

A Research Report in Investment in Independent Oil and Natural Gas Exploration: Black Gold is Back

By Russell Hasan

Altenews.com

Introduction

Peak Oil and Its Effects

The Price of Oil

Independent Oil and Gas Companies

Unconventional Oil

Oil Sand

Oil Shale

Unconventional Gas

LNG and GTL

Biogas

Coal Bed Methane

Shale Gas

Tight Gas

Conclusion

Introduction:

As we enter the beginning of the 21st Century, the global economy is entirely dependent upon oil. The cars we drive, the homes we heat, and the electricity we use all depend upon the energy economy, which is dominated by oil. However, it is widely acknowledged among experts that the end of the era of oil may be near. Various statistics support the claim that “peak oil,” a steady and permanent decline in oil resources, may have begun. If that is true, then the global economy, which is addicted to oil, will run out of oil before the end of this century. As the conventional oil reserves controlled by the “Big Oil” companies dry up, the importance of independent oil exploration and unconventional oil reserves will grow, and investors may profit off of this growth. Every investor who seeks to profit off of the energy markets must understand the oil industry, the oil-based economy, and peak oil, in order to capitalize upon the future of the energy industry. It is also necessary to understand natural gas investment, because natural gas, despite being more useful for power plants than for transportation, may last longer than oil, and a post-peak oil economy may transfer to more natural gas usage. This research report gives a general overview of independent and unconventional oil and natural gas exploration, which may be called alternative oil and gas, and the offers conclusions with advice for investors on how to invest in alternative oil and gas.

Peak Oil and Its Effects:

This report will begin with an account of peak oil and its impact on the energy industry. Peak oil, also called Hubbert's peak, is a theory first presented by an American geologist in the late 1950's. In an era in which oil was cheap and plentiful, and there were ample oil reserves both in America and around the world, Hubbert warned that oil reserves were finite and diminishing, and that if production and consumption trends continued that it would be possible for all the oil in the world to be used up in the near future. This would bring about the phenomenon known as "peak oil," in which global oil production would reach a point at which production would peak, and after which production would gradually and steadily decrease until all of the oil is used up. The theory of peak oil is very controversial, with many advocates and many critics, but as will be explained below, it is reasonable to assume that peak oil will happen at some point in the next ten to thirty years.

The theory of peak oil is incredibly important and will have a worldwide impact on technology, the economy, energy, and transportation. The greatest impact is very simple to understand in economic terms. As supply decreases, price increases. Thus, as peak oil happens in oil fields around the world, the price of oil will go up. This will have several effects. First, oil will be more expensive, and oil companies will be more profitable. Second, there are unconventional oil reserves around the world that are more expensive to produce than conventional oil reserves, and as the price of oil goes up, it will become economical to produce that oil. Third, the price of gasoline will go up, and this will impact the global transportation infrastructure that is dependent upon automobiles. This last effect will encourage the development and profitability of alternative fuels such as ethanol, hydrogen, and plug-in hybrids. However, perhaps the easiest way to take advantage of peak oil is by finding the best independent oil companies seeking to exploit unconventional oil and investing in them. By understanding peak oil, it will be possible to invest in unconventional oil before it has reached its prime and thereby see a high return to investment.

Before we examine the statistics relating to peak oil and the peak oil controversy, we must provide some background relating to the oil industry. Oil was made in prehistoric times when small organisms were buried in the ground. Over time, heat and pressure converted the biomass into oil. If there was too much heat, the oil turned into natural gas, and if there was too little heat, the material did not convert into oil. Because of this, oil is only found at a particular depth where the temperature made it possible to produce the oil. Oil is scattered around the world, buried underground in formations of rock. These accumulations of oil are called oil reserves. An individual oil reserve is called a petroleum system. A petroleum system consists of the source, the reservoir, and the trap. The source is the source rock, the rock where the oil formed and is held. The reservoir, also called the migration path, is a permeable rock that enables the oil to be removed. The trap, also called the cap rock, keeps the oil in place. When a petroleum system is found, wells are drilled, liquids are pumped into the well to promote oil flow, and the oil is

pumped out of the well. In technical terms, the factors that determine production are the permeability of the rock and the saturation of the resource.

One of the most important aspects of the oil industry, which most investors should keep in mind, is that the oil reserves of a particular area cannot be directly measured. Instead, the oil industry has a variety of technologies to probe the ground and geological formations in order to estimate how much oil may be in the ground and where the oil may be. Because of this, the oil industry has three categories of classification for measuring the oil resources of a given area: proven reserves, probable reserves, and possible reserves. These three categories are based on the probability of oil being found in the area at that quantity.

Two other factors that play into this is the fact that the amount of oil that can be recovered from a petroleum system changes as the oil production process goes on, and also, even more importantly, the amount of oil that can be recovered in an area at a profit changes based on both the price of oil and oil extraction technology. For example, when a new oil field is found, in the initial stages the oil flows easily and a lot of oil can be recovered. As the production goes on, the oil becomes more difficult to extract, and it also becomes more expensive to extract. Secondly, and more significantly, it is important for the oil investor to understand that there are actually vast quantities of oil in the ground all over the world, and that a small fraction of the present oil is counted among the known oil reserves. This is because only a small fraction of the oil can be recovered for a profit based on the current price of oil and the current oil technology. As peak oil takes place and the conventional oil dries up, the price of oil goes up and there is more motivation for oil technology to develop. Thus, as peak oil progresses, conventional oil production declines, but unconventional oil production, which is more expensive and more technologically challenging, increases to meet the demand for oil.

It is reasonable to assume that oil production will follow a curve similar to the way in which equilibrium changes according to demand and supply. Cars and the automotive infrastructure of roads and gas stations are present around the world as the primary means of transportation. In both rural and urban areas, from the taxis on city streets to the cars that a suburban family depends upon to go places, cars are entrenched as the dominant form of transit, and because of this gasoline usage, and therefore oil demand, is highly inelastic. The supply of oil, on the other hand, is highly elastic, as oil reserves grow when more oil becomes cost-effective to extract. It can be expected that peak oil will open up unconventional oil to profitable extraction, and investors who put money into unconventional oil now may see significant gains when peak oil advances.

In simple terms of economics, oil supply is elastic, while oil demand is inelastic. Therefore, as oil demand rises, oil supply will rise, and the price of oil at the point of equilibrium will go up. The smart investor will be able to profit off the rise in oil prices by investing in unconventional oil and gas.

It is also worth noting that much independent oil and gas exploration is opposed by environmentalists and the environmental lobby. Oil sands require strip mining, coal bed

methane has a high water usage, LNG terminals have security risks, ANWR exploration is blocked by Congress, and oil shale is also opposed by environmentalists. As the demand for energy and the price of oil go up, environmentalists will have to spend more to oppose unconventional drilling, and this will open up more territory for independent oil and gas exploration. Investors can take advantage of this by spotting the independent oil and gas companies that will experience an advantage from more drilling permits.

Now it is necessary to present the data relating to predictions of when peak oil will happen. Since oil data is commonly given with natural gas data, both will be presented. In order to predict when peak oil will happen, it is useful to have estimates as to how much undiscovered oil is left in the ground. The United States Geological Survey (USGS), in its World Petroleum Assessment from 2000, lists oil in billion of barrels and gas in trillion cubic feet. According to their data, which is divided between the USA and the rest of the world, the proven oil reserves that are present, and the oil that has not yet been discovered, are:

Oil in Billion Barrels:

Non-US:

Undiscovered conventional oil, 649

Total: 2659

US:

Undiscovered conventional oil, 83

Total, 362

Worldwide Total: 3021

Gas in Trillion Cubic Feet:

Non-US:

Undiscovered, 4669

Total, 13,493

US:

Undiscovered, 527,

Total, 1908

Worldwide Total: 15,401

The undiscovered oil and gas by region is also given, with oil given in million barrels, and gas given in billion cubic feet:

Russia and surrounding area ("Former Soviet Union"), oil 115,985, gas 1,611,262

Middle East and Northern Africa, oil 229,882, gas 1,369,993

Central and South America, oil 105,106, gas 1,087,521

Asia, Africa and Europe, not significant

Worldwide Estimates, oil 674,200, gas 3,659,700

Paul Roberts, in his book “The End of Oil,” offers details relating to peak oil. He states that the USGS claims that worldwide there are 1.7 trillion barrels proven reserves, 900 billion barrels of undiscovered oil, and an estimated 1.5 trillion barrels yet to be found. Peak oil will happen in 2030, according to those estimates. A more conservative estimate, calculated by a peak oil research group, claims that there are only 1 trillion barrels left, including both proven reserves and undiscovered oil. Peak Oil will take place in 2010, according to that estimate.

The two United States government departments that give geological estimates relating to peak oil, the Energy Information Administration and the United States Geological Survey. EIA is more optimistic than USGS. Both indicate that peak oil in the U.S. has already happened, and that worldwide peak oil will happen within the next thirty years.

Industry analysts are divided about when and whether peak oil will happen. Arjun Murti of Goldman Sachs predicted peak oil in 2007, and oil at \$105/barrel in 2007. James Hubbard of UBS also claims that peak oil is near. Oil exploration expert Peter Tertzakian also claims that peak oil will happen. Daniel Yergin, author of the famous book on the oil industry “The Prize,” does not believe in peak oil, thinks there is much future oil growth left. However, most oil experts agree that peak oil will happen. The major oil company Chevron believes that peak oil will happen, and is promoting itself as an oil company that can cope with peak oil.

The key difference between someone who is close to the conventional oil industry, which is often collectively referred to as “Big Oil,” and someone who is close to the renewable energy movement, is the position in regards to the phenomenon called “peak oil.” Big Oil generally claims that peak oil is a myth, while renewable energy advocates claim that peak oil is coming, and that the global economy and the transportation infrastructure will have to shift away from oil and gasoline and to alternative fuels when peak oil happens. Peak oil will affect the oil that is best and easiest to recover first, such as the light sweet crude and the conventional oil reserves, and it will affect unconventional oil last, because that oil will be the last to be used up. Thus, peak oil will diminish the importance of the Big Oil corporations and increase the value and significance of the independent oil exploration companies that are producing unconventional oil reserves. Renewable energy contrasts itself with fossil fuels precisely because oil and natural gas are not renewable, in that there is a limited and finite amount present for extraction. This means that as the supply of the commodity decreases, its value will rise, and smart investors can take advantage of this. To make the best investment in oil, it is also necessary to have an understanding of the factors that affect the price of oil, and also to understand how the oil industry works, and how independent oil company investments should be approached.

The Price of Oil:

The price of oil has recently seen a sharp drop from around \$75/bbl to under \$60. This drop has been caused by several factors, such as Iran, and the decrease has also affected many industries, for example by pushing ethanol prices down. Business opportunities in alternative energy depend upon the ability of the relevant technologies to compete with fossil fuels. One of the primary alternative energy markets, be it for ethanol, hydrogen, or hybrid and electric cars, is the automotive market. The primary competition is from gasoline, which is made from refined oil. The question that looms on the horizon of alternative energy, the question that everyone in the energy industry wants an answer for, is how high will the price of oil go, and how long will it stay there? The price of oil is also very important for oil investors. We at Alternative Energy News Source list several factors for your consideration below that may have an impact on the future price of oil.

1. Iran: Iran has made it very clear to the West, and to America in particular, that they are going to move forward with their nuclear program. When the U.N. deadline passed and Iran was not attacked, it eased fears relating to Iranian oil supplies and helped lower the price of oil. It is not clear whether Iran wants nuclear weapons, or whether they just want a domestic nuclear energy program. What is clear is that the West, led by America and Israel, do not want to see a nuclear Iran. With America's military devoted to Iraq, it is unlikely that a war started by the USA will break out in the near future. However, a war is possible, and the threat of war should keep the price of oil above \$60/barrel for several years, because Iran will use attacks on Middle Eastern oil infrastructure with their long-range missiles to retaliate if they are attacked, and this would cut oil production in not only Iran, but also Saudi Arabia and the United Arab Emirates. The Iran situation does not look like it will change anytime soon, so the price of oil is unlikely to collapse in the near future. Some analysts have made predictions that if a war with Iran does actually happen then it will bring oil to \$100/barrel, and maybe higher.

It is also unlikely that any Iranian development will further lower the price of oil. Recently the U.N. deadline for Iran to stop enriching uranium has passed. Because there was no immediate U.S. attack, and various countries such as Germany and Russia are against a war with Iran, analysts believe that negotiations will continue for an extended period of time. This has caused oil to drop from around \$75 to around \$60. However, Bush has used strong rhetoric towards Iran that is similar to the pre-Iraq war speeches, America and France are both supportive of a war with Iran, and there are reports that Israel is preparing for war with Iran. America and Israel could attack Iran, and the price of oil will remain sensitive to this threat.

2. Iraq: Several years after the end of the Iraq war, Iraq's oil infrastructure is still not at the level that it once was. Despite an initial military victory, the Iraqi insurgency has prevented any major progress in rebuilding Iraq, and the American planning for the rebuilding was also not very well done. With the majority of Iraq's oil off the market for the next several years, it will be difficult to find any excess oil capacity in the Middle East.

3. The Gulf of Mexico Coast: As the one-year anniversary of Hurricane Katrina is remembered, it is increasingly evident that the American oil refinery capacity and the main American pipelines, which are concentrated in the Gulf of Mexico coast, are in the center of an area that is very dangerous due to hurricanes and tropical storms. Some scientists believe that global warming is increasing the frequency and danger of hurricanes, and evidence of this is presented in the movie "An Inconvenient Truth." Other scientists believe that the bad hurricane seasons are a natural phenomenon. Either way, a hurricane could knock out American refining capacity at any time, driving gasoline prices even higher, and this threat should have an impact on gas prices for some time to come. Hurricane season is annual, so the threat will rise again every year.

There was a recent discovery of new oil reserves in the Gulf. However, this oil will take several years to recover, recovery may not begin until 2010, and based on estimates of oil production and consumption, the oil will only give America one to three years of oil supply, assuming that all the oil is used in America. When worldwide oil demand growth is considered, this new oil is just a drop in the bucket, and it is unlikely to push oil below \$50. There are also ongoing battles with environmentalists about coastal drilling, which may limit any further oil discoveries in the area. This oil may reduce oil prices down to \$60 in 2010, but it will likely not go below \$60, and the price will skyrocket again three years later when this additional oil capacity has been expended. The new Gulf of Mexico oil found is only 3 to 5 billion barrels, and the U.S. consumes 5.7 bb per year.

4. Alaska: The BP pipeline leak has closed Prudhoe Bay, the largest oil field in America and has seriously reduced American domestic oil production. This decrease in oil capacity will probably have an impact that will last at least into next year. It is also clear that ANWR drilling is not going to be allowed anytime soon, so American domestic oil production will not be able to rise to meet growing American demand.

5. Venezuela: Hugo Chavez and his Leftist government are using oil diplomacy all over the world, cutting deals to sell their oil only to governments that support Venezuela's ideology. It is unlikely that Venezuelan oil will reach the U.S. in the near future. There are also reports that Venezuela is having trouble getting their oil to the other countries that they are dealing with, and that the oil industry workers strike often and are ineffective. Chavez has inspired the nationalization of oil resources throughout South America, which may decrease South American oil imports to the rest of the world. Venezuelan oil sand is difficult to recover with the available technology of the region, lowering oil output. Venezuela has the largest concentration of oil reserves in South America, effectively cutting off oil relief from the Southern Hemisphere.

6. Saudi Arabia: Saudi Arabia remains one of the top oil producers in the world, and one of the most reliable. However, it is very possible that Saudi Arabia may be drawn into a conflict if war breaks out in the Middle East. There are also reports that Saudi Arabia may be experiencing peak oil, as some of their major oil fields have decreased production, and their reported proven reserves may be overstated. It is therefore

questionable whether Saudi Arabia will be able to increase oil output to meet expected increases in oil demand. Peak oil in general should cause worldwide oil production to decrease continuously for years, and as oil production slows, oil prices will climb. There is some debate about when peak oil will happen, but it is widely accepted that American production has already peaked, and that analysis of proven reserves indicates that a global peak may happen as soon as 2010, and will almost certainly happen by 2030. A Goldman-Sachs analyst has said that if peak oil has a large impact it could push oil to \$105/barrel within the next several years. Nothing can be done to prevent peak oil from diminishing oil production in the long term, and alternative energy will have an opportunity to replace the lessening oil output to meet the growing energy demands of the global economy. Saudi Arabia, like all OPEC nations, is known to give incorrect and inflated reports of its proven reserves, and Saudi Arabia does not allow foreigners to audit their oil reserve records, making independent verification impossible.

7. Canada: Canadian oil sands have attracted worldwide fame as one of the biggest oil reserves left in the world. Canada is the top oil exporter to the U.S., and it is also the most politically stable oil producing nation. However, America cannot expect Canada to remain its private source of oil resources. Nations from all over the world, and particularly in Asia, are trying to cut deals with Canadian oil sand companies to get their share of Canada's oil. There is also a situation with many mergers and acquisitions among Canadian oil companies. It is difficult to tell where Canada's oil will be going when the dust from the deals and acquisitions settles. Also, oil sand is heavier than light sweet crude and is more expensive to extract, and the price of a barrel of Canadian oil will be reflected in the global price of oil.

8. American oil shale: Oil exploration companies are saying that there may be more oil in Colorado and Utah oil shale than there is in all of Saudi Arabia. However, the American government has not even finalized a system of giving out permits for exploration, and the technology for cost-effective oil shale drilling is still being developed. Oil shale oil is contained in the shale rock, and must be converted into liquid oil at a cost. It is expected that a barrel of oil from shale will be more expensive to recover than in other more conventional oil reserves. It may be a long time before this oil comes to market, and when it does it may be more expensive than was expected. Oil shale, and also oil sand, can only be profitably recovered if the price of oil remains high, so that if excess capacity must come from this sources when conventional oil can no longer meet demand, the price of oil will continue to be high, possibly anywhere from \$70 to \$100/barrel.

9. The American economy: The American economy does not appear to be slowing down significantly, and the American addiction to oil can be expected to keep oil demand up. The American government does not seem close to passing legislation to mandate higher car mileage standards, and the major car companies continue to market gas-guzzling SUVs and light trucks to the public in spite of the high price of gasoline. The American demand for automotive fuel may justify \$60 or higher oil for years to come.

10. India and China: The economies of India and China continue to grow, as many analysts expected, and with more of the people in Asia now driving cars, there is a

growing demand for oil. As these economies continue to expand, the global demand for oil will rise, and the price of oil can be expected to rise along with it. So long as Indian and Chinese oil demand continues to keep pace, oil prices will not fall far below \$60.

11. Coal and natural gas: The two other fossil fuels, coal and natural gas, cannot significantly displace oil demand and lower the price of oil. Coal emits huge amounts of toxic air pollution. Also, coal can be used in coal power plants, but it cannot displace oil-based gasoline as a portable, efficient high-energy car fuel. Coal-to-liquid fuel technologies have some historical basis, but it is not widely believed that it would be practical or cost-effective to convert massive amounts of coal into liquid fuel to augment gasoline. Similarly, it is very difficult to use natural gas as an automotive fuel. The best alternatives to oil-based gasoline are ethanol, hydrogen, and electric or plug-in hybrids, and with gas above \$3/gallon, the time is right to capitalize upon opportunities in alternative fuels. In the power generation markets, coal and natural gas can replace oil, but oil is used primarily to make gasoline, not to fuel power plants, so there is not much usage to be displaced. Also, coal has the additional problem of tremendous air pollution when used in coal power plants.

12. Russia: The Russian government has recently seen an increase in the power of the state over free enterprise, and this has been most extreme in the Russian energy industry. The Russian state-owned oil and gas company has monopolized Russian energy resources, and there is no end in sight to Russian attempts to gain more energy resources. Russia has put pressure on Europe to accept Russian control of the gas in the Russia. In the recent past, Russia has cut supplies to countries that have opposed it, and put pressure on Big Oil by investing in various Big Oil companies. With the Russian oil and natural gas resource under state control, both Russia and Europe will have a growing demand for energy resources.

In conclusion, for many different reasons, people in the energy sector should not expect oil to drop far below \$60 for a long period of time, at least for the next several years, and maybe longer. Oil will likely climb back to \$75 as the Iran situation plays out and global energy demand increases. There is also a decent chance of \$100/barrel oil by 2010, depending on the politics of the Middle East, the effect of peak oil upon oil discovery, and the demand for oil in various nations. In conclusion, all of the above make oil at \$50 nearly impossible, and the range to be expected is \$60 to \$75 for the next few years. Now is the right time for unconventional oil and gas projects to be undertaken with the expectation of being able to make a profit based on the price of oil in both the short term and the long term. These factors make it likely that the high price of oil is here to stay, and investors and businesses should act accordingly.

Independent Oil and Gas Companies:

There are many reasons why investing in independent oil and gas companies is very exciting. The primary reason is the state of the oil and natural gas industry. The oil industry is dominated by a few major multinational oil corporations, which are typically called "Big Oil." The Big Oil companies concentrate their exploration on conventional

oil reserves, using their geopolitical influence to get oil from the Middle East, Africa, South America and elsewhere. This leaves the unconventional oil reserves such as oil sand and oil shale free to be explored by the independent oil and gas companies. Big Oil also concentrates on proven reserves, leaving the more risky probable reserves and possible reserves to the independent companies. Rather than competing with the independent oil and gas companies for the unconventional and more risky oil and gas reserves, Big Oil typically waits for an independent exploration company to have a big find, and Big Oil then acquires the smaller company and exploits the reserves that were acquired. This makes the independent oil and gas market highly volatile, but there is the opportunity for investors reap great rewards if they invest in a small independent oil or gas company that has a big find and is then bought by one of the Big Oil companies. When investing in an independent oil and gas company, the investor is expecting the region that is being explored to yield a large find of either oil or natural gas, which will attract the attention of a Big Oil company. If this happens, the investor should see significant return to investment.

Unconventional Oil:

There are three main types of unconventional oil. The first is oil that is in a standard petroleum formation, but which is in an area that has not been explored. There are many regions of the planet that have oil resources which have not yet been discovered. Because oil can be anywhere, and the scientific methods for detecting oil are not able to find all of the proven reserves and possible reserves, it is possible for there to be oil anywhere. It is necessary to drill and to use the various methods of testing for oil in order to determine where the remaining oil resources are. Because of this, a small independent oil exploration company may choose a location somewhere that has not seen a lot of previous oil exploration, for example somewhere in Asia or the United States, and then explore the area. If by chance a large oil formation is found, the oil company will exploit the reserves and will then become a target for acquisition by a Big Oil corporation. The success of this depends on the technical expertise of the independent oil company's engineers, the geological qualities of the area, and the quality of the oil that is found. All of these factors will determine whether the oil can be recovered at a profit, which will influence the success of the independent oil exploration company. Oil exploration is underway in many different places around the world.

The other two kinds of unconventional oil are oil sand and oil shale. Oil sand is concentrated in western Canada, while oil shale is concentrated in western USA. The next two sections will discuss these investment opportunities.

Oil Sand:

Oil sand is a kind of oil that is very thick and of poor quality. It is also called tar sand. Previously, the technology to recover and convert oil sand into oil cost effectively was not available. Recent developments in technology combined with a high price of oil have

made oil sand recoverable, and prompted high interest in oil sand among energy investors.

The global oil reserves consisting of oil sand are concentrated in two places, Canada and Venezuela. Because of the unstable political climate of Venezuela, most analysts do not consider its oil reserves. Canada, on the other hand, has a very stable political climate. This aspect of Canada's oil compares favorably with the other main oil center, the Middle East, which has a history of unstable political situations.

Oil sand was once too expensive to extract at a profit. Research by the Alberta Oil Sands Technology and Research Authority, as well as Suncor and Syncrude, reduced extraction cost to \$10-15/bbl. Technology included steam assisted gravity drainage (SAGD) and directional drilling of horizontal wells. This made oil sand economically recoverable, which it had not been before. With this new oil counted, Canadian oil reserves went from 5 billion to 179-180 billion barrels. BP counts 17 billion, counting only oil sands "under development." Canada counts oil in "crude bitumen" and "established reserves" instead of crude oil and proven reserves. Bitumen, which contains the oil in the oil sand, is a thick, black substance commonly used for asphalt. It is also called tar sand, although actual tar is made from coal. Oil sand recovery requires a mine to get the bitumen, and an upgrader to convert the bitumen into synthetic crude oil. Strip mining is used to get the bitumen.

The Canadian oil sands are concentrated in the province of Alberta, in western Canada. There are three oil sand deposits: Peace River, Cold Lake (which also has some liquid oil), and the Athabasca oil sands. Athabasca is the largest deposit and the only one with surface deposits that can be strip-mined.

Canadian conventional oil has peaked already, and oil sand is expected to peak in 2020. As peak oil takes effect and global oil reserves decline, Canada stands as an unconventional oil play that may produce significant profits when conventional oil dries up. There is a shortage of labor and housing at Fort McMurray, the main town in the Athabasca oil sand area, which indicates the high growth potential of the area. Most mines, including Suncor and Syncrude, are near this town. The Canadian Association of Petroleum Producers has predicted that by 2020, 90% of Canadian oil will come from oil sand, with total oil production being 1.75 gigabarrels per year.

There are many exciting investment opportunities in the Canadian oil sand. A list of major sand oil plays follows: Syncrude Canada Limited, Suncor Energy, Shell Canada, Nexen, CNRL, Imperial Oil, and SynEnCo Energy and SinoCanada Petroleum Corporation. These and other oil sand companies deserve careful consideration on the part of energy investors.

Oil Shale:

The other kind of unconventional oil is oil shale. Oil shale technology and exploration are still under development, but oil shale has great potential. Oil shale deposits are concentrated in the western United States. It is estimated that there are 1 trillion to 800 billion bbl in U.S. The oil shale is mainly found in the Powder River basin.

Because the oil in oil shale is trapped in the rock, it is twice as expensive to recover as oil sand. Methods and technology for cost-effective extraction and processing are still being developed. Critics also point out that there may be extreme environmental damage from strip-mining in dry land and water usage issues.

The oil shale must be recovered and then converted through pyrolysis (extreme heat without water or air) to convert it to oil. This raises logistical problems that have not yet been solved. Shell has developed method for electrical conversion of oil shale to oil in the ground over time “in situ” to reduce environmental impact and cost, such that it becomes the same as a conventional oil well. Oil shale exploration permits are still being handed out, and oil shale is a young industry. Because of this, there is a high degree of risk for investors, but the energy investor who can find a profitable oil shale company may see very high returns once oil shale technology and exploration matures.

In terms of regions, the Bakken shale in Montana and North Dakota is said to contain a great deal of shale oil. One estimate places the reserves at 400 billion bbl. Because of the large concentration of oil and the permeability of the rock, it is possible to get a lot of oil from a well, and this is an exciting area of shale oil for investors to consider.

Natural Gas:

Natural gas forms historically when oil formations are exposed to pressure and heat, which converts the oil into gas. Gas is found in gas fields, coal beds, and oil fields. It is used to fuel power plants, CNG vehicles, and to make hydrogen. Because gasoline, which is made from oil, is the primary vehicle fuel, natural gas has developed as a fuel for power plants. There is a lot of gas buried around the world, but natural gas usage is limited by transportation and gas lines.

Natural gas production takes place in the U.S., Russia, Asia, Australia, Mexico and Venezuela, China, India, Saudi Arabia, Iran, and some African and European countries. Former Fed Chairman Alan Greenspan has warned that a natural gas crisis in the United States might happen, and that LNG would be necessary to get the natural gas required by the economy. The United States currently uses 22 trillion cubic feet of gas per year, and that could go up as peak oil causes declines in oil usage. Natural gas is also attractive because of peak oil. Natural gas will outlast oil if peak oil happens, according to most estimates.

The National Petroleum Council says conventional gas will peak and unconventional gas will be necessary to maintain production. There are many different kinds of unconventional natural gas that are being exploited. These include LNG and GTL and biogas. Tight gas sands, shale gas, and coal bed methane will all be necessary. The U.S.

Geological Survey says that there is 135 tcf of recoverable unconventional gas in U.S., and 460 tcf total. The Rocky Mountains have high unconventional gas reserves, although unconventional gas resources are scattered around the world. The Rocky Mountains have been called the “Persian Gulf” of unconventional natural gas, because the Rocky Mountains contain tight gas sands, shale gas, and coal bed methane resources.

LNG and GTL:

LNG and GTL are two technologies that have been developed to enable the commercial exploitation of stranded gas fields. Stranded gas fields are fields of gas that are too far away from roads, trains, or gas pipes to be transported to areas where the gas needs to be used. There are stranded gas fields in the remote regions of the Middle East and in various other places. LNG, which stands for liquid natural gas, is a technology in which the natural gas is taken to an LNG terminal and is frozen to the point of becoming a liquid. It is then shipped overseas by LNG tanker and it is taken to an LNG terminal where it is converted back into natural gas for usage in the destination market. There are proposed LNG terminals in California, New York, in various parts of Asia, and elsewhere. GTL, which stands for gas to liquid, is a technology in which the natural gas is converted into a liquid fuel for transportation. There is GTL development in the Middle East and elsewhere. LNG and GTL have not yet developed as a primary means of gas transportation, but investors should know about the high potential that LNG and GTL have as natural gas usage rises in response to higher energy demands.

Biogas:

Biogas is gas made by organic methods. It can be made the gas that arises from landfills, manure, biowaste, and other biomass. Natural gas is naturally released from manure and the garbage in landfills, and this gas can be collected and processes the produce synthetic natural gas. Biogas is a very exciting area in independent oil and gas, and in the energy industry as a whole, because biogas is renewable, in that it can be created continuously. Because it is renewable it can never run out, and as conventional natural gas resources are exploited and used up, biogas will be an attractive option for producing natural gas. Biogas is still in the early stages of development, but the right biogas company could be profitable for investors.

Coal Bed Methane:

Coal bed methane is an exciting area of unconventional natural gas exploration that has a lot of potential and is often overlooked by investors. Coal bed methane is the gas that is trapped in coal beds prior to being degassed. The methane is of similar quality to conventional natural gas. Coal bed methane, which is also called CBM, is a way for energy investors to take advantage of coal mining without investing in coal. Every coal bed must have the gas removed before coal mining can begin. Coal bed methane mining requires technical expertise, and the quality and experience of the engineers involved in the project should be examining by any CBM investors. The most amazing thing about CBM is the surprisingly large quantity of CBM gas that can be exploited profitably.

According to coal bed methane expert Brian Hughes, there is enough coal bed methane to rival or outpace conventional natural gas production.

Two major CBM sites are in the United States. These include the Powder River Basin, in Wyoming and Montana. It is the largest coal region in U.S. Recently it was the site of major coal bed methane drilling. The USPGC says 24 tcf of gas may be present. CBM is also exciting because wells could be drilled for as cheap as \$80,000. The San Juan Basin in Colorado is another CBM site, The USPGC says 10 tcf may be present there.

Shale Gas:

Shale gas is a situation in which the natural gas is trapped in shale stone. The Barnett Shale in Texas is a shale gas play, and some say that it is the largest gas area in the U.S. Because the gas is trapped in the shale, the ability to recover the gas depends on fracturing technology, which is also called fracing. Shale gas has become commercially viable recently with new fracing technology. Other issues with shale gas arise because some of it is underneath the city of Dallas, Texas. Shale gas is an exciting area for investors, but the technology and the location of the wells has to play a critical role in choosing a shale gas company.

Tight Gas:

Tight gas consists of natural gas trapped in reservoirs from which it is difficult to recover the gas. In technical terms tight gas is a kind of unconventional gas, consisting of gas in a reservoir that has stone with low permeability. This can be either tight gas sands or gas shales. As the price of natural gas rises to keep pace with energy demands, tight gas will become more profitable to recover, and investors should keep a close watch of tight gas developments. The most important elements in tight gas recover are the fracturing technology and the expertise of the engineers who work for the company. Basin centered gas accumulation also now plays a role in tight gas recovery.

Tight gas plays an important role in global natural gas markets. Tight gas made up 19% of USA natural gas production in 2004, according to USGS. The U.S. EIA says that tight gas could be 35% of United States gas in the future. The U.S. Govt tried to use a nuclear bomb to get tight gas out in 1969 and 1973, but the gas was radioactive and could not be used.

One of the most significant tight gas areas is the Piceance Basin, a large gas area in Colorado with a branch in Utah. The U.S. Potential Gas Committee says there may be 31 tcf in Piceance. The gas had not been recovered because the low gas price had made it not economically recoverable, but new technology and tight energy supply has made domestic energy more important. A well can cost \$1.2 million, but energy demand should support all forms of unconventional gas exploration.

Conclusion:

A list of the various factors that an investor should consider before investing in unconventional oil and gas follow:

1. The technology that is being employed to explore for and recover the oil and gas resources, both in terms of established fracking technology, and any experimental or new technology in use such as GTL or synthetic oil and gas
2. The qualifications and history of success of the company's executives
3. The technical expertise and qualifications of the company's engineers
4. The location that the company has permits to explore, and the proximity of oil or gas pipelines
5. The geology of the region where the company is exploring for oil or gas, and a wide variety of geological factors that may indicate the presence of oil or gas
6. The cost of drilling a well, and the cost of getting permits to explore for oil and gas
7. The permeability of the rock and the saturation of the resource
8. The price of oil and natural gas, both in the region in which the company operates and worldwide
9. Any news of merger or acquisition activity relating to the company
10. The government of the region where the company operates, both for an indication of the political stability of the region, and also to know whether the exploration company benefits from any agreements with the local government
11. The presence or absence of environmentalists who are legally contesting the development of the local oil and gas resources

There are many alternative oil and gas companies worth considering. A selection from the Altenews list of stocks follows:

Alternative Oil and Gas Stocks:

American Oil & Gas Inc., AEZ

Galaxy Energy Corp., GAX

Houston Exploration Co., THX

Imperial Oil Ltd., IMO

Interoil Corp., IOC

Meridian Resource Corp., TMR

Petroleum Development Corp., PETD

Provident Energy Trust, PVX

Southwestern Energy Co., SWN

St. Mary Land & Exploration Co., SM

Storm Cat Energy Corp., SCU

Suncor Energy Inc., SU

Swift Energy Co., SFY

Syngas International Corp., SYNI.OB

Syntroleum Corp., SYNM

Range Resources Corp., RRC

Rentech Inc., RTK

Talisman Energy Inc., TLM

Terax Energy Inc., TERX.OB

The Exploration Co., TXCO

W&T Offshore Inc., WTI

It takes some luck to find an independent oil and gas exploration company with the right combination of a license to drill in an area that actually has oil or gas resources left that can be recovered profitably, as well as management and engineers with experience and talent. However, because the global demand for energy is so strong and inelastic, and the oil and gas industry is so prone to acquiring smaller companies, if the right company can be found, an investor may see the stock price rise dramatically when oil or gas is found and when the company is acquired by Big Oil. Because of peak oil and the growing demand for energy fueled by the global economy, the demand for oil and gas will only go up in the future, and now is the time for the smart investor to put some money into a good independent oil and gas exploration company.