

An appropriate return to the Crown from the petroleum estate

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Abstract

Under the Crown Minerals Act 1991 and the Continental Shelf Act 1964, the Crown, represented by the Minister of Energy, owns or has jurisdiction over all petroleum in land within New Zealand, the Exclusive Economic Zone (200 nautical miles from the coastline) and New Zealand's continental shelf where this extends beyond 200 miles.

Crown ownership of New Zealand's petroleum resources dates back to 1937, when the Government enacted the Petroleum Act 1937 and declared petroleum in its natural condition to be the property of the Crown.

The objectives in passing the Petroleum Act 1937 included the need to recognise that New Zealand had petroleum resources and that these were a potentially valuable national asset rather than property associated with individual ownership. The Petroleum Act's purpose was to make better provision for the encouragement and regulation of mining for petroleum and to provide for matters incidental hereto.

The Crown Minerals Act 1991 superceded the Petroleum Act 1937. It confirmed Crown ownership of petroleum and the Act defines the mechanisms for managing the Crown mineral estate asset, including the Crown's petroleum resources.

The Crown Minerals Act and associated minerals programmes (the Minerals Programme for Petroleum January 1995, being that programme relevant to this paper) put strong emphasis on efficient allocation and obtaining a fair financial return in respect of Crown minerals and petroleum, reiterating the concept that the Crown mineral estate is an asset that has to be effectively managed.

The value of the mineral and petroleum estate to the Crown has been assessed at around \$1.3 billion. Most of this value (over 90%) is in petroleum. The value has been determined on the basis of energy resources levies and royalties payable on current mining licences, fees payable on licences and permits, and an estimate of expected royalties and fees from future discoveries.

The return to the Crown from the petroleum estate is obtained directly in the form of royalties, energy resources levies and fees. In 1998-99, about \$120 million was obtained. The return to the Crown is also obtained in the form of exploration work undertaken and copies of all data and associated reports.

The value of the petroleum estate is determined by such value drivers as perceived relative prospectivity, costs of development and extraction, oil and gas prices, sovereign risk, royalty regime and work programme requirements and tax. Crown Minerals can influence the royalty regime and work programme requirements and through promotion can try and influence perceived relative prospectivity.

Introduction

The Crown, represented by the Minister of Energy, owns or has jurisdiction over all petroleum existing in its natural condition in land within New Zealand, the Exclusive Economic Zone (200 nautical miles from the coastline) and

New Zealand's continental shelf where this extends beyond 200 miles. This ownership right is established under the Crown Minerals Act 1991 and the Continental Shelf Act 1964.

The territory extends over approximately 4 million km², and within the territory there is considerable potential for the

discovery of petroleum reserves. Known sedimentary basins with petroleum potential extend over 560,000 km². Deep sea basins under study by the Institute of Geological and Nuclear Sciences (see other conference papers) extend over considerably more area.

Petroleum nationalised in 1937

Crown ownership of petroleum in New Zealand dates back to the Petroleum Act 1937. This Act was passed into law with the support of the Labour Government of the day and the Opposition parties. National ownership of petroleum was supported for national interest reasons. In particular, it was argued in the Parliamentary debate that there was value to be gained by New Zealand having identified petroleum discoveries and a thriving petroleum exploration and development industry. Amongst the objectives in passing the Act was the recognition that New Zealand had petroleum resources and that these were a potentially valuable national asset rather than property associated with individual ownership.

The role of government was to facilitate the discovery of petroleum by the private sector and to encourage its development. Crown ownership of petroleum was to provide clarity to investors about ownership rights and freed investors from having to deal with “ownership rights” claimed by a multitude of land owners. The Petroleum Act set up a sound allocation framework particularly providing to investors certainty of tenure and clarity of administration so that if a successful discovery was made, the investor would be able to develop that discovery and benefit from it without property rights challenges.

The return wanted by the Government from New Zealand’s petroleum resources at this time was discoveries made. This was a time when the world was close to major international conflict and the Government and New Zealand communities knew that the country was very vulnerable to being cut off from overseas oil supplies. The community and Government were keen to facilitate discoveries and increased availability of local oil and gas.

Licences had to be worked

The Petroleum Act 1937 accordingly provided for prospecting licences of no more than 200 square miles in area. These would be granted for a period of 5 years, on the condition that the area be continuously worked. The licensee was required to commence geological, geophysical or other investigation for mining purposes within 3 months of the grant of the licence and to maintain these investigations throughout the term of the licence, with the exception that “such investigations could be suspended whenever the licensee was undertaking drilling within the licence”. The licensee was required to drill a well within 3 years of licence commencement.

In brief, the licensees had to “use or lose” the licence.

Financial return also required

The Government also required a monetary return from those holding licences. For a prospecting licence there was an annual fee payable of 5 shillings for every square mile or part square mile. For a mining licence (which could be up to 100 square miles) the annual fee payable was 10 pounds for every square mile or part thereof. As well, royalties of no less than 5% were payable on oil and gas sold.

Crown Minerals Act 1991

Since this time, the Government has continued to recognise that the petroleum resources of New Zealand (the petroleum estate) are a valuable asset – an asset to be used to benefit the entire nation. The Crown Minerals Act 1991 confirmed the Crown’s ownership of petroleum. The Act sets out the mechanisms for managing the Crown mineral estate including petroleum.

The policies, procedures and provisions to be applied under the Crown Minerals Act 1991 in the management of the petroleum estate are set out in the Minerals Programme for Petroleum. Under section 22 of the Act, the Minister and Secretary are required to exercise their functions and provisions under the Act consistent with the Minerals Programme for Petroleum when considering petroleum permit and permit change applications.

Government wants continued investment

The Minerals Programme is based on the premise that the desired outcome of Government management of the petroleum estate is to allow continuing investment in petroleum prospecting, exploration and mining.

The Minerals Programme notes (paragraphs 2.7 and 2.8 refer):

“Continuing investment in petroleum prospecting, exploration and mining is considered desirable given the strategic importance to New Zealand of access to supplies of petroleum. Over the last two decades, some 65 to 70 percent of New Zealand’s energy consumption requirements have been met by petroleum in the form of natural gas, oil, condensate or LPG. Indigenous petroleum production which makes good use of investment expenditure and is competitively priced and unsubsidised, will benefit the economy. Security of supply issues are less important today than in the past, with fuels like oil and coal readily tradeable internationally. This is less so for gas, and there are economic advantages in having a continuing supply of gas available for reticulation to industrial, commercial and domestic consumers and for electricity generation, where cost effective. Continuing investment in petroleum exploration is needed to identify new sources of supply which are cost competitive, given the expected decline and exhaustion of presently producing fields.”

“The alternative to allowing continuing investment is to decline to allocate petroleum permits with the outcome of petroleum remaining in the ground. This approach is not considered in the interests of the economy.”

Accordingly, the fundamental policy objective established for the management of petroleum is:

“To allow continuing investment in petroleum prospecting, exploration and mining which is in accordance with good exploration and mining practice, always provided that:

- there is efficient allocation of petroleum prospecting, exploration and mining permits;
- the Crown obtains a fair financial return from the extraction of petroleum by a permit holder; and
- there is due regard to the principles of the Treaty of Waitangi.”

A further 10 policies are established in the Minerals Programme. These are intended to achieve the objectives of efficient allocation of rights to petroleum and the obtaining by the Crown of a fair financial return from its petroleum. These are:

- petroleum prospecting, exploration or mining permits should be obtained by the person who is most likely to effectively and efficiently prospect or explore and develop the petroleum resource;
- permit areas should be prospected, explored or mined in accordance with an appropriate work programme which has the objective, either:
 - (a) in respect of prospecting and exploration permits, of assessing the petroleum resource potential of the permit area; or
 - (b) in respect of mining permits, of achieving sound management of the petroleum resource through good mining practice, including the avoidance of wastage of petroleum;
- the conditions of the petroleum permit should be complied with;
- exploration and mining operations should result in increased knowledge of New Zealand’s petroleum resource and petroleum potential;
- the Crown, as owner of the petroleum resource, should obtain a guaranteed minimum royalty payment from the extraction of its petroleum;
- the Crown, as owner of the petroleum resource, should benefit in sharing in any substantial profits arising from a petroleum development;
- the royalty regime in place should be sufficiently internationally competitive to attract mobile and competitively driven investment;

- the investor should perceive that sovereign risk is minimised (sovereign risk is defined as the risk that the government may change significant aspects of its policy and investment regime);
- the allocation and royalty systems should be clearly outlined and easy to comply with and administer; and
- the allocation and royalty systems should not impose unreasonable transaction costs and should not significantly deter investment.

The Crown Minerals Act and the Minerals Programme for Petroleum put strong emphasis on efficient allocation and obtaining a fair financial return as illustrated above, reiterating the Government’s view that New Zealand’s petroleum resources are a valuable asset that the Government has to manage effectively, including obtaining an appropriate return from the asset.

The financial value of the Crown Mineral Estate

During 1998-99, Crown Minerals, a Group within the Ministry of Economic Development, commissioned work looking at the financial value to the Government of the Crown mineral estate, including petroleum.

The financial value is determined by the consideration received by the Crown in exchange for granting property rights in the form of exploration and mining permits and licences. There are two types of property rights created: the right to gather information about the petroleum or minerals (prospecting and exploration permits) and the right to win and own the petroleum or minerals in the area of the permit (mining permits).

At present the Crown’s consideration is almost entirely derived from the second type of property right (mining permits and licences) in the form of royalties and energy resources levies. There is also potential value to be obtained from permit fees, but at present these do not make a significant contribution.

The financial value is in two parts:

An actual asset

This is equal to the present value of: royalty and energy resources levies payments on mining permits and licences for projects that are producing revenues and profits; and royalty payments on mining permits for projects that are not producing revenues and profits but it is known that they will.

A contingent asset

This is equal to the present value of: royalty payments on mining permits that have been or will be granted for projects that may produce revenues and profits; and permit fees for future exploration projects.

The financial value of the Crown's mineral estate has been estimated at nearly NZ\$1.3 billion. This is the value to the Crown obtained essentially through royalties, energy resources levies and to a much lesser extent permit fees. Of this value 40% relates to the actual asset (the known production) and 60% to the contingent asset (predicted future revenue streams). NZ\$1.230 billion of the \$1.3 billion, or 90%, is derived from petroleum.

Methodology for determining asset value

This value was derived using a monte carlo modelling technique. For petroleum the methodology used was as follows:

- A Monte Carlo analysis was conducted to estimate:
 - the timing of exploration and development of the total oil and gas reserves in New Zealand; and
 - the stream of revenues that are likely to be generated from those reserves.
- The simulation encompassed the following steps:
 - A model was developed which defined the total amount of oil and gas reserves (based on probability distributions and estimates of total reserves) in each of the six basins.
 - Probability distributions were assigned to the probability of drilling a well and the probability that a drill is successful.
 - Exploration, development and operating costs were assigned which vary with the size of the find, and the life of the well.
 - A Monte Carlo simulation was conducted to estimate the expected royalty stream based on the probability distributions and cost assumptions in the model, over the next 30 years.
 - This was added to the existing forecasts of royalty and ERL cash flows from Maui and Kapuni (the forecasts were also assigned a probability distribution).
 - The stream of the revenues was discounted using an ungeared cost of capital, to obtain a present value in today's dollars.

The following geological, financial and economic assumptions were adopted for estimating the contribution of petroleum to the value of the Crown mineral estate.

Global assumptions

Oil Price: US\$12 (sd=32%)

NZD/USD: 0.50 (sd=5.6%)

Gas Price:

Overseas market NZ\$2.50 (sd= 10%)

Domestic market NZ\$1.50 (sd= 16%)

After tax discount rate = 8.86%

Existing Maui & Kapuni royalties (sd=20%)

Exploration assumptions

Probability of drilling:

Offshore: 25%, 5% if previous drilling unsuccessful

Onshore: 25%

Probability of successful drilling:

15% for Taranaki

10% other basins

Exploration & appraisal costs:

Onshore oil: exploration \$3m, appraisal \$8m

Offshore oil: exploration \$12m, appraisal \$40m

Development costs:

Offshore FPSO <100mb oil: \$200m

Offshore platform >100mb oil: \$420m

Onshore <10mb oil: \$30m

Onshore >10mb oil: \$60m

Offshore gas: \$150m

Annual operating costs: 10% of development costs

Royalties assumptions

AVR: 5% of total gross revenue

APR: 20% of profits (before tax)

Exploration and development costs are capitalised and amortised over the first four years of production

Minimum economic size for development

Offshore oil: 30 m bbls

Onshore oil: 3 m bbls

Offshore gas: 100 billion scf

Gas production

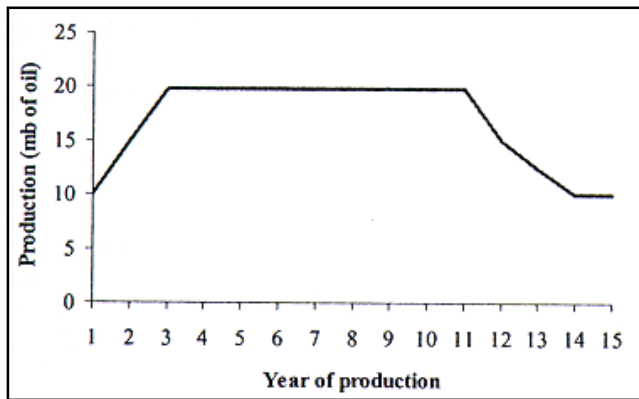
Gas production: 1 mb oil = 4 billion scf gas

Minimum economic size for gas: 300 billion scf

Production profile

A standard production profile was assumed. The following graph shows the profile applied to a 250 mmbbl well.

The total present value of petroleum royalties was estimated to be NZ\$1.230 billion with a 68% probability that the present value of the petroleum revenues will lie between NZ\$0.744 billion and NZ\$1.716 billion.



How can the financial value be increased?

The financial value to the Government of the Crown Mineral estate is most able to be increased by new commercial discoveries and production. This requires increased exploration and well drilling.

What is the Government's potential to increase exploration, discoveries and thus the value of the Crown mineral estate? There are various key factors that drive the investment decisions of private sector explorers and developers, including (in order of importance):

- perceived relative prospectivity (influenced by *information* and *promotion*)
- costs of development and extraction
- commodity prices e.g. oil and gas prices
- sovereign risk
- *financial terms*
- tax
- *ease of entry*
- *work programme requirements*

Of these, those in italics relate to the policies for management of the Crown mineral estate.

The Government, through Crown Minerals, has put a lot of effort into defining the royalty and allocation provisions for investing in petroleum exploration and mining, i.e. the *financial terms* and the *ease of entry*. These provisions are clearly outlined in the Minerals Programme for Petroleum 1995 and the Crown Minerals (Petroleum) Regulations 1999. The royalty and allocation rules would appear to be robust and internationally competitive. A five yearly review of the provisions is about to be initiated in partnership with industry. In general, it is not expected that there will be any major changes to the overall provisions.

There may be some consideration as to whether the Crown should be obtaining a financial return from exploration permits. This is, however, only at the discussion or conceptual stage.

Promotion of New Zealand petroleum opportunities

Crown Minerals also gives considerable attention to influencing perceptions of the prospectivity of New Zealand, through major international promotion efforts. The strategy for promotion includes marketing campaigns to North America, Australia and the United Kingdom-Europe. There is specific targeting of companies considered likely to invest in New Zealand. Crown Minerals has exhibitions and speaking slots at key industry conferences.

There is also indirect promotion through publications. These are an important means of conveying information generally and promoting petroleum exploration in New Zealand.

An example is the recently produced publication *Explore New Zealand Petroleum*. This publication highlights present exploration activities and successes, and discusses exploration objectives and geology, and the legislative regime. There is particular emphasis on the exploration companies currently investing in New Zealand, including statements from them on the potential they see in New Zealand and why they are committed to investment here.

In-house research has shown that there is a perception that New Zealand has low prospectivity, is gas prone, and that there is little upstream and downstream activity in the petroleum market. The focus of *Explore New Zealand Petroleum* is to provide information to the international petroleum market to counter this view by providing potential investors with the good news of the last 12 months. In particular, the willingness of companies currently investing here to discuss their commitment to New Zealand shows that it is not just the Government saying we have a good news story, but that this story is supported by those in the industry.

Backing up the information given out through the promotion work is the real data, the seismic tapes, petroleum reports, and other data accessible through the Crown Minerals Resource Data Library. This library provides ready access to valuable past exploration data to assist explorers and developers in making their investment decisions.

Concluding comments

In 1937, the potential value of the petroleum resources of New Zealand resulted in nationalisation of ownership of petroleum. Since this time, the role of government has been to facilitate the discovery of petroleum in order that New Zealand may benefit from its potential petroleum resources. At present, the Government obtains a direct return of some \$120 million from royalties, energy resources levies and fees from petroleum extraction and permits. This is about a 10% annual return on the estimated value of the petroleum estate asset of NZ\$1.230 billion. The Government also obtains a return from obtaining copies of all data and associated exploration reports, which, after a maximum of 5 years, are available through the Resource Data Library; and through

the New Zealand community having access to natural gas and oil.

Indirectly, the Government obtains a return through oil and gas supplies being available to assist economic growth, investment in New Zealand, and through investment contributing to regional development, as well as a direct return through taxes.

For the future the Government wants to maintain its return from the petroleum estate and it wants to obtain additional financial value from its potential petroleum resources.

This requires an investment environment that attracts exploration investment.

It requires maintenance of an active international promotion programme to make investors aware of New Zealand's petroleum potential. This includes making the Resource Data Library information from previous exploration accessible to explorers.

In 1937, the Petroleum Act was passed to facilitate the discovery of petroleum by the private sector and to encourage its development. The need for a partnership between industry and the Government was recognised. The importance of a sound partnership between government and industry is still fundamentally relevant.

The Government wants to have continuing investment in petroleum exploration and development and an active and expanded New Zealand petroleum industry.

Author

EVELYN COLE is the Unit Manager, Policy and Strategy in Crown Minerals, a group within the Ministry of Economic Development. Evelyn has been with Crown Minerals and its predecessors for 13 years. Her responsibilities have included preparing the Minerals Programme for Petroleum 1995 and managing petroleum licensing and permitting from 1987 to 1996.