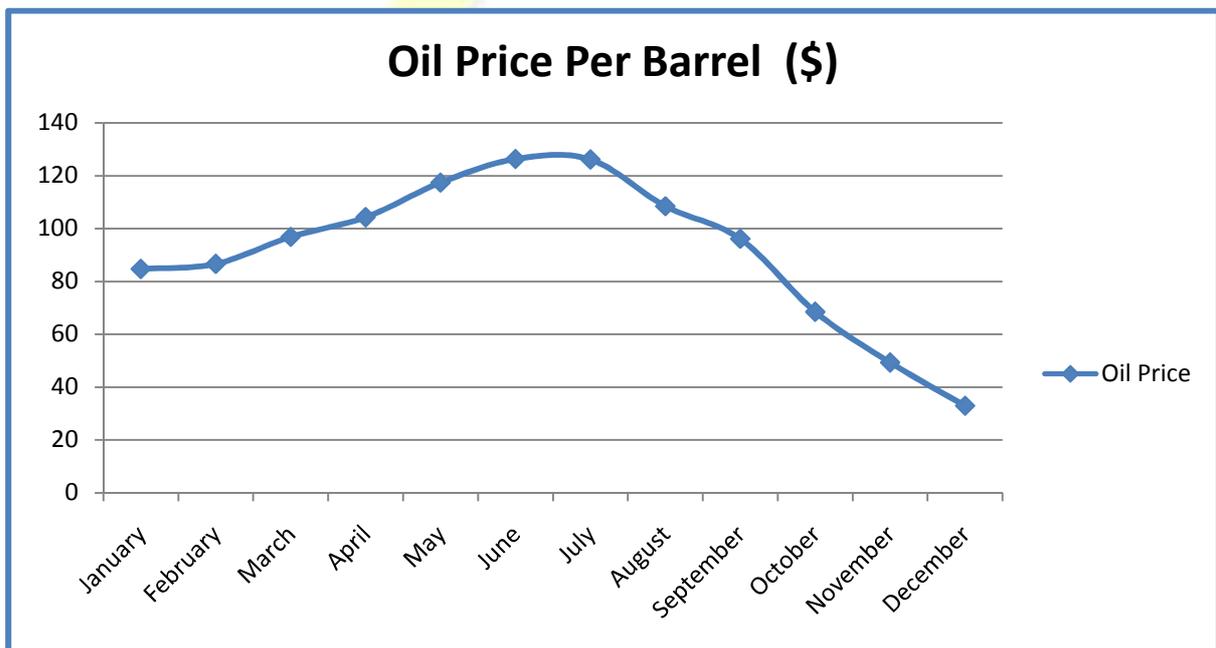
Standard deviation : 5.32

Year - 2007			
January	\$46.53	July	\$65.96
February	\$51.36	August	\$64.23
March	\$52.64	September	\$70.94
April	\$56.08	October	\$77.56
May	\$55.43	November	\$86.92
June	\$59.25	December	\$83.46
		Yearly Average	\$64.20



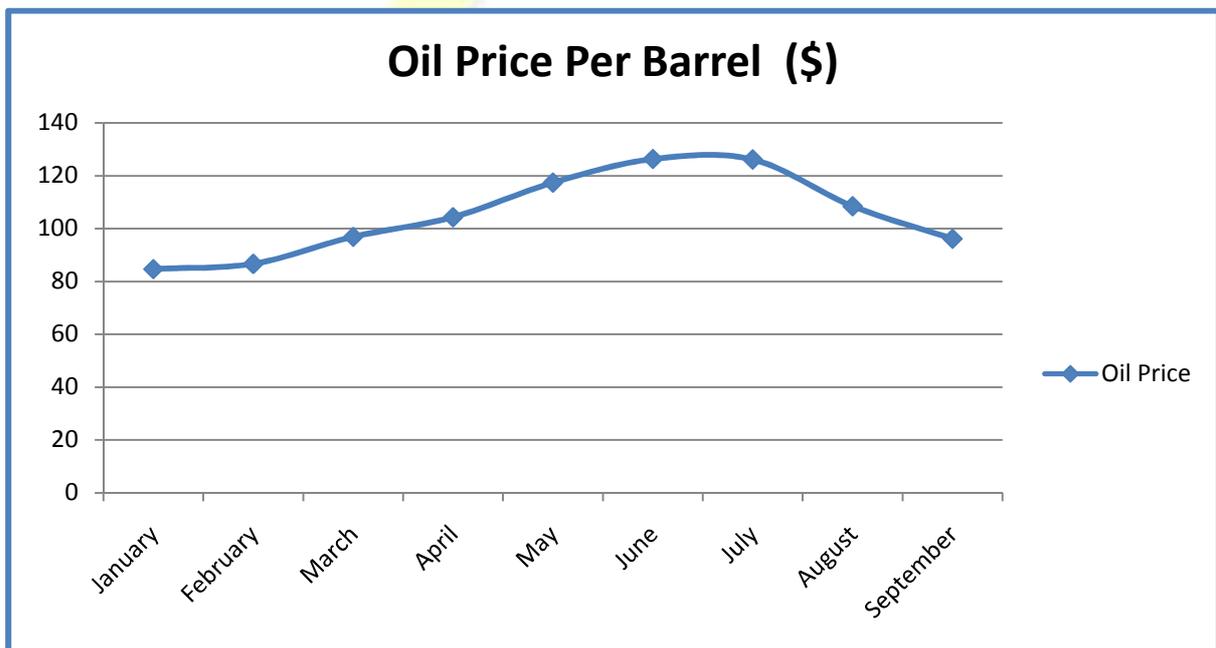
Standard deviation : 13.11

Year - 2008			
January	\$84.70	July	\$126.16
February	\$86.64	August	\$108.46
March	\$96.87	September	\$96.13
April	\$104.31	October	\$68.50
May	\$117.40	November	\$49.29
June	\$126.33	December	\$32.94
		Yearly Average	\$91.48



Standard deviation : 29.22

Year - 2009			
January	\$33.07	July	\$56.16
February	\$31.04	August	\$62.80
March	\$40.13	September	\$60.98
April	\$42.45	October	
May	\$51.27	November	
June	\$61.71	December	
		Yearly Average	\$44.12



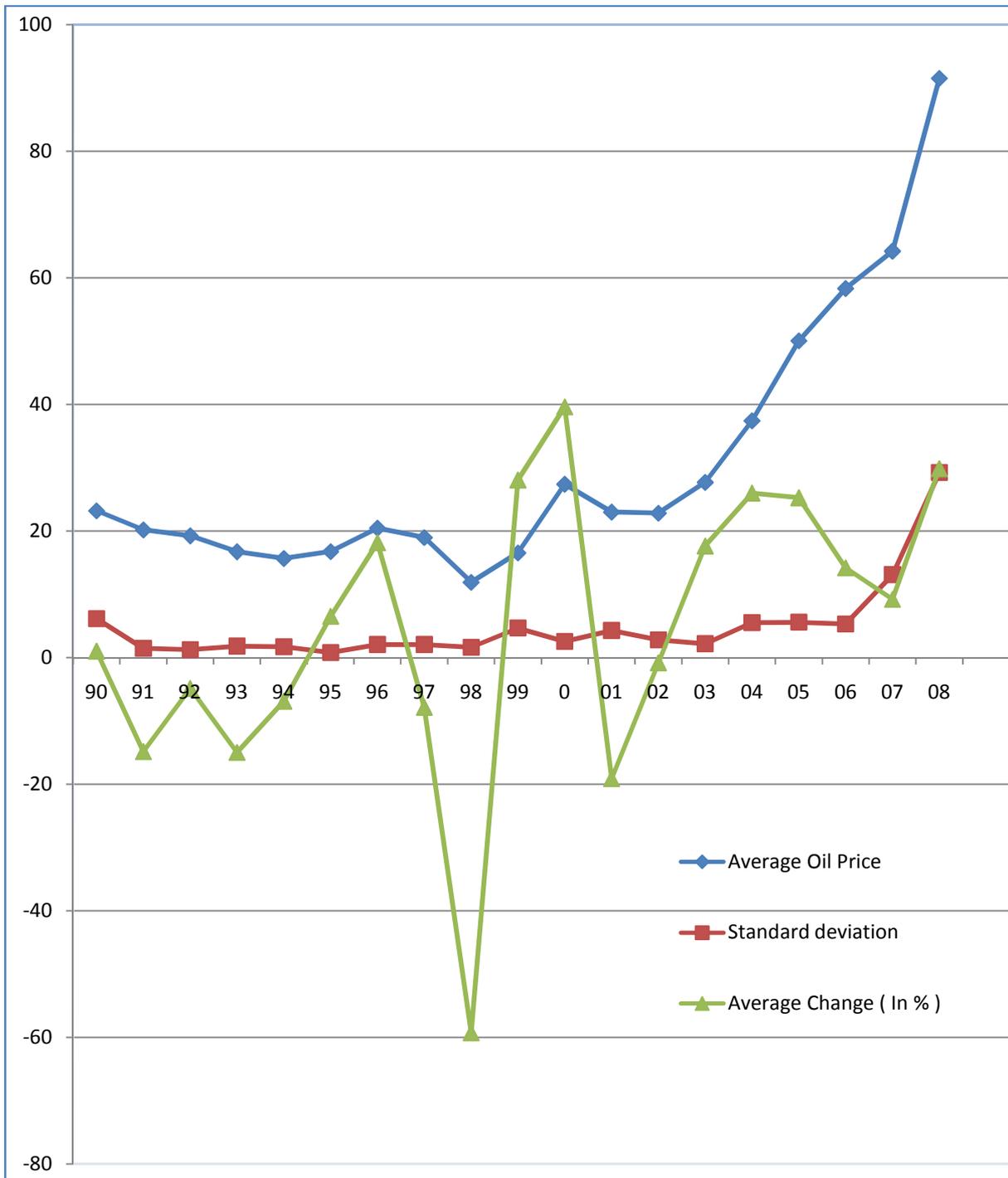
Standard deviation : 12.49 (9 months)

Behavior Of Oil Prices

In the following table statistical tools are applied to determine the behavior of oil prices with the passage of time:

Year	Average Oil Price (\$)	Standard Deviation	Change (%)
90	23.19	6.15	1
91	20.19	1.47	-15
92	19.25	1.27	-5
93	16.74	1.82	-15
94	15.66	1.72	-7
95	16.75	0.81	7
96	20.46	2.08	18
97	18.97	2.07	-8
98	11.91	1.65	-59
99	16.55	4.68	28
00	27.4	2.55	40
01	23	4.3	-19
02	22.81	2.82	-1
03	27.69	2.21	18
04	37.41	5.53	26
05	50.04	5.6	25
06	58.3	5.32	14
07	64.2	13.11	9
08	91.48	29.22	30

Graphical Representation



Average Oil Price :

The Average oil price line (BULE) shows the oil prices of past 19 years in the international market.

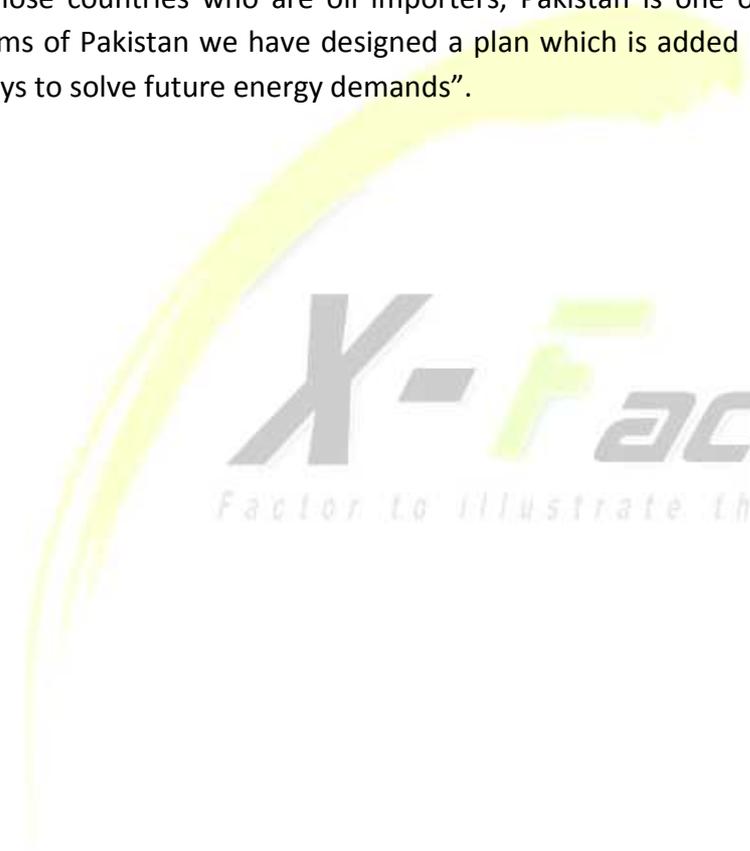
Standard Deviation :

The Standard Deviation line (RED) shows the proportion of variation in oil prices during past 19 years, that how the prices are fluctuating with the passage of time (Gradually or suddenly).

Average Change :

The average change line (Green) shows the proportion of change in the oil prices during past 19 years.

From above observation it can easily be justified that oil prices are increasing day by day and going to be more unstable, in other words the oil prices are going to be more unstable (Sudden huge ups and downs). By this whole situation it is very difficult to produce energy from oil for those countries who are oil importers, Pakistan is one of them. To solve the energy problems of Pakistan we have designed a plan which is added in this project under the name "Ways to solve future energy demands".



X-Factor
Factor to illustrate the truth!!!

Strategies of Pakistan to cut down the oil import bill

By going through the above discursion it is very much clear that the Pakistan's economy is an oil based economy, unstable currency and oil prices increase the burdon on foreign reserves and makes economy unstable and uncertainty increases. So keeping this problem in view the government of Pakistan is investing in the different sources of energy to fulfill energy demands and also to cut down the oil import bills,

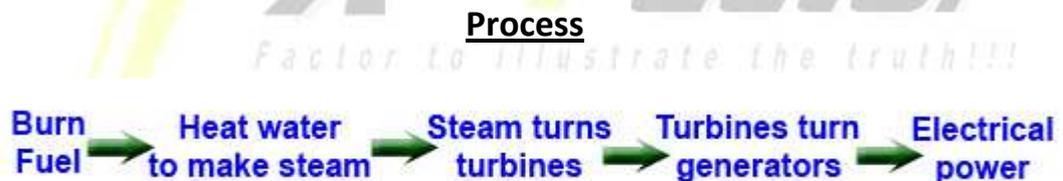
- 1) Fossil fuels.
- 2) Solar power.
- 3) Wind Power.
- 4) Hydroelectric power.

1) Fossil fuels :

Coal, oil and gas are called "fossil fuels" because they have been formed from the organic remains of prehistoric plants and animals. Fossil fuels provided around 66% of the world's electrical power, and 95% of the world's total energy demands (including heating, transport, electricity generation and other uses).

How it works :

- Coal is crushed to a fine dust and burnt.
- Oil and gas can be burnt directly.



The steam that has passed through the power station's turbines to be cooled, to condense it back into water before it can be pumped round again. This is what happens in the huge "cooling towers" seen at power stations.



Some power stations are built on the coast, so they can use sea water to cool the steam instead. However, this warms the sea and can affect the environment, although the fish seem to like it.

Advantages :

- Very large amounts of electricity can be generated in one place using coal, fairly cheaply.
- Transporting oil and gas to the power stations is easy.
- Gas-fired power stations are very efficient.
- A fossil-fuelled power station can be built almost anywhere, so long as you can get large quantities of fuel to it. Didcot power station, in Oxfordshire, has a dedicated rail link to supply the coal.

Disadvantages :

- Basically, the main drawback of fossil fuels is pollution. Burning any fossil fuel produces carbon dioxide, which contributes to the "greenhouse effect", warming the Earth.
- Burning coal produces more carbon dioxide than burning oil or gas. It also produces sulphur dioxide, a gas that contributes to acid rain. We can reduce this before releasing the waste gases into the atmosphere.
- Mining coal can be difficult and dangerous. Strip mining destroys large areas of the landscape.
- Coal-fired power stations need huge amounts of fuel, which means train-loads of coal almost constantly. In order to cope with changing demands for power, the station needs reserves. This means covering a large area of countryside next to the power station with piles of coal.

Is it renewable?

Fossil fuels are not a renewable energy resource. Once we've burned them all, there isn't any more, and our consumption of fossil fuels has nearly doubled every 20 years since 1900. This is a particular problem for oil, because we also use it to make plastics and many other products. [R-11]

2) Solar Power :

We've used the Sun for drying clothes and food for thousands of years, but only recently have we been able to use it for generating power. The Sun is 150 million kilometers away, and amazingly powerful. Just the tiny fraction of the Sun's energy that hits the Earth (around a hundredth of a millionth of a percent) is enough to meet all our power needs many times over. In fact, every minute, enough energy arrives at the Earth to meet our demands for a whole year - if only we could harness it properly.

How it works :

There are three main ways that we use the Sun's energy but most important is solar cells. (really called "photovoltaic", "PV" or "photoelectric" cells) that convert light directly into electricity. In a sunny climate, you can get enough power to run a 100W light bulb from just one square meter of solar panel. This was originally developed in order to provide electricity for satellites, but these days many of us own calculators powered by solar cells.



Solar cells provide the energy to run satellites that orbit the Earth. These give us satellite TV, telephones, navigation, weather forecasting, the internet and all manner of other facilities.

The graphic shows a GPS satellite. A satellite navigation receiver in a car gets signals from a whole host of these and works out it's own position. [R-12]

Advantages :

- Solar energy is free - it needs no fuel and produces no waste or pollution.
- In sunny countries, solar power can be used where there is no easy way to get electricity to a remote place.
- Handy for low-power uses such as solar powered garden lights and battery chargers, or for helping your home energy bills.

Disadvantages :

- Doesn't work at night.

- Very expensive to build solar power stations, although the cost is coming down as technology improves. In the meantime, solar cells cost a great deal compared to the amount of electricity they'll produce in their lifetime.
- Can be unreliable unless you're in a very sunny climate. In the United Kingdom, solar power isn't much use for high-power applications, as you need a large area of solar panels to get a decent amount of power. However, technology has now reached the point where it can make a big difference to your home fuel bills..

3) Wind Power :

We've used the wind as an energy source for a long time. The Babylonians and Chinese were using wind power to pump water for irrigating crops 4,000 years ago, and sailing boats were around long before that. Wind power was used in the Middle Ages, in Europe, to grind corn, which is where the term "windmill" comes from.

How it works :

The Sun heats our atmosphere unevenly, so some patches become warmer than others. These warm patches of air rise, other air blows in to replace them - and we feel a wind blowing.



We can use the energy in the wind by building a tall tower, with a large propeller on the top. The wind blows the propeller round, which turns a generator to produce electricity.

We tend to build many of these towers together, to make a "wind farm" and produce more electricity. The more towers, the more wind, and the larger the propellers, the more electricity we can make. It's only worth building wind farms in places that have strong, steady winds, although boats and caravans increasingly have small wind generators to help keep their batteries charged. The best places for wind farms are in coastal areas, at the tops of rounded hills, open

plains and gaps in mountains - places where the wind is strong and reliable. Some are offshore. [R-13]

Advantages :

- Wind is free, wind farms need no fuel.
- Produces no waste or greenhouse gases.
- The land beneath can usually still be used for farming.
- Wind farms can be tourist attractions.
- A good method of supplying energy to remote areas.

Disadvantages :

- The wind is not always predictable - some days have no wind.
- Suitable areas for wind farms are often near the coast, where land is expensive.
- Some people feel that covering the landscape with these towers is unsightly.
- Can kill birds - migrating flocks tend to like strong winds. However, this is rare, and we tend not to build wind farms on migratory routes anyway.
- Can affect television reception if you live nearby.
- Can be noisy. Wind generators have a reputation for making a constant, low, "swooshing" noise day and night, which can drive you nuts.

Is it renewable ?

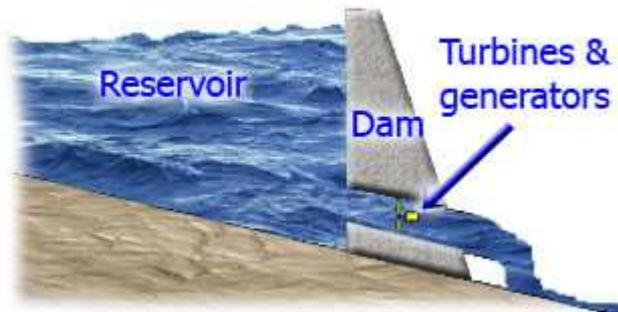
Wind power is renewable. Winds will keep on blowing, it makes sense to use them.

4) Hydroelectric power :

The name comes from "hydro", the Greek word for water. We have used running water as an energy source for thousands of years, mainly to grind corn. In 1882 on the Fox river, in the USA, hydroelectricity produced enough power to light two paper mills and a house. Nowadays there are many hydro-electric power stations, providing around 20% of the world's electricity.

How it works :

A dam is built to trap water, usually in a valley where there is an existing lake. Water is allowed to flow through tunnels in the dam, to turn turbines and thus drive generators. Notice that the dam is much thicker at the bottom than at the top, because the pressure of the water increases with depth. Hydro-electric power stations can produce a great deal of power very cheaply.



Gravitational potential energy is stored in the water above the dam. Because of the great height of the water, it will arrive at the turbines at high pressure, which means that we can extract a great deal of energy from it. The water then flows away downriver as normal. In mountainous countries such as Switzerland and New Zealand, hydro-electric power provides more than half of the country's energy needs.

Advantages :

- Once the dam is built, the energy is virtually free. *The truth!!!*
- No waste or pollution produced.
- Much more reliable than wind, solar or wave power.
- Water can be stored above the dam ready to cope with peaks in demand.
- Hydro-electric power stations can increase to full power very quickly, unlike other power stations.
- Electricity can be generated constantly.

Disadvantages :

- The dams are very expensive to build. However, many dams are also used for flood control or irrigation, so building costs can be shared.

- Building a large dam will flood a very large area upstream, causing problems for animals that used to live there.
- Finding a suitable site can be difficult - the impact on residents and the environment may be unacceptable.
- Water quality and quantity downstream can be affected, which can have an impact on plant life.

Is it renewable ?

Hydro-electric power is renewable, The Sun provides the water by evaporation from the sea, and will keep on doing so. [R-14]



X-Factor
Factor to illustrate the truth!!!

Problems Regarding The energy sectors in Pakistan

Pakistan is investing in the energy sectors (discussed in the topic – strategies of Pakistan to cut down oil import bill) to fulfill the energy demands but there are many problems (identified below) due to which the investment is not feasible for long time :

S.no	Energy Sector	Problems in Pakistan
1	Fossil Fuel :	* Pakistan imports oil to fulfill energy demands.
		* Environmental problems (Pollution causes global warming to increase)
		* Mining for coal is very difficult (Especially in the area of Thar)
2	Solar Power :	* Very Expensive.
		* Not A reliable source of energy because it does not work during night.
		* Very high maintenance cost.
		* Replacement of solar cells is required after each 25 to 30 years.
3	Wind Power :	* The wind is not always predictable (Some days have no wind)
		* Expensive Land (Land best for wind power is near coastal areas, which is very expensive)
		* high maintenance cost.
		* Can kill Birds.
		* Can be noisy.
4	Hydero Electric Power:	* Effect the television transmission (if an individual live nearby)
		* There is a severe shortage of water in Pakistan, according to UN report near by year 2050 in Pakistan there will be a severe shortage of water, the reason for that is global warming, due to global warming the glaciers of himalayas are melting... In future there will be a shortage of water even to drink! now the question arises that if we will have shortage of water to drink so from where we store it in dams to generate electricity?
		* Suitable areas for dams in Pakistan are near fault lines e.g : Kalabagh Dam, If government decides to build the dam it can trigger an earth quake.
		* The dams are very expensive to build.
		* Dams will flood a very large area.
		* Water quality and quantity downstream can be affected (which can have an impact on plant life.)

By going through the above discussed problems the future of Pakistan is looking uncertain, so government must think about it and take some bold decision to fulfill the future energy demand and also to cut down the oil imports to fruitful future.



Ways to solve future energy demands & to cut down oil imports

Global energy demand is increasing day by day, Pakistan is also affected by it, Pakistan is basically an agro-based economy but now we are moving toward industrialization. Our population is also increasing with alarming rate consequently our energy demands are also increasing. To fulfill our energy demands we rely on "OIL" import and alternatives are very limited and less effective. As discussed above "as a result our economy is an oil based economy".

So, for a better future and sustainable energy supply we must take some bold decisions. According to me following measures must be taken on immediate bases:

We have made a plan by which we can cut down our oil imports and make our country an independent country in term of energy generation and economically. Our plan is divided into two parts :

- A) Short term plan.
- B) Long term plan.

Explanation of plans

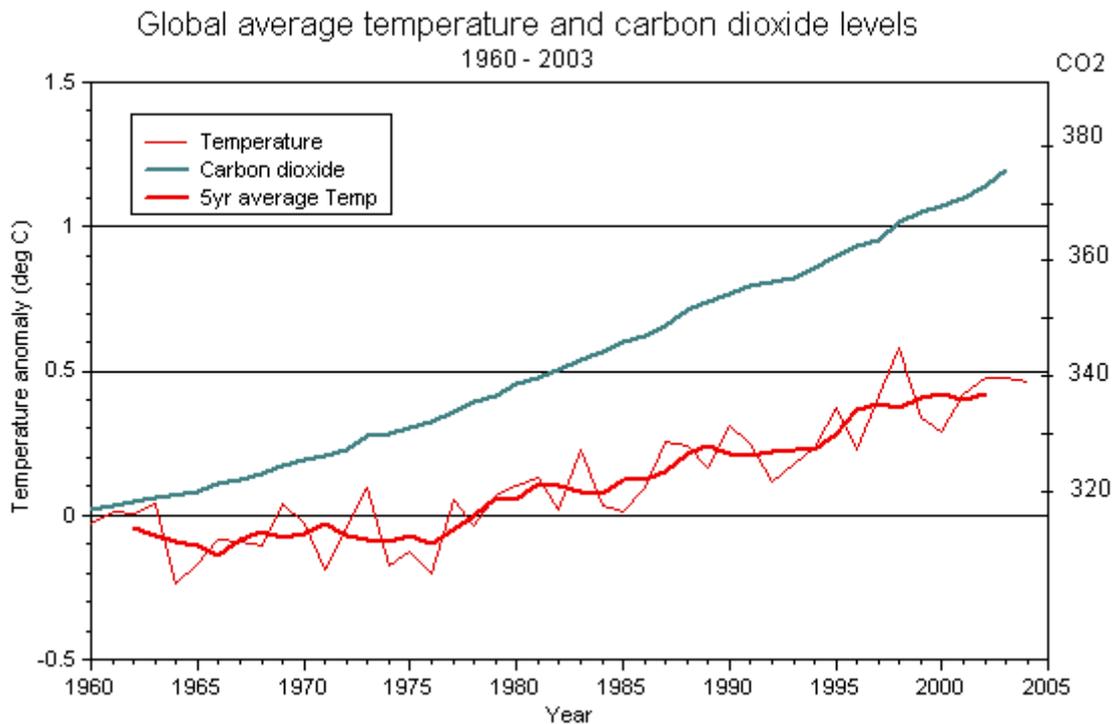
A) Short term plan :

Our short term plan is consist of measures which must be taken under consideration on immediate basis. To improve our economic system and its energy generation, the short term plan is consist of following considerations :

- 1) Thar Coal.
- 2) Use of garbage as a source of energy.
- 3) Physical change in economic system.

1) Thar Coal :

Pakistan is rich of natural resources, coal is one of them and we can easily use it as a source of energy in thermal power plants. Coal is a very efficient source of energy; we can easily access it and generate energy. There are many countries in the world that use coal to fulfill their energy demands, (e.g. China, India, America, Canada and Australia), by considering coal as a energy source, Australia is a biggest example for us, it fulfill all of his energy demands by using coal. Nowadays environment issues are very critical, one to industrialization, emission of green house gases is increasing day by day as a result temperature around the globe is increasing or we can say global warming. Our whole eco-system is disturbed due to global warming. Here is a chart which illustrates the history of global warming :



Under the consideration of global warming phenomenon the coal is not a fusible option, it effect the climate of whole world even Pakistan itself, but for the country like Pakistan, where there is already an energy crisis and economy is going in recession due to shortage of energy and huge oil import bills, there is no any other option, so it is decided to use coal as a source of energy but for short time period to minimize the environmental damages. Under the sand of thar desert there are huge reserves of coal, considered among the world's largest coal reserves, according to experts, in Thar there are 175 million of tons of coal reserves. By using this we can fulfill the energy demands of whole Pakistan for at least upcoming 200 years, it is not a risky task, so Pakistan should start the generation of electricity from the coal as soon as possible but for short term period. (Till the long term projects not completed).

2) Use of garbage as a source of energy :

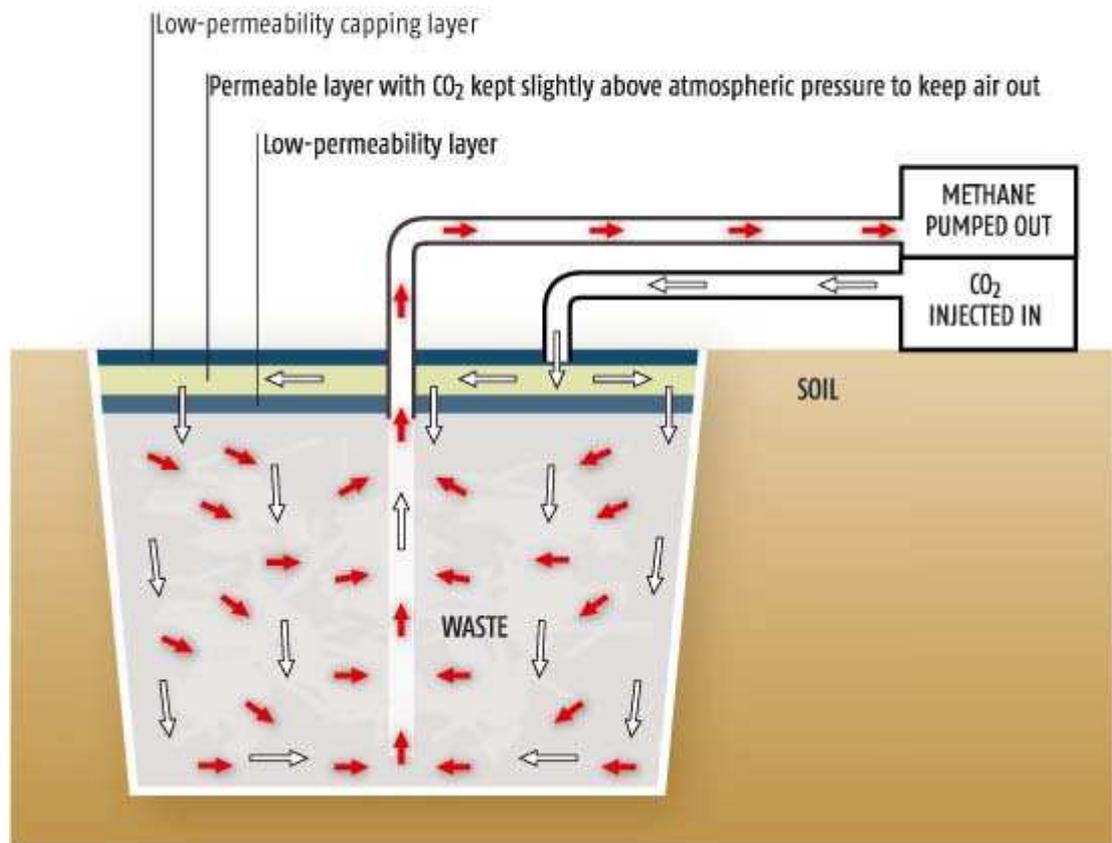
As a Muslim it is our primary job and also a part of our faith to keep our self and our surroundings clean but in spite of that our roads, streets and open areas all are full of garbage, causing many viral diseases to spread.

Our garbage is rich of organic material which we can use as a source of energy. In Brazil's capital city " Sao-Paulo " they do the same thing. The garbage across the whole city is collected, organic, volatile, and non volatile materials are separated and the goods which can be recycled (e.g. tins, bottles and plastic material) are sorted out. The organic compound which clocking with the passage of time is dumped under the surface of earth, when the process of clocking starts, it

produce methane gas, which is collected with the help of pipes and used as a source of energy, as illustrated below:

ENERGY FROM WASTE DUMPS

As methane is sucked out of the landfill, it is replaced by CO₂ drawn from the pressurised membrane



“Sao-jao” is the worlds largest land fills and also a power plant, it runs on an endless supply of cheap fuel, not coal, not oil, its garbage. Sao-jao was ones an empty valley of size 175 foot bill field, now trash rises in layers 7 meters deep in between a 20cm layer of dirt as the valley of trash grows; the pressure creates a liquid bi-product called lecher. To prevent contamination of soil and ground water, the base if the land fill is lied with the thick poly methane blanket (5mm thick), as garbage decomposes, it naturally produces methane gas trapped beneath the dirt and extracted with the help of pipes, 200 vertical tubes/pipes are used, 1 ton of trash produced up to 200 liter of gas which is enough to power one house for 1 hour, layer by layer Sao-jao fills with the energy.

In one year this land fill can create enough electricity for 400,000 people, “Rio-de- Janeiro” operates round the clock year by year.

Every day it grows by 6 to 7 thousand tons of garbage, according to technical director of biogas (a company that harnesses the gas). The land fill contains seven layer of garbage over each other, each layer is 7to 8 meters thick and the

total depth is 80 to 90 meters thick from which we can conclude that it is a big valley used as a source of unlimited energy supply. If garbage were a drink, then a “ Sao-Paulo ” will be a sham pain, few cities through out such a heavy dump, banana peels, egg shells, coffee bears, vegetable and fruit peels, domestic garbage is rich of organic material, up to half of land fill is organic matter rich in methane. According to secretary for environment of “Sao-Paulo” he made the city garbage problem dispersed by tapping trash for fuel. This process of generating energy is not only clean but also invisible, when the gas is collected it flows to the generation plant, engineers chill the gas up to 13c, as it cools water condenses and we get 50% more pure methane, in the final stage gas flows to 24 generators burned as fuel, the electricity then produced is traveled to the local utility then to the residence of “Sao-Paulo”.

From a valley of garbage a river of energy flows its only limit the size of land fill. Sao-jao can hold about 20 year worth trash, first five year is produced the most methane, then production generally declines but then the land fill is self may be recycled as a park or agriculture land(because of its fertility). In some religions recycling is an article of faith, in “Sao-Paulo” it is a fact of life, and it happens a millions of time a day.

The materials which can be recycled are sent to the recycling industry. The recycling process requires less energy as compare to the primary manufacturing process as a result less energy demands and more efficient production is carried out t low manufacturing cost.

In 1980 the industrial sector of “Sao-Paulo” was declared the most polluted place on the earth, pollution effected the jungles and triggered made slides, the number of cancer patient increased rapidly, the babies entered in the world with birth defects (with out brains) and even much more, and the industrial valley of “Sao-Paulo” was declared as a valley of death. In 1980 the government forced the industries to clean up there acts and the industrial area have restated itself, factories invested billions to upgrade plants, they installed modern equipment to stop pollution and wastes was no long wasted. Today the water, land and air are so much fresh , the “Sao-Paulo” is now recognized as model turn around by the united nations, from rural to urban areas “Sao-Paulo” is building its image.

After a long nightmare the life is cheaper then trash, now they don't throw garbage, they use it to generate energy, they do not throw tins, paper, plastic and glass etc. they simply recycle it, in other words they don't throw out across of energy they harvest it. [R-15]

If “Sao-Paulo” can produce energy so why don't Pakistan. Our cities are also producing lots of tons garbage on daily basis (e.g. Karachi) containing rich organic

compound, by considering the development in “Sao-Paulo” we have to adopt same technology to cut down our energy demands and it provides us benefit in following ways:

- It helps us to keep our cities clean.
- It generates energy.
- It increases the fertility of land.

3) Physical change in economic system :

Pakistan is an oil based economy, oil prices are not stable and reliable, it varies from time to time. As we use more and more oil it negatively effects the whole economy in the form of inflation.

Biggest flaws of Pakistan’s economy is dependency on oil, Pakistan fulfills its oil demands by 15% of domestic production and remaining 85% is imported, its a very bad condition nominal change in oil prices can cause huge inflation, oil prices creates multidimensional effects on economy (as discussed in Pakistans economy, Page -)

So to cut down the oil import bill we have to change our economic system, following are some ways to change the economic system:

- 1) Railway network.
- 2) Public transportation.
- 3) Goods transportation.
- 4) Divide the economy in sectors.

1) Railway network :

Railway network is the backbone of the developed nations but in Pakistan the railway network is destroyed and neglected, we always relay on trucks, buses and personal convince which causes to increase oil demand.



We have to focus on railway network for public and goods transportation because one train can carry more than 100 trucks, so its very efficient and effective and also helpful to cut down the oil demands. It can effect the economy in following ways :

- Time saving (Railway transportation is fast as compare to other to other sources e.g: cars and busses)
- It reduces the Oil Demand.
- It helps to reduce the pollution.

2) Public Transport :

Public transport in Pakistan is mainly based on busses and other vehicles, busses and small vehicles consume more oil as compare to railway, which causes oil import bill to increase.



So government must focus on intercity railway system for public transportation within the cities and also motivate and facilitate public to go through it. It can effect the economy in following ways :

- It reduces the Oil Demand.
- It helps to reduce traffic in urban areas.
- It helps to reduce the pollution.
- It helps to increase the savings of the public (the money which was previously spent on petrol and vehicles is transferred in to savings)

3) Goods Transportation :

In Pakistan mainly the goods are transported by trucks due to which on one hand oil import bill increase and on other hand cost of goods also increases, consequently inflation increases.

Pakistan must develop efficient railway system to transport/ supply goods through out the country, by changing economic system of transportation from trucks to railway we can even beat the inflation up to some extent because by railway network we can transport large quantity of goods at very low transportation cost. It effects the economy by following ways :

- It reduces the transportation cost.
- It reduces the oil demand (Trains use less oil as compare to trucks).
- Time saving.
- It reduces the traffic on our highways.
- It helps to reduce the pollution.
- Near some people it can increase the unemployment, that's not true because the goods are transported by train to different cities and further distribution to its destination is done by the trucks.

4) Divide the economy in sectors

Pakistan is a large country, we have to divide country in sectors connected by railroad with each other, as illustrated below:



In the map illustrated above Pakistan is divided in different sectors and each sector is connected by rail road (illustrated by dark line) this way we can efficiently supply the goods around the whole country, when goods

are transported in sectors, from there further distribution is done by trucks. It effects the economy in following ways :

- Effective Management.
- It reduces the transportation cost.
- It reduces the oil demand (Trains use less oil as compare to trucks).
- Time saving.
- It reduces the traffic on our highways.

B) Long term plan :

After implementing short term plane we have to work for a sustainable energy source to fulfill our energy demands for that we have to work in following fields :

- 1) Nuclear energy.
- 2) Geothermal energy.
- 3) Physical change in economic system.

1) Nuclear energy :

Nuclear power is generated using Uranium, which is a metal mined in various parts of the world. Nuclear power produces around 11% of the world's energy needs, and produces huge amounts of energy from small amounts of fuel, without the pollution that you'd get from burning fossil fuels.

Advantages :

- Nuclear power costs about the same as coal, so it's not expensive to make.
- Does not produce smoke or carbon dioxide, so it does not contribute to the greenhouse effect.
- Produces huge amounts of energy from small amounts of fuel.
- Produces small amounts of waste.
- Nuclear power is reliable.

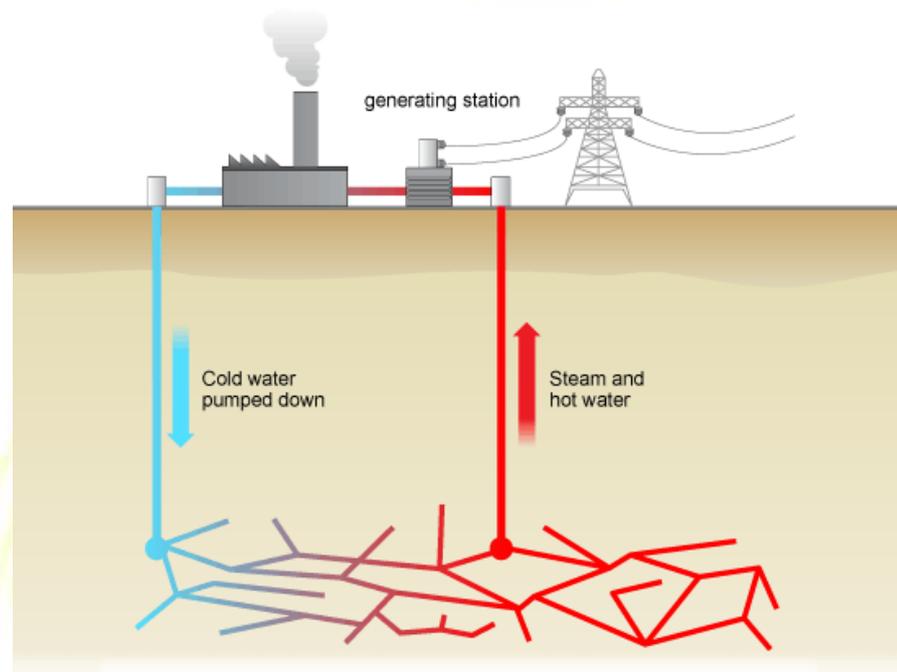
Pakistan is a nuclear state, we can fulfill our energy demands by using nuclear energy, in a result oil demand decreases, so government must focus on it.

2) Geothermal energy :

The name "geothermal" comes from two Greek words: "geo" means "Earth" and "thermal" means "heat". The centre of the Earth is

around 6000 degrees Celsius - easily hot enough to melt rock. Even a few kilometers down, the temperature can be over 250 degrees Celsius if the Earth's crust is thin. In general, the temperature rises one degree Celsius for every 30 - 50 meters you go down, but this does vary depending on location. In volcanic areas, molten rock can be very close to the surface. Sometimes we can use that heat. Geothermal energy has been used for thousands of years in some countries for cooking and heating.

Hot rocks underground heat water to produce steam. We drill holes down to the hot region, steam comes up, is purified and used to drive turbines, which drive electric generators. There may be natural "groundwater" in the hot rocks anyway, or we may need to drill more holes and pump water down to them. As illustrated below :



How useful it is depends on how hot the water gets. This depends on how hot the rocks were to start with, and how much water we pump down to them. Water is pumped down an "injection well", filters through the cracks in the rocks in the hot region, and comes back up the "recovery well" under pressure. It "flashes" into steam when it reaches the surface by using generators energy is produced. [R-16]

Advantages :

- Geothermal energy does not produce any pollution, and does not contribute to the greenhouse effect.
- The power stations do not take up much room, so there is not much impact on the environment.

- No fuel is needed.
- Once you've built a geothermal power station, the energy is almost free. It may need a little energy to run a pump, but this can be taken from the energy being generated.

In Pakistan there are many mountain ranges from where we can generate geothermal energy, by using geothermal energy we can produce energy at low cost and consequently the need for thermal energy reduces, which results in reduction of oil demand.

3) Physical change in economic system :

After changing the economic system (Physical change / operational change) as discussed in short terms plan and implementation of long term plan is also started, By using Nuclear and geothermal energy, there is no any shortage of electricity, even it is in surplus. At that point there is a further need of changing in physical economic system, which is to change the railway network from oil based to electricity based. by advancing railway network we can cut the oil demands up to a very large scale.



Conclusion

Pakistan economy is an oil based economy, the domestic production is less due to which Pakistan imports oil to fulfill its energy demands. The currency (Rupee) is unstable, the oil prices are also unstable as discussed in "Oil Prices track record & behavior". In this topic by observing the oil prices of past 20 years, it is clearly illustrated that oil prices are unstable and continuously increasing, due to unstable currency the oil import bill increases and also cause a significant reduction in foreign reserves account.

The increase in oil import or prices causes a systematic risk in the economy, which effects the whole economy step by step. Each and every sector which is linked with oil (directly or indirectly) is effected, economy goes in recession and problem of inflation arises.

To tackle down this whole problem in this project we have presented a strategic plan under the platform of "**X-Factor**", consist of short term and long term plan. We are not experts but we tried our level best to propose a plane to solve Pakistan's economic problems by cutting down the oil demand.



X-Factor
Factor to illustrate the truth!!!

REFERENCES

R. No	Source
[R-1]	http://americanhistory.suite101.com/article.cfm/history_of_crude_oil
[R-2]	http://www.rgemonitor.com/economonitor-monitor/255555/wti_brent_dubai_as_oil_price_benchmarks_caveat_emptor
[R-3]	http://www.nymex.com , http://www.simex.com.sg .
[R-4]	http://www.wtrg.com/prices.htm , http://www.nber.org/papers/w14492
[R-5]	http://ideas.repec.org/a/onb/oenbmp/y2004i2b2.html
[R-6]	http://www.investopedia.com/ask/answers/06/oilpricesinflation.asp?viewed=1
[R-7]	http://www.eia.doe.gov/oiaf/aeo/otheranalysis/aeo_2006analysispapers/efhop.html
[R-8]	Book : Pakistan and Oil impact
	1 "How Pakistan is Coping with the Challenge of High Oil Prices," by Afia Malik, Pakistan - Institute of Development Economics
	2 "Inflation in Pakistan: Money or Wheat," by Mohsin S. Khan, and Axel - Schimmelpfennig, International Monetary Fund
	3 "Pakistan's Macroeconomic adjustment and assumption of growth, 1999-2004," by - Henri Lorie, and Zafar Iqbal, International Monetary Fund
	4 "Contribution of Workers' Remittances to the Economy of Pakistan," by Zafar Iqal, - and Abdus Sattar, Pakistan Institute of Development Economics
	5 "Exchange Rate instability and Trade," by M. Ali Kemal, Pakistan Institute of - Development Economics
	6 "Interim Monetary Policy Measures," by State Bank of Pakistan May 2008 -
	7 "Inflation Monitor," by State Bank of Pakistan May 2008 -
	8 "Pakistan Energy Yearbook," Hydrocarbon Development Institute of Pakistan 2007 -
[R-9]	http://en.wikipedia.org/wiki/Pakistani_rupee
[R-10]	http://www.ioga.com/Special/crudeoil_Hist.htm
[R-11]	http://www.darvill.clara.net/altenerg/fossil.htm
[R-12]	http://www.darvill.clara.net/altenerg/solar.htm
[R-13]	http://www.darvill.clara.net/altenerg/wind.htm
[R-14]	http://www.darvill.clara.net/altenerg/hydro.htm
[R-15]	Documentary - Mega coty (Sao-Paulo)
[R-16]	http://www.darvill.clara.net/altenerg/geothermal.htm