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**CRUDE OIL IN THE 21TH CENTURY AND REAL  
DEPENDENCY ON OIL.  
NEW TECHNOLOGIES AND METHODS FOR HEAVY OIL  
EXTRACTION**

*Key words: Crude Oil, wells Drilling, oil pipelines, tar sands, heavy oil, refining capacity, bitumen*

There was always need for oil since the most ancient times and has been mentioned by most ancient historians since the time of Herodotus. It was used chiefly as a liniment or medicine, not as a fuel. Further use of oil in ancient times, was when ancient man started coating their boats with oil. Bitumen kept them from leaking. The practice quickly spread around the world. Currently, we use oil in all of its form. As a fuel, oil was originally used as kerosene for lighting, replacing animal, vegetable and coal oils. Its biggest use, however, came with the development of the automobile. Today almost all forms of locomotion cars, trucks, buses, trains, ships and airplanes are fueled by oil, diesel or gasoline.

Oil and oil products are moved by ship, barge, truck, rail and pipeline. The oil transport system is global, including super tankers and continent crossing pipelines. As a fuel, oil is used primarily in the form of gasoline and diesel to power vehicles. Since the smoke emitted from the oil refineries is hazardous to humans and animals, the crude oil refinery is usually located far away from residential areas where proper facilities are available for waste disposal and the infrastructure should be suitable for the storage of the end products and shipment. The different Types of Crude oil have variations in viscosity and appearance from one oil field to another. While all Types of crude oil are basically hydrocarbons, there are differences in their properties, especially in the variations in the molecular structure.

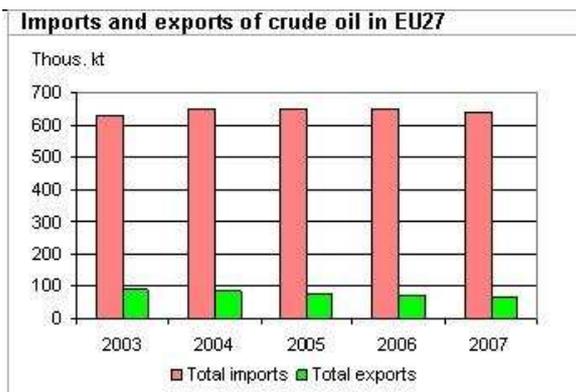
Established in 1960 OPEC, with five founding members Iran, Iraq, Kuwait, Saudi Arabia and Venezuela, took over a decade to establish its influence in the world market. Thus OPEC takes active participation in improving the global economy and to supply oil to the consumers at a reasonable price. At present, the twelve member nations include Algeria, Ecuador, Angola, Iran, Iraq, Nigeria, Kuwait, Libya, Saudi Arabia, Qatar, United Arab Emirates and Venezuela

While China is the second largest consumer of oil, its robust economy continues to excel with a growing trade surplus despite high oil prices.

Oil exporting countries are in a unique position to benefit from world demand for petroleum products. On the following list, only Russia, Norway and Mexico are not members of OPEC and therefore have limited say in setting oil prices.

Given the limited reserves of oil in the Member States, the EU is a net importer of crude oil. Net imports comprised the largest share of crude oil inputs into EU refineries. However, in refined petroleum products EU27 imports and exports are close to balance: the EU has to import gasoil (mainly from the Russian Federation), while it exports its excessive gasoline (mainly to the United States of America). In total, European Union countries lead the world by importing about 18 million barrels of oil each day. However, no single European nation comes close to matching American demand for foreign oil. Germany's oil imports amount to less than a quarter of international fuel shipments to the U.S.

Even though Germany is a leader in developing alternative energy sources like wind and solar power, Deutschland remains heavily dependent on imported oil. The world's leading exporter depends on oil to make leading luxury automotive brands including Mercedes-Benz, BMW, Volkswagen, Audi and Porsche.



[http://ec.europa.eu/energy/observatory/oil/import\\_export\\_en.htm](http://ec.europa.eu/energy/observatory/oil/import_export_en.htm) (1)

Major oil producing countries in the Asia region include Azerbaijan, Bangladesh, Indonesia, Kazakhstan, the Partitioned Zone located between Saudi Arabia and Kuwait, and Thailand. Net oil-equivalent production of more than 1 million barrels per day during 2009 in these countries represented more than about 40 percent of the companywide total. Caspian Sea contains about 100,000 million barrels of oil. It also contains over 35,000 million cubic meter of flue gas. Daily extractions of crude oil and gas and transportation of them are the main pollution sources of the Caspian Sea. The Caspian Sea is the largest inland body of water in the world. It washes five countries: Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan. A significant part of it is located in the Caucasus. Azerbaijan also has heavy oil resources.

Because Crude oil is one of the most demanding commodities in the world. The highly volatile nature of crude oil has forced many companies to move away from crude oil industry.

The prices of crude oil are often monitored by economists around the world and they pass crude oil news to the leading companies in crude oil industry. The consumption level of crude oil has increased is increasing continuously every year.

Many factors influence the price of crude oil. But the basic influence is the demand and supply, which often helps in a self price correction method. Some of key factors for oil price fluctuations are :Instable political situations in oil exporting countries (Middle East, Persian Gulf), investment slowdown, weak dollar, weather and investor demand. Drilling procedure: Onshore drilling generally requires low investments and bear lower economic risks. Offshore drilling consumes over 65% of the planned investments before the extraction process commences, increasing the risk of losses.

Recent studies have shown that it would be increasingly difficult to meet the growing demand for oil across the globe in coming years. As a result oil prices are expected to shoot up at exponential rates. Oil pipelines are the safest transportation system used for carrying oil to markets, large reserve facilities or refineries. Not only are they an economical way to deliver oil, oil pipelines can transfer large quantities of crude oil across long distances.

Some of the major oil pipelines of the world are:

- Petronet, Africa
- Big Inch, North America
- Transpetro, Latin America
- Druzhba, Europe
- Baku-Tbilisi-Ceyhan pipeline, Asia

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Oil pipelines have always been an issue of concern in the context of geopolitics and international security. An example of disputes that have occurred due to the route of oil pipelines is that between Russia and Ukraine, where pricing and debt issues resulted in Russian gas supplier Gazprom discontinuing supply to Ukraine.

The most common method of crude oil extraction is drilling. Drilling is not an overly complicated process however a standard method has been developed to provide maximum efficiency. The first step of the process involves drilling into the ground in the exact location where the oil is located. Once the casing is properly perforated a tube is run into the hole allowing the oil and gas to flow up the well.

Oil can also be extracted from oil sands, often called tar sands. Oils sands are typically sand or clay mixed with water and a very viscous form of crude oil known as bitumen. The extraction process for oil sands is quite different from drilling due to the high viscosity of this extra-heavy oil. Rather than using drills, crude oil is extracted from oil sands through strip

mining or a variety of other techniques used to reduce the viscosity of the oil. This process can be far more expensive than traditional drilling and is found in high abundance only in Canada and Venezuela. As oil demand continues to rise, and reserves become depleted, oil sands could provide one of the last viable methods for extracting crude oil from the Earth. Global demand for crude oil has been rising steadily over the past 20 years. Almost 50 percent of the crude oil that Canada produces is classified as heavy oil, which is denser, thicker and, more costly to produce and refine into other products. The market price for heavy oil is only about one-half that of light crude oil, which is the price generally quoted by the media.

The first Heavy Oil study was produced in 2007 and focused on North America. It reveals the role of heavy oil in the overall world energy supply over the next 20 years and incorporates both upstream and downstream information. Integrating up- and downstream activities is particularly important for heavy oil as operators need to know that there is refining capacity for their production and refiners need to know what will be coming their way in the future. Interest in Canadian heavy oil remains high, with many international players buying into the country's acreage. Canada is widely seen as the global technology leader, and several Canadian oil sands technologies are now starting to be applied elsewhere, such as SAGD pilot projects in Russia. Canada is, however, expected to provide the biggest increases in production rates, having established the momentum to stay ahead of the rest of the world.

Heavy fuel oil is considered more environmentally hazardous than other marine fuel oils because it is slow to break down in the environment, particularly in icy Arctic waters and coastal areas to reduce the EU's contribution to global warming and ensure reliable and sufficient supplies of energy. The most far-reaching reform ever of European energy policy, the package aims to make Europe the world leader in renewable energy and low-carbon technologies. In the North Sea, in areas such as West of Shetlands, high oil prices are encouraging operators to bring several small fields into production up to 15 years after their discovery. Norway is producing the Grane heavy oil field, making it currently the largest heavy oil producing country in Europe.

In Africa, most of the current heavy oil activity is offshore Angola, where new reserves are being discovered and brought into production. Madagascar has significant heavy oil and bitumen deposits and the country is very interested in developing them, particularly as it has few other hydrocarbon reserves. Australia produces heavy oil from two small fields. Most of the new projects are light oil or natural gas, and it is unlikely that it will become a significant heavy oil producing area. Parts of Russia, China, and Syria have great potential, as

does Madagascar where heavy oil development is new and reasonable terms are being offered to develop resources. Azerbaijan which is located in South-western Asia also has heavy oil resources, which are not exploring yet due to the high cost. In Canada in the province of Saskatchewan, vast heavy oil resources are only beginning to be delineated. Regardless of the technology used in the field, the important matter for portfolio managers to remember is that, unlike lighter crudes, heavy oil is not a commodity. Although the amount of heavy oil being produced each year will grow. Adding heavy-oil reserves to a portfolio will not bring a rapid increase in production. The upfront capital expense can be far greater than the cost of developing a conventional field, and the payout takes much longer. The portfolio manager's goal, thus, is not for a high rate of return short term, but to secure long-term cash flow. The high cost of production is just part of the story. Heavy-oil producers in North America have had to become part of the supply chain by investing in pipelines to deliver, and refineries to process their oil. That makes financing a problem. Bankers are used to paybacks of 10 or 15 years, not 30 to 50 years. The fact remains that heavy oil is not a commodity.

To develop a new resource, it is important to consider the downstream side. Producers must transform their heavy crude into something they can sell at an attractive margin. That is the strategic decision companies have to make, and it is the most difficult part of the game.

Of the feasibility of the process would likely need to be undertaken on a case-by-case basis, in combination with field trials.

Worlds Heavy Oil Congress recently held in Alberta, Canada in March 11. There were organized sessions about Global Heavy Oil Projects: A regional update on projects and the ability to meet demand, Defining the New Playing Field: Evolving Environmental Policy and Impacts on Heavy Oil.

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