

Case Studies on
Oil Industry

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OVERVIEW

Oil¹ is a precious energy source. It, fulfills 40% of the global energy needs², is one of the oldest in the world as well as one that affects the world economy. Oil provides the raw materials for many essential chemical and industrial products³. The industry, in recent years, has been characterised by rising oil consumption, declining crude production and low reserve accretion.

There are two major sectors in the oil industry – upstream and downstream. In between, there is one more sector called midstream. The midstream sector processes, stores, markets and transports commodities such as crude oil, natural gas and natural gas liquids (NGLs) such as ethane, propane and butane. However, midstream operations are usually included in the downstream category.

The upstream sector involves the processes of oil exploration⁴ and drilling. Exploration of oil is conducted both on land and on the continental shelves across the world. Over the decades, drilling technology has advanced greatly, allowing oil producers to access more deposits, thus resulting in an increase in reserves.

The downstream sector involves refining, transporting and marketing of oil and oil products. After the crude oil is extracted from oil wells, it is transported to the production units through pipelines, train cars, large oil trucks, etc. At the production unit, it is processed and refined into different products that include liquefied petroleum gas (LPG), gasoline, jet fuel, kerosene, middle distillates including heating oil and diesel fuel, residual fuel oil and asphalts. These products are then transported to their actual points of sale – from where they are supplied to the eventual consumers. Oil products are also used in the chemical industry to produce petrochemicals.

Both the upstream and downstream sectors are subject to stringent operating criteria such as environmental and safety regulations, and product specifications. Most oil companies specialise in any one of the specific functions either in the

¹ Oil (crude oil or petroleum) is a flammable liquid containing a mix of different hydrocarbons that occurs naturally in deposits, found mostly beneath the surface of the earth. It is formed from organic material, buried deep within layers of rocks, which decomposes in the absence of oxygen, to form petroleum. The organic material is formed from the remains of plants and animals, which over millions of years have fallen to the floor of shallow seas, and have been covered by sediment layers (salt, sand, clay and others).

² <http://www.mbendi.co.za/indy/oilg/p0005.htm>

³ Intermediate products such as ethanol, ethyl chloride, methanol, styrene and butadiene, which evolve during the production of petrochemicals, are used in the manufacture of other products such as plastics, synthetic fibers and synthetic rubbers. Oil derivatives are used in the preparation of products such as candles, paints, carpets, soaps, perfumes, balloons, margarines, cassettes, insecticides, telephones, crayons, nylon ropes, toothbrushes, deodorants, nail polish, lipstick, polyester, and many more.

⁴ The process finds the oil existence and is a very expensive exercise as it involves seismic surveys and the use of advanced technology (such as laser and satellite) to detect oil deposits.

upstream or downstream activities such as exploration, oil drilling, oil field services (help in setting up oil wells), pipelines (construction), equipment markets and gas stations (petrol pumps). However, a significant number of companies are also integrated into other upstream or downstream businesses. But, most of all global oil majors have vertically integrated operations ranging from oil exploration (upstream) to end-marketing (downstream). The level of vertical integration of larger companies gives them a huge advantage over medium and small oil industry players. This enables oil majors to exert monopoly power; thus the oil market cannot be considered a competitive one.

Since the world's oil reserves are limited and their distribution is uneven (with countries consuming most oil having less oil reserves), the business of oil has had high political significance. By the turn of the 20th century, the oil industry pegged around a handful of vertically integrated oil companies with access to huge crude oil reserves.

Evolution of the Business of Oil

The oil industry's history dates back to over five thousand years, when oil seeping out from the earth was used in waterproofing boats and baskets, lighting and paints in the Middle East. It was also used for building mortar, roads, but was primarily used for medication.⁵ The evolution of modern oil industry began only in the mid-19th century.

Then, whale oil was used as a major source of fuel for lamps and for making candles in many parts of the world. During this period, petroleum was obtained by skimming it from ponds and by distilling coal. As the demand for whale oil increased, the global whale population decreased rapidly. As the supply of whale oil fell, its price increased phenomenally.

In these circumstances, the quest for a long-lasting, affordable and readily available alternative to whale oil, resulted in the discovery of land oil reserves. The modern oil industry was thus born in 1859, when Edwin L Drake, a former railroad conductor, dug the first oil well near Titusville in the US. Soon, the oil exploration business spread across the world. The first oil refinery was set up in 1861, in the US. Since the late 19th century, many oil companies have been established; these include Standard Oil (which later split into 34 oil companies including Exxon, Mobil, Chevron, ARCO and Amoco), Texaco, Shell and British Petroleum. A majority of oil discoveries in the 19th century were in North America, mostly in the US.

⁵ "History of oil industry", <http://www.rigjobs.co.uk/oil/history.shtml>

During World War II, oil played a major role in international politics since it was vital to conduct mechanised warfare. This, coupled with the threat of Soviet Union that emerged as one of the global powers during World War II, made the US and its allies (Britain, France and Germany) move to the use of oil over coal to fuel their industrial growth in the post-war period. Till that time, the US had been self-sufficient and could also meet 90% of Europe's oil needs. However, after the late 1940s, rapid growth in oil consumption forced the US to import oil, as its resources could not meet the growing demand. During this period, the focus shifted to the Middle East, which possessed about two-fifths of the world's known oil reserves. The cost of oil extraction was much lower in the Middle East, compared to other parts of the world. As a result, countries including Saudi Arabia and Kuwait began flooding the world with their oil supply in the late 1950s. This oil was priced lower than that of other countries, resulting in a sharp growth in oil consumption across the world. The economic growth of the industrialised world became vitally dependent on access to oil.

As demand continued to grow, oil companies began to look for oil below the seabed. The first oil wells to be built in open waters were in the Gulf of Mexico. In 1959, the massive Groningen land gas-field was discovered in the Netherlands. Geologists estimated that the same rock formations might be found beneath the southern North Sea basin in UK waters. Gas was discovered off the English East Coast in the 1960s. New fields were explored in ever deeper and wilder waters, like the Atlantic Ocean west of Scotland. In 1969, oil exploration really began in the North Sea. The subsequent development of the North Sea is one of the greatest investment projects in the world.

The period between 1948 and 1972 was termed the 'golden age of oil' as world oil consumption during this period increased fivefold. While oil consumption in North America tripled during this period, it grew 11 times in other places. This clearly indicated the growing importance of oil in people's lives across the world. Oil changed the way of life and work in developed countries, by spurring mass use of motorised vehicles, use of synthetic materials and access to electricity. As a result of its commercial importance, the oil business boosted the economies of many countries during this period.

In 1961, the Organization of Economic Cooperation and Development (OECD) was instituted by countries which were committed to a market economy. Many countries from North America, South America, Europe and Asia became members of OECD, which helped expand free trade and cooperated in matters of international economic importance, such as dealing with the OPEC oil cartel. OECD developed

strategies to curb OPEC's power in determining the oil prices and to cope with the looming energy crisis⁶.

Though the Middle East had huge oil reserves, it could not reap very high profits because oil prices were determined by the refineries and OECD. This system benefited only the refineries, and not the oil-producing countries. This led to the formation of the Organization of Petroleum Exporting Countries (OPEC)⁷ in 1960, to unify and coordinate the petroleum policies of the 12 major oil producing and exporting countries. OPEC set production quotas for each of its member states. By setting production quotas, it was able to regulate the supply of oil and thereby manipulate the global oil price. Thus, OPEC began to control the oil business to ensure benefits to its own members. This was noticeable in 1974 when their embargo⁸ on oil caused the price of crude oil to soar.⁹

As part of the embargo, the Arab nations cut their production levels drastically, resulting in a much reduced oil supply during the period. However, though the embargo was targeted at only the countries supporting Israel, it ended up affecting the global oil industry; it created a fear of oil shortage in the world, prompting countries to increase their oil storage levels. The reduced production and increased demand for oil resulted in a drastic increase in oil prices during this period; global oil prices increased fourfold (from \$2.90 per barrel to \$11.65). Oil-dependent economies across the world were severely and adversely affected.

As a result of this crisis, the Western countries started focusing on oil security and conservation, and promotion of alternative energy sources – to reduce uncertainty arising out of volatile oil prices in the future. They undertook initiatives to conserve oil resources. These mainly included reforming oil security laws, insulating homes better, improving energy efficiency in industrial processes, making automobiles with higher mileage and searching for alternative fuels for automobiles. These initiatives, coupled with many other factors, reduced the OPEC's power to a certain extent in the next few years. The embargo was lifted in 1974 and OPEC increased production quotas in 1975 to bring down the oil prices.

By the early 1980s, OPEC was no longer able to regulate the supply of oil effectively and the oil industry moved closer to a market-driven, competitive era. Oil was even floated on the New York Mercantile Exchange (NYMEX) in 1983. As oil prices

⁶ In 2004, OECD had 30 member countries, with a shared commitment towards market economies and democratic government.

⁷ OPEC was formed by five founding members, namely Iran, Kuwait, Iraq, Saudi Arabia and Venezuela. Later on, Qatar, Indonesia, United Arab Emirates, Libya, Nigeria and Algeria also joined it.

⁸ In 1972, Syria and Egypt started a war on Israel and many countries including the US supported Israel in the war. As a result, in 1973, many oil exporting Arab countries imposed an oil embargo on the countries supporting Israel.

⁹ <http://www.mbenidi.co.za/indy/oilg/p0005.htm>

continued to tumble, OPEC decided to lower its production quotas to stabilise prices between 1982 and 1985. After many OPEC nations reneged on their production quotas during this period, Saudi Arabia (as the largest producer) tried to compensate and prevent further falls in the oil prices by reducing its own production. However the situation did not improve. Saudi Arabia was not able to bear the brunt of reduced oil production for long and it more than doubled its production in 1985. As a result of this, oil prices plummeted to below \$10 in mid-1985.

By 1986, OPEC countries rose above their internal differences and tried to stabilise the prices by setting new production quotas. However, by then, oil production in non-OPEC countries increased, because of which the impact of OPEC's actions on world oil prices reduced. Since 1986, oil prices did not fluctuate very widely. The OPEC was now more of a price-taker in the market, and sought to ensure oil price stability by responding quickly to the market's requirements. World oil consumption increased during the 1990s (to 6.2 million barrels per day between 1990 and 1997). But the oil industry faced many ups and downs on account of factors such as the Iraq-Kuwait war, collapse of the Soviet Union, the Asian Financial crisis, and increased oil exports from Russia in the late 1990s.

Unable to withstand the increasing competition and bear the high R&D costs, many independent, small and medium companies in the industry went bankrupt. Many countries in Europe and Asia privatised their oil industries, to attract foreign investment and step up economic growth. Apart from this, during the late 1990s, the industry experienced a phase of consolidation, with many major oil companies merging. Some major oil mergers during this period were those of Exxon with Mobil (ExxonMobil), British Petroleum with Amoco and Arco (BP), and Chevron with Texaco (ChevronTexaco).

At the turn of the 20th century, oil prices had soared to more than \$30 per barrel. This was mainly due to economic recovery in many countries across the world, and production cuts by OPEC as well as non-OPEC countries.

Oil Industry in the 21st Century

In the early 21st century, it was estimated that the world's 300 largest oil fields contained three-quarters of the world's oil reserves. The remaining 25% of the oil reserves were distributed across thousands of smaller oil fields. Oil companies typically concentrate on extracting oil from the largest potential deposits first. Major oil reserves were located in the Persian Gulf, North Sea, North and West Africa and the Gulf of Mexico. Among the 90 oil-producing countries, five countries in the Middle East had two-thirds of the proven world oil reserves. According to

reports, the original recoverable oil from the earth is estimated at 2,330 billion barrels of which about 90% has already been discovered and 50% has been produced. Reports also state that in 2000, the world was consuming four barrels of its known reserves for every new barrel discovered. In other words, while 22 billion barrels of oil are extracted annually, only 6 billion barrels of new oil reserves that can be used in the future are discovered to compensate for the oil extracted. In 2000, the oil depletion rate was estimated at 2.2% per year. The gap between the consumption and discovery of oil is increasing, taking the world towards a deficit in oil, which is why oil is referred to as a non-renewable energy resource.

In early 2000s, North America, Oceania, Western Europe and the Far East consumed 77.5% of the oil industry's output, while they produced 44.4% of it. However, these places contain only about 12.5% of the world's total oil reserves. In contrast, the Middle East, which has about 65% of the world's oil reserves, produced about 30%, while consuming only 6% of the world's supply.

Between 1992 and 2001, the global production of petroleum increased by 9.5 million barrels per day, at an average annual growth rate of 1.5%. Saudi Arabia, the US and Russia were the largest producers of petroleum in 2001, jointly accounting for about 31.7% of the total global petroleum production.

These countries were followed by Iran and Mexico, which jointly accounted for 9.9% of the world's production. Saudi Arabia and Russia are the largest exporters of oil today. In 2001, the US retained its position as the world's largest consumer of oil (19.6 million barrels per day), accounting for 25% of the world's total consumption. It was followed by Japan, China, Germany and Russia. In 2003, oil prices were expected to skyrocket on account of the US-Iraq war. However, both the OPEC and non-OPEC countries produced more oil and made it available in the market, resulting in stability of world oil prices. In early 2004, the price was hovering about \$32 per barrel.

In early 2004, the major global oil companies were BP Plc. (UK), ExxonMobil (US), Royal Dutch/Shell Group (UK/Netherlands), ChevronTexaco Corp. (US), and Total SA (formerly TotalFinaElf). BP is the world's largest integrated group with proven reserves of 18.3 billion barrels of oil equivalent. ExxonMobil is the second largest, with proven reserves of 21.2 billion barrels of oil equivalent. Royal Dutch/Shell Group is the third largest oil and gas group with proven reserves of about 15.2 billion barrels of oil equivalent.

Royal Dutch/Shell Group is a joint venture between Royal Dutch Petroleum (60%) and Shell Transport and Trading (40%). ChevronTexaco is one of the largest

integrated oil companies and the second largest in the US, with proven reserves of 12 billion barrels of oil equivalent. Total SA (South Africa) is also one of the largest integrated oil companies with proven reserves of 11.4 billion barrels of oil equivalent.

There is fast growing oil consumption in the non-OECD Asian countries. The non-OECD Asia (including both India and China) accounts for around 40% of the total increase in world oil use. The gap between demand and supply is set to widen unless major gas discoveries are made. The growth of the gas/LNG imports are very closely intertwined with the power sector, and the competition, and, perhaps, to an extent of replacement of coal as the preferred fuel. The setting up of Natural Gas import infrastructure would depend to a large extent on the ability of the power sector to pay for gas as against the cheaper coal, or an alternative fuel.

The world oil consumption has increased by 1.2 million barrels per day in 2005, even after the increase of 2.6 million barrels per day in 2004.¹⁰ In 2004, China's oil use increased by 0.9 million barrels per day and, at the same time, its demand increased by only 0.4 million barrels per day in 2005. Oil & Gas Journal, in its report, has shown that the world oil reserves are estimated at 1,293 billion barrels as of January 1st 2006.¹¹

Because the world's population is growing and living standards are rising worldwide, energy consumption globally is expected to rise by more than 50% over the next 25 years. But finding supplies to match that growth is going to be increasingly tough, and will require vast new investments in the coming decades.¹²

There are accumulating risks to energy production, including rising geopolitical barriers, inflation in costs, dwindling petroleum engineers, and growing constraints on carbon dioxide emissions.¹³

According to the International Energy Agency, which collates data from all oil-producing countries, peak oil will arrive between 2013 and 2037, with production thereafter expected to decline by about 3% a year. While oil from conventional sources is expected to decline, more and more is expected to come from unconventional supplies found in oil-rich rocks, especially in the US and in deposits of tar found in Venezuela.¹⁴

¹⁰ <http://www.economywatch.com/world-industries/oil-industry.html>

¹¹ Ibid.

¹² Jad Mouawad, "Oil Industry Offers Sobering Outlook on Supply", <http://www.nytimes.com/2007/07/18/business/18end-oil.html?ex=1342411200&en=5892c76468cf72ca&ei=5090&partner=rssuserland&emc=rss>, July 18th 2007

¹³ Ibid.

¹⁴ John Vidal, "Analyst fears global oil crisis in three years", <http://www.guardian.co.uk/oil/story/0,11319,1470330,00.html>, April 26th 2005

These trends in the industry will lead to a series of important implications and questions for managerial executives. This case study volume discusses the evolution of the global oil industry since its inception and details how industry forces and political business environment affected oil companies and the industry trends. It also details how each player revived their strategies, to survive in the industry or to retain their market share.

This book contains case studies of different companies that were chosen to illustrate a range of important issues in competitive situations in the oil industry. Companies examined in these cases allow the reader to systematically analyse the important types of strategic decisions. Based on the analysis, various decisions are taken up. Each type of decision raises its own economic and administrative issues. The strategic decisions highlighted in the case studies are:

- **Major Capacity Expansions:** The decision to commit resources as a substantial addition to the firm's capacity, whose success depends on future industry conditions and what competitors choose to do
- **Vertical Integration:** The extension of the firm's scope of operations through either forward or backward integration
- **Entry:** The decision to enter a new industry through acquisition or internal development
- **Divestment:** The often painful decision to withdraw from the industry
- **Mergers and Acquisitions:** Agreements among firms in the same industry including supply agreements, joint ventures and cross-licensing.