

## THE ROLE OF TNCs IN ENERGY PRODUCTION AND DISTRIBUTION

The production and distribution of energy in its various forms is a highly expensive undertaking. Only companies with sufficient funding can undertake the costly business of locating, extracting, refining and distributing the energy needs of the ever growing population of Planet Earth. The same applies to the research required to locate and exploit new sources of energy.

This role is for the most part taken on by transnational or multinational companies rather than individual entrepreneurs or governments. Such companies often produce wealth greater than many of the world's smaller economies and are seen as a driving force behind much of the economic activity taking place today.

Eleven of the top 20 TNCs are involved with power production and distribution (Figure 1). This shows the importance of this sector of industry and the revenues that can be gained from it. These include companies from China and Russia, which, prior to the breakdown of communism, were directly controlled by the state. Today they operate in the broader sphere and like their western counterparts, operate on a worldwide scale.

Oil and gas are the driving force behind the world economy. TNCs are constantly looking at ways of increasing their reserves of these finite fossil materials. This requires highly technical and innovative ways of locating new sources of oil and gas in particular and ensuring that once retrieved it can be safely transported from source to refinery to market. Such companies require the services of geologists, engineers and skilled workers to ensure that this process operates as smoothly as possible and without environmental harm occurring. This has not always been as successful as hoped as seen with the disasters in Alaska in 1989 with the *Exxon Valdez* tanker or the explosions on a Transocean-owned rig operating in the BP-operated field in the Gulf of Mexico in April 2010.

Figure 1: The major TNC/MNCs involved in power production and distribution and their overall position in the ranking of the top 20 TNC/MNCs in the world

Rank	Company	Products	Revenue 2012 US \$ (Billions)	Headquarters
1	Exxon Mobil Corporation	Oil and Gas	482	Irving, Texas, USA
2	Royal Dutch Shell	Oil and Gas	481	The Hague and London
4	Sinopec	Oil and Gas	441	Beijing, China
5	BP	Oil and Gas	388	London
6	China National Petroleum	Oil and Gas	378	Beijing
7	Saudi Aramco	Oil and Gas	356	Dharan, Saudi Arabia
9	State Grid Corp of China	Electricity	265	Beijing
10	Chevron	Oil and Gas	253	San Ramon, California, USA
11	Conoco Phillips	Oil and Gas	251	Houston, Texas, USA
13	Total	Oil and Gas	215	Courbevoie, France
18	Gazprom	Oil and Gas	158	Moscow

### The process from discovery to delivery

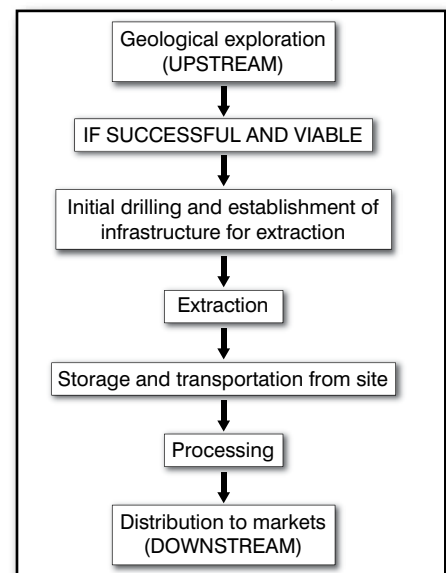
The whole process from discovery to exploitation of an economically viable reserve of either oil or gas is both lengthy and expensive. It needs the might of MNCs, or an equivalent-sized company or country, with sufficient financial wealth and expertise for it to be seen through. Figure 2 summarises what such companies have to do before the supply of either oil or gas can occur.

Two companies are going to be discussed in detail. BP, based in London, and Gazprom, based in Moscow, are similar companies but with very different origins.

#### BP

BP is the fifth largest company in the world and is one of the six major oil and gas producers. It is a vertically integrated company, which means that it not only explores for, produces, refines and distributes its products, but is also involved with petrochemicals and power generation. In a world where the green agenda is a priority, BP is also involved with biofuels and wind power.

Figure 2: A simplified flow diagram illustrating the processes undertaken by MNCs in their quest to locate, extract and distribute oil and natural gas



As a company it operates in over 80 countries. It produces 3.3 million barrels of oil equivalent per day and has proven reserves of 17 billion further barrels of oil equivalent. BP operates 20,700 service stations worldwide (Figure 3) and is the second largest producer of oil in the USA. The company also has a 19.75% interest in Rosneft of Russia,

Figure 3: A BP petrol station near Windsor, Berkshire



Source: Paul Sheppard

the world's largest publicly traded oil and gas company, by hydrocarbon reserves and production.

In many countries, BP just sells its products, but in 25 countries oil and gas exploration and/or production are taking place. BP has the expertise to explore and extract oil and gas products in many contrasting but harsh environments. It currently has nine deepwater exploration blocks in **Angola's** territorial waters. They also operate offshore in the Nile delta of **Egypt** where they are responsible for the production of 15% of the country's oil and 40% of their gas production. Similarly BP operates in **Azerbaijan** with a number of partners including Socar, where they extract most of the country's oil from their sector of the Caspian Sea. In **the Netherlands**, BP operate the second largest oil refinery in Europe.

BP was the first company to drill for oil in the North Sea and the first to explore for oil in Alaska, USA, again two harsh but contrasting environments.

In the **UK**, BP employs over 10,000 people and it operates 40 offshore oil and gas fields, owns four onshore terminals and has constructed a pipeline capable of transporting 50% of the oil and gas produced in the country. 200,000 barrels of oil are extracted from the North Sea daily and new technology is enabling the company to further invest in the region with £10 bn being invested in oilfields such as Clair and Devenick by 2017. At Saltend by Hull, BP operates a petrochemical plant producing acetic acids and acetic anhydride for use in the chemical, pharmaceutical and textile industries.

30% of BP's business takes place in the **USA**, where \$55 bn has been invested since 2007, making it the second largest oil and gas producer in the country. Its main bases are in **Alaska** and the **Gulf of Mexico**.

On 20 April 2010, BP's *Deepwater Horizon* platform suffered an explosion which killed 11 people and discharged 4.9 million barrels of oil into the Gulf of Mexico. The sea floor well or oil gusher spilled oil for 87 days until it was eventually capped on 15 July 2010. To counter the effects of the oil spill, BP employed skimmers and floating booms to contain the oil spill as well as using controlled burning to disperse the oil. Some 1.84 million US gallons of corexit oil dispersant were also used to control the spread of the oil.

This spill devastated hundreds of miles of coastline and threatened people's livelihoods as well as damaging the marine and coastal ecosystems, especially in the estuaries and wetlands which border the coast. In November 2012, BP accepted responsibility for the accident and pleaded guilty to manslaughter in relation to the 11 deaths. The company also funded a \$20 bn trust for claims against the company and to rectify the ecological damage caused by the oil spill, which was the largest-ever accidental spill in the history of oil exploration, extraction or transportation.

However in October 2013, the US appeals court halted some of the payments due to be paid to what were considered to be non-legitimate claims. This refers to businesses that appear not to have suffered damages as a result of the accident but which had claimed compensation. Claims

Figure 4: Shah Deniz Alpha Gas Platform, Caspian Sea, Azerbaijan



Source: BP Press

in excess of \$42.6 bn had been submitted, but Judge Brown of the US appeals court considered that many were unlawful and detrimental to BP.

The accident and subsequent claims have not prevented BP from continuing to invest \$4 bn annually in the region and this figure is guaranteed for each of the next ten years. It has enhanced its safety and risk management strategies to ensure that further accidents of this type do not occur again. What it does illustrate however, is the problems involved in searching for, extracting and transporting a product which is vital to the world's economy in such difficult environments.

Offshore exploration is, however, only one of the extreme environments in which such multinational companies work. Other examples are illustrated below both with BP and Gazprom.

In Alaska, BP operates 13 oilfields and four pipelines. These all operate under Arctic conditions with extremes in temperature, daylight and wind. Together with a mountainous terrain and a fragile tundra ecosystem, the operating conditions are challenging. Not only this but also the classification of much of the land as wilderness and National Park means that the operating conditions are even more complex. Pipelines had to be built above the frozen tundra so as not to melt the permafrost and also not to block the paths of wildlife.

Figure 5: Gazprom Natural Gas and Oil Production between 2005-2011

	2005	2006	2007	2008	2009	2010	2011
Natural gas (BCM)	555	556	549	550	462	509	513
Crude oil (m tonnes)	9.5	34.0	34.0	32.0	31.6	32.0	32.3

Source: Gazprom in Figures

A resource only becomes a resource once it can be exploited and only when all of these barriers were overcome was BP allowed to open their oilfields. The pipelines were essential as Alaska does not boast a great demand for oil being only sparsely populated. Oil had to be transported to the coast for shipping to the lower 48 states of the USA for refining and later use. This is an example of the vertical integration mentioned when a company not only extracts a product, but transports and later refines it at a suitable location.

The same applies in the Gulf of Mexico. Here the Caribbean Sea which experiences a five month hurricane season, affords new challenges for the extraction process and the subsequent piping of the oil to shore for later refining.

### Beyond finite resources

BP Biofuels is a branch of the company which investigates and produces renewable energy. In December 2012 a further \$350 million was announced to expand their tropical sugar cane mill located in Edeia, Goias State in **Brazil**. This will enable 5 million tonnes of sugar cane to be processed annually producing 450 million litres of ethanol equivalent. Ethanol is an alcohol produced from the fermentation of products such as sugar cane and sorghum and can act as a replacement for petrol normally used in cars. It is said to reduce greenhouse gases by 90% compared to petrol.

BP take such environmental concerns as greenhouse gases seriously and this is seen as a way for such a major player in the energy production sphere to influence and bring about change, especially as such products are renewable and not finite.

## Gazprom

**Gazprom** has very different origins to BP and is an MNC which emerged from the break-up of the former USSR or Soviet Union.

Gazprom, classed as a Russian company, was formed in 1989

following the collapse of the former Soviet Union (Figure 5). It is the largest extractor of natural gas in the world and the fourth largest oil producer in Russia. Originally a state-run company in the former Soviet Union, it was semi-privatised following the Soviet Union's break-up. This removed it from total government control. However, the new Russian government remained a major decision-maker for the company, owning 38% of its shares since 1997. A further 10.74% was purchased in 2005 for \$7 billion from three Gazprom subsidiaries and meant that the company once again came under government control. The removal of government restrictions on foreign investment, allowing up to 10% of a company to be purchased by foreign investors, led to Gazprom being listed on the London and Frankfurt stock exchanges.

Gazprom can be classed as a multinational company because of foreign investment in it and the fact that it operates in **Algeria and Libya** in North Africa, **Bolivia and Venezuela** in South America, the former Soviet republics of **Kazakhstan, Kyrgystan, Tajikstan and Uzbekistan**, as well as **Iraq and Vietnam**.

It produced 513.2 billion cubic metres (BCM) of natural gas in 2011, accounting for 17% of world production. The natural gas is not only supplied to customers in Russia but also to members of the CIS (Commonwealth of Independent States), and also to Europe. To supply the markets with this product, 158,200 km of gas pipelines have been constructed from the various fields to the markets served by them.

The natural gas fields exploited by Gazprom are located on the **Yamal Peninsula** in NW Siberia, the Far East and on the Arctic Shelf.

Gazprom's operations on the Yamal Peninsula, like BP's oilfields in Alaska, are located in the harsh Arctic environment with permafrost, a fragile ecosystem and in relative

isolation from where the exploitable gas reserves are required. However, its development is integral to Russia's energy strategy up to 2030, aiming to meet both the country's domestic energy needs and as a source of foreign exchange from exports.

Gazprom Neft, 96% owned by Gazprom, is the subsidiary which is responsible for 10% of oil and gas production and 14.6% of refining activity in Russia. The company was established in 1995 and became a private company in 1996 when Roman Abramovich (owner of Chelsea Football Club) and Boris Berezovsky purchased the company for \$110 million.

Most of their activities are located in Siberia, including the regions of Omsk, Tomsk, Tyumen and Irkutsk, where oil extraction and refining take place. Petroleum, produced at the five refineries owned or part owned by Gazprom Neft, is sold in 1,100 filling stations in Russia. A further 500 exist in the former Soviet republics, including Tajikstan and Belarus, altogether making it one of the top three petrol station brands in Russia. Aviation fuel, motor oils and lubricants are also produced.

Exports are via pipeline and tanker with pipelines running to the Black Sea ports of Novorossiysk and Tuapse and Primorsk on the Baltic Sea, whereas for Germany and the Czech Republic, the Druzhba pipeline serves as the method of transport for the oil.

To ensure that environmental as well as economic considerations are met, as well as exploiting the reserves, Gazprom aims to restore land damaged by earlier exploration. It also aims to increase grazing land for reindeer, protect the cultural and archaeological sites of the indigenous population and also ensure that new technologies which create the least disturbance of the natural environment are used.

Yamal is just one of the areas being exploited in Russia albeit the most important. Gazprom's development strategy states that 'as a global energy company (they aim) at building the entire gas chain from hydrocarbons production to their distribution in new markets'

Gazprom are also active in the Barents Sea where the Prirazloomnaya drilling rig is preparing to extract oil by the end of 2013. This rig became newsworthy when four Greenpeace members tried to board the rig to prevent it from further drilling in September 2013. In response Russians seized the Greenpeace vessel, the *Arctic Sunrise*, in international waters and led it to the Russian port of Murmansk. Greenpeace believe the extraction of oil in the Barents Sea could lead to an 'environmental catastrophe', even though Gazprom's published environmental policy and subsequent safeguards contradict such a view.

Such published safeguards have enabled Gazprom to become involved in oil and gas exploration outside of Russia and the CIS. Algeria in North Africa is one such example where they are active in conjunction with the Algerian State Oil and Gas Corporation, Sonatrach. In August 2006 a Memorandum of Understanding was signed to allow the processes outlined in Figure 2 to be developed. At the end of 2008 Gazprom gained the rights to explore 3,250 sq km of the El Assel area, located in the Berkine Basin of Algeria, for hydrocarbons (49% Gazprom & 51% Sonatrach). The first prospecting well was drilled in 2010 and in November 2010 the discovery of retrievable deposits of oil were discovered at 4,400 metres.

Such international activities can, however, create disputes not just between companies but between countries, as seen between Russia and **Ukraine**. Russia supplies 25% of the EU's natural gas and, 80% passes through pipelines crossing Ukraine. A dispute began in 2005 between Ukraine's Naftogaz Ukrainy and Gazprom over gas supplies and prices. Russia claimed that Ukraine was not exporting the gas delivered through the pipelines to Europe but retaining it for domestic use. This was later verified as being true by the Naftogaz Ukrainy and Russia, in response, cut off all supplies passing through Ukraine in January 2006 for four days. This had an effect on European gas supplies and was repeated once again in 2009 when disagreements over Ukraine's debt with Russia led to reductions in gas supply. The result was that 18 European nations experienced shortages of gas and exposed their vulnerability to both supply chain and political pressures on their economies.

Figure 6: Gazprom's Sakhalin-2 oil platform



Source: Gazprom <http://www.gazprom.com/press/gallery/extraction/sakhalin/>

## Conclusion

BP and Gazprom are examples of multinational companies working in the field of exploration, production and transportation of oil and gas to serve the needs of people in the 21<sup>st</sup> century. They have different origins but both operate around the world and are active in very harsh and challenging environments. They aim to safely produce and distribute their products, not the easiest of challenges, and are subject to scrutiny by both governments and environmental activists. Their wealth and experience and development of cutting edge technology enable them to operate successfully around the globe,

and to invest in areas where the government of a country may have the asset but not the experience or the necessary finance to develop it themselves. This further enhances their role as multinational companies and their dominance in the list of the top MNCs in the world today.

## References

[www.bbc.co.uk](http://www.bbc.co.uk)  
[www.bp.com](http://www.bp.com)  
[www.gazprom.com](http://www.gazprom.com) (especially for maps of pipelines)

## FOCUS QUESTIONS

1. On a world map, locate all of the places mentioned in the text in bold. Investigate and describe the problems created in particular by their locations, climates and environments for oil and gas exploration, extraction and transportation.
2. Compare and contrast the workings of BP and Gazprom.
3. How can oil exploration, extraction and transportation become political issues?
4. Why do organisations such as Greenpeace become involved in issues concerning oil and gas exploration, extraction and transport?
5. Use the flow chart in Figure 2 to summarise the work of either BP or Gazprom OR to research Total or another MNC concerned with the production of finite energy resources.
6. Investigate the impact of the Exxon Valdez grounding off Alaska in March 1989.