

# NZ energy markets – an upstream view

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## 2003 an overview

2003 was a good year for the oil industry.

A year ago, a general strike in Venezuela, civil unrest in Nigeria and the dual threats from global terrorism and a Gulf War all supported oil prices. 2004 may see a slow production claw-back from these troubled OPEC regions, but an interplay of firming demand and a cohesive OPEC should support mid US\$20's oil prices (down from the plus US\$30 2003 WTI highs). History says that political tensions will put a premium on to oil prices and 2004 may well be no exception.

New Zealand oil/condensate producers have not only reaped the benefits of the international pricing but have also received a favourable exchange rate for some time. However with the recent exchange rate movement those without forex hedging will now be receiving significantly lower returns.

World gas prices have similarly been buoyant, especially in USA where they have been up to US\$8 GJ. Demand for gas is strong around the world and this is being reflected in prices.

The New Zealand gas market has been going through rapid change. With the impending demise of the national treasure, Maui, New Zealand has received a wake-up call, especially in light of the problems dry winters present.

Gas is the hot topic, who has it, who is going to get it, on what terms and at what price. Substitute fuels are being used in some instances, primarily coal, which does not fit comfortably with the government's Kyoto objectives. There is even talk of LNG imports.

But the gas supply picture may not be quite as bad as some suggest. Exploration is ongoing. We do have time to find more hydrocarbons. But the Government needs to clearly focus on this as an important agenda item and work with the industry to ensure we drill considerably more wells.

## Some exploration history

From 1900 to 2003 over 600 wells have been drilled in New Zealand.

However only the Taranaki basin has provided successes which have been able to be converted into commercial production. Post 1900 62% of all exploration wells drilled have occurred in the Taranaki basin and of these 75% have been onshore.

It has been the onshore discoveries which have provided the quantity of discoveries but offshore which has provided the volume of hydrocarbons.

The 1960 – 70s remain the halcyon days of New Zealand exploration with the discovery of Kapuni and the world class

Maui fields. These discoveries remain our two largest discoveries to date accounting for 86% of New Zealand's total hydrocarbon reserves.

These were followed by the useful 1980s – 1990s when the McKee, TAWN, Mangahewa and Kupe discoveries were made. And finally in 2000 the largest offshore discovery post-Maui, Pohokura.

In the next few years we have possibly three new offshore developments coming into production, Pohokura, Maari and Kupe. So things are not exactly quiet on the upstream development front with possibly 3 – 5 new offshore platforms and all the ancillary activity which goes with this.

But, one might ask, surely the Pohokura discovery bodes well for exploration prospects. After all, if something close to the size of Kapuni and a third the size of Maui can be discovered 40 years later, then surely that supports the thesis that more wells will generate more discoveries. Some argue the time has never been better to make gas discoveries. The demand is there, the price is much better, and thus the stimulus to spend and find more gas is a given.

If only it were that simple. The primary difficulty is prospectivity.

In the early stages of exploring any hydrocarbon generating basin the obvious “bumps” are drilled first and a priority is naturally given to the biggest “bumps”. Hence Maui and Kapuni, followed by the smaller McKee, TAWN, and Mangahewa.

We are now at the stage with the Taranaki basin where the obvious “bumps” have been drilled and others discredited by dry holes. Discoveries like Pohokura come from the application of more sophisticated exploration techniques to generate more subtle plays. And of course there is always the unexpected, like Rimu, which demonstrate that gaps do exist in the collective exploration knowledge.

We are now at the more difficult phase of the exploration cycle, risky and high cost, where the probability of success is low.

Added to this is the commercial risk and financial detriment associated with New Zealand’s remote location and associated exploration costs.

## The participants

Over the years a few of the world majors have drilled wells in New Zealand. Shell, BP, Esso, Arco, Amoco and Conoco have all come and gone, or in the case of Shell, about to go.

A number of smaller offshore exploration companies are presently here led by OMV, Swift, Tap, AWE and Origin.

And of course we have our local explorers, Todd Energy, NZ Oil & Gas and Indo-Pacific.

The explorer who has drilled the most wells in New Zealand’s history is in fact the Crown through Petrocorp, having participated in 120 wells. Todd Energy closely follows with 116 wells and then Fletcher Challenge Energy - 105 wells, Shell - 104 wells and BP - 69 wells.

Since 1955, 252 exploration wells have been drilled for a commercial success rate of around 7%.

Interestingly in each of the decades since 1965 a consistent 50 plus wells have been drilled. Approximately one well out of every three has been offshore, but of concern is the fact that offshore exploration, where the larger discoveries are more likely to be made, has significantly reduced in recent years.

The quantum of discoveries has increased in each decade since 1955 but of course, the large ones have increasingly been followed by smaller ones.

For a small country we do have experienced local and international explorers willing to drill wells. The majors may have gone but that is understandable. They are really only interested in “elephants” and on present knowledge there are none to be found. Instead there are likely to be smaller discoveries which may continue to meet the needs of New Zealand’s small gas market.

## Gas supply/demand in New Zealand

New Zealand is not generating sufficient discoveries to replace consumed hydrocarbon reserves.

From a self-sufficiency of in excess of 60% in oil/condensate in the mid 1980s, we now face a self-sufficiency of 29% today.

With gas, the P50 (50% probability) case shows demand outstripping supply in 2010 but the P10 (10% probability) case changes that position to 2015. Of course demand is likely to match supply over time, especially with Methanex able to take considerable swing capacity.

It is a well recognised principle with gas fields that we witness “reserves creep”. This means that as the field moves through its production cycle, a better history match is made with the field reservoir model, and a more reliable reserves forecast can be made. This often results in considerably more gas reserves ultimately being produced than the more conservative original forecasts.

Kapuni is an excellent example of this having had its original estimate of reserves redetermined upwards by 400%.

## Bridging the gap

New Zealand is not alone in the world today facing depleting gas reserves and an energy supply/demand crunch.

For example, the US is already finding itself in a pickle. Short-term supplies are difficult and storage levels are at their lowest since 1976. Prices have moved dramatically but the long-term supply position remains bleak, despite a growing demand for gas. But domestic reserves are mature and recent exploration efforts disappointing.

The fundamentals of the situation in the UK are similar. A large indigenous gas resource has been rapidly exploited, but will soon be unable to keep up with demand. Long-term imports will be required and that is possible given the diversity of European pipeline gas.

Elsewhere in Europe the same problem exists.

The world is hungry for gas. Global production of natural gas is currently some 2600 billion cubic metres annually

(approx. 17 Maui gas fields) and is expected to grow to 4755 billion cubic metres by 2025, an average growth of 2.75% per annum.

## Response of Governments

With the demand for natural gas rising fast, driven by the power generation sector and with a declining reserves to production ratio Governments are starting to be concerned.

The dramatic power failures in recent months in North America and Europe have highlighted the fragility of a number of electricity networks and markets.

Industry deregulation disasters in California and excessive regulatory intervention in other instances have added to the problems. And then on top of that the high profile Enron collapse has further hastened government intervention into energy markets.

In New Zealand our problems are not dissimilar to those being experienced in other parts of the world.

We have deregulated our electricity market with some success. However the State (through its 3 SOEs) has a dominant position in generation and retailing of electricity. The State has a monopoly position in electricity transmission and has under funded the transmission network for some years, causing unacceptable constraints in transmission and unnecessary price fluctuations.

All is not well particularly in a dry year when failure points are exposed. The dry year highlights our shortage of electricity generation which in turn highlights a very tight gas market.

We have one sizeable gas field coming into production in 2006. Australia by comparison has 50 Pohokuras waiting in the wings.

The margin for error is too tight. Our national energy strategy is not risk averse enough.

The Government needs to take some bold moves on the supply side of the equation as other Governments around the world are doing.

Before anyone considers making the massive investment required for LNG it would be prudent to seriously accelerate our hydrocarbon exploration impetus. The government can and must lead this initiative. In the past it has by investing in infrastructure and ultimately in exploration itself, with some success.

It has also provided (at times) an appropriate fiscal regime to incentivise the exploration effort. In my strong view this is the only course to consider today. It is no longer appropriate for Government to risk tax payers wealth drilling wells.

Other Governments around the world are addressing the effectiveness of their exploration regimes and attempting to make them more attractive to explorers.

In Australia, USA, Indonesia, UK to name a few, that momentum is evident.

## What can be done in New Zealand

In essence we have a mature hydrocarbon province where investment terms must be adapted to reflect the rising costs and dwindling profitability of increasingly marginal production.

Maui with its swing, deliverability, low gas price, security of supply has been a wonderful energy source for the nation. But those days are nearly at an end.

Other mature fields will and are facing the Maui dilemma. How long does the producer keep going in the face of rising costs and dwindling profitability.

So what can be done to assist this situation and promote/accelerate exploration in New Zealand.

- a) Government could reconsider its position on ERL and royalties. To forgo the antiquated and inequitable ERL tax would be positive to mature producers. One proposal might be that this occur only where the producer is prepared to spend the forgone ERL and/or royalty on further exploration/appraisal wells, preferably in the existing production licence. This would assist producers to focus on marginal plays, tight gas and deep gas, all expensive, but now is the time to test these.
- b) Government could provide a tax reserve provision to assist in the planning of new developments. The Maui B tax reserve for example, significantly assisted the funding risk of Maui B. With the departure of the majors, smaller companies will very much need the assistance of such measures.
- c) Marginal fields require a more flexible approach from government to the royalty take. What is the use of leaving scarce and hard fought for hydrocarbons in the ground because the royalty take kills the project economics.

With smaller marginal fields this will happen sooner than many realise.

Government needs to send a positive signal that it will reconsider its royalty take in the event of a marginal field.

- d) As an immediate direct incentive a royalty exemption akin to the 1980s Australian exemption from excise tax should be implemented. A royalty exemption for the first 30 million boe should be introduced urgently.
- e) In addition PEANZ have presented a number of other very worthwhile proposals to government to address a range of fiscal issues.

Given the “wake-up” call of Maui, coupled with the very tight and vulnerable energy markets we look to government to speedily engage with the industry to address these issues.

## Downstream market power

Finally the issue of downstream market power needs to be addressed.

Much has been said in recent months by the large downstream users alleging upstream market power. Allegations have been made that the gas industry is controlled by a few.

Nothing could be further from the truth.

The exploration sector is highly competitive with very low barriers to entry.

Exploration success is a function of technical competence, financial resource and perseverance. Some get there and others do not. For those that do it is ridiculous to then criticise them for their success on some trumped up market power charge.

Different fields compete and different owners have different commercial objectives. And there are significantly more gas producers than large users.

New Zealand has a very small gas market by international standards. It has only two large electricity generators requiring gas, both with significant market power. Both of them are reluctant to engage in the post Maui gas market preferring to stoke-up the LNG fires and claim there is not enough domestic gas to meet their requirements.

They then choose to import substitute fuels (granted in some instances this may be necessary, but not always) at prices significantly in excess of what they are prepared to pay for domestic gas.

The truth is that these market dominant buyers want to retain contract benefits they have long been used to from Maui, that is, unlimited swing, optionality, deliverability on tap, security of supply and a low price. Understandably they find it hard to change, but change they must.

The only other significant player of consequence is Methanex and although they are prepared to pay reasonable prices they may be here today and gone tomorrow. But I hope not, because Methanex are a very valuable gas customer, vital to any new significant gas discovery.

The government Policy Statement for the gas industry is generally well conceived. Open access on the Maui pipeline is an urgent priority and any moves to an open tradable spot market would be welcome.

Equally the dis-aggregation of the market power by the two large electricity generators utilising gas is desirable. This could be achieved by the government aggressively encouraging the rapid development of gas fired electricity cogeneration schemes. Not only would this provide the highest efficiency thermal generation it would also ensure generation was being built close to the demand load, with the corresponding transmission savings.

Finally, some of us in the energy business who are vertically integrated from gas production to electricity generation may just prefer to build our own electricity generation as a means to capture a fair value from gas used in electricity generation.

We at Todd Energy originally moved downstream to monetise stranded gas. That move has allowed us the option of where we ultimately use/sell our gas; do we use it ourselves, sell it to our own customers, or sell it to the large aggregators of gas. The jury at this stage is out on that issue.

## To conclude

New Zealand oil/gas exploration is at a crossroad. Our self sufficiency of oil and gas has reduced significantly.

In particular New Zealand needs to be assured of an ongoing gas supply to meet its fuel requirements and its environmental management objectives.

We have a robust infrastructure of treatment plants, processing plants, pipelines and above all people capable of doing the job.

But hydrocarbons are a depleting resource and more have to be found to replace those used.

Explorers have had reasonable success over the last 60 years with a 7% success rate from 252 exploration wells. However the smaller discoveries likely today are only going to be made by companies with more limited resources.

Governments around the world are re-engaging with their upstream petroleum sectors, because many are facing the same problem as New Zealand. The attractiveness of exploration regimes is being re-examined.

In New Zealand too little attention has been paid by Government to the upstream exploration and production sector. That must change.