

Exploration of oil and gas in pakistan



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After brief introductory slides, I shall apprise the house regarding historical perspective of oil and gas exploration in Pakistan; current status of exploration activities and future prospects. I will also touch upon issues confronting this industry. Later I shall present the overall analysis of the situation and present few recommendations as well for the way forward. To start with the acronyms; Abaca stands for Billions Cubic Meter per Annum and MAC is Millions Cubic Feet.

Both the terms relate to the volume of gas. OBOE is Barrels of oil equivalent and TOE is tons of OLL equivalent.

I will present definition of both the terms in succeeding slide. The term E & P refers to exploration and production of oil and gas. Whereas EIA stands for Energy Information Administration and is United States' principle agency which collects, analyzes and disseminates information regarding energy. Now coming over to the definitions; Barrel of Oil Equivalent is a term used to refer to the amount of energy that is equivalent to the amount of energy found in a barrel of crude oil; which is approximately equal to 5.

8 million British Thermal Units. (www. Investigated. Mom) Whereas; Tone of Oil Equivalent is considered as an amount of energy released by running one tone of crude oil which is approximately equal to 11,630 Kilowatt Hours refer to the searching for and the recovery and production of crude oil and natural gas. The upstream sector is also known as the exploration and production (E) sector.

The upstream sector includes the searching for potential underground or underwater oil and gas fields, drilling of exploratory wells, and subsequently

operating the wells that recover and bring the crude oil and, 'or raw natural gas to the surface. ([Http://answers. Yahoo. Com](http://answers.yahoo.com)) The Midstream term refers to those industry activities that fall between exploration and production (upstream) and refining and marketing (downstream). The term is most often applied to pipeline transportation of crude oil and natural gas. ([http: maw](http://maw).

[Languages. Co. UK](http://www.languages.co.uk)) The component of oil and gas industry involved in refining and marketing the product is called downstream sector. More generically, the term can be used to refer to any step further along in the process.

([http://www. Languages. O. UK](http://www.languages.co.uk)) Wellhead Price is the price of natural gas or Crude Oil at the mouth of the well. It represents the cost excluding other expenses required to transport and deliver Having covered the definitions, now I shall highlight few facts about Pakistan in the realm of oil and gas domain (Pakistan Economic Survey 2012-13) ([http:// finance. Gob](http://finance.gob).

PC) Natural gas accounts for 49.5 % of total primary energy supply mix of Pakistan. Oil accounts for 15 % of the energy mix. Pakistan is 21st largest gas consumer in the world.

Pakistan was gas sufficient until 2005, but increased demand fostered by lack of alternate fuels coupled with diminishing production constrained by unattractive fiscal terms have resulted in systematic gas and power shortage. The acts reveals the reality that how important oil and gas is for Pakistan for its day to day functioning. After brief introduction of Upstream sector, now I shall apprise the house regarding historical perspective of this <https://assignbuster.com/exploration-of-oil-and-gas-in-pakistan/>

domain. (Lead Gomes) The history of oil and gas in Pakistan dates from the 19th century, when the country was still part of undivided India, under British rule.

The first exploration well in the region was drilled in 1887, in Minimal, followed by thirteen wells in Balloons, which produced 25,000 barrels of crude during 1885-1892.

Later the combined efforts of Anglo-Oil Company (COCA) and Burma Oil Company (BOCA) resulted in oil being produced in several fields in the Photograph region. After the independence of Pakistan in 1947, the Government promulgated the Regulation of Mines and Oilfields and Mineral Development Act of 1948 aiming at accelerating exploration and production activities in the country.

In 1952, gas reserves estimated to be over 10 Trillion Cubic feet were discovered in the Sue Balloons. Following the natural gas discovery at Sue; the Government of Pakistan signed gas concession agreements with several international oil companies including Standard-vacuum Oil (1954), Hunt International Oil (1955), Shell Oil (1956), Sun Oil (1957) and Tidewater (1958) - leading to significant gas discoveries in several fields.

However, since the discoveries didn't bear oil, exploration activities declined leading to the Government decision to undertake hydrocarbons exploration directly through newly established state owned companies, including Oil & Gas Development Corporation (GOGH), established in 1961 and later incorporated as GOOGOL. The other main government controlled company,

Pakistan Petroleum Ltd (PL) was first established in 1950, under the control of BOCA.

Later on in 1997 BOCA sold its equity in PL to the Government of Pakistan. Successful exploration campaigns opened new gas provinces in Kinds, Punjab and Balloons, but all onshore.

As per statistics of September, 2012; a total of 810 exploratory wells have been drilled (since inception), of which 794 are onshore and 16 offshore. After introductory historical perspective, now in succeeding slides; I will cover major oil and gas explorations undertaken in Pakistan since its inception. (wry. Dawn.

Com dated 12 July, 2012) As already highlighted; the first oil field in independent Pakistan was discovered in the biggest natural gas field in Pakistan for years, was discovered. In 1955 Commercial drilling and exploring of Sue gas field was started.

Later in 1964 Toot Oilfields, located in the Photograph region of Punjab were found. However, commercial production from Toot Oilfields started in 1967. 1976 was the year of discovery of Doodads gas field in Punjab. Whereas, Union Texas Pakistan discovered oil field in lower Kinds in 1981.

Inheres Danni gas field, located about 135 SMS in south-west of Islamabad, was discovered in 1983. Tango Adam oil field, located in Hydrated, was drilled and completed in 1984. Year 1986 witnessed the peak in oil production from Toot Oilfields Inch was 2, 400 barrels per day.

Moreover, Chaw Anural field, located 90 SMS away from Islamabad, was also discovered in June of 1986. Danni gas field started commercial production in December 1989. Whereas; Quadruped gas field was discovered in Kinds in 1990.

It remains the third largest gas field in Pakistan. In 1994 Raja oil field, located in Jaguar Khan, was discovered. Chance oil fields located in Cyber Buckwheat started oil production in 2004. In 2006 Meal oil fields Nerve discovered in the area of Chat.

NASHUA oil fields were discovered in 2009 in Kara district of Cyber Buckwheat.

Whereas very next year Sheehan gas field, was discovered in Chat. Now coming over to PRESENT status of Upstream sector of Pakistan There are varying estimates as far as Pakistanis undiscovered oil and gas reserves are concerned. As per US Energy Information Administration (EIA); Pakistan has proven reserves of around 0. 28 Billions Barrels of Oil and 24 Trillion Cubic Feet of Gas. However, as per report published in Economic Times dated 28 August, 2013 : [www.](http://www.economists.com)

[Economists. Com](http://www.economists.com)); there are 9 Billion Barrels of Oil and 105 Trillion Cubic Feet of Shale Gas reserves in Pakistan.

Whereas estimates of Lead Gomes from Oxford Institutes for Energy Studies depicts that there are 3. 6 Billions Barrels of oil and 66.

3 Trillion Cubic Feet of gas reservoirs (Lead Gomes). Whatever the estimates are; it is evident that large amount of Oil and Gas reserves of Pakistan are

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yet to be discovered. During course of the presentation; we would see how little has been tapped so far. Now we will see brief overview of explored crude oil reserves and their production trends.

As per statistics published in Pakistan Energy Book 2012 (<http://hide.com>); there are total of 150 oil fields giving indigenous production.

Original recoverable reserves from these fields were around 1,052.

385 Millions Barrels. Presently balance recoverable reserves from these fields are approximately 341.932 Millions Barrels. The biggest Reserves are in Manical in KIP estimating to 24.3 Millions Barrels. The next view foil indicates that the oil production during last couple of years remained stagnant except year 2011-12 when slight rise in production was observed.

Remained in negative. Resultantly, putting burden on import bills to meet demand of around 0.4 millions barrels per day as per estimates of US Energy Information Administration.

If we narrow down the analysis to province level; the trends of oil production in Pakistan as published in Pakistan Energy Book 2012 from period 2006 to 2012, show that 02 Fields in Balochistan; Such had negative and 09 positive growth rate. Most of 09 fields in KIP had positive growth rate. Whereas; most of 28 fields of Punjab experienced negative growth rate.

Similarly majority of the 100 fields of Sindh had negative growth rate. The statistics published in Pakistan Energy Book 2012 regarding production status of gas; it reveals that there are total of 146 gas fields across Pakistan.

The Original recoverable reserves of non-associated gas from these fields were estimated to be 56. 0196 ETC.

As per static of Pakistan Energy Book; Pakistanis balance recoverable non-associated gas reserves from the explored gas fields are now 26. 65084 ETC. The biggest explored remaining reserves are in Quadruped estimated to be 3. 26811 ETC and that of Sue are 2. 52 ETC. Additionally, Pakistan also has 0. 26259 ETC balance recoverable reserves of associated gas from around 44 fields against original recoverable reserves of 1. 35961 ETC.

The statistics on the view foil show that the production of non-associated gas is on the rise since 2006 to meet the growing demand. However, resultantly the reserves are depleting rapidly. Whereas the production of associated gas is on decline as flashed. However, the net production of gas is ever growing since 2006.

The year wise trend of growth rate in terms of production of non-associated and associated gas is shown on next viewless. Annual growth rate of non-associated gas remained positive for last couple of years except 2010-11. But in case of associated gas; a continuous trend of negative growth rate is being observed since 2006.

The statistics also reveals that the annual growth rate of production of gas has seen surge in year 2011-12 after negative growth rate in 2010-11. Trend analysis of associated and non associated gas fields presently producing gas; reveals that out of 94 fields of non-associated gas and 36 fields of associated gas; most of the fields are showing negative growth rate.

However, non-associated gas fields had shown positive Annual Cumulative Growth Rate of 2.3 %; whereas, associated gas fields had negative Annual Cumulative Growth Rate of -18.2 %. The preceding scenario entails that the present reserves of oil and gas are minimizing.

On the contrary the demand / consumption of gas and petroleum products is ever rising. The import bills for petroleum products is inflating thereby putting more burden on foreign exchange reserves of already weak economy. Moreover, there has not been any significant breakthrough in terms of major successful upstream discovery in recent past. However, it is heartening that oil and gas development activities during 2011-12 showed progress as compared to preceding year. During this year, 21 exploratory seven gas fields were discovered following a success ratio of 1: 3.

3.

The production of gas increased by 227 Millions Cubic Feet Per day and reached all time high of 4259 Millions Cubic Feet Per Day. Similarly, oil production moved up from 65,866 barrels per day in 2010-11 to 67140 barrels per day in 2011-12. (Pakistan Energy Book 2012) Another important aspect is that on 21 January 2014 Government of Pakistan provisionally awarded 50 petroleum exploration blocks to eight companies including both local and foreign companies as follows (MINOR).

We hope that the renewed efforts shall result in new discoveries. Summary of blocks awarded

Company Name	No. of Blocks
F Blocks Oil & Gas Development Company Limited	29
Pakistan Petroleum Limited	10
Pakistan Oilfields Limited	Mari
Petroleum Company Limited	Ocean
Pakistan Limited	Oil & Gas

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Investments Limited AY Hajj Enterprises (Pit) Ltd releases Resources Inc. MOVE (Pakistan) Exploration G.

M. B. H Rota I NOW coming over to the FUTURE PROSPECTS According to American Energy Group official website ([http://www. Egg. Net/](http://www.Egg.Net/)); With regard to Pakistan in-country opportunities, experts view Pakistan as a country with realistic potential for the discovery of large oil and gas reserves.

Previously perceived as containing far less oil and gas potential than the Arabian Peninsula countries, Pakistan has never received the extensive exploration efforts required to fully explore [ears, a significant number of well known international oil and gas operators have moved into Pakistan. These operators include BP Amoco and Premier from the United Kingdom, BP from Australia, China Oil from China, MOVE from Austria, Patrons from Malaria, MOL from Hungary and Shell Oil from the Netherlands. Oil and Gas Journal (<http://www. G>].

Com) states that keeping in view Pakistanis proved reserves of natural gas, it ranks among top twenty five countries in the world in relation to proved reserves of natural gas. There is also geological data which suggests that Pakistan is blessed with hydrocarbon producing structures which mirror those of the Arabian Peninsula. Modest success rate of discoveries versus Upstream drilling also supports the position that Pakistan is a geologically sound location in which to focus exploration efforts.

However to exploit the hidden potential of Pakistanis oil and gas reserves; there is dire need to adopt multi faceted approach to attract local and foreign investors. Now prior to analyzing the overall situation; I shall discuss <https://assignbuster.com/exploration-of-oil-and-gas-in-pakistan/>

challenges faced by upstream industry in Pakistan. The biggest deterrent to investment in the oil and gas exploration in Pakistan is the deteriorating security environment particularly in Balochistan and KP provinces.

The menace has spread to other parts of the country as well. Therefore foreign investors are fearful and reluctant to invest.

Despite having some high potential prospects; large reserves remain grossly unexplored especially in Balochistan and KP. Another challenge faced by upstream industry is the Political Instability in the country.

It needs no emphasis that International companies only invest in countries having political stability. In a country like Pakistan; a political change can bring change in policy thus leading to huge loss to the investor. Therefore least an investor can ask for is the political stability to ensure continuation of policies for security of their investment.

Unfortunately, this has been a weak area for Pakistan since inception.

Another hindrance in growth of the industry is the aspect of Policies and Incentives. As we can appreciate that Oil and gas exploration is a high cost, high risk and technology intensive business and unless attractive incentives are offered international companies having finances and latest technology; will not be interested in investing in the country. Major oil companies also prefer to invest in countries with well defined policies and transparent procedures for award of exploration contracts.

In addition to its foundation legislation, the 1948 Regulation of Mines and Oilfields and Mineral Development Act, the Government of Pakistan has

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regularly issued successive Petroleum policies; the first of which was in 1991. Subsequent policy improvements were issued in 1993, 1994, 1997, 2001, 2007 and 2009.

While Pakistan had well defined petroleum policies; but the incentives offered failed to attract big players. Apart from host of factors influencing or attracting the investors; the single most important factor in attracting investment and making the country a preferred destination for international companies is the wellhead price.

Although not at the top; Pakistan remained competitive in the region but failed to attract major players Lets now have an overall analysis of the Upstream sector. To start with State of Foreign Investment As we know that like any other sector; foreign companies can only be attracted in Upstream sector; if conducive and enabling environment is provided to the investors. Main components of the conducive and enabling environments are Friendly sustained policies, Financial security, Competitive environment, political stability and security.

The first three factors pertain to policy matters and will be covered separately.

The last two have been point of concern for Pakistan for decades as a nation state. However, we can say that now Pakistan is on the track to gradually attain political stability and enforce writ of state to ensure security for the investors. Pakistan has introduced various policies in the past for attracting investment in E & P main; however, due to numerous reasons; and security

situation being one of the most crucial aspect, the response has not been in commensuration to the potentials of the country.

However, it is expected that incentives offered to investors through Petroleum policy of 2012 (Lead Gomes) shall bring dividends. A glimpse of this we have seen through award of 50 exploration blocks to local and foreign investors.

As regards to the Long Term Policy Matters The Economic Advisory Council set up by the Government of Pakistan mandated an Energy Expert Group to prepare an Integrated Energy Plan for providing a short, medium and long term strategy for ensuring energy security of the country.

Expert Group came out with integrated energy plan ([http://www. PC. Gob. PC](http://www.PC.Gob.PC)) in 2009 outlining guidelines for energy security of Pakistan through 2022.

The areas covered by the study group includes Exploration & Production, Natural Gas and LNG, Oil (including Refining, OMC, LAP and Ethanol), Power (Hydro, Thermal, Transmission and Distribution), Coal , Alternative and Renewable (Wind, Solar, Mini-Hydro, Bio-Mass, Bio-Diesel) and Nuclear.

The objective of the plan as stated in the report of the group is “ to provide a road map for Pakistan to achieve greater energy self sufficiency by pursuing policies that are sustainable, provide for energy security and conservation, and are environmentally friendly. ” It is fundamental requirement for Pakistan to ensure economic growth of country and raise human development level; which obviously is not feasible without overcoming

energy challenges facing country today. Therefore, it is paramount that energy needs of all sectors of society are met in sustainable manner.

Moreover, Pakistan has to rely more on indigenous resources to ensure competitive prices and self reliance.

Roth rate through to the year 2022 and wants to ensure greater self reliance, then the least what Pakistan should ensure is to increase its primary energy supply twofold and its electricity generation capacity/supply three times from 2007-08 levels. But if Pakistan continue ' business as usual', the import bill for meeting our energy requirements would increase from USED 12 billion in 2007/8 to USED 41 billion by the [ear 2022 based on crude oil price of USED 70 per barrel.

Keeping in view volatile international market prices of oil; the import bill can sky rocket if the prices increase or Peak Rupee devalues. The objective set by Energy Group has set target of import bill to \$ 17 billion by the year 2022. Therefore, the country needs to maximize use of indigenous resources. As per statistics; Pakistan needs to increase power generation capacity to 50,000 MM by 2022 from the current power generation capacity of around 14,000 MM.

Similarly the existing demand for Natural Gas is 4.5 Billions Cubic Feet and if policies are not aligned to realities; the demand is likely to reach to 10.2 Billion Cubic Feet by the year 2022. Similarly, due to depleting reserves; the supply of natural gas is likely to be reduced to 2.7 BC. It is therefore essential that the demand be prioritize so as to reduce it to 6.

6 BC by 2022. Subsequently, policies and plans must be developed to increase indigenous production of Natural Gas to a minimum of 5 BC by 2022. Now coming over to Exploration and Production Exploration activity for oil and gas on modern lines commenced in Pakistan in the sass and some small oil fields were discovered in the Photograph area.

However no significant discovery was made until 1952 when the Sue Gas Field with reserves was explored. Over the years; many sizable and a large number of small gas fields were covered but there was no success in finding any significant oil deposits.

In 2008 Pakistanis gas production peaked at 4. 0 billion cubic feet per day while the oil production was only 70, 000 barrel per day. Consequently Pakistan has been termed as a gas rich sedimentary area. Extensive studies have been carried by geologists to determine the oil and gas potential of Pakistan in its onshore and offshore zone.

In the sass a study placed the potential at 40 billion barrel oil and 200 trillion cubic feet of gas. However with the advancement in technology and availability of more data from drilling and seismic activity across the country these estimates have been scaled down as have been flashed earlier during the presentation.

From the given preview it is obvious that a healthy potential exists for finding more gas in the country. So far most of the gas has been discovered in Sins and parts of Balloonists contiguous to Kinds and Punjab.

In recent years oil and gas was discovered in KIP with a sizable discovery in the Tall block near Chat. Although several prospects exist in the area; however, all Punjab, with the exception of Potato basin, the exploration efforts have been fruitless due to the shallow basement in most of the province. While Kinds has been extensively explored yielding handsome discoveries. It may be noted that 70% of the country's current gas production comes from Kinds.

However, only a fraction of the sedimentary area of Balloonists has been tested primarily due to adverse security environment.

Only 40 of the 700 exploration wells drilled in the country have been drilled in Balloonists which comprises 45% of Pakistanis land mass. Besides security, lack of infrastructure and water has inhibited exploration in Balloonists due to high cost of accessibility and operations in remote area. Similarly in the offshore economic one, stretching over 250000 sq km, only 16 wells have been drilled so far. Although existence of a petroleum system was proven in some wells no commercial discovery has been made in the offshore.

High drilling cost is the major inhibitor in offshore exploration.

Cost of an offshore well drilled in deep water in year 2008 was around US\$ 70 million. This is at least four times the cost of drilling onshore. It is the view of the Energy Expert Group that Pakistanis GAP is expected to grow between the range of 3. 5 to 5.

0%; and energy demand over the next 15 years is expected to grow to 122.46 Motes by the year 2021-22. Domestic energy resources, Inch supplied 43 Motes in 2007-08 are expected to produce 88 Motes by 2021-22 as per Energy Expert Group estimates.

But If we maintain the 'business as usual' attitude, Pakistan is certain to face a large and growing energy deficit during the next 15 years. The major portion of this deficit would have to be met through imports of Hydrocarbons which Pakistanis limited foreign exchange reserves will not be able to afford.

This is why it is imperative for Pakistan to have radical rethink of energy policy while focusing on self reliance and diversifying the energy mix. Due to the large transmission and distribution gas grid in Pakistan, Natural Gas will continue to play a major role in Pakistanis energy mix.

Apart from maximizing indigenous resources; Pakistan will therefore need to arrange gas imports both through cross-border gas pipelines and in the form of liquefied natural gas (LNG) to meet the deficit. However, it is in the country's national interest to develop its domestic energy resources including increased onshore and offshore oil and gas production; apart from ensuring sustainable development of the Tar coal reserves, Alternative & Renewable resources as well as in the Nuclear sector. Despite these efforts Pakistanis dependence on imported energy is expected to stay more or less at 30% of its energy supply.

Finally I shall present few RECOMMENDATIONS which are aimed at attracting investors and accelerating Upstream activities in Pakistan.

The first is the aspect of Improvements of Security Situation. Whatever other situation improves significantly. Although Government of Pakistan is already making all possible efforts to control the menace of terrorism and other security issues. However, it is recommended that Government should bring all stakeholders onboard, roommate an aggressive policy to curb the elements creating law and order situation in country and then execute the policy in letter and spirit without any exception.

Otherwise the exploration of huge Gas and Oil Reserves shall remain a dream. Second important aspect is to Ensure Political Stability. It is now time for political leadership of Pakistan to take all possible measures to ensure that Pakistan forgets the traces of past and becomes a politically stable state. Political stability not only means that the democratic process continues but also that the policies, which are in est.

interest of country, are sustained to get confidence of the investors.

Otherwise merely having five yearly polling process will not bring any change. rhea third recommendation is to offer good Incentives to Investors. Ministry of Petroleum issued latest E & P policy in January, 2012 with an aim to attract private sector. Various incentives offered include increase in floor price, enhancing of ceiling price, authorization to export of their share of crude and gas subject to Pakistan net proven gas reserves being sufficient to meet projected demands over next fifteen

Hear, allowing E companies to contract with gas transmission and distribution companies and third parties for sale of their share of gas in Pakistan at negotiated prices, permitting E companies to request

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government to purchase 90 % of their share of pipeline specifications gas through a nominated buyer, authorization to E companies to retain right to sell 10% of their share of pipeline specification gas to any other buyer with prior consent of the Government.

However, it is imperative for Pakistan to critically evaluate results of these initiated measures and bring necessary amendments and improvements wherever required.

Pricing is another very important factor which can be a linchpin to attract the investors. Historically, in the energy sector; the major issue that Pakistan faced was related to the pricing of fuels and other sources of energy. To attract investment, there was a need for greater transparency of the pricing mechanisms.

In revised E policy of 2012; Pakistan has increased the well head price to attract international companies. However, Pakistan must monitor its dividends and review the price to make it competitive in the region.