

# Since we last met: Production, development and engineering highlights in 1998 and 1999

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## Abstract

The last two years, from the perspective of New Zealand's major oil and gas producer, has been remarkable for the amount of volatility and change in the market place. Oil prices have gone from below US\$10/ bbl to over US\$25/ bbl. The energy reforms in both the gas and electricity sectors have produced wild swings in demand making planning and forecasting a near impossibility. This has been compounded by major changes in weather patterns resulting in lake levels (and therefore hydro generation and gas demand) varying from lake levels below the 65 year average to major flooding in the South Island within a matter of days.

There have been two major incidents, which have had an impact on developers and operators in New Zealand, which have caused a rethink of the gas contingency plans. The first of these was the Mercury Energy crisis, and the second the Longford Gas Plant explosion which resulted in the state of Victoria being without gas for a number of weeks.

Despite the above, 1999 was a record year for gas and condensate production. The Naphtha plant at the Maui Production Station was commissioned and Naphtha exports commenced. Although LPG exports reached new levels, LPG domestic sales continued to decline. With a surplus of LPG in New Zealand this decline should be of concern to the new government.

The three new commercial discoveries (East Coast, southern Taranaki and offshore Maari Field) must make 1999 one of the more successful years from an exploration point of view and this really opens up prospects for further discoveries and development in the next few years.

Judgement was given in the long running Kapuni gas dispute, but with the number of court cases currently being pursued by a number of energy companies, one can only conclude that 1998/1999 was a boom time for the legal fraternity and, together with all the energy reforms, 2000 will continue to be as profitable for them!

## Introduction

Anyone involved in the oil and gas business in New Zealand, or indeed in the energy sector would be forgiven for thinking that in the last two years they have been on a non-stop roller coaster ride. I wonder how many other industries have had to work in such a volatile environment? Look at the variations there have been in some of the key indicators:

### Oil prices

Figure 1 shows that oil prices since the last conference which had been stable at around US \$16/ bbl plummeted to around \$10/bbl early in 1999. This had us all rushing for the machetes to slash our budgets, to cancel or defer projects and to renegotiate contracts. Within Shell Todd Oil Services, we had been priding ourselves on reducing operating costs by over 5% per annum, but this drop in oil prices really focused our

minds and resulted in a drop in budgets of 14%. The Opec partners however have managed to hold together this time to restrain demand and now prices have recovered to around US \$30/bbl. An amazing 300% increase.

### Lake levels

What has this got to do with a petroleum conference? Well for the company which produces 92% of NZ's gas, it has a huge impact on gas production, with over a third of the gas used for thermal power generation. Lake levels fluctuated from near record low levels (for Lake Taupo) to the highest levels ever recorded in Lake Wakatipu and Lake Dunstan). This played havoc with our production forecasts and gas offtake. The rate of change in levels as shown in Figure 2 in November last year is remarkable. Is this an early warning of a changing climate?

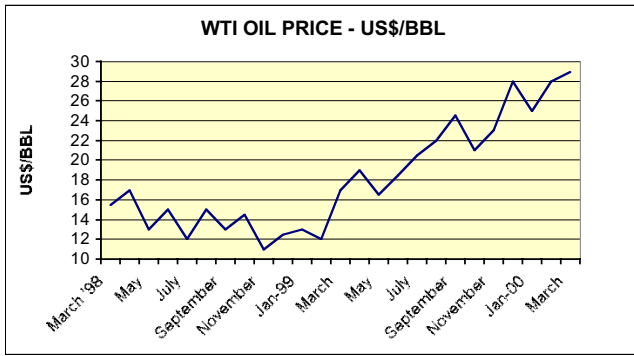


Figure 1.

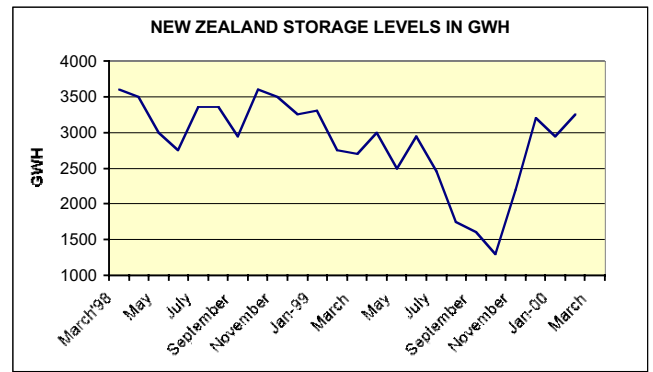


Figure 2.

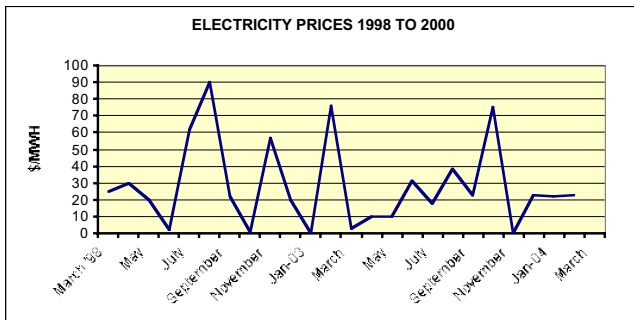


Figure 3.

## Electricity prices

Those involved in selling gas into thermal power stations also had a very volatile year as demonstrated in the wild fluctuations in bulk electricity markets (Figure 3). Prices have varied from near zero to \$90/MWhr on a daily basis, caused by the competitive market place, lake levels and the commissioning of new generation, efficient, combined cycle power stations. We also witnessed the crazy situation on a number of occasions of water being spilt in the South Island while gas fired stations ran at maximum capacity in the North Island. Great for the gas industry, but not ideal from an economic or environmental viewpoint.

## Production

Despite the above volatility, 1999 was a record year for gas production with 215 PJ being produced, with corresponding high levels of condensate and LPG. Figure 4 shows however that gas rates fluctuated from 10 to nearly 20 PJ/month. The energy reforms and volatility already highlighted meant that demand forecasts from the electricity sector became almost meaningless making forward planning very difficult. Although LPG exports to Australia and even as far as China reached new record levels, LPG sales in New Zealand continued to decline. LPG is taxed heavily compared to Australia and is no longer competitive as a fuel in New Zealand compared with petrol. The result is that a considerable quantity of this premium fuel is not sold and is in fact re-injected into the gas stream. This situation should be of concern to the Government.

A Naphtha extraction plant was commissioned at the Maui Production Station in early 1999 and Naphtha is now exported as a premium product into the Japanese market.

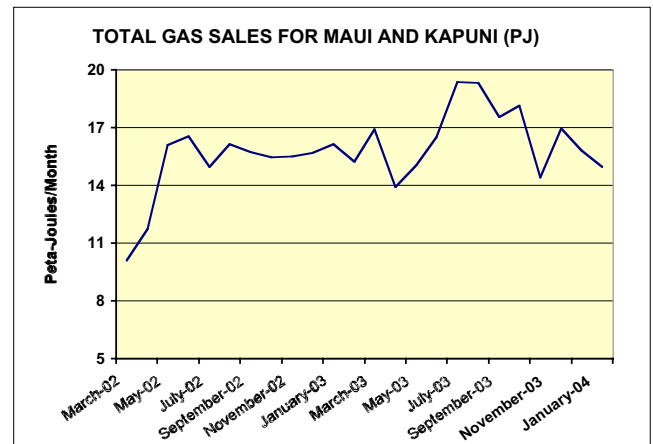


Figure 4.

Oil production from both the Maui FPSO and from the onshore Fletcher fields continued to follow the natural field decline. Oil production will increase when the three new horizontal oil wells currently being drilled into the Maui B D sands come into production mid this year.

## Incidents

There have been two major incidents which have had an impact on developers and operators in New Zealand. The first of these was the Mercury Energy crisis, and the second was the explosion at the Longford gas plant in Victoria, which resulted in the State of Victoria being without gas for a number of weeks. The result of this is that the major gas users and the gas suppliers have worked closely together to develop a gas contingency plan for New Zealand.

However in New Zealand the gas supply has continued to remain remarkably reliable with no gas supply interruptions. The industry has also made significant improvements in its safety performance and is now a leading industry in New Zealand in the area of safety. Within Shell Todd Oil Services we have now gone for 2.5 years and 2.6 million man-hours without a lost time injury. This performance was never properly recognised by ACC and it was gratifying to make substantial savings in accident insurance through private insurance companies who did take properly into account the performance of this industry. The proposed ACC reforms are certainly seen by our company as a step backwards.

## **Litigation**

Judgement was given in the long running Kapuni gas dispute which has also cleared the way for further competition in the gas market. However all the energy reforms and other contract issues have led to a number of court cases and arbitration disputes being pursued by various energy companies.

1998/1999 was certainly a boom time for the legal fraternity, and unfortunately the outlook for 2000 is for this to continue.

## **Development**

There have been no significant projects or developments, other than the Naphtha project, carried out in this industry

in the last two years. However the significant offshore Maari Field discovery (the subject of a separate paper) by the Operator, STOS, on behalf of Shell Petroleum Mining, Cultus, and Todd Energy will lead to a new offshore development in the next 2/3 years. In addition the discoveries on the East Coast, southern Taranaki and the recent promising Pohokura discovery makes the last 12 months one of the more successful periods in New Zealand from an exploration stand point. This must really open up some of these areas for further exploration and development.

The industry is heading for an exciting next few years.

## **Author**

CHRIS BEATH graduated from Canterbury University as an Electrical Engineer. He worked for 10 years for the New Zealand Electricity Department designing building and commissioning thermal power stations. Following 2 years in U.K. as a CBI scholar he joined Shell Todd Oil Services as a project engineer, involved in the construction of Maui A & B platforms and the recent FPSO project. He has also worked in Nigeria and the Netherlands.