



ESSENTIAL PETROLEUM RESOURCES' MODERN GUIDE TO INVESTING IN OIL STOCKS (OR HOW TO CASH IN ON HIGH OIL PRICES)

Introduction by John Remfry (Managing Director)

Long before the arrival of the Internet and technology stocks, Australians were making fortunes by investing in oil explorers.

Listed explorers such as Weeks Australia and Santos created fabulous wealth for their shareholders through oil strikes from a single exploration well. Ten-fold increases in share prices were common after a major find.

Of course, fortunes were lost as well. But contrary to investment folklore, finding oil is not a matter of chance. A wide range of factors can substantially boost an explorer's chance of a discovery. Oil exploration – like any commercial endeavour - is about knowing your business and sensible management of risk.

For investors, the oil sector offers real advantages over more popular alternatives at the higher-risk end of the investment spectrum. In particular, it's a much easier business to understand than Internet-based business models or the discovery and commercialisation of biotechnology.

Understanding and knowledge means less risk and greater opportunity to profit. This is the motive behind the publication of Essential Petroleum Resource's modern guide to investing in oil stocks.

It is designed for the millions of Australians who have entered the share market in recent years and have little or no experience with investment in oil stocks. Opportunities to invest in oil explorers have dwindled, although there are still more than 100 companies in the Australian Stock Exchange's energy index.

Publication of the guide coincides with increased interest in the oil and gas sector as a result of record oil prices. This has prompted more Australians to think about how they can share in the windfall gains of some oil explorers and producers through investment in listed companies in the sector.

We hope you find this guide a valuable reference.

1. The Economics of Oil and Gas

Oil is traded at both "spot prices" and on longer term contracts. The "spot price" means that producers sell oil at prices that vary from day to day. The price they receive depends on who is in the market on any particular day, and how much they are prepared to pay. If market prices rise because of reduced supply, oil producers can immediately benefit.

Another feature of oil economics is the US dollar, which is the currency in which oil is traded around the world. This is a bonus for local oil producers, who are paid for their production in US dollars, not depreciated Australian dollars.

Some oil producers are missing the double bonus of high world oil prices and low Australian dollar because they “hedged” or “sold forward”. This means part or all of the oil they produce is already sold at prices below the current high levels. Producers forward sell to guarantee prices. Sometimes this works in their favour, sometimes it doesn’t, depending on the movement in market prices after the decision to forward sell.

The gas market in Australia is different to oil. Gas is sold under long-term contracts at fixed prices per unit. This means gas producers generally have consistent, predictable revenue. Pure gas producers have a low risk profile and behave more like a cash or bond investment. However, many gas producers are also explorers. The chance of gas discoveries adds potential for significant growth in value of the company, with a commensurate increase in their share price.

Our local gas market is maturing following the deregulation of wholesale gas and electricity supplies around Australia. More sellers are set to enter the market as new discoveries are added to supplies, while more wholesale buyers are forming to supply newly competitive retail markets. In time, we can expect gas to trade at spot prices in Australia, just as it is in the US.

2. The Basics of Finding Oil

Discovering oil begins many months and generally even years before a drill rig sinks a well.

First, the broad area of search needs to be selected. The boundaries of the search areas are defined by large geological structures known as basins, often spanning many thousands of square kilometres. As the name suggests, a basin is an area that was lower than the surrounding territory in ancient times. Sediments from oceans, lakes and rivers were deposited in vast thicknesses.

The search for oil is concentrated within the rocks formed by these sediments. Oil and gas may exist in the sedimentary rocks of a basin if large amounts of decaying vegetation were deposited and trapped within the silts and sands to create “source rocks”.

Australia has many basins. Some of these are rich producers of oil and gas, some have yielded nothing. The biggest oil producer is the Gippsland Basin in Bass Strait.

Other large producers are the Cooper-Eromanga Basin in central Australia, the result of a vast inland sea in ancient times, and the Carnarvon Basin off the north west coast of Western Australia. It is home to some of the world’s largest reserves of natural gas.

An oil explorers choice of basin will be influenced by their view of its prospectivity (it’s potential for oil and/or gas discoveries), the amount of exploration that has already occurred in the area and their ability to identify new targets.

Some companies explore several basins at the same time, which may increase the chances of a discovery, but involves higher cost.

After selecting the basin, the next step is to identify “prospects”. This term is used to describe an anomaly or unusual feature beneath the surface of the earth that the explorer believes to be worthy of drilling. Given that a single onshore exploration well costs in the order of \$1 million, an intensive effort is made to develop possible oil and gas targets to “prospect” status.

The development of a prospect often includes a seismic survey, which is not unlike an ultrasound examination of a human body. In oil exploration, a seismic survey reveals the layers and densities of rocks within the earth. New information from these surveys will improve a geologist's ability to identify a prospect using existing information from geological maps and old exploration wells in the area.

Exploration is more difficult than it might seem because rocks in the basin areas are usually folded, faulted and reoriented by powerful movements within the earth's crust over millions of years. There can be several episodes of movement after the source rocks were created, which makes it even more difficult to understand the geological history of the area. Geologists develop "models" or theories to explain how the rocks in the exploration area came to be in their current state. These models are vitally important to predicting where oil and gas might be trapped in commercial quantities.

3. How to Gain Leverage to High Oil Prices

The following check list will help investors identify listed oil and gas companies with leverage to high oil prices.

(i) Is the company in the oil sector or the gas sector?

Many people use oil and gas as interchangeable terms, but there's a vast difference between the two in the Australian market. Oil prices float with changes in the global market, giving exposure to price rises. Gas prices are generally fixed under long term contracts but the newly deregulated electricity market is also exposing gas producers to very high spot prices for peak electricity demand. Many resource companies are in both sectors because oil and gas are sometimes found together. However, find out the split between the company's oil and gas revenues to get a clear picture of the markets they are in.

(ii) Is the company a producer or an explorer?

Companies that are focused on production offer less upside than those with a large exploration effort. Discovery of new reserves is the only way to generate a several-fold increase in a resource companies share price. Find out how much the company is spending on exploration in the short to medium term and how many exploration wells it is participating in.

(iii) Has the company forward sold or hedged its production?

Forward sales to lock in prices are a common practice among oil producers. Unfortunately, it can mean missing on windfall revenue gains from a spike in oil prices. Oil producers should be able to provide you with detailed information on the proportion of their production that has been sold forward, the prices of these sales and the expiry date of the forward sale contracts.

(iv) How many shares does the company have issued?

Some oil explorers have long histories and massive numbers of shares on issue. This means the additional cents per share from higher oil prices or the value increase from an exciting discovery will be less compared to a company with a smaller capital structure.

(v) Are options available?

It's common practice for oil explorers to issue options to buy shares in the future at a fixed price. This can provide large exposure to discoveries with minimal capital outlay. Options were developed by resource companies as a mechanism to call up fresh capital if exploration had yet to make a bankable discovery. Oil company options are usually listed and trade at low values compared to the ordinary shares. The risk with options is the company will not make a discovery before the option expires. In this situation, the investor can either exercise the option, which could mean paying more for shares than the price in the market, or having the options cancelled and losing their small outlay to buy the options. Check the date of the options against the timetable for the company's exploration program. The more wells being drilled before the expiry date, the greater the chance of an upward share price movement that will put the options "in the money". That is, the option purchase price plus its exercise price will be less than the market price.

4. Tips to Reduce Your Investment Risk

The following check list will help investors back companies with a greater chance of making discoveries and reduce their risks.

(i) Does the company offer a spread of exploration and discovery opportunities?

The maxim 'don't put all your eggs in one basket' applies to oil exploration as much as personal investment. In the oil exploration business, this means spreading an exploration program across a number of basins or petroleum systems. Some companies pursue exploration programs in a number of basins, although this can involve high costs and is more complex to manage. Costs can be reduced if a number of companies are participating in a joint venture to explore an area. However, this also reduces share of discoveries and leverage. Some companies spread their risk within one basin by targeting a number separate "petroleum systems" – which are different occurrences of oil and gas from separate source rocks, reservoir rocks and traps.

(ii) How prospective is the area?

Some basins are more prospective than others. Try to find reports from brokers and the industry more generally on the prospectivity of the basin in which your company is planning to search. Have other wells nearby found oil and gas? Were they commercial finds? Can parallels be found between these finds and the prospects that your company has identified? Investors can reduce their risks by backing companies with exploration programs in areas that are known to produce oil and gas because of earlier discoveries. Of course, areas with little or no history of oil and gas may have rich reserves that no-one has found. Explorers in these areas offer the highest rewards, but the risks of not making a discovery are also much greater.

(iii) Is the company participating in enough exploration wells?

Oil exploration wells do not have a 100% success rate anywhere in the world. As a rule of thumb, investors should expect one well in every five to produce a commercial discovery. In some areas, the success rate is much higher. For example, 12 of the first 13 oil exploration wells in the Gippsland Basin hit their target when drilling began in the 1960s.

To reduce risks for their investors, oil explorers should have a program of more than two or three wells. A small program may beat the averages, but the risks of failure are vastly reduced if the exploration program includes at least half a dozen wells.

(iv) Will discoveries be economic to bring into production?

A huge oil discovery thousands of kilometres from the nearest port will be worth much less than a smaller discovery near infrastructure. In fact, there are many examples of substantial oil and gas finds that have been undeveloped for decades because of the high cost of bringing them into production. Offshore discoveries in particular fall into this category more frequently because of the technical, financial and logistical problems of developing an oil or gas field in the ocean. As an investor, minimising risk means ensuring a company has sensible and economic plans to bring any discoveries into production. Exploration closer to infrastructure is much more likely to result in a commercial discovery than exploration in remote areas because the financial barriers to production are lower.

(v) Is there a ready market?

Oil discoveries will always find a ready market, but the same cannot be said for gas. In the south and east of Australia there is strong demand for gas and an increasingly accessible marketplace. Deregulation has made the insular gas markets of each Australian state a thing of the past. Interconnections between the states are increasing and a quasi-national market is developing. However, Western Australia has a different supply picture. The North West shelf provides vast gas supplies to Western Australia, which makes it difficult to find markets for small gas discoveries. Investors should expect to see a feasibility study for marketing production before an exploration program begins.

(vi) Are there environmental or landowner risks that could stop development?

Exploration today requires much more than a geologist and a drill rig. Good companies recognise the importance of responsible management of environmental and cultural concerns in the communities in which they operate. Companies that fail in this area reduce their chances of gaining access to land and may find it impossible to bring otherwise commercial discoveries into production. Ensure that any explorer you are considering has an appreciation of these issues.

5. General Tips - What to Look For in an Oil and Gas Explorer

(i) Good people are paramount

Good people are paramount to the success of any exploration business, as with any commercial endeavor. Excellent technical skills can create a unique competitive advantage, particularly when it comes to developing geological models and associated prospects. Strong planning and financial management skills are also necessary to build companies with a viable purpose and every opportunity to commercialise discoveries. Any company in which you invest should have a qualified and experienced management team. A reputation of past success and a track-record of taking care of investors are also desirable.

(ii) Cash in the bank

Exploration needs faith. Explorers can expect to drill five or more wells before they make a discovery, which can take nerves when an exploration well costs \$1 million or more onshore and many times that offshore. Until a discovery is made, an explorer lives on its cash reserves and the faith of its investors. Ensure any company in which you are investing has the cash reserves to mount a worthwhile exploration effort, or strong partners who can fund and conduct the bulk of exploration on its behalf.

(iii) Leverage to discoveries

Exploration is about the excitement of finding and unlocking the value of potentially vast natural reserves, hidden deep below the surface of the earth. If you're going to back an explorer, make sure it offers plenty of leverage to rich discoveries.

6. Glossary of Terms

Barrel

The unit of volume measurement used for petroleum and its products. One barrel equals 42 US gallons or approximately 159 litres

Basin

An area of the earth's crust which has downwarped and in which sediments have accumulated. It is in such basins that hydrocarbons may be found.

Carried interest

When a company pays for all or part of a partner's costs during exploration or development, usually as a means of acquiring a share of the partner's interest in an exploration licence.

Condensate

A term used to describe hydrocarbons associated with natural gas that are liquid under surface conditions but gaseous in an underground reservoir.

Crude oil

Cubic foot

The standard unit of measure for gas, typically expressed as billions of cubic feet or BCF.

Earth's crust

The crust is a thin, outermost section of the Earth, averaging about 30 kilometres in thickness. Movements within the crust over many millions of years are the primary factor in the deposit, formation and movement of oil and gas reserves within the uppermost layers of the crust.

Exploration licence

Oil and gas exploration in Australia is regulated by state governments. An explorer must obtain a Petroleum Exploration Licence (PEL) or Petroleum Exploration Permit (PEP) to search a particular area. Exploration companies typically share PELs or PEPs.

Farm out

Companies can "farm out" or relinquish part of their interest in a PEP or PEL in return for a commitment by the acquiring company to pay part or all of the seller's share of exploration and development costs (see "carried interest").

Fault

A fracture in the Earth's crust along which rocks on one side are displaced relative to another. Faults can play a key role in creating a zone where hydrocarbons are trapped.

Hydrocarbons

Compounds containing the elements hydrogen and carbon - the basic elements of oil and gas. The presence of hydrocarbons is usually the first indicator of oil or gas deposits. Hydrocarbons are formed in source rocks by the break down of trapped organic material under heat and pressure deep underground.

Lead

An area delineated by seismic coverage in which trap, reservoir and seal may have been identified, but requires further exploration before being suitable for drilling.

Migration

Hydrocarbons are lighter than water, which is always present at the depths where oil and gas are found. This difference begins a process of migration or movement by hydrocarbons towards the surface. The distance and direction travelled by the hydrocarbons will depend on the whereabouts of reservoir rocks and impermeable barriers. Identifying migration paths is crucial to discovering accumulations or reservoirs of oil and gas.

Natural gas

A mixture of light hydrocarbons (generally methane) found naturally in the earth's crust, often associated with oil.

Operator

Exploration permits or licences are "operated" by a nominated party. The operator - usually an exploration company acting on behalf of all interest holders in the permit or licence area - has legal authority to drill wells and undertake production if hydrocarbons are found.

Petroleum system

A petroleum system is an association of source rocks in communication with a reservoir rock in a sealed trap at the time hydrocarbons were formed. It is a combination of all the elements required for an accumulation of oil and gas.

Porosity

Some rock types are porous, usually those formed from ancient sand deposits. Hydrocarbons are found in the pores of these rocks. Porosity (the volume of pore space expressed as a percentage of total rock volume) is therefore an important factor in oil and gas discovery.

Prospect

An anomaly or feature sufficiently defined to warrant the drilling of a well without further investigation.

Reserves

Generally, these are estimated volumes of crude oil, condensate, natural gas liquids and associated substances that are expected to be recoverable from known accumulations. Reserve estimates are based on interpretations of geologic and/or engineering data and can be categorised as developed, possible, probable and proved, depending on the degree of certainty.

Reservoir

Permeable and porous rocks (usually sandstones, limestones and dolomites) capable of containing significant quantities of hydrocarbons.

Risk

An expression of uncertainty (high risk) or certainty (no risk) relating to the presence of the principal geological factors controlling oil accumulations.

Seismic

A method of prospecting involving the generation of sound waves at the surface and recording the reflected or refracted waves from the subsurface the geometry and depth of subsurface rock units.

Source rock

A rock containing sufficient organic matter to be capable of generating oil and/or gas under the right conditions of temperature, pressure and time.

Trap

A body of reservoir rock, vertically or laterally sealed, orientated in a way that allows it to retain hydrocarbons.

Zone

A rock formation lying in a belt between adjacent rock beds. A zone producing hydrocarbons is known as a pay zone.

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