



Hale & Twomey Limited

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Analysis of Feedback on Tendering Process for Additional Stock to Meet New Zealand's IEA Obligations

Key Issues Requiring Government Decisions

Next Steps and High Level RFP Design

**Report to
Ministry of Economic Development**

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1.0 Introduction

The government has decided that the best way to obtain the additional stock required to meet New Zealand's International Energy Agency (IEA) obligations is to run a tender process. As part of developing that tender process, the Ministry of Economic Development (MED) issued a questionnaire to interested parties.

This report analyses the responses to that questionnaire and then identifies the key issues requiring government decision. Different options are presented along with the advantages and disadvantages of each option. Further work required is then summarised which highlights the issues that need to be considered in the high-level design of a Request for Proposals (RFP).

2.0 Feedback Summary

The feedback from the respondents to the questionnaire has been very useful. While there remain issues and differences about some of the key design features there is broad agreement in a number of areas. In addition a number of stock holding opportunities are mentioned that could be cost effective if allowed by the design. Broadly the issues can be put into two categories – those areas where respondents generally thought that flexibility would give the government the most effective outcome and those areas where decisions need to be made and certainty is required.

The largest design issue remains the issue of changing stock value and who should carry the exposure. We analyse this issue and assess options for the government in progressing this issue. Some commercial and competition issues are starting to come out in the responses. We identify these and comment on how they might be managed.

Table 1: Feedback Summary

Where Flexibility is desired		Where Certainty is required	
Location	Government should be open on NZ/offshore split until relative costs/benefits can be assessed and G to G agreements in place	Rules for release	Needs to be defined and confirmed prior to the RFP/tender round
Stock Type	Government should be open to both crude and product stocks	Stock specification	Needs to be well defined but those proposed in the questionnaire were reasonable (slight modification for product)
Separate Stock/ Flexibility	There might be better value if there is some flexibility over the separation and use of the stock. Allowing synergistic benefits may reduce costs.	How stock is released	Who owns the stock and what happens to it if required in an IEA event needs to be defined so exposures are known.
Length of Term	Best to have a portfolio approach to meet the changing requirements. No need to define exactly.	Costs, payment, payment frequency	Companies need to know frequency of payment, currency of payment and other details.
		Assessment Criteria	Need to be known before he tender. Transparent and to include 'total system cost'

2.1 Feedback by Subject

2.1.1 Price Risk and Stock Ownership

This remains the major issue in the design with some companies suggesting that the risks involved might mean they don't tender. All agreed that having tenderers managing the risk would increase the cost to the government/consumer. This issue is explored in more detail in a Section 3.1.

2.1.2 Flexibility/ Separate Stock

A number of companies suggested that if the requirement on how stock should be held is too tightly defined the government will miss out on cost effective stock options. These involve stock options where stock would be held in tanks that are not physically isolated from normal stocks but could be isolated administratively and on an accounting basis.

Effectively this might enable redundant tanks within existing terminals to be recommissioned, allow stock to be turned over (maintained) or enable companies to get some synergistic benefits, all having the effect of reducing overall cost. Companies believe that the issue of not affecting the market and normal commercial drivers can be managed.

These options include:

- Spare tanks in product terminals that could be recommissioned
- Spare capacity in crude oil/condensate tanks that could be used
- Increasing stock levels permanently in certain tanks
- Investment in new tanks that increase stocks but also give oil companies more delivery flexibility (i.e. not necessarily isolated).

This issue is discussed in Section 3.3.

2.1.3 Location

Companies generally thought the location split proposed was reasonable as a first pass although the government should be open to changing the split based on the Request for Proposal (RFP) responses.

One company¹ suggested the government needed to decide what role security had in the stock holding and set the New Zealand requirement based on that information. They suggested the stock number recommended by the Covec/H&T Oil Security Report (190,000 tonnes) was a reasonable basis. Beyond the base security level the decision on location should be price driven. Another company's² view was that stock should all be held in New Zealand because freight to New Zealand might be difficult to obtain in an emergency.

A number of companies suggested Marsden Point was the logical place for any new crude oil tank construction because of its proximity to the refinery.

This issue is discussed in Section 3.4.

2.1.4 Stock Type/Specification

Companies agreed that both crude and product should be considered. In discussion with some companies there was comment that for true 'security stock', 20-30% should be held as product as that is the percentage of the market supplied by direct imports. If there were a major incident it would affect product imports as much as crude and if New Zealand only has crude stocks the market will be 20-30% short.

One company³ suggested that fuel oil should be excluded, as it provided no real security. Fuel oil is the cheapest option (cheaper than crude) and yet is included in the stocks that have a multiplier when calculating oil stocks. Therefore the cheapest option to meet IEA targets would be a lot of fuel oil stocks. However fuel oil can't be refined and is less than 3% of the domestic market. Therefore it does not provide any real security (except for that 3% of the domestic market).

¹ [Withheld under section 9(2)(b)(ii) of the Official Information Act 1982]

² [Withheld under section 9(2)(b)(ii) of the Official Information Act 1982]

³ [Withheld under section 9(2)(b)(ii) of the Official Information Act 1982]

Companies agreed with the specifications proposed with some minor adjustments as follows.

Crude held in New Zealand Must be refinable at NZRC - companies suggest there might also be a split by grade type (e.g. high/low sulphur split) to ensure processing feasibility at NZRC.

Product held in New Zealand Must meet the appropriate New Zealand specification for the region where stored (slight change from the most severe seasonal specification as some companies indicated if they held product they would probably turn it over with each seasonal change).

Offshore crude Must be saleable (refinable) in the location held (within Australia and NZ for stock held in Australia).

Offshore product Fungible (i.e. readily marketable) grade for that region.

The specifications are basically agreed so no significant decisions are required. NZRC has supplied a table on crude type requirement based on feedback that some limits are required to ensure crude stored in New Zealand is refinable. This can be used as the basis for the specifications. The issue of requiring some product stock for security reasons is discussed in Section 3.4. We suggest fuel oil is not excluded but limits are placed on the total amount that will be accepted (in line with market percentage) so over provision of fuel oil does not occur.

2.1.5 Length of Contracts

Companies felt it was in the government's interest to keep this flexible to see what is offered and for the government to select a portfolio of contract lengths to best meet its stock requirement (and manage price risk if relevant). The length varied between stock (short if companies had price exposure) and tanks (at least 10 years, preferably longer for new tanks).

This issue is discussed in Section 3.6.

2.1.6 Rules for Release of Stock

All companies felt these need to be defined prior to any RFPs or tenders. This is included in the list of work required for the next steps.

2.1.7 How Stock would be Released in an Emergency

Companies also saw this as critical to be well defined prior to the RFP and tenders. The decisions required will depend on stock pricing risk and ownership decisions. This is discussed in Section 3.2. In addition to the decisions needed, a process for releasing stocks needs to be developed. This is included in the work list.

2.1.8 Payment Issues and Other Risks

There were a number of issues raised/clarity required around payment issues and managing other risks. These include:

- Frequency/Timing of Payment Needs to be set up front
- Currency of Payment Decision is required
- Interest rate exposure How this might be managed
- Standard of Bidders Govt must be assured that bidder will meet appropriate safety and environmental standards and is of suitable financial stability.

2.1.9 Cost and Expertise

One company⁴ raised the issue of the costs of managing the tender process and management of the stock system. They believe these costs are underestimated and quoted the costs of a European stock agency, which are 4 mln Euro/annum (NZ\$7.3 million/annum) with a staff of more than 30+ people. They also raised the issue of sufficient available expertise within the government to run the stockholding.

It is difficult to comment on the issue of cost and expertise until the decisions are made as to where responsibilities sit (i.e. what is paid for in the tender and what the government has to do). However we would comment that stock holding agency mentioned holds approximately 25 million tonnes (product equivalent which means actual tonnes would be a bit higher) and has strict requirements to meet for product categories and location. This is about 50 times the level of stock New Zealand requires, with rules and restrictions that are likely to require more management. Therefore direct cost comparison is difficult. We would comment that an agency system may result in somewhat higher administration costs but this may be more than offset by savings if it resulted in a more efficient system.

2.1.10 Type of options

The feedback suggested a number of storage options that might be proposed depending on the final contractual arrangements. For information we have summarised these in the tables below.

Table 2: New Zealand Options

[Withheld under section 9(2)(b)(ii) of the Official Information Act 1982]

Table 3: Offshore Options

[Withheld under section 9(2)(b)(ii) of the Official Information Act 1982]

2.1.11 Commercial Issues

A number of respondents raised issues that highlight different commercial positions of companies that might tender. These include:

Quality standards for stand alone storage: A number of companies said they may not tender if they were required to hold stock in tanks they felt were not of suitable standard or increased their risks.

Offshore storage: One company⁵ raised a number of objections to holding stock offshore including that revenues (PMFL levy revenue) will go out of the country.

Subsidising alternate routes: Some companies were concerned that payment for stocks could end up subsidising new terminals affecting their business model

Commercial difficulties: There were comments that those who don't refine/sell oil in New Zealand had a disadvantage in some areas such as sale (and use) of stored oil. A role for government in coordinating deals was proposed.

These issues do not require immediate decisions except the setting of tank standards which has been included in the work list. We see the heart of the issue being concern that the IEA levies may be used to 'subsidise' the setting up of competitive terminals which could undermine other's competitive position. *[Withheld under section 9(2)(b)(ii) of the Official Information Act 1982]*. We don't think the government needs to make a call on this at the

⁴ *[Withheld under section 9(2)(b)(ii) of the Official Information Act 1982]*

⁵ *[Withheld under section 9(2)(b)(ii) of the Official Information Act 1982]*

moment but it does need to be aware of the conflicting commercial interests as it proceeds with the process.

3.0 Key Issues Requiring Government Decisions

Based on the feedback we have identified the following key issues requiring government decisions. In this section each issue is analysed, with the options and their advantages and disadvantages assessed and summarised for the decision the government needs to make. The list is in approximate order of importance with the major items first.

1. Stock Pricing Risk and Ownership
2. Release of Stock in an Emergency
3. Separate 'isolated' stock versus flexibility
4. Onshore/Offshore Split
5. Splitting tenders between tanks and stock
6. Length of Tenders
7. Other Issues

3.1 Stock Pricing Risk and Ownership

Most submissions raised the issue of stock price risk and how it might be managed. Some suggested that it would be best managed by the government owning the stock itself. This section summarises the comments made and assesses options that might be used to manage or avoid that risk. We also comment on what is the real or underlying risk rather than the risk created by the tendering system.

3.1.1 Summary of Feedback on Stock Risks

The following is a summary of the comments made about stock risk in the feedback to MED's questionnaire (with the number of respondents making the comment in brackets).

- May mean that we are unlikely to tender – (1)
- Will increase costs/ not result in minimising cost objective – (4)
- Government could own stock to minimise risk – (2)
- Can only own/manage stock if government takes end of tender risk – (1)
- Government manages risk component as a centralised process – (1)
- Have short contracts rather than reprice – (1)
- Shorter periods better for risk management – (2)
- Difficult to manage exposure if the Govt. has right to buy at any time – (4)
- Repricing won't take away underlying risk – (3)
- Risk can be partially managed by having different length of contracts – (2)

We consider the feedback reasonable, with the primary point being that leaving the price exposure with the tenderer will increase the cost and is creating exposure that need not be there. This is discussed below.

3.1.2 Underlying Risk Assessment

The current requirement is to increase stocks by about 500,000 tonnes. In the base case this is expected to increase to around 650,000 tonnes over the next few years. However there are two situations which could see the target reduce relatively quickly. One is that the IEA reduces the 90-day target or changes some of the rules (e.g. counting stock-on-the-water) that would have the same effect. The other is that there is a stepwise increase in New Zealand's indigenous oil production such as might happen if for example, the Tui and Maari fields are developed. We would expect things such as demand shifts or growth of alternate fuels (e.g. biofuels) to happen over a longer timeframe.

The chance of the IEA reducing their target seems remote in the short to medium term. The IEA's main concern at the moment is that overall stocks may be falling because of the increased use of 'ticketing' and inventory swaps. Given concern over forward supplies it seems very unlikely that reductions would be contemplated. Enquiries by New Zealand about counting stock on the water also indicate that rule changes are unlikely.

Production changes are likely and the Covec/Hale & Twomey report showed that the target could quickly fall by as much as 25% if Tui and Maari were both developed. Both these projects are actively being assessed and remain real possibilities for development based on press statements by some of the development participants. In addition there is currently increased exploration activity in New Zealand which could result in future developments that might increase New Zealand's indigenous production.

However even with upstream developments, it is likely New Zealand is going to need the bulk of its stock requirement (up to 75%) to be held for a reasonably long period of time (quite likely decades unless there are major changes in demand or a major oil discovery in New Zealand). In addition for any major discovery the lead-time before development and production is likely to be at least five years.

With such a long-term requirement, if the government owns the stock there is little need to hedge any exposure. The government will need to buy stock to offset any sales to meet its ongoing requirement and in the event that stock is needed, prices are likely to be high resulting in little risk of loss on sale. Over the long time period the stocks are required, the stock pricing risk becomes less significant (some might argue that the stock is likely to be an asset of increasing value as well).

Greater price exposure comes when the risk is transferred to a company tendering stock where they have an exposure at the end of the contract period. This exposure is real for the tenderer and because it is likely to be for a shorter period, far more likely to be of impact.

There are ways this risk might be mitigated without the government owning the stock and options are discussed in the following sections. This might be via very long contracts or through the requirement to buy more oil at the same time sales are made.

3.1.3 Example of the Actual Risks

If the government (or agency) owned the stock what are the actual risks involved? Oil markets can be highly volatile, varying by substantial amounts over the course of a year (both from price and exchange rate).

Assuming there is a mix of stock contract lengths, with the maximum amount coming off tender in any one year being 20% of the total stock, then the risk at the end of each year is about US\$9 million (NZ\$13 million) for every US\$10/bbl movement in the price of oil. As there is a high probability that the oil stocks are still needed, stock will need to be purchased (new tender) for replacement. This purchase will be in the same market (same price) as any sale so will offset any difference with the initial purchase price. In effect it will be as if the same oil is held at the price initially purchased. Our assessment of the expected need to continue to hold stock reduces the actual end year risk to about US\$1.5 million (NZ\$2 million) per US\$10/bbl movement, which in the context of the annual estimated cost of the program (NZ\$60-\$105 million)⁶ is not significant. This could be easily managed within the annual adjustment of the PFML.⁷

⁶ Costs from this report

⁷ Petroleum Fuels Monitoring Levy

This example demonstrates that the continued need to hold oil mitigates risk and the government is hedged in effect by the need to buy replacement stock at the same time as any sales (or end of tenders). Having a mix of contracts lengths (limit volume up for tender at any one time) helps smooth the cash flow and provides a good tool for mitigating the risk of changing targets.

The key issue is that leaving price risk with the tenderer creates a risk that would not otherwise be there (e.g. if the government owned the stock).

3.1.4 Options for Stock Ownership and Risk Management

Based on the feedback and our analysis we have developed four options that might be used as the basis for stock ownership. They vary from the tenderer owning the stock and managing the risk (with the resulting issues as identified) to the government owning the stock (with the issues that creates for the government). The following table summarises the four options with variations on a couple of the options.

Table 4: Stock Ownership and Pricing Risk Options

Option	Explanation	Pros	Cons
1 a) Tenderer owns stock and takes pricing risk	Tenderer owns product and decides to hedge or not. Either hedge cost or assessed risk will be built into price or tender to government	<ul style="list-style-type: none"> • Easier to administer as leaving everything to be priced by tenderer • Govt doesn't own oil • Easy for offshore options 	<ul style="list-style-type: none"> • Some companies may not tender due to risk • Less competition • Higher cost option • Creating a risk that needs to be managed
b) Tenderer owns stock but pricing risk managed in contract	Tenderer owns product. All contracts are repriced annually and include the cost to hedge for one year (one company estimated this cost at US\$2.50/bbl/yr)	<ul style="list-style-type: none"> • Risk factor taken out as a variable as it would be fixed in contract • Govt doesn't own oil • Easy for offshore options 	<ul style="list-style-type: none"> • Some companies may not like RM strategy therefore not tender • More complex • Higher cost option • Creating a risk to be managed

Option	Explanation	Pros	Cons
2. Investor Option. Tenderer owns stock but Govt. takes end of contract pricing risk.	Tenderer owns product but govt manages risk at end of contract by taking exposure between entry and exit price (positive or negative). Varying contract lengths manage cash flow exposure. Provider of stock is effectively a provider of capital. ⁸	<ul style="list-style-type: none"> • No price risk to tenderer so can concentrate on lowest cost of capital • Govt taking risk so not paying additional for it • Still feasible for offshore options • Removes impediment to wide participation • Avoids creation of unnecessary risk 	<ul style="list-style-type: none"> • End of contract financial exposure that needs to be managed (not large as shown above) • Requires more active management (and expertise) from govt
3. a) Agency Model. Separate agency (Govt. owned) that can own stock or have others provide stock	Agency can choose to own stock (be the investor) and can manage exposures. Agency still has the option to use other options (offshore, private companies) if this is more cost effective	<ul style="list-style-type: none"> • Keeps all options open • Ensures lowest cost of capital • Agency (Govt) taking risk so not paying additional for it • Offshore option feasible • Can ensure appropriate expertise 	<ul style="list-style-type: none"> • Government effective guarantor of agency • Likely higher administration cost • More complex as more options available
b) Private Company providing agency <i>([Withheld under section 9(2)(b)(ii) of the Official Information Act 1982])</i>	Rather than Government owned a private company (<i>[Withheld under section 9(2)(b)(ii) of the Official Information Act 1982]</i>) provides the agency.	<ul style="list-style-type: none"> • Keeps all options open • Ensures lowest cost of capital (if govt guaranteed) • Not paying additional to manage risk • Still feasible for offshore options • Leverage off existing company expertise 	<ul style="list-style-type: none"> • Still requires a govt guarantee • Likely higher administration cost • More complex as more options available • Conflict issues between company running agency and other providers
4. Government owns stock	Similar to a strategic petroleum reserve where the government makes all the decisions.	<ul style="list-style-type: none"> • Ensures lowest cost of capital • Govt taking risk so not paying additional for it 	<ul style="list-style-type: none"> • Govt is in oil ownership (increases public debt) • Makes offshore options difficult • May make cost effective commercial options more difficult • Additional expertise required in govt

3.1.5 Assessment of Cost of Different Options

The following section builds up an illustrative cost for each option using a simplified single period analysis. The detailed assumptions are given in Appendix 1. While different stock ownership options may lead to different stock holding options being available for consideration (e.g. offshore options), for this analysis all four options use the same mix of stock holding options. This enables direct comparison of different costs of capital, operating, administration and management costs and risks with each option.

Cost of capital was highlighted as a key issue in some responses and it is a key driver of the overall cost of the stocks system. However there is some misunderstanding on how the cost of capital should be applied in this situation.

⁸ There may be an issue whether a particular price movement may encourage or discourage the investor to retender. As the Government has this exposure there should not be any pricing drive affecting this decision.

In an evaluation context such as this, cost of capital should reflect opportunity cost taking into account relative risks of the assets the capital is being employed to finance. In this case that is oil stocks and tanks. The cost of employing capital in these assets should reflect the risk associated with the volatility of returns relative to the risks associated with investing in other assets. These risks are present regardless of whose capital is used to finance the assets. Whether the government's capital or private sector capital is used, the risks associated with the assets remain unchanged. For efficient allocation of capital it is important that the options are evaluated on the basis of the asset risk.

This means even if the government's capital is used it should be the opportunity cost assessed, taking into account the risks, not the actual cost of raising capital⁹ (exactly as the private sector would do). The differences between the cost of capital for each option is thus based on the risks involved rather than who is providing the capital.

The opportunity cost of capital is also different than hurdle rates which companies use internally for assessing capital projects and allocating capital. In the case of the multinational oil companies although their ability to raise capital is substantial because of their size and financial standing their hurdle rates are high as they have many opportunities to use that capital to leverage high returns. However the hurdle rates for individual companies are not relevant in this assessment if a competitive dynamic for providing that capital is created (i.e. the competitive dynamic should provide capital at a rate the market would assess rather than an individual company). For some of the design options, there may be features which reduce competition. In these cases a cost of capital higher than the straight asset risk assessment is used.

The opportunity cost of capital (pre-tax nominal) for each option is assessed as follows:

Table 5: Cost of Capital

Option	Cost of Capital (pre-tax nominal)	Reasoning
Option 1	18%	The risks for the tenderer are higher because of price risk even if this is partially managed by hedging. Leaving tenderers with the price risk is also likely to limit competition. For this reason the rate assumed is similar to a hurdle rate for a commercial company.
Option 2	12.5%	With the government taking price risk, the risks for the tenderer are reduced. In addition, long-term contracts with the government as counterparty may attract greater competition from infrastructure type investors. The rate used is mid-range of those assessed as reasonable by financing experts.
Option 3	11.5%	In theory this should be the same as Option 2 (same risks). However we have assumed the market will still price in a bit more risk (i.e. it is not a perfect market) therefore Option 3 is marginally lower.
Option 4	11.5%	Same as Option 3.

Note that as offshore options are assumed to be part of the mix (50%), for Options 3 & 4 we have assumed that these stocks will be commercially owned and will be at the same cost as Option 2.

Other main assumptions:

- Base crude cost US\$50/bbl (WTI) but much of the crude stored may be cheaper
- 50% onshore/50% offshore

⁹ The logical conclusion if only the Government's cost of raising capital is used (not opportunity cost), is the Government should run every business in New Zealand because it would be much cheaper (no risk priced).

- Exchange rate US/NZ of 0.7
- Price risk is only directly costed in Option 1 when taken by the tenderer
- While Options 2 to 4 have lower cost of capital it is assumed there will be a fee for management of the stock system

The risk the government takes by taking on the pricing risk could be calculated for each option although as shown in Section 3.1.3 is likely to be fairly small and arguably has as much upside as downside. Such a calculation while feasible is beyond the scope of this report. It may be worth doing some further modelling to establish the size/probability of the risk profile.

The assumptions give the following resulting costs:

Table 6: Cost of Options

	Capital cost of stocks and tanks (NZ\$M)	Total Annual Cost (NZ\$M)	Annual Cost per litre ¹⁰ (NZ c/l)
Option 1	472.7	104.8	1.53
Option 2	472.7	65.6	0.96
Option 3	472.7	63.3	0.92
Option 4	472.7	63.1	0.92

While the above costs are estimates and the actual cost difference will depend on whether different options produce a different mix of stocks held, it does provide a useful indication. Option 1 is substantially more costly than the other options both because of the higher rate of return required and the cost of managing the stock price risk (estimated at NZ\$15.5 million annually). The variation in the other cases is primarily from different rate of returns. For Option 2 to be successful the risks need to be removed so the 'infrastructure type' investor will be attracted to invest.

3.1.6 Government Decision on Stock

The government needs to make a call on the stock ownership and pricing risk, deciding which option best meets its need. Our view is either Option 2 (government takes end of period risk) or Option 3 (Agency model) best meets the desires of the government while meeting the key objectives of ensuring a competitive process and minimising cost. We believe these options are also most likely to attract a wide participation resulting in a more competitive tender.

The issue with Option 1 is that risk is being created or managed when it need not be there resulting in higher cost. The issue with Option 4 is the direct involvement in oil ownership by the government, which is not desired and possibly makes some good commercial options (e.g. offshore storage) a lot more difficult.

3.2 Release of Stock in an Emergency

This issue follows on from the stock pricing risk where a decision can only be made once stock ownership is confirmed. Companies highlighted that they could not manage the unknown risk of the government having the right to buy the stock at any time at a fixed price, which potentially would create a mismatch with hedge contracts.

How stock would be released in an emergency needs to be spelt out along with the rules for release before the RFP process. Options are outlined in the following table. The options will depend on the decision made for stock ownership

¹⁰ Litre figure covers all petrol and diesel and domestic aviation fuel and fuel oil

Table 7: Release of Stock in an Emergency

Option	Explanation	Pros	Cons
1. Govt instructs stock owner to sell stock (Tenderer owns stock)	Govt doesn't purchase stock. Tenderer takes risk, which may be mitigated as price is likely to be high. Tenderer replaces stock and contract price reset.	<ul style="list-style-type: none"> • Simple as Govt. doesn't need to get involved 	<ul style="list-style-type: none"> • Govt not getting benefit if sold when market high • Risk remaining with tenderer which is likely to discourage tenders
2. Govt has obligation to replace stock before end of contract with same quality. (Tenderer owns stock)	In this case the Govt. takes all the risk – they have a right to take the stock, sell it (therefore need a right to buy) and then must replace with similar stock (or cash settlement at market price)	<ul style="list-style-type: none"> • No risk for tenderer • Govt. gets any premium if sale price is higher than replacement price 	<ul style="list-style-type: none"> • May be issues with 'like' replacement • Govt. needs to set up ability to sell oil (can tender for replacement barrels)
3. Govt (or agency) owns stock (Option 3 or 4)	In this case there are no issues as the Govt owns/controls the stock	<ul style="list-style-type: none"> • Simple • Govt. gets any risk premium in price 	<ul style="list-style-type: none"> • More administration and experience required

3.2.1 Government Decision Required

The government can't decide on the preferred option until the decision is made on stock ownership. Once that decision is made this decision may be obvious. However we think Option 1 may discourage tenderers so Option 2 may be more sensible if the tenderer owns the stock. As well as deciding on the above option the government needs to outline procedures as to how the stock would be released and the timing required (e.g. available within 14 days to be tendered to the market with possible release within 30 days).

3.3 **Standalone Stock versus Flexibility**

A number of respondents were concerned about the requirement outlined in the questionnaire that any IEA stock must be isolated or standalone. This was proposed due to concerns that IEA stock should not affect normal commercial stock holding requirements in any way. However some respondents thought that if the rules were too restrictive then good opportunities for stock holding would be lost, especially the effective use of spare tanks in currently used tank farms. Also stock turnover requirements require some sort of integration with current stocks. In effect having flexibility in the options that can be proposed will allow companies to pursue options they would do if they had the obligation to hold the stock (i.e. cheapest options).

The government needs to make a decision on what is going to be allowed. This needs to be done in conjunction with the development of rules for release. The following table looks at the options that the government has.

Table 8: Separate 'isolated' stock versus flexibility

Option	Explanation	Pros	Cons
1. Ensure stock is isolated	Government ensures that the IEA stock will not affect normal commercial stocks.	<ul style="list-style-type: none"> • IEA stock easily identified and quantified • No impact on normal commercial stocks 	<ul style="list-style-type: none"> • Will rule out some cost effective (and flexible) opportunities • Will increase costs

Option	Explanation	Pros	Cons
2. Allow commingling with normal stock and manage separation contractually	Leave flexibility in the design to allow companies to come up with innovative options.	<ul style="list-style-type: none"> Cheapest options will be allowed Good NZ based stock options available (i.e. good security stock) 	<ul style="list-style-type: none"> Will need strict rules on release of IEA stock Penalty system needed More complex for govt Difficult to define and monitor normal or "acceptable" stock levels

3.3.1 Government Decision Required

The government needs to decide on the requirements for the isolation of the IEA stock. While commingling stock increases the complexity for government many options require some integration for them to be feasible. We think it is premature to exclude all these options when the issue of not affecting commercial stocks might be managed quite feasibly. We note that some other country's agencies allow such designs¹¹. At this stage we believe the rules should have some flexibility with the issue to be reconsidered once actual proposals can be assessed after the RFP. One of the requirements of the RFP could be for companies who propose commingled or non-isolated stock options, to propose how they would ensure that commercial stocks are not affected.

Certainly keeping flexibility in the system will probably require a penalty system to be developed. The government also has the right to implement a compulsory days product stock obligation if they felt there was any game playing or relying on IEA stock for normal business.

3.4 Onshore/Offshore and Crude/Product Split

Most responders thought the government should retain flexibility and see what came out from the RFP process. One company suggested the government needs to make a call on whether improved security is an issue and if so put a limit (suggested the Covec/H&T figure of 190,000 tonnes in New Zealand). Another raised a number of reasons why the stock should be held in New Zealand not offshore. Comment has also been made (verbally) that if security is an issue then product should be held in approximate proportion to the market proportion of direct imported product supply.

The following table summarises the options.

Table 9: Onshore/Offshore and Crude/Product Split

Option	Explanation	Pros	Cons
1. Leave flexible until after RFP	Don't want to rule out any options and can assess after the RFP based on price.	<ul style="list-style-type: none"> Keeps all options open Simple Leaves the decision to when more information is available 	<ul style="list-style-type: none"> May not provide any NZ security Funds going offshore Possible political issues with not improving 'perceived' security
2. Set an amount to be held in NZ to ensure security (possibly with product portion)	Government needs to decide what role security plays (as in Covec/H&T report). Based on that decision it should set a limit (minimum) for NZ based stocks (and proportion product).	<ul style="list-style-type: none"> Clarity for everyone on the rules NZ security will be improved Still feasible for offshore options Balances two conflicting drives 	<ul style="list-style-type: none"> May not be cheapest option in total

¹¹ For example we note that the Irish Stock Holding Agency (NORA) is able to arrange for oil to be held by a commercial undertaking in non-segregated tankage. Commercial operators are still expected to hold reasonable levels of operating stocks.

Option	Explanation	Pros	Cons
3. Hold all stock in NZ	To provide security for New Zealand all stock needs to be held in New Zealand	<ul style="list-style-type: none"> • Maximises security benefit • No perception or political issues with security provision 	<ul style="list-style-type: none"> • Likely to be much higher cost • Will take longer to put in place (new tanks required) • Rules out a number of options

3.4.1 Government Decision Required

The government needs to decide on their preferred option for the split. In general while we think flexibility through the RFP process will ensure all options can be considered, there is value in dealing with the security question now. We think the proposal to use the Covec/H&T number has some substance as it gives justification for setting a minimum 'hold in New Zealand' stock. We also think that a proportion of product stock should be included in the 'hold in New Zealand' requirement. The decision on the split could be amended after the RFP if costs for different options are substantially different than expectations.¹²

We think requiring 100% of the stock to be held in New Zealand would be wrong at this stage. It would take away flexibility and possible low-cost options that offshore stock may provide and as shown in the Covec/H&T report is unnecessary for security.

One company was concerned that shipping would not be available to bring offshore stock to New Zealand in an emergency. However it is debatable whether shipping will be more available (less stock to carry) or less available in an emergency.

3.5 Splitting Tenders between Tanks and Stock

There were a variety of responses on this issue reflecting the options each respondent had available for additional stocks. Some companies thought they should not be split while others were only interested if they were. The ultimate decision will depend on the decision made on stock ownership as that could avoid some of these issues.

The following table looks at the options that the government has.

Table 10: Splitting Tenders between Tanks and Stock

Option	Explanation	Pros	Cons
1. Split tank and stock tender	Government will accept tenders for tanks and stock separately.	<ul style="list-style-type: none"> • Some companies have tank only options¹³ • Allows for different length of stock and tank contracts 	<ul style="list-style-type: none"> • No one likely to tender stock only options • Standards between tank and product owner • Mismatch in contract lengths • More difficult to compare options • Some companies only want to do combined
2. Allow split tenders and combined tenders	Leave it flexible to allow full range of options	<ul style="list-style-type: none"> • Ensures all options kept open 	<ul style="list-style-type: none"> • Makes comparison more difficult • Govt may have to put parties together

¹² It is likely stocks would only be held offshore if there were a significant cost benefit

¹³ [Withheld under section 9(2)(b)(ii) of the Official Information Act 1982]

Option	Explanation	Pros	Cons
3. Only have combined tenders	Tenders are only accepted for stock and tanks together. Companies are expected to do JVs if they only have stock or tanks	<ul style="list-style-type: none"> • Easier administration • Any risks/ standards issues sorted out commercially in JV • Easier to assess 'total cost' of proposal 	<ul style="list-style-type: none"> • May rule out some tank only options • Requires commercial parties with different interests to get together

3.5.1 Government Decision Required

The decision on splitting the tenders can't be made until the stock ownership is decided. The difficulty indicated in the responses is there are a number of tank only options but not stock only options. The decision on stock pricing risk and ownership may correct this imbalance. In general we think that it is better if the stock owner and the tank provider can agree terms and arrangements commercially rather than the government getting involved (unless they are owner of one of the assets).

3.6 Length of Contracts

Most respondents thought the government should leave this flexible as a mix of contract lengths is likely to best meet the government's risk management objectives (meet changing target and manage price exposure as discussed in Section 3.1). However respondents also raised this issue for tank investment (refurbished or new) where longer contracts are preferred. The length of stock holding contracts will depend on the stock ownership decision so this discussion deals with tank investments.

Tank assets are long life investments and respondents raised the issue for new tanks that if the terms were short, they would need to recover their investment over a short period. For new tanks, terms of between 10 and 20 years were preferred. This issue is highlighted in the following table. Tanks are normally a forty-year investment although an investor may amortise that over a somewhat shorter period to minimise risks. The following table shows for an investment of \$100 million what the annual cost is likely to be assuming a 10% return given a variable time for the recovery period.

Table 11: Annual payment for variable recovery periods

Period to Recover (years)	Annual Cost (\$M)	Percentage increase
40	9.30	
20	10.68	15%
15	11.95	28%
10	14.80	59%
5	23.98	158%

As the recovery period gets shorter the cost increases substantially. However countering this exposure, if the government signs up to long-term deals and gets left paying for tanks they don't need then the overall cost could be greater.

The cost increase by recovering the long-term investment over 20 years is not substantially different than 40 years (and might be what an investor would require). However 20 years is still a very long agreement for both parties. A 10-year agreement may be a more realistic contract length. However a tank owner recovering their investment over 10 years requires an annual payment 60% higher than for a 40-year recovery or 40% higher than a 20-year recovery.

One way of managing the conflicting risks (paying a lot for a long-life asset in a short period and the risk of paying for unused assets) is for the government to sign 10-year deals with the right to renew for another 10 years with the tank cost for that second 10 year period set in the

original contract and reflecting payments made in the first period. In this way the benefits of paying a higher rate earlier can be recovered in the second period if the contract is rolled over.

Alternatively for a portion of the required tankage (up to 50%) the government may be prepared to do long-term (15 or 20 years) deals.

For existing/refurbished tanks we believe the government should be prepared to be flexible with terms anywhere between one and ten years.

3.6.1 Government Decision Required

The government needs to decide on the length of contracts they are prepared to accept, particularly around tank contracts. In general we believe the length of contract should be left flexible for the tenderer to propose. However it would be sensible for the government to outline the maximum period of the contract they are prepared to accept and perhaps propose a suitable structure (e.g. 10+10 roll-over) for long-term tenders.

3.7 Other Issues

There are a number of other items requiring decisions but of a lesser importance than the issues already covered. These items are listed with a discussion below.

Exchange Rate Exposure	Because any stock is valued in US\$ any stock also has an exchange rate exposure. One company suggested that payment could partially be in US\$. That would then cause an exposure for the government as their income is in NZ\$. The bulk of the exchange rate exposure could be handled in the same way as the oil price exposure (i.e. tenderer hedges it or government takes end of period risk). For any offshore stock options the government needs to decide how it wants to pay. If it only wants to pay in NZ\$ then any tenderer needs to build the exposure (or hedge cost) into the charge.
Interest Rate Exposure	One company suggested interest rates could be left floating or fixed in offers. The government needs to decide if there should be any flexibility in this area. Our view is this should be left to tenderer to decide with the government interested in the net cost.
Payment Frequency	Companies want to know how and when payments would be made (e.g. quarterly in advance)
Stock Specifications	As discussed in 2.1.4 these are basically agreed and could now be defined for final agreement. The main issue is whether any particular types of crude should be specified. NZRC has proposed some categories for crude stored in New Zealand.
Assessment Process/ Criteria	There was little feedback on the assessment process other than it needed to be transparent and include 'total system cost' (i.e. all costs over the period of the tender). The government needs to start defining the assessment criteria.
Government to Government agreements	One company asked about the government-to-government agreements and how they were progressing. There is concern that they may take longer than the proposed tender timetable.

4.0 Next Steps & High Level RFP Design

The following list details the steps needed to move the stock tender process forward. They are in approximate chronological order although some could be reversed if necessary. The key is the decision process shown in step 1 which may lead to changes in the following steps. The decisions will also impact on some of the elements of the RFP design although many requirements are generic.

We recommend that a number of these action items should be progressed in close consultation with the industry and that working groups should be convened as appropriate.

1. Work through the decisions listed in Section 3, particularly the stock ownership/risk decision. The decisions include:
 - a. Stock ownership and pricing risk
 - b. Release of stock in an emergency (pricing exposure)
 - c. Separate stock versus flexibility
 - d. Onshore/offshore and crude/product split
 - e. Splitting tenders between tanks and stock or combined
 - f. Length of tenders

The outcome of each of these decisions may then require some further work streams.

2. Develop the policy for under what circumstances stock would be released. This includes:
 - a. What category of event would trigger release (e.g. IEA event)?
 - b. What is the process gone through?
 - c. Who participates in the decision?
 - d. Who makes the final release decision?
3. Develop proposal for how stock would be released in an emergency. This includes:
 - a. How long before it needs to be available?
 - b. How would the stock be released to market (sale process)?
 - c. Who would manage the release (i.e. the sale process)?
 - d. Which stock would be released first (priority)? Does this vary depending on event?
 - e. Contractual arrangements for release (e.g. so much to each party in the market)
4. Define stock specifications requirements including:
 - a. Crude requirements for New Zealand (including any categories for different type)
 - b. Product requirements for New Zealand
 - c. Crude requirements for offshore storage
 - d. Product requirement for offshore storage
 - e. Maintenance requirements for the crude or product (e.g. turnover)
5. Develop the payment proposal including where exchange rate risk will sit. The quality (standard) of bidders also needs to be defined.
 - a. Frequency of payment
 - b. Payment in advance
 - c. Currency of payment
 - d. Quality requirements

6. Develop forward expectation for stock requirement over next 10 years (with possible variation from demand and upstream production). Use this to plan bands for stock. Bands should be split so that each band has a quantity and a length (e.g. want to have 40% of the volume for 10 years).
7. Define the parameters for the each category for inclusion in RFP (tanks and/or various stock categories). This is to set the framework for how much flexibility tenderers have in their proposals. Define acceptable standards.
8. Develop draft assessment criteria. This will need to define:
 - a. The cost element breakdown that will be required in the tender including ongoing costs during tender and any costs involved at start and finish of tender (identification of "whole of life" cost)
 - b. How the total cost will be built up and converted into a cost/contribution to IEA inventory
 - c. How different categories will be compared where applicable
 - d. How any security (or other) benefit will be assessed if that is deemed relevant
 - e. Meet the requirements of the Government's procurement guide¹⁴
9. Issue all the above (if relevant) for comment and discussion with industry/interested parties
10. Modify proposals based on feedback and then release as the basis for the Request for Proposals
11. Develop draft Request for Proposal. This will include the following:
 - a. Background including its role in subsequent tender
 - b. Requirement: What is being tendered for
 - c. Timetable
 - d. Detailed breakdown of requirements:
 - i. Specifications required
 - ii. Rules for release
 - iii. Process for release of stock
 - iv. Parameters regarding location/stock separation
 - v. Payment options/details
 - vi. Requirements for tank and operating standards
 - e. Evaluation criteria
 - f. Financial standing of bidders

¹⁴ It is likely there will be discussion during the RFP process between the government and tenderers. This will need to be managed carefully to avoid conflict issues and meet good procurement practice.

Appendix 1: Assumptions for Cost Analysis

General Assumptions

Onshore/Offshore mix	50/50
All stock crude oil except 20% NZ held stock product	
Mix of crude in NZ	75% medium_heavy/25% light
Mix of crude offshore	50% Australian (light)/50% USA (heavy)
Exchange rate (US/NZ)	0.7
All crude cost factored off WTI	US\$50.00/bbl (US\$393/tonne)
Average cost of crude in NZ	US\$47.63/bbl (US\$362/tonne)
Average cost of crude offshore	US\$47.00/bbl (US\$359/tonne)
Average cost of product in NZ	US\$60.00/bbl (US\$472/tonne)
Typical bbl/tonne conversion factor	7.60
Tank costs from Covec/H&T Oil Security Report	– land cost included.
Use of existing tanks lower cost than new	70% of new cost assumed (marginal cost could be very low)
New Zealand storage	50% new tanks, 50% existing
All offshore storage existing tanks	
Terminal operating and turnover costs as per Covec/H&T Oil Security Report	
Annual domestic consumption	6862 million litres (from MED) ¹⁵
Government's administration costs	
Option 1	NZ\$0.5 million
Option 2	NZ\$0.6 million
Option 3	NZ\$1.0 million
Option 4	NZ\$0.75 million

Assumptions by Option

	Option 1	Option 2	Option 3	Option 4
Rate of Return (pre tax nominal)	Commercial Rate 18%	Infrastructure Investor – 12.5%	Government equiv. – 11.5%	Government equiv. – 11.5%
Risk management cost	US\$2.50/bbl/yr (NZ\$15.5 mln/yr)	No direct cost	No direct cost	No direct cost
Other costs built into offer	NZ\$0.30/bbl/yr (NZ\$1.3 mln/yr)	NZ\$0.30/bbl/yr (NZ\$1.3 mln/yr)	NZ\$0.20/bbl/yr (NZ\$0.9 mln/yr)	NZ\$0.20/bbl/yr (NZ\$0.9 mln/yr)
Management Fee	N/A	NZ\$0.25/bbl (NZ\$1.1 mln/yr)	NZ\$0.25/bbl (NZ\$1.1 mln/yr)	NZ\$0.25/bbl (NZ\$1.1 mln/yr)

Rate of Return: Option 1 is reflective of a commercial return. In option 2 the government takes the risk so the tanks/stock become like an infrastructure investment with steady returns over a long-term. These rates are based on advice from companies with financing expertise. Government equivalent returns are similar with a small difference reflective an 'imperfect' market.

Risk: Risk is only explicitly priced in Option 1. In all the other cases the Government takes the risk and it is assumed risk is largely managed by the continuing need for stock holding (i.e. minimal purchase/sales once system is operation). It would be possible to model this risk but it is beyond the scope of this report.

Other costs built into offer: This is to cover insurance and other costs in putting a storage option together. It is highest in the commercial case, as they need to recover costs being managed internally.

Management Fee: For all options, except Option 1, it is assumed someone would need to manage the stocks for the investors/agency/government. For option 2 it is assumed an oil company may be involved in putting the deal together and this might be their fee. This fee does not include tank farm operating costs and direct stock turnover costs.

¹⁵ Includes all petrol, domestic diesel, domestic jet and domestic fuel oil

Appendix 2: Cost of Options

Summary Of Cost Analysis for Stock Ownership/Risk Options

Total Capital Cost of Tanks, Land and Stock

	NZ\$ million
Option 1	472.7
Option 2	472.7
Option 3	472.7
Option 4	472.7

Annual Cost of Total System

	NZ\$ million	NZ c/litre
Option 1	104.8	1.53
Option 2	65.6	0.96
Option 3	63.3	0.92
Option 4	63.1	0.92

IEA Stock Cost Calculation Spreadsheet

Note the model is single period for simplicity. For full analysis a multi-period model should be done. However as oil price is not directly impacted by inflation or depreciation the simplification is reasonable. For the tankage a annual payment function has been used although this has been compared to a full 20-year NPV model (with depreciation) to ensure it is a reasonable approximation.

<u>General Assumptions</u>		New Zealand		Offshore		<u>Basis for Assumptions</u>	
1	Offshore/New Zealand Inventory Split	50%		50%		Assume an amount held in New Zealand for security reasons Balance offshore assuming that may be cheaper	
2	Crude/Product split	Crude Product	80% 20%	100% 0%		Assume a portion of NZ stock to be product for security reasons Assume all offshore stock to be crude	
3	Type of crude		Light	Heavy			
	In NZ		25%	75%		Assume some crude in New Zealand is light (more expensive) with the balance being heavy (cheaper) but still acceptable for NZRC	
			Aus	USA			
	Offshore		50%	50%		Assume half the offshore crude in in Australia (more expensive) with the balance being in the USA (heavy & cheaper)	
4	Exchange Rate US/NZ		0.70				
5	Crude/Product Price	WTI			Barrels to tonnes	US\$/tonne	
	-average price landed in NZ (heavy)		50.0 USD		7.86	393	All crude prices work off a nominal WTI headline price
	-average price landed in NZ (light)		46.5 USD		7.50	349	Typical NZRC medium/heavy crude (Oman). WTI less \$6.00/bbl + freight
	-average price landed in Taranaki (light)		51.0 USD		7.86	401	Typical NZRC light crude. WTI less \$1.00/bbl + freight
	-average price in Aus (light)		49.0 USD		7.86	385	Typical NZ produced light crude (FOB - excl. freight). WTI less \$1.00/bbl
	-average price other (US) (heavy)		50.0 USD		7.86	393	Typical Aus light crude (1/2 FOB/ 1/2CIF). WTI less \$1.00/bbl + 1/2 freight
	-average price product in NZ (landed)		44.0 USD		7.40	326	Typical US heavy crude (e.g. Mars) cost in the US. WTI less \$6.00/bbl
	-average price product offshore (FOB)		60.0 USD		7.86	472	Typical NZ product price (avg. petrol/diesel). WTI+\$6.5/bbl + freight
			56.5 USD		7.86	444	Typical product price (avg. petrol/diesel) FOB. WTI+\$6.5/bbl
6	New tank cost crude (\$/tonne)		356.0 NZD				From Covec/H&T report

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	New tank cost product (\$/tonne)	391.0	NZD	From Covec/H&T report
	Cost of land (\$/tonne)	43.0	NZD	From Covec/H&T report
	Recovery years for new tanks	20	years	Aim for new tank contracts is to recover investment over long period
	Existing Tanks Cost: crude (% of new cost)	70%		Assume existing tanks are charged between 50-75% of new tank cost
	Existing Tanks Cost: product (% of new cost)	70%		As above (note marginal cost for existing tanks could be quite low)
	Offshore tank cost (assume all existing tanks)	70%		As above
	Proportion of NZ crude tanks new build	50%		Proportion of tanks that need to be new built
	Proportion of NZ product tanks new build	0%		Proportion of tanks that need to be new built
7	Operating costs: crude	2.0	NZD/tonne	From Covec/H&T report: Only covers the terminal operating costs
	Operating costs: product	3.0	NZD/tonne	From Covec/H&T report: Only covers the terminal operating costs
	Turnover Cost: product	2.5	NZD/tonne	From Covec/H&T report
8	Amount of Stock required			
	IEA tonnes	500,000		Input cell - can vary
	Crude physical equivalent	578,704		Calculation based on IEA rules
	Product physical equivalent	462,963		Calculation based on IEA rules
9	Total litres of domestic consumption	6861.8	million litres	All petrol, domestic diesel, domestic jet, domestic fuel oil (no bitumen/ special products). From MED data.
10	Administration Costs		NZD millions	This section estimates government's administration costs.
	Base Government Costs (annual)	Option 1	0.50	In general the expenses will increase as responsibilities increase.
		Option 2	0.60	The highest cost would be an agency structure which is the most flexible
		Option 3	1.00	but also the most complex. Note stock management charges are
		Option 4	0.75	excluded from these amounts.

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Assumptions for Commercial Ownership with risk (Option 1)				Comment
		New Zealand	Offshore	
Pre-tax Cost of Capital (Nominal)	Stock	18%	18%	Assume a typical commercial return for business with some risks. Needs to be at least typical return for current NZ business to make it worthwhile (although this is below international oil company overall average return)
	Tanks	18%	18%	
Annual Risk Management Cost	US\$/bbl	2.50		Estimate provided by industry
Annual cost built into offer	NZ\$/bbl	0.30		Includes insurance cost, general risk, internal costs
Management Fee	NZ\$/bbl	0.00		Not applicable for this option (built into return)

Assumptions for Commercial Ownership without risk (Option 2)				Comment
		New Zealand	Offshore	
Pre-tax Cost of Capital (Nominal)	Stock	12.5%	12.5%	This case assumes scheme attracts infrastructure investors who want returns between 2% & 3% (pre-tax) above risk free long-term rate for long-term low risk investment. Arguably offshore rate may be lower but offset by increased exchange rate risk. Govt. as counterparty reduces risk.
	Tanks	12.5%	12.5%	
Annual Risk Management Cost	US\$/bbl	0.00	N/A	Not applicable as government takes pricing risk
Annual cost built into offer	NZ\$/bbl	0.30		Includes insurance cost, general risk, internal costs
Management Fee	NZ\$/bbl	0.25		Assume investor needs other party (e.g. oil company) to manage stocks and quality, turnover.

Assumptions for Agency Ownership (Option 3)				Comment
		New Zealand	Offshore	
Pre-tax Cost of Capital (Nominal)	Stock	11.5%	12.5%	This case assumes an agency is set up to manage the whole scheme. As the agency is Govt. guaranteed its cost of capital should be similar. However for offshore we assume the stock still needs to be commercially owned so the cost of capital is the same as Option 2.
	Tanks	11.5%	12.5%	
Annual Risk Management Cost	US\$/bbl	0.00	N/A	Not applicable as government takes pricing risk
Annual cost built into offer	NZ\$/bbl	0.20		Includes insurance cost
Management Fee	NZ\$/bbl	0.25		Agency needs someone to manage stocks: maintain quality, reporting surveying, turnover, etc.

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Assumptions for Government Ownership (Option 4)				Comment
		New Zealand	Offshore	
Pre-tax Cost of Capital (Nominal)	Stock	11.5%	12.5%	This case assumes govt ownership. The cost of capital is as supplied by MED. It reflects an equivalent 'commercial' cost for government borrowing (6% after tax). As above offshore stocks are still commercially owned.
	Tanks	11.5%	12.5%	
Annual Risk Management Cost	US\$/bbl	0.00	N/A	Not applicable as government takes pricing risk
Annual cost built into offer	NZ\$/bbl	0.20		Includes insurance cost
Management Fee	NZ\$/bbl	0.25		Government needs someone to manage stocks: maintain quality, reporting surveying, turnover, etc.

Option 1: Commercial ownership with risk - Cost Build Up

				US\$min	NZ\$min
Cost of Stock In New Zealand		Tonnes	Barrels		
	Crude	231,481	1,756,944	83.7	119.6
	Product	46,296	363,889	21.8	31.2
Cost of Stock Offshore	Crude	289,352	2,207,755	104.0	148.5
	Product	-	-	-	-
Total Stock Cost		567,130	4,328,588	209.5	299.3
Return on Investment in Stock			NZ		27.1
			Offshore		26.7
			Total		53.9
Tank Cost (including land) in New Zealand	Crude				78.5
	Product				14.1
Cost of Tanks Offshore	Crude				80.8
	Product				-
Total Tank Cost					173.4
Return on Tank Investment			NZ		17.3
			Offshore		15.1
			Total		32.4
Risk Management Cost (annual)				10.8	15.5
Other costs (annual)					
Operating Costs					1.2
Turnover Cost Product					0.1
Annual costs built in offer					1.3
Management Fee					-
Government Administration Costs					0.5
Total Other Costs					3.1
<u>Summary</u>					
Total Capital Cost (NZ millions)					472.7
Total annual cost for return on investment					86.3
Total annual costs					18.6
Total Annual Cost					104.8
Total Litres (millions)					6,861.8
Cost /litre domestic consumption				NZ c/litre	1.53

Option 2: Commercial ownership without stock price risk - Cost Build Up

				US\$mIn	NZ\$mIn
Cost of Stock In New Zealand		Tonnes	Barrels		
	Crude	231,481	1,756,944	83.7	119.6
	Product	46,296	363,889	21.8	31.2
Cost of Stock Offshore	Crude	289,352	2,207,755	104.0	148.5
	Product	-	-	-	-
Total Stock Cost		567,130	4,328,588	209.5	299.3
Return on Investment in Stock			NZ		18.9
			Offshore		<u>18.6</u>
			Total		37.4
Tank Cost (including land) in New Zealand	Crude				78.5
	Product				14.1
Cost of Tanks Offshore	Crude				80.8
	Product				-
Total Tank Cost					173.4
Return on Tank Investment			NZ		12.8
			Offshore		<u>11.2</u>
			Total		23.9
Risk Management Cost (annual)				-	-
Other costs (annual)					
Operating Costs					1.2
Turnover Cost Product					0.1
Annual costs built in offer					1.3
Management Fee					1.1
Government Administration Costs					<u>0.6</u>
Total Other Costs					4.3
<u>Summary</u>					
Total Capital Cost (NZ millions)					472.7
Total annual cost for return on investment					61.4
Total annual costs					4.3
Total Annual Cost					65.6
Total Litres (millions)					6,861.8
Cost /litre domestic consumption				NZ c/litre	0.96

Option 3: Agency Model backed by Government - Cost Build Up

				US\$mIn	NZ\$mIn
Cost of Stock In New Zealand		Tonnes	Barrels		
	Crude	231,481	1,756,944	83.7	119.6
	Product	46,296	363,889	21.8	31.2
Cost of Stock Offshore	Crude	289,352	2,207,755	104.0	148.5
	Product	-	-	-	-
Total Stock Cost		567,130	4,328,588	209.5	299.3
Return on Investment in Stock			NZ		17.3
			Offshore		<u>18.6</u>
			Total		35.9
Tank Cost (including land) in New Zealand	Crude				78.5
	Product				14.1
Cost of Tanks Offshore	Crude				80.8
	Product				-
Total Tank Cost					173.4
Return on Tank Investment			NZ		12.0
			Offshore		<u>11.2</u>
			Total		23.2
Risk Management Cost (annual)				-	-
Other costs (annual)					
Operating Costs					1.2
Turnover Cost Product					0.1
Annual costs built in offer					0.9
Management Fee					1.1
Government Administration Costs					<u>1.0</u>
Total Other Costs					4.2
<u>Summary</u>					
Total Capital Cost (NZ millions)					472.7
Total annual cost for return on investment					59.1
Total annual costs					4.2
Total Annual Cost					63.3
Total Litres (millions)					6,861.8
Cost /litre domestic consumption				NZ c/litre	0.92

Option 4: Government Ownership Onshore/Investor offshore- Cost Build Up

				US\$mIn	NZ\$mIn
Cost of Stock In New Zealand		Tonnes	Barrels		
	Crude	231,481	1,756,944	83.7	119.6
	Product	46,296	363,889	21.8	31.2
Cost of Stock Offshore	Crude	289,352	2,207,755	104.0	148.5
	Product	-	-	-	-
Total Stock Cost		567,130	4,328,588	209.5	299.3
Return on Investment in Stock			NZ		17.3
			Offshore		<u>18.6</u>
			Total		35.9
Tank Cost (including land) in New Zealand	Crude				78.5
	Product				14.1
Cost of Tanks Offshore	Crude				80.8
	Product				<u>-</u>
Total Tank Cost					173.4
Return on Tank Investment			NZ		12.0
			Offshore		<u>11.2</u>
			Total		23.2
Risk Management Cost (annual)				-	-
Other costs (annual)					
Operating Costs					1.2
Turnover Cost Product					0.1
Annual costs built in offer					0.9
Management Fee					1.1
Government Administration Costs					<u>0.8</u>
Total Other Costs					4.0
<u>Summary</u>					
Total Capital Cost (NZ millions)					472.7
Total annual cost for return on investment					59.1
Total annual costs					4.0
Total Annual Cost					63.1
Total Litres (millions)					6,861.8
Cost /litre domestic consumption				NZ c/litre	0.92