



**Cost of Capital Workshop  
12th-13th November 2009**

**Cross-submission by  
Maui Development Limited**

**2 December 2009**

## 1 Introduction

Maui Development Limited (MDL) welcomes the opportunity to cross-submit on the Commerce Commission (Commission) Cost of Capital Workshop (Workshop) held on the 12th and 13th November 2009. We appreciate the effort made by the Commission to ensure that the information and methods to determine the cost of capital accurately reflect the characteristics of the businesses subject to a Default Price Path.

MDL are of the view that the Commission has been handed a difficult task in delivering a WACC figure for each regulated industry. This is especially apparent given:

- There is little robust data to support the selection of input parameters; and
- That the models already have a pre-existing level of error; and
- That the definition of a final WACC figure from a range is so uncertain that probabilistic simulation techniques are needed.

While we appreciate the legal requirement to establish a cost of capital methodology and sympathise with the Commission's position, in the context of the Maui Pipeline we are concerned that the final weighted average cost of capital (WACC) for the Maui Pipeline is not set at a level that will undermine investment or the security of New Zealand's energy supply.

With this in mind the approach that MDL has taken in preparing its cross-submission has been to:

- Address the specific questions raised by the Commission during the Workshop; and
- Highlight the areas of the Commission's proposed methodology that we feel may not compensate for the unique risks facing the Maui Pipeline business; and
- Assist the Commission by providing further information about the unique characteristics of Maui Pipeline and based on these, what we believe would be reasonable cost of capital input parameters for Maui Pipeline.

Because MDL is required to set Maui Pipeline tariffs annually, and because MDL has undertaken to use the Commission's guidelines in this process, we feel that our views are well founded and hope that they will assist the Commission establish a cost of capital range that is appropriate for Maui Pipeline. We would welcome the opportunity to discuss any of the views expressed in this cross-submission with the Commission.

A summary of the main points in MDL’s cross submission is provided in Table 1.

**Table 1: Summary of main points**

<p><b>Methodology</b></p> <p>MDL supports the use of the simplified Brennan-Lally CAPM but observes that no perfect methodology for determining the cost of capital exists. Other forms of the CAPM should be used as a cross check. Weaknesses in cost of capital models should be offset by qualitative adjustments where models are proven to underestimate the WACC.</p>
<p><b>Industry wide versus firm specific parameters</b></p> <p>Due to the MDL entity structure and lack of a balance sheet for that entity, MDL would support the use of an industry benchmark for leverage. Given the unique characteristics of Maui Pipeline, MDL’s preference is that the debt premium and asset beta should be firm specific.</p>
<p><b>WACC and NPV = 0</b></p> <p>NPV=0 is unlikely to promote investment in Maui Pipeline especially in a capital constrained environment. Owners of the Maui Pipeline will have a number of other investment opportunities in New Zealand or overseas. Competing investment opportunities will be NPV positive.</p> <p>MDL agree that risks not incorporated in the WACC derivation will need to be compensated through the inclusion of theoretical insurance costs (or WACC adjustment) within the regulatory revenue calculation, if not then NPV = 0 will not be achieved.</p>
<p><b>Risk free rate</b></p> <p>MDL sets a term for the risk free rate based on the Commission approach. The term for the risk-free rate is currently matched to the term of the regulatory period. MDL is concerned that the Commission will lock in a historically low risk-free rate for the regulatory period resulting in an under recovery for the whole regulatory period. A preferable approach may be to adjust the term to match investment cycles of electricity and gas companies. This could involve the use of ten year bond yield rates.</p> <p>The approach taken by the Commission to calculate the risk-free rate should be transparent and use publically available data so that firms can track changes to the risk-free rate over time.</p>
<p><b>Debt premia</b></p> <p>MDL supports adjustments made to the debt premia for the size of the regulated firm to account for the higher rates of interest that smaller firms generally have to pay and for the higher debt issue costs. Difficulty setting the debt premia at a point in time for the duration of the regulatory period should be considered as part of the asset beta building block. MDL would determine the debt premium at a point in time by reference to the level of credit risk observed in the market,</p>

referencing the asset swap spread and the bond swap spread.

**Asset beta**

MDL believe that Maui Pipeline faces sufficient systematic risk to warrant a firm specific asset beta. There are few if any useful market comparators that could be used in conjunction with the Straw Person approach to determine an appropriate asset beta for Maui Pipeline.

**Tax adjusted market risk premium**

KPMG CF holds the view that tax adjusted market risk premiums have stayed between 7% and 8% over the last decade. KPMG and MDL place more weight on historical estimates, recent updates, and to an extent the Ibbotson approach rather than the Seigel approach. KMPG and MDL favour a MRP that is reflective of bonds and equities that have a term similar to the regulatory period.

**Alpha adjustment**

An alpha adjustment has been used successfully in the past by MDL to mitigate the effects of a government proposed ban on thermal power generation. MDL is of the view that the Commission should remain open to the use of alpha adjustments in the future to capture the impact of unforeseen events such as the ban on thermal power generation.

**Choosing a point on the range**

Difficulties associated with selecting a final cost of capital point along a range are acknowledged by MDL. However the 75% point in the WACC range may still underestimate the true value of the WACC for a given industry. The two issues of potential error, and the desire to select a point above the mean could each be treated with separate adjustments.

## **2 Methodology**

The simplified Brennan-Lally Capital Asset Pricing Model is commonly used by practitioners in New Zealand and reflects aspects of the tax regime unique to New Zealand. MDL has adopted the simplified Brennan-Lally approach for the purposes of its annual tariff calculation, as the Maui Pipeline Operating Code requires it to follow standard New Zealand practice for calculating the cost of capital.

There is no perfect methodology for calculating the cost of capital, and each approach has its own weaknesses. For example, as discussed at the conference, the simplified Brennan-Lally approach may underestimate the cost of capital for low-beta companies and over estimate the return for high beta stocks when comparing the outturn of the model to actual market returns. It is the nature of such proxy models for estimating market returns that inaccuracies will occur.

The simplified Brennan-Lally methodology has the advantage in New Zealand of having been tested and debated over time and being widely used and understood. MDL submits that the method be retained, but that the Commission should be cautious of the outturn of the model and specifically;

- Cross-check the outturn of the simplified Brennan-Lally approach against other approaches such as the classical CAPM model; and
- Be prepared to make qualitative adjustments to the outturn of the calculation to take into account weaknesses in the model as they are identified. For example, if it is established empirically that the simplified Brennan-Lally model underestimates WACC, and this is supported by cross-checks, an upward adjustment could be made.

## **3 Industry wide versus firm specific**

The Commission outlined three parameters that it believes could either be industry wide parameters or firm specific. These are leverage, debt premium and asset beta.

### **3.1 Leverage**

Due to its entity structure MDL does not have a balance sheet of its own and therefore it is not possible to observe MDL's actual leverage. MDL accepts that the Commission should assume MDL to have a level of debt. This is because MDL's existing position arises from its Joint Venture structure and under a more common corporate ownership structure MDL could be expected to hold an optimal level of debt.

MDL's view is that it is not practical, and it is potentially inefficient, to estimate this level of debt for MDL separately from other electricity and gas firms, and it will not be likely that analysis will derive a material difference in the optimal level of leverage. For these reasons, MDL would accept an industry-benchmark level of assumed net debt.

### **3.2 Debt premium**

Equally, it is not possible to observe the cost of MDL's debt. In the past, MDL has estimated a debt premium taking into account;

- The likely credit margin consisting of:
  - the credit spread (or "asset-swap" spread) given the level of gearing assumed (40% in this instance); and
  - the cost of hedging a floating interest rate exposure, which is indicated by the spread between the long term bond rate and the swap rate of equivalent duration (the "bond-swap" spread).
- The annualised cost of upfront fees payable to raise fixed rate finance.

For the purpose of discussion here, the advantage of MDL's approach above is that it relies on readily available data from Australia and New Zealand and therefore offers transparency as to the debt premium for interested parties. The Commission has noted that a firm's actual portfolio will be made up of a number of instruments.<sup>1</sup> The cost of some of these instruments, such as private bond placements and bank debt, are observable while others are not. Following the Commission's approach will not allow MDL to observe a risk free rate for the Maui Pipeline over time.

### **3.3 Asset beta**

Asset beta is the most difficult element of the CAPM to estimate for unlisted firms when there are few listed industry comparators. In this context, an industry wide approach may be attractive to the Commission. However, MDL is concerned to emphasise its different systematic risk profile compared to other electricity and gas firms. Later in this submission we discuss some of the differences between a point-to-point gas transmission business and other gas and electricity businesses but they can be summarised as being;

- Customer dependence – Maui Pipeline has two large direct use customers<sup>2</sup> that account for approximately 45% of all gas transported through the Maui Pipeline.<sup>3</sup> If indirect use of Maui Pipeline by large industrial users is also included, then that figure would be around 75% of the total annual Maui Pipeline throughput. As a consequence commercial decisions made by one customer have a significant impact on the return from Maui Pipeline under price regulation;
- Customer type – the demand for gas from the Maui Pipeline's two direct use customers, Methanex and Genesis Energy, varies in response to wider economic factors from time to time and supply

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<sup>1</sup> Commerce Commission 'Cost of capital data request' by email, 4 November 2009

<sup>2</sup> Prior to 2009 there were 3 large direct use customers, However New Plymouth Power Station is no longer operational

<sup>3</sup> Maui Pipeline Commercial Operator estimate

availability. This variable demand makes Maui Pipeline a riskier investment compared to a gas distribution businesses;

- Taranaki gas dependence – Maui Pipeline, to a much greater degree than gas distribution businesses, is dependant on the continuation of large-scale gas exploration in the Taranaki basin to avoid the stranding and decommissioning of all or part of the Pipeline.

For these reasons we believe that the Maui Pipeline requires a firm specific asset beta or firm-specific adjustments to an industry-wide asset beta.

#### **4 WACC and NPV = 0**

We understand the theoretical reasons behind the NPV = 0 methodology. However, MDL reiterates its comments from previous submissions that in a capital constrained environment investors in Maui Pipeline are unlikely to invest at NPV = 0 given the range of investment options open to them. While upstream development is unlikely to be affected by this constraint on the Maui Pipeline, ongoing pipeline investment will be affected.

We agree with comments made at the conference that all risks not incorporated with the WACC derivation need to be compensated through the inclusion of theoretical insurance costs (or WACC adjustment) within the regulatory revenue calculation. If these costs are not included then NPV = 0 will not be achieved.

#### **5 Risk free rate**

Until now, MDL has set a term for the risk-free rate to match the regulatory period, which for the purpose of setting Maui Pipeline tariffs is currently one year. This approach has been adopted so that MDL can be consistent with the principle of matching the term used to the regulatory period. However, a preferable approach may be to align the risk free rate to investment cycles, to better reflect the actual context in which gas and electricity firms invest. This issue is particularly relevant at the present time, as the yield curve is currently steeply upward sloping, with a premium on liquidity. We are concerned that if the Commission locks in a historically low risk-free rate, due to selecting a short period, when the market evidence is that there is a significant premium on liquidity, the Commission will be setting up an under-recovery for the whole period. This risk is in part mitigated by an increase in the debt premia and market risk premium, but our view is that these inputs are likely to be less fluid over the regulatory period than the risk free rate.

When calculating the risk free rate for MDL, KPMG currently refers to government wholesale bond information from the Reserve Bank of New Zealand. A monthly average of the daily closing rate is taken to avoid the effect of any specific trades. We adjust the rate for the effect of semi-annual coupons. The output of this approach will be different from the Commission's proposed approach. For example, this approach suggests a risk free rate of 4.95% for a five year regulatory period starting on 1 September 2009. However, it has the significant advantage over the

Commission's proposed approach of relying on public information and requiring less calculation and interpolation. This enhances transparency and allows parties to observe changes in the risk free rate over time.

The net impact of this approach – a ten year rate using Reserve Bank data adjusted for coupons – would be a risk free rate of 5.71%.

## **6 Debt premia**

As a result of the global financial crisis, debt premia observed in the market have increased, going some way to offsetting the decrease in the risk free rate. We also note anecdotal market evidence that costs of raising debt in the market has also increased.

We also note the difficulties in separately identifying debt issue costs from debt premia in market data. Due to these difficulties we support including an allowance for debt issue costs within the debt premia value rather than separately estimating these costs within operating costs in the building blocks calculation.

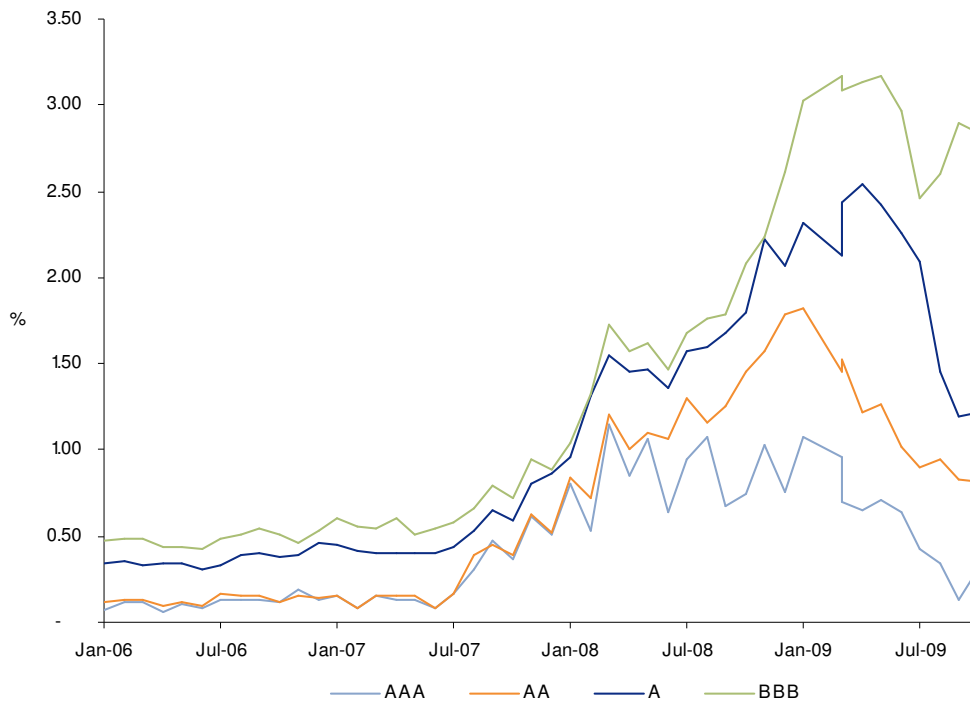
We support adjusting the debt premia for the size of the regulated firm to take into account that smaller firms generally have to pay higher rates of interest and adjust for economies of scale that occurs around debt issue costs. That is, debt issue costs as a portion of debt decrease as the level of debt drawn down increases. Therefore we would expect debt premia to be higher for smaller firms.

An additional challenge to this approach is the need to observe the debt premia at a particular point in time, to be set for the regulatory period. The effect of this should not be asymmetric, but can be significant especially when the regulatory period is long. KPMG's preferred approach is to consider this issue as part of the asset beta building block.

KPMG would determine the debt premium at a certain point in time by reference to the level of credit risk observed in the market. We would reference to two market derived spreads:

1) Asset swap spread. The spread that bondholders will receive by exchanging their fixed rate bonds for floating rate securities, using the swaps market. As such, this spread represents the incremental risk of the corporate bond over inter-bank credit risk. Figure 1 below shows the level of swap spreads in Australia, including the impact of the financial crisis. New Zealand spreads have not been used due to the lack of depth and liquidity in the New Zealand Bond market.

**Figure 1: Australian asset swap spreads**

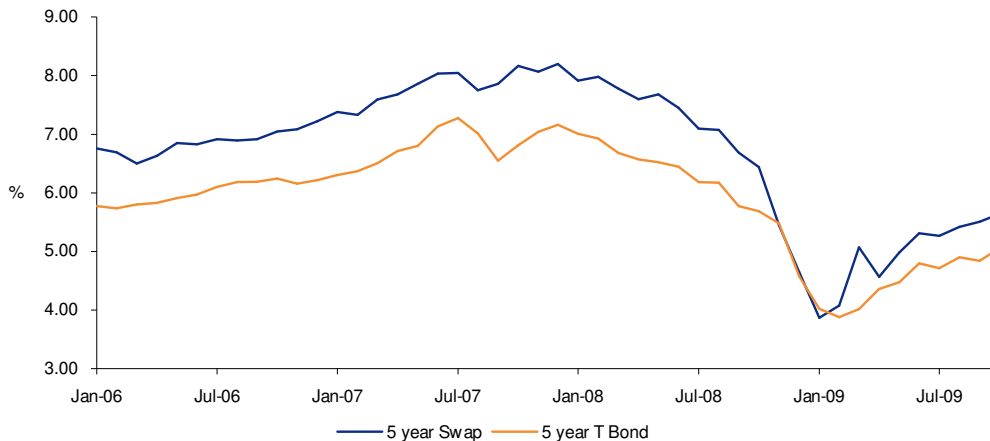


Source: Bloomberg

2) Bond swap spread. This spread represents the difference between the long term government bond rate and the swap rate of equivalent duration. In theory, the swap spread represents the additional credit risk of the interbank market above that of the government debt market. However it should be noted that the size of the bond swap spread can vary with changes in supply and demand for hedging.

While the 5 year bond-swap spread has historically averaged around 80 to 100 basis points, it has recently converged to close to nil. KPMG CF considers this to be attributable to the implementation of the Crown Retail Deposit Guarantee Scheme announced and released by the Reserve Bank in October 2008. Interbank credit risk premiums are now slowly diverging from sovereign credit risk premiums, as demonstrated in Figure 2 below, but have not yet recovered to historical average. We expect this to happen over time.

**Figure 2: Interbank and sovereign credit risk premiums**



We note that this calculation will need to be conducted closer to the start date of the regulatory regime to take into account changes in the debt premia up to that date.

## 7 Asset beta

MDL and KPMG have attempted to calculate an asset beta for Maui Pipeline using the Straw Person approach. This is outlined below. Our conclusion from this analysis is that using this approach in relation to the Maui Pipeline requires an almost entirely subjective analysis, with few satisfactory market comparators and some relevant evidence from other regulators. This leads us to conclude that the asset beta for the Maui Pipeline can only be estimated to a wide variation using the Straw Person methodology.

1) *"Qualitatively assess the level of systematic risk for the [gas transmission] industry in New Zealand arising from the general economy;"*

In this section MDL and KPMG address the specific question raised by the Commission about the systematic risk to MDL. To attempt this qualitative assessment we have referred to the factors outlined in the Commission's Draft Decisions Paper for the Authorisation for the Control of Supply of Natural Gas Distribution Services by Powerco Ltd and Vector Ltd dated 4 October 2007. These are;

*Industry, i.e. the nature of the product or service.*

Maui Pipeline provides a gas transmission service from the Oaonui Processing Plant and other connection points in the Taranaki to two large stations and interconnection points for the transmission network owned by Vector. In the last two years around 75% of the gas transported through the Maui Pipeline was used either directly or indirectly for electricity generation and methanol production.

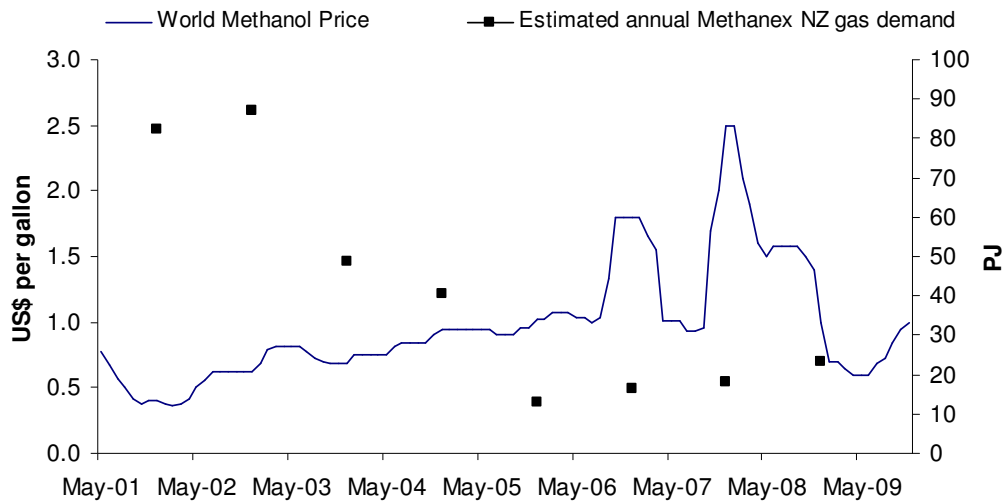
*Nature of the customer*

The large direct use end users of the gas supplied by the Maui Pipeline are Genesis Energy’s Huntly Power Station, the Methanex Methanol Plant and Vector gas transmission and distribution users (a mix of industrial, commercial and residential customers). Demand profiles for each are discussed below:

- As there is a higher marginal cost to gas generation (as opposed to hydro or wind generation) a small decrease in national electricity demand or increased supply of generation with low fuel costs is likely to have a magnified impact on gas demand from Huntly Power Station. In this respect gas demand by Huntly is likely to be more sensitive to real aggregate output shocks than other gas customers;
- The Methanex Methanol plant, at Motunui near Waitara, is also highly sensitive to changes in real international demand, the price of gas, and availability of gas. For example, this occurred when the published price of Methanol decreased from US\$2.50 per gallon in January 2008 to US\$0.60 per gallon in June 2009<sup>4</sup> as the global financial crisis struck. This price decrease was caused by a reduction in global demand for Methanol.

Figure 3 below shows an approximate correlation between the world methanol price and gas demanded by Methanex following the increase in methanol prices in 2006 and the availability of additional gas for Methanex.

**Figure 3: Historical Methanol price and Methanex NZ gas demand**



Source: Methanol prices from [www.methanex.com](http://www.methanex.com)  
Methanex demand estimated from the MED Energy Data Files (2001 to 2008)

- Vector is best placed to describe its customer profile and mix of residential and industrial customers, so we will not attempt that here.

<sup>4</sup> <http://www.methanex.com/products/methanolprice.html>, 23 November 2009

Demand shocks in the Vector network will create different effects for the Maui Pipeline as they will for the Vector distribution network.

#### *Pricing structure*

Currently, Maui Pipeline Tariff 1 is based on a gigajoule kilometre calculation, while Tariff 2 is based on gigajoules carried. There are no fixed charges payable by shippers or welded parties. This means MDL has no guaranteed revenue and, in the absence of knowledge about contracts to ship gas held by third parties, has higher exposure to GDP shocks than an equivalent company with fixed charges.

#### *Duration of contract prices with suppliers and customers*

Contracts do exist between gas producers, shippers of gas, and end users, and it is the nature of the gas exploration and production industry that some of these will be long term. However, the details of these arrangements are confidential to suppliers of gas and their customers and are not available to MDL. Furthermore, the Maui Mining Companies themselves compete and do not disclose any supply contracts that they hold. Because information on duration of contract prices with suppliers and customers is not available to MDL it is therefore unaware of the length or price of any contracts to ship gas through the Pipeline.

#### *Presence of price or rate-of-return regulation*

This is dependent on the determination of the Commission. Price regulation would expose MDL to significant volume volatility and the resultant revenue risk. Rate-of-return regulation would reduce this volatility for MDL. KPMG's view is that a decision to apply price regulation would be inappropriate for the Maui Pipeline, in the context of gas suppliers negotiating wholesale arrangements at arms length with large, sophisticated customers where the pipeline component of the price is inconsequential.

#### *Degree of monopoly, i.e., price elasticity of demand*

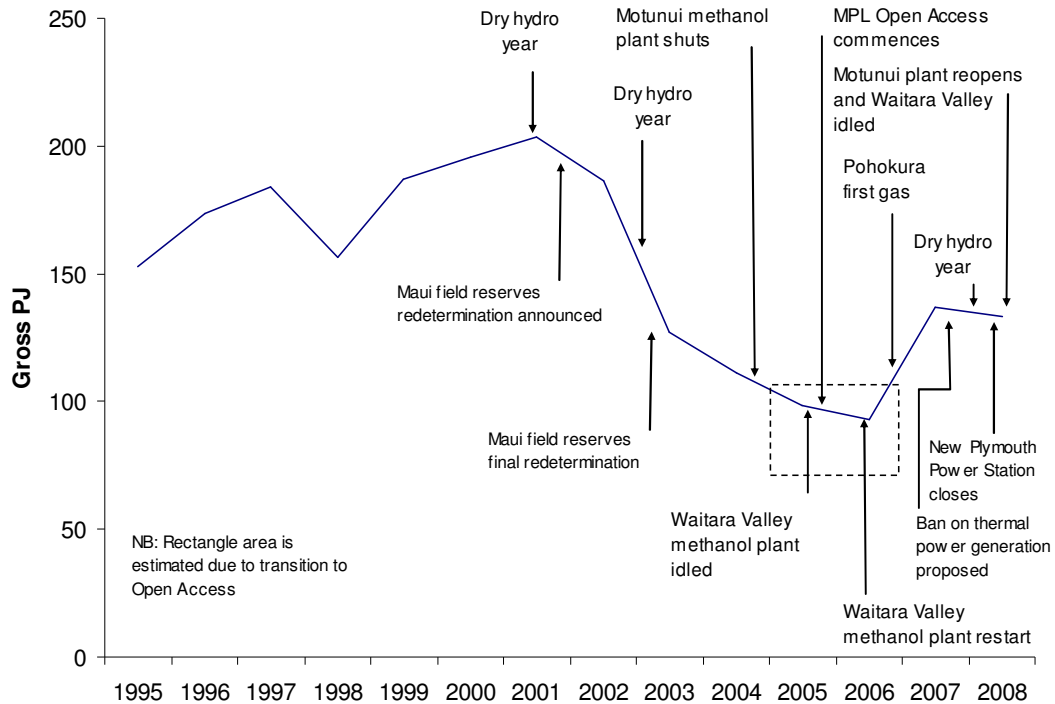
A number of factors need to be considered here:

- Demand from Huntly is sensitive to price. Electricity is generated at Huntly from gas when the price of a marginal unit of electricity is higher than the marginal cost of generating that unit using the E3P gas fired electricity generator Huntly. In the absence of any information about the gas contract (for example take or pay arrangements) we can assume that electricity generated from gas at Huntly is relatively substitutable.
- Demand from Methanex is also sensitive to the price of gas, as Methanol is an internationally traded commodity. If the price of gas increases beyond the international price of methanol then it becomes uneconomical for Methanex to continue to produce Methanol and demand ceases. This is supported by the statement on the Methanex website that states "*Since 2004 Methanex has been operating its New*

*Zealand plants as "flexible assets" – adjusting their operations based on gas availability and methanol market requirements.*<sup>5</sup>

- The price elasticity of demand for gas from residential end users is higher than electricity demand, given that electricity is more incompletely substituted by gas than vice versa. The degree of monopoly for gas is lower than electricity, which is more ubiquitous, but this may not be a material factor in the setting of asset betas.

**Figure 4: Historical Maui Pipeline throughput**



Source: Maui Field production data from MED Data Files, and Maui Pipeline Measured Quantities published in the publications page of the OATIS website

The Maui Pipeline runs parallel to a smaller transmission pipeline owned by Vector Limited. The Commission in its 2004 Gas Control Inquiry stated that *"The Commission considers that once the proposed Maui Pipeline open access arrangements are put in place, there is some potential for competition between NGCT [now Vector] and MDL in the North Taranaki to Huntly market. However, ... competition between them is unlikely to be vigorous, particularly for large loads."*<sup>6</sup> Open access arrangements are now in place. These arrangements include pricing methodologies that remove any ability MDL has had to monopoly price. In this respect we believe that MDL's service does not have the degree of monopoly power possessed by the other regulated entities.

<sup>5</sup> [http://www.methanex.com/ourcompany/locations\\_newzealand.html](http://www.methanex.com/ourcompany/locations_newzealand.html), 23 November 2009

<sup>6</sup> Commerce Commission Gas Control Inquiry Final Report, Public Version, 29 November 2004, paragraph 17.27.

### *Nature of the company's real options*

The 2005 MED WACC Methodology report suggests that gas pipeline businesses in New Zealand are incomplete and therefore have an option to expand their existing networks. This ability to react to unexpected changes in real Gross National Product ("GNP") should be reflected in a higher asset beta.

If real demand decreases, point to point gas transmission businesses do not have the ability to close down one section of the pipeline to compensate, resulting in an asymmetric risk profile that is sensitive to changes in GDP. As such point to point gas transmission businesses should receive a higher asset beta to reflect this sensitivity to changes in real GNP.

### *Operating leverage*

Relative to other companies, the Maui Pipeline has a low operating to capital cost ratio and few variable costs. Fuel for compressors and the cost of balancing gas make up the majority of variable costs and these are less than 10% of total costs. This means that the Maui Pipeline is unable to cut costs in response to demand shocks and they therefore have a disproportionate effect on returns under rate of return regulation.

Businesses operating gas transmission pipelines in New Zealand face primarily fixed costs. This increases earnings variability in periods of fluctuating revenue. This suggests that gas transmission businesses require a higher asset beta than other industries where costs can be more easily controlled.

Table 2 below illustrates Maui Pipeline fixed costs on a \$ per km basis. Because the Maui Pipeline open access regime only commenced in 2005 the true level of fixed cost is only starting to become apparent. The last two years might offer some indication of what to expect in the future.

**Table 2: Maui Pipeline "Direct Line Costs per km (\$)"**

	<b>Oct-Dec 2005</b>	<b>Jan-Dec 2006</b>	<b>Jan-Dec 2007</b>	<b>Jan-Dec 2008</b>
Direct Line Costs per km (\$)	32,475	26,549	41,429	38,858

Source: Maui Development Limited, GIDR, Calendar Year 2008

### *Market weight*

With knowledge of MDL's approximate asset base it is unlikely that an adjustment for market weight would be necessary, it would constitute less than 1% of a market portfolio based on the total market capitalisation of the NZX50. In any event, market diversification arguments are less relevant to Maui Pipeline if benchmarks are derived from offshore data.

2) "Qualitatively assess the level of systematic risk for the [gas transmission] industry in New Zealand arising from how the regulatory environment is actually imposed (including the allocation of risk between shareholders and customers, and the ongoing clarity and certainty of the allocation of risk) and from how the approach to the imposition of regulation may change in future;"

The detail of the regulatory regime to be imposed on the Maui Pipeline will influence this consideration, including;

- Whether price or rate-of-return regulation is adopted;
- The length of the regulatory period, including the risk that cost of capital inputs will change over time;
- The ability to recover costs under the proposed regulation; and
- The chance that the type or substance of the regulation will change in the future.

Many of the Commission's decisions regarding input methodologies require corresponding adjustments elsewhere in the methodology. For example, risks relating to the setting of inputs for the full regulatory period should be considered here.

3) "Identify listed entities which operate [gas transmission] businesses in New Zealand and for each entity obtain the unadjusted equity beta estimate, the standard error of the estimate and the average leverage reported by Bloomberg and calculate the unadjusted asset beta estimate;"

There are no other pure gas transmission businesses within New Zealand. The most comparable listed companies in New Zealand and the reason why they can not be used to estimate an asset beta for MDL are listed in Table 3 below:

**Table 3: Asset beta comparison**

<b>Company</b>	<b>Comparable systematic risks?</b>
Auckland International Airport Limited	No – Airport industry
Contact Energy Limited	No – Electricity generation
Infratil Limited	No – diversified infrastructure portfolio
The New Zealand Refining Company Limited	No – oil and gas user, not transmission
Port of Tauranga Limited	No – Ports industry
Telecom Corporation of New	No – Telecommunications industry, vertical

Zealand Limited	integration
TrustPower Limited	No – distribution assets
Vector Limited	No (discussed in more detail below)

4) "As a sense cross check, identify listed entities which operate [gas] businesses (gas distribution and retailers) in New Zealand and for each entity obtain the unadjusted equity beta estimate, the standard error of the estimate and the average leverage reported by Bloomberg and calculate the unadjusted asset beta estimate;"

The only listed entity which operates a gas distribution business in New Zealand is Vector. Vector is significantly different to MDL in a number of respects including:

- Size – Vector has total assets of \$5.5 billion. MDL’s asset base is estimated at less than 15% of this. The value of shareholder funds in the Maui Pipeline would also be less than 15% of the average of the 10 largest companies on the NZX. It is generally accepted in valuation methodology that small companies attract higher betas than large companies. This premia is often described as a ‘size premia’.
- Customer dependence – The Maui Pipeline has three major customers and these are predominantly large industrial gas users. In comparison Vector has thousands of customers that are a mixture of residential, commercial and industrial users. The impact of a smaller, high volume customer base on Maui Pipeline throughput is illustrated in Figure 4 above.
- Industry – Vector operates electricity distribution networks, gas distribution networks, gas metering services, communications services and vegetation management.

For the above reasons Vector’s measured market beta is not an accurate reflection of the risks and therefore the required returns from Maui Pipeline. Maui Pipeline is likely to have significantly more volatility in its revenues than Vector. Subsequently the Maui Pipeline should have a higher beta than Vector.

Other companies identified by the Commission in its Straw Person example are listed in Table 4 below:

**Table 4: Asset beta company comparison**

Company	Asset beta	Comparable systematic risks?
Horizon Energy	0.19	No – electricity distribution assets
Contact Energy Limited	0.8	No – electricity generation assets

TrustPower Limited	0.52	No – electricity distribution assets
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- These companies are unsatisfying comparators for MDL and Maui Pipeline, but they do demonstrate that companies within the same broad industry can have markedly different asset betas, due to a number of factors including how liquid the stock is and how frequently it trades. Horizon Energy has the lowest asset beta on the NZX, as shown in
- Table 5 below, but this may reflect liquidity factors and market weight rather than industry-specific factors.

**Table 5: NZX50 asset beta's**

NZX50 index statistics			
	Raw equity beta	Leverage	Asset beta
Average	1.00	0.29	0.69
Minimum	0.28	0.00	0.19
Maximum	2.4	0.88	1.79

Note: Raw equity beta calculated based on weekly two year data. Leverage calculated based on point estimate. Asset beta calculated using formula  $B_e = B_a + B_a (L/(1-L))$

Source: Bloomberg 23 November 2009

5) "Also as a sense cross check, identify listed entities in Australia, the UK and the US which operate [gas transmission] businesses and for each entity obtain the unadjusted equity beta estimate, the standard error of the estimate and the average leverage reported by Bloomberg and calculate the unadjusted asset beta estimate;"

KPMG identified 33 listed companies with Australia, the UK and the US which operate gas transmission businesses. Of the companies identified not one of these operated solely as a gas transmission business as each incorporated either gas distribution networks, retail gas arms, gas processing facilities, electricity networks or energy exploration. Some of the most comparable companies are included in appendix two, and one particular comparator is discussed below.

**Table 6: APA group description**

Country	Company	Bloomberg company description
Australia	APA Group	APA Group has interests in a portfolio of high-pressure gas transmission pipelines in Australia covering four states and two territories. APA Group transmits natural gas.

Source: Bloomberg

APA appears to be a useful listed comparator for MDL as it is largely a gas transmission business. Additional information on APA Group challenges this assumption:

*"APA Group (APA) is [...] a major ASX-listed gas transportation business with interests in gas infrastructure across Australia, including 12,000 km of natural gas pipelines, over 2,800 km of gas distribution networks and gas storage facilities. APA is Australia's largest transporter of natural gas, delivering more than half of Australia's annual gas use through its infrastructure.*

*APA also has investments in other energy infrastructure through its minority interests. [...] APA employs over 1,100 people, who perform all commercial, regulatory, government and stakeholder-related functions, as well as the day-to-day operations and maintenance for both APA assets.*

*APA generates strong and secure cash flow from contractual and regulatory arrangements on its assets."*<sup>7</sup>

We observe a raw equity beta of 0.75 for APA With an observed leverage of 68% and an implied asset beta of 0.24 using the Commission's methodology. APA appears to be the best publicly listed company comparable to the MDL in terms of its activities. It is however significantly larger than MDL and Maui Pipeline, for example having 40 times more transmission pipeline as well as distribution assets. It also owns a number of pipelines and is geographically diverse. This also diversifies supply and demand risks compared to the Maui Pipeline.

There are clear reasons why point-to-point gas pipelines tend to not be listed internationally. First, they tend to be a conduit to link an oil or gas field to a market. The gas field owners are required to control the pipeline to deliver on contractual obligations. These owners do not want to be exposed to the risk of increasing shipping tariffs from a third party provider. Second, a pipeline is exposed to supply and demand shocks at either end of the pipeline that it is unable to control. Finally, a pipeline has a much higher chance of declining over time than growing revenues. This does not make it an attractive public stock, unless the pipeline is part of a wider vertically or horizontally integrated portfolio.

The usefulness of information from international comparators is limited. Another alternative source of information is comparison with the betas assigned to gas pipeline businesses by other regulators. This information is contained in Appendix one.

Care needs to be taken when comparing these betas, as they reflect different regulatory environments. For example, where a pipeline faces price regulation it can be expected to have a higher beta than an equivalent firm facing rate of return regulation. A price-regulation beta should be adjusted before being applied to a rate of return company. In addition, many other

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<sup>7</sup> <http://www.apa.com.au/about-apa.aspx>, 23 November 2009

factors will be different. It is common for Australian pipelines to have a fixed charge component to their tariffs.

The Australian information above suggests an asset beta range of 0.5-0.65. Care needs to be taken when delivering the equity betas above, because different leverage and debt beta assumptions are used.

The Parmelia Pipeline is a 420km point-to-point gas transmission pipeline serving Perth from inland Western Australia. In 2000, the Western Australian Office of Gas Access Regulation (OffGAR) stated that a range of between 0.45 and 0.6 would be a reasonable range for an Australian gas transmission business. However, the Parmelia pipeline is a small pipeline with a limited number of users. For this reason, the OffGAR estimated an asset beta of 0.65 for the Parmelia Pipeline.<sup>8</sup>

The Tubridgi Pipeline System consists of two 87 kilometre long pipelines running from the Dampier-Perth Pipeline at Nanutara to the Tubridgi Gas Plant at Urala. To estimate an asset beta for this pipeline in 2001, the OffGAR started with the low point on the United Kingdom's Monopoly and Mergers Commission range of 0.45-0.6 for utilities subject to price cap regulation and added 20% for company-specific and regulatory risks to reach a starting point asset beta of 0.55 for Australian utilities. It then made further adjustments to take into account supply uncertainty, the low number of users and the risks associated with the untested regulatory regime. It concluded on an asset beta of 0.65 for the Tubridgi Pipeline System.<sup>9</sup>

6) *"Re-lever the plausible range of the unadjusted asset beta estimate, using the estimated leverage range, to obtain the plausible range of unadjusted equity beta estimate."*

This first requires estimation of a reasonable range for asset betas for the Maui Pipeline. Clearly there is limited relevant market evidence for gas transmission businesses. Our option is to therefore take a wider industry estimate and make qualitative adjustments to it to reflect the industry risks of point-to-point gas transmission. These can be cross-checked against relevant Australian comparators.

A reasonable starting point might be the asset beta that the Commission determined for the controlled gas distribution businesses in its 4 October 2007 draft decisions paper. This was set at 0.6 for a five year term, reduced to 0.56 for a three to four year term. In the recent past, KPMG has adopted an asset beta of 0.5 for the Maui Pipeline over a one year term. A key reason for this was to ensure that MDL complied with Commission guidelines as required by the Maui Pipeline Operating Code. The introduction

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<sup>8</sup> Western Australia Office of Gas Access Regulation, *Final Decision: Access Arrangements Parmelia Pipeline*, 20 October 2000 at <http://www.era.wa.gov.au/cproot/4223/2ParmeliaFDPtAr1.pdf>

<sup>9</sup> Economic Regulation Authority of Western Australia, *Tubridgi Pipeline System Access Arrangement Information: The weighted average cost of capital for the Tubridgi pipeline*, 28 September 2001 at <http://www.era.wa.gov.au/cproot/5232/2/TPSWACCcalculationFinal19Oct01.pdf>

of the new regime allows us to consider a correct asset beta for the Maui Pipeline rather than follow recent Commission decisions.

On top of the industry asset beta, a qualitative adjustment is required to reflect the additional risk and volatility that MDL faces but which gas distribution businesses do not. An adjustment is required for the following factors:

- **Legislative/government risk** - A significant amount of the total gas transported through the Maui Pipeline is used for electricity generation. The future implementation of the Emissions Trading Scheme may affect demand for gas-fired electricity generation more than general demand for gas or electricity. If the ETS affects Genesis Energy's investment decisions around Huntly or further gas generation in the upper North Island, Maui Pipeline would be particularly affected.
- **Number of customers.** The Maui Pipeline has only three customers. In comparison gas distribution businesses have thousands of customers in a range of industries and individual decisions by any one of them will not impact the returns of the gas distribution business.
- **Nature of customers.** Maui Pipeline customers are weighted towards electricity generation and methanol production. Electricity generation at Huntly from gas is volatile to climate, demand, and the cost of alternative supply. Methanol production is dependant on the local price of gas and the international price of methanol.
- **Taranaki gas supply dependence.** MDL owns a point to point gas transmission pipeline and therefore is dependent on the continuation of large-scale gas supply from Taranaki after the end of the Maui gas contract<sup>10</sup>. Gas distribution businesses on the other hand are less dependent on a single source for their gas supply, e.g. the Vector gas distribution business would benefit from gas finds on the east coast while MDL would not. Maui Pipeline's dependence on Taranaki gas increases investment risk and required return.

The size of the adjustment required to take into account these gas-transmission specific factors is difficult in the absence of market comparators. KPMG's view is that an adjustment of between 0.06 and 0.10 to the gas distribution beta of 0.6 would compensate for these additional risks. This implies an asset beta range of 0.66-7.0. with a mid point of 0.68 for the Maui Pipeline. At a leverage of 40% and a debt beta set at 0, this implies an equity beta of between 1.1 and 1.17, with a mid point of 1.13.

## **8 Tax adjusted market risk premium**

During discussion of the tax-adjusted market risk premium (MRP) at the conference, KPMG offered to provide further support for its position on the MRP in cross submission.

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<sup>10</sup> This ended in June 2009

KPMG Corporate Finance holds the view that the MRP in New Zealand has sat in a range between 7% - 8% over the last decade. This view is maintained primarily based on our view of academic research into the MRP in New Zealand including;

**Table 7: MRP estimates**

<b>MRP estimate</b>	<b>Author</b>	<b>Date</b>	<b>Method</b>
7.3%	<i>Lally and Marsden</i>	2004	Simple historical average for New Zealand market over 1931 - 2002
7.5-7.9%	Marsden	2005	Simple historical average for New Zealand market over 1931 - 2004
5.6-6.3%	Lally and Marsden	2004	Siegel methodology for New Zealand data 1931-2002
6.0 - 6.8%	Marsden	2005	Siegel methodology for New Zealand data 1931-2004
4.7 - 7.7%	Lally	2005	Forward-looking estimate for New Zealand market

These recent historical and forward looking estimates of the tax-adjusted market risk premium are broadly consistent with offshore evidence after adjustments for the difference in the definition of the standard and tax-adjusted version of the risk premiums.

In recent times we have adopted a TAMRP of between 7.25% and 7.75% and we are confident that this reflects the current range of the MRP in New Zealand. To support this view we would add the following points;

- In estimating the cost of capital under a domestic CAPM we place relatively more weight on the historical estimates and the more recent updates, and have some preference for the Ibbotson rather than Siegel approach;
- We observe that the premium required by investors in current market conditions has increased. Our fellow practitioners in other jurisdictions have been lifting their view of the MRP over the last 18 months.
- Our estimate is of the current MRP rather than the long-term view, which would reflect the outlook over the whole business cycle;
- For regulatory purposes, we favour a MRP that reflects a view of bonds and equities that have a term similar to the regulatory period. For regulatory periods of 1-3 years we would dilute the impact of long-term bonds on the above estimates. Reducing the impact of longer term bonds will increase the effective market risk premium; and

- Recent research reviewed by KPMG in the United States supports the view that stock returns are not serially independent but rather exhibit negative serial correlation. This supports the use of an arithmetic mean as used in the simple historical average studies listed above. We acknowledge that the use of an arithmetic mean inflates the MRP compared to a geometric mean; and

In the case of the Maui Pipeline, KPMG has recently been comfortable in applying a MRP of 7.75% for the tariff setting period of one year using this approach. This was applied in conjunction with an asset beta of 0.5, which in our view is conservative for the Maui Pipeline.

## **9 Alpha adjustment**

In the recent past, MDL has faced a situation similar to those described by the Commission in section 5.1.1 of the revised Draft Guidelines. MDL can see the potential that it is exposed to Type II risks, for example if electricity increasingly replaces gas as a preferred form of energy. However, its exposure to these type of risks is generally low.

In the case of MDL, it has recently faced a Type I risk. In September 2008, the government passed the Electricity (Renewable Preferences) Amendment Act 2008 ("Thermal Ban"). As part of the Thermal Ban, the government committed to raise the amount of electricity generated in New Zealand from renewable resources to 90% by 2025. To achieve this target, the government placed a ten year moratorium on new gas-fired electricity generation, except to the extent necessary to maintain security of supply. In addition, as part of the earlier New Zealand Energy Efficiency and Conservation Strategy (NZECS) the government announced that it would consider further regulatory options to reinforce the government's objectives for limiting new fossil fuel generation. These options included;

- Reducing future gas exploration permits for on- and off-shore Taranaki;
- Stricter resource consent requirements for new gas generation facilities and prioritisation of renewable investment;
- Restrictions on SOEs building new gas-powered generation and replacing current generation with renewable generation; and
- Increasing the cost of gas by the impost of a carbon charge of up to \$380,000/Pj to meet Kyoto Treaty obligations.

At the time of the 2008 tariff review, the Thermal Ban had been introduced into Parliament but was yet to be passed. MDL and KPMG saw that the impact of this policy was not reflected in MDL's asset life forecasts (based on a physical life of 60 years) or in adjustments to MDL's cash flows. These regulatory trends placed asymmetric risk on the volume of gas to be transported north from Taranaki to replace the Maui Pipeline volumes over the life of the pipeline. Under the Commission's approach to cost of capital, MDL earns a return on capital over the physical life of the asset but this

does not factor in the unique risk of asset stranding of the pipeline sooner than anticipated.

Moreover, it was our view that this trend has potentially greater implications for MDL than other pipeline operators. The Maui Pipeline is solely a point-to-point gas transmitter and cannot set off the risk of transmission with reticulation and retail activities. Other utility operators with residential customers are likely to be less severely impacted by regulations that hinder gas-fired electricity development and increase the price for large commercial clients with relatively higher price elasticity.

This is the type of risk that the firm would naturally insure against, but no insurance for this type of risk is available. The firm must therefore self-insure.

In the draft Guidelines, the Commission proposes to provide insurance to industry in the event of Type II events by collecting an insurance premium and holding it in a fund. We would encourage the Commission to think about this proposal further. Under this scheme it appears that the Commission takes on significant reinsurance risk and exposes the Crown to a level of potential liability that it does not intend to. The Commission should consider what it would do if a number of these stranding events come to pass, the reserve fund is exhausted and ex-post recovery is not possible.

As it is not possible for MDL to recover the cost of expected stranding after the stranding event, MDL sought an adjustment to the cost of capital to compensate for the risk. KPMG calculated the adjustment by estimating a risk-adjusted asset life.

- We assumed a uniform distribution of asset lives, acknowledging the lack of reliable data to the contrary;
- We estimated that a realistic worst case was that by 2025, the NZES target date for 90% renewable energy, there is no gas being transported through the pipeline;
- A realistic best case scenario was that estimated volumes continue to flow through the pipeline until the end of the physical asset life in 2056;
- We calculated that an additional return of 3.1% per annum from 2008 would compensate for the net present value of the unexpected loss of all cash flows from 2025
- The midpoint time between 2025 and 2056 is mid-way through the year 2040. This date would imply a necessary adjustment of 0.7% - 0.8%, because of the length of asset life that has already passed.

Based on the information at that time KPMG recommended an alpha adjustment to the cost of equity of between 0.8% and 1.5%, to be revised annually to incorporate new information. [MDL incorporated an alpha

adjustment of 0.5% into the tariff]. In 2009 the alpha adjustment was removed from the calculation, reflecting the passing of the Electricity (Renewable Preferences) Repeal Act 2008.

This example shows the operation of the alpha adjustment in practice. We are confident that in this example the alpha adjustment led to a more accurate reflection of MDL's forward-looking cost of capital, where regulatory change had a real effect and this was not able to be foreseen and therefore incorporated elsewhere in the cost of capital calculation. MDL's view is that the Commission should remain open to the use of alpha adjustments in the future to capture the impact of unforeseen events such as the introduction of the Thermal Ban.

## **10 Choosing a point on the range**

At the workshop we appreciated the open discussion on the methodologies being used in these areas. Our overall impression, however, was that the Commission has been handed an almost impossible job by the requirement to come up with a single WACC number for each industry subject to a Default Price Path. Our reasons for taking this view will be well-known to the Commission, but in summary:

- Solid supporting data for the parameters being used in the models is almost non-existent in some cases. This applies particularly to the estimates of the market risk premium and asset beta. We have earlier provided some supporting information for our views as to what these values should be.
- The models themselves are recognised as being in error to some extent;
- The procedure for estimating a range of WACC values has to ignore covariances between parameters for reasons of ease of calculation and because the covariances themselves are difficult to estimate.
- The use of the 75% point in the WACC range may still underestimate the true value of the WACC applying to a given industry. To our mind, setting the estimated WACC at the 75% point merely asserts that there is a 75% chance that the true WACC value is less than the estimated WACC value, but that there still is a 25% chance that the true WACC value is higher than the estimation;
- The use of the 75% point is intended to address both potential errors in the approach and the desire to set a WACC that sits above the mean. The Commission could usefully unpick these two motivations and address them in separate adjustments.

We think that these factors taken together mean that the Commission is faced with a very difficult task, particularly as it recognises the harm that the under estimation of an industry WACC can cause. For our part we note that the WACC values used in the Default Price Path calculations will have a substantial effect on the future income, investment and viability of our own industry.

## 11 Conclusion on cost of capital

It is too early to estimate the cost of capital for Maui Pipeline. The Commission is yet to confirm its approach, and many of the parameters - such as the risk free rate - need to be considered closer to the start of the regulatory period. Nevertheless, it may be helpful to the Commission for MDL to summarise its views on some of variables that are less likely to change substantially before the commencement of the first regulatory period. These are presented below in Table 8 below;

**Table 8: Cost of capital variables**

	<b>Low</b>	<b>Mid-point</b>	<b>High</b>
Asset beta	0.55	0.62	0.68
Tax rate	30%	30%	30%
Debt beta	0.00	0.00	0.00
Equity beta	0.92	1.13	1.36
Alpha adjustment	0.00%	0.00%	0.00%
Gearing	40.00%	45.00%	50.00%

As stated above, we recognise that the Commission has much challenging work to do to settle on a view of the cost of capital parameters. We would welcome the opportunity to work with the Commission to develop cost of capital parameters for Maui Pipeline that reflect the true cost of capital and the Commission's objectives in including MDL in the regulatory regime.

**Table 9: Beta information from regulated Australian Pipelines**

Regulator	Regulated Entity	Asset	Report	Report date	Equity beta	Asset beta
ACCC	Envestra Limited	Riverland Pipeline	Access Arrangement Information	11 November 1999	1.3	0.6
ACCC	AGL Pipelines (NSW) Pty Ltd	Central West Pipeline	Final Decision: Access Arrangement	30 June 2000	1.5	0.6
OffGAR	AlintaGas	Mid-West and South-West Gas Distribution Systems	Access Arrangement Information	13 July 2000	1.08	
OffGAR	CMS Gas Transmission of Australia	Parmelia Pipeline	Final Decision: Access Arrangement	20 October 2000	1.33	0.65
OffGAR	Various Tubridgi parties	Tubridgi Pipeline System	Final Decision and Final Approval: Access Arrangement	19 October 2001	1.33	0.65
ACCC	NT Gas Pty Ltd	Armadeus Basin to Darwin Pipeline	Final Decision: Access Arrangement	4 December 2002	1.0	0.5
ACCC	East Australian Pipeline Limited	Moomba to Sydney Pipeline	Final Approval	8 December 2003	1.0	
IGPAR	Epic Energy	Dampier to Bunbury Natural Gas Pipeline	Access Arrangement Information	30 December 2003	1.2	0.6
ACCC	APT Petroleum Pipelines Ltd	Roma to Brisbane Pipeline	Final Decision: Revised Access Arrangement	20 December 2006	1.0	
ACCC	Anglo Coal & Mitsui	Dawson Valley Pipeline	Final Decision: Access Arrangement	22 August 2007	1.0	
ACCC	GasNet Australia (Operations) Pty Ltd and GasNet (NSW) Pty Ltd	Victoria high pressure gas system (the Principal Transmission System)	Final Approval: Revised Access Arrangement	25 June 2008	1.0	
ERA	Goldfields Gas Transmission Pty Ltd	Goldfields Gas Pipeline	Approved Access Arrangement Information	17 December 2008	0.8 - 1.33	

Source: All documents sourced from either the AER or ERA websites at <http://www.aer.gov.au/content/index.phtml/itemId/678602> or [http://www.era.wa.gov.au/0/48/48/third\\_party\\_acc.pm](http://www.era.wa.gov.au/0/48/48/third_party_acc.pm)

Note: ACCC: Australian Competition & Consumer Commission; ERA: Economic Regulation Authority; OffGAR: Office of Gas Access Regulation; IGPAR: Independent Gas Pipeline Access Regulator

**Table 10 International listed gas transmission entities**

<b>Country</b>	<b>Company</b>	<b>Bloomberg company description</b>
Australia	APA Group	APA Group has interests in a portfolio of high-pressure gas transmission pipelines in Australia covering four states and two territories which transport natural gas.
Australia	DUET Group	DUET Group invests in energy utility assets located in Australia and New Zealand. The Group's investment assets include gas pipelines and electricity distribution networks.
Australia	Hastings Diversified Utilities Fund	Hastings Diversified Utilities Fund invests in utility infrastructure assets such as gas transmission and distribution assets, electricity generation, transmission and distribution assets, hydro and wind power generation assets and regulated and unregulated assets.
Canada	Pacific Northern Gas Ltd	Pacific Northern Gas Ltd. owns and operates natural gas transmission and distribution systems. The Company's western transmission line provides service to communities and industrial facilities. Pacific's subsidiaries provide gas distribution service.
United States	Chesapeake Utilities Corp	Chesapeake Utilities Corporation is a utility company that provides natural gas transmission and distribution, propane distribution, and information technology services. The Company distributes natural gas to residential, commercial, and industrial customers in Delaware, Maryland, and Florida. Chesapeake Utilities' propane is distributed to customers in Delaware, Maryland, and Virginia.
United States	National Fuel Gas Co	National Fuel Gas Company is an integrated natural gas company with operations in all segments of the natural gas industry, including utility, pipeline and storage, exploration and production, and marketing operations. The Company operates across the United States.
United States	Northwest Natural Gas Co	Northwest Natural Gas Company distributes natural gas to customers in western Oregon, as well as portions of Washington. The Company services residential, commercial, and industrial customers. Northwest Natural supplies many of its non-core customers through gas transportation service, delivering gas purchased by these customers directly from suppliers.
United States	ONEOK Partners LP	ONEOK Partners, L.P., through a subsidiary limited partnership, owns a general partner interest in a master limited partnership. The partnership owns an interstate pipeline system that transports natural gas primarily in the upper Midwest and Mid Continent regions of the United States.
United States	Piedmont Natural Gas Co Inc	Piedmont Natural Gas Company, Inc. is an energy and services company that primarily transports, distributes, and sells natural gas. The Company serves residential, commercial, and industrial customers in North Carolina, South Carolina, and Tennessee. Piedmont also, through subsidiaries, markets natural gas to customers in Georgia, and distributes propane in various states.
United Kingdom	National Grid PLC	National Grid PLC owns, operates and develops electricity and gas networks. The Group's electricity transmission and gas distribution networks are located throughout the United Kingdom and in the north-eastern section of the United States. They also own liquefied natural gas storage facilities in Britain and provide infrastructure services to the mobile telecom industry.

Source: Bloomberg