the australian PIPELINE industry association Ltd

29 October 2007

Mr Greg Wilson
Chairperson
Essential Services Commission of Victoria
Level 2, 35 Spring Street
MELBOURNE VIC 3000

Dear Mr Wilson

Re: ESC Draft Decision on the 2008-2012 Gas Access Arrangement Review.

In August 2007 the Essential Services Commission of Victoria (ESCV) released its Draft Decision on the on the 2008-2012 Gas Access Arrangement Review for Victorian gas networks. In this decision the ESC determined that a reasonable rate of return for investment in gas network infrastructure was a real after tax rate of return of 5.60%, based on an equity beta of 0.7. The Australian Pipeline Industry Association (APIA) is concerned by this decision and submits that this level of equity beta, and the implied return on equity, could be less than the actual costs of equity for Victorian gas infrastructure businesses and as a result would be too low to encourage continued investment. In APIA's view an equity beta for Victorian gas network infrastructure that reflects the actual cost of equity is generally consistent with the cost of equity for other regulated energy infrastructure in Australia and is best characterised by an equity beta of 1.0.

The ESCV has also estimated a rate of inflation of 3.0% used to calculate the real risk free rate. This 10-year forecast of inflation has a distorting effect and would understate the weighted average cost of capital by up to 0.5%.

APIA is concerned that lower rates of return (and lower prices) are seen as inherently desirable by regulators, particularly as the short-term benefits of these lower prices are readily communicated. However the focus by regulators on price reductions without sufficient consideration of the long-term consequences of these actions could, in the medium term, result in a degradation of infrastructure. While the ESCV seeks to reduce costs to users, such a reduction in costs, would restrict future investment, which would eventually be to the detriment of users.

The ESCV decision also increases the perception of regulatory risk associated with the Australian utility industry. This compounds the reduced incentive to make sufficient investment to ensure future supply.

APIA, along with the Energy Networks Association (ENA) and the Electricity Transmission Network Operators Forum (ETNOF), has sought advice from NERA about the Rate of Return in the Commission's Draft Decision in particular about the equity beta and the inflation forecast used to derive the risk free rate.

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Issues with Determining Beta Values

In determining rates of return market practitioners generally use a CAPM and WACC approach. Much of the input data for this approach, such as the betas, is open to interpretation.

NERA's paper on equity betas demonstrates two very significant issues not identified in the analysis by Allen Consulting Group (ACG) that the ESCV has relied on. These two problems are:

1. Use of historic proxy betas is only one source of a beta estimate and is not necessarily the best source. The historic proxy beta approach estimates a cost of equity significantly less than the approach used by US regulators.
2. The group of comparators used by ACG has not been adequately considered for its robustness.

APIA supports the findings of the NERA paper in relation to beta.

Issues with estimating inflation and the risk free rate

The ESCV has accepted the advice of NERA and ACG that there are biases in the yields on indexed CGS and has used a method for estimating the real risk free rate based on an inflation adjustment to the yield on nominal Commonwealth Government Securities (CGS). However, the 10-year forecast of inflation it has used is unreasonable and inconsistent with current forecast of inflation based on the reasonable expectations of the Reserve Bank of Australia's ability to keep inflation within its legislated target.

NERA's paper on inflation rates used in estimating the risk free rate demonstrates a number of significant analytical weaknesses in the ESCV's inflation forecast that would have the effect of significantly understating the risk free rate.

APIA supports the findings of the NERA paper in relation to inflation estimation.

Uncertainty in Determining a Regulatory Rate of Return

Gas infrastructure regulators use a CAPM and WACC approach to derive a rate of return as required by the Code (s8.30 - s8.31). Given the uncertainty in calculating and applying variables, such as beta, to rate of return formulae, a reasonable range of cost of capital estimates should be derived rather than a point estimate.

Given that uncertainty exists, the determination of a rate of return should not apply theoretical models without consideration of the impact the determination would have on investment levels. The CAPM and WACC approach should be used to provide a framework for considering the cost of capital rather than a theoretical answer.

Maintaining Infrastructure Investment

Given the uncertainty in rate of return outcomes, the regulator should exercise judgment in selecting a rate. This judgement should have regard to the objectives of

the regulation. The generally agreed objective of gas infrastructure regulation is to promote efficient investment in, and efficient operation of, natural gas services for the long term interests of consumers.

This objective can only be met if there is an efficient and continuing level of investment in gas infrastructure. Such investment will only occur if rates of return are sufficient to support investment in new and replacement assets. Thus the rate of return needs to be at a level which encourages rational and planned investment that benefits customers in the long term.

To ensure investment levels are maintained the rate of return should be drawn from the upper end of the range of rate of return outcomes. A rate of return chosen from the lower end of the range will not promote investment. Underinvestment in the maintenance and economic expansion of a gas supply system cannot easily be reversed and would have a detrimental effect on long-term efficient system operation and security of supply and would not be in the long-term interests of consumers.

A rate of return from the upper end of the range ***may*** encourage some overinvestment in networks, this would result in spare capacity which would either be sold at a discount or be stranded by regulators if it remained empty (until used by a growing market). A rate of return from the lower end of the range would encourage underinvestment in pipelines and, over time, this would result in a restriction of gas supply to end users. Of these options, the first option is less disruptive to users and potential users.

The risk of underinvestment is exacerbated by the fact that the ESCV has set gas network betas, and hence rates of return, lower than the electricity network betas and rates of return. This has the effect of encouraging investment in electricity infrastructure at the expense of gas infrastructure.

Conclusion

In conclusion, APIA submits that the Commission should revise the allowed Rate of Return for the gas distribution businesses by using a forecast of inflation of 2.5-2.6% and so reflects the prevailing cost of capital in the financial markets. In addition, it should approve the equity beta of 1.0 proposed by the gas distributors being a value that will deliver an estimate of the cost of equity beta that is based on a sound understanding of the CAPM and estimates of beta that reflect the actual cost of equity.

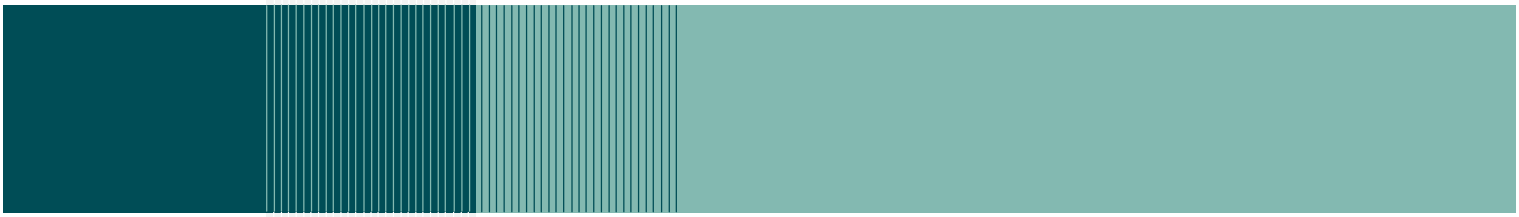
Yours sincerely

CHERYL CARTWRIGHT
Chief Executive

29 October 2007

ESC Draft Decision: Inflation Expectations

APIA, ENA and ETNOF



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The Essential Services Commission's (ESC) Draft Decision acknowledges that inflation-indexed government bond rates currently represent a biased estimate of the ten year real risk free rate. Rather than incorporating an upward adjustment to the observed real government bond yields (as proposed by distributors, in light of NERA's earlier work[1] for the ENA on this issue), the ESC deducted an estimate of the "market-based expected rate of inflation" from the nominal ten year government bond rate. The 'market-based' inflation rate forecast used in this context was 3%, which was derived from a sample of two year inflation rate forecasts ranging from 2.5% to 3.8%.

In our view, the methodology adopted by the ESC when estimating the real risk free rate is an acceptable alternative, assuming there is no underlying bias in the nominal risk free rate. Notwithstanding the appropriateness of the methodology adopted by the ESC, there are a number of shortcomings with the 3% inflation rate forecast utilised by the ESC to estimate the ten year real risk free rate. These shortcomings stem from:

- the ESC's decision to use of a two year inflation rate forecast horizon when deriving an effective ten year real risk free rate;
- the emphasis the ESC has placed on the upper bound of the Reserve Bank of Australia's (RBA) inflation target band when selecting the 3% inflation rate forecast; and
- the composition and size of the inflation rate forecast sample set developed by the ESC for the purposes of identifying the "market-based expectations of inflation".

On the basis of the analysis contained in this report, in our opinion the 3% inflation rate forecast relied upon by the ESC overstates the market expectations of inflation over the next ten years and is therefore inconsistent with section 8.2(e) of the Code.

By deducting an overstated inflation rate from the ten year nominal government bond rate, the ESC has effectively calculated a ten year real risk free rate that is lower than that required to ensure that the rate of return accorded to distributors is commensurate with prevailing conditions in the market for funds and the risk involved in delivering the reference service as required by section 8.30 of the Code.

In our opinion, an inflation rate estimate of between 2.5% to 2.6% would accord with the current market expectations of the inflation rate that is expected to prevail over the next ten years and is consistent with the views of both the RBA and the Commonwealth Treasury.

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[1] NERA, *Bias in Indexed GCG Yields as a Proxy for the CAPM Risk Free Rate*, March 2007, and NERA, *Absolute Bias in (Nominal) Commonwealth Government Securities*, June 2007.

1. Introduction

This report has been prepared by both Greg Houston (Director) and Katherine Lowe (Consultant) of NERA. We have both read the Guidelines for Expert Witnesses in Proceedings of the Federal Court of Australia and have made all inquiries that we believe are desirable and no matters of significance which we regard as relevant have, to the best of our knowledge, been withheld in the preparation of this report. A copy of our Curriculum Vitae is attached in Appendix B. We have been assisted in the preparation of this report by Brendan Quach and Tara D'Souza. Notwithstanding this assistance, the opinions in this report are our own and we take full responsibility for them.

We have been engaged by a consortium of energy industry associations[2] to consider the appropriateness of the ten year real risk free rate estimates adopted by the ESC in the 2008-2012 Gas Access Arrangement Review Draft Decision (Draft Decision). Specifically we have been asked to consider the appropriateness of the method by which the ESC has estimated the ten year real risk free rate.[3]

Our report is structured as follows:

- Chapter 2 examines the methodology adopted by the ESC when calculating the ten year real risk free rate with particular emphasis placed on whether:
  - the "market-based expected rate of inflation" utilised by the ESC in the calculation of the ten year real risk free rate represents the best estimate arrived at on a reasonable basis as required by section 8.2(e) of the National Third Party Access Code for Natural Gas Pipeline Systems (Code); and
  - the estimated ten year real risk free rate used in the calculation of the rate of return will provide a return which is commensurate with prevailing conditions in the market for funds and the risk involved in delivering the reference service as required by section 8.30 of the Code.
- Chapter 3 appraises the ESC's decision to use of a two year inflation rate forecast horizon when deriving an effective ten year real risk free rate;
- Chapter 4 considers the emphasis the ESC has placed on the upper bound of the Reserve Bank of Australia's (RBA) inflation target band when selecting the 3% inflation rate forecast;
- Chapter 5 analyses the composition and size of the inflation rate forecast sample set developed by the ESC for the purposes of identifying the "market-based expectations of inflation"; and
- Chapter 6 sets out our conclusions.

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[2] Australian Pipeline Industry Association (APIA), Electricity Networks Association (ENA) and the Electricity Transmission Network Owners Forum (ETNOF).

[3] A companion report by NERA addresses the appropriateness of the ESC's conclusion that the equity beta of a regulated gas distribution business is in the range of 0.5 to 0.8, which is a further critical input in the ESC's determination of the appropriate rate of return to apply in the context of its Draft Decision.

2. Ten Year Real Risk Free Rate Estimate

The ESC's Draft Decision acknowledges that inflation-indexed government bond rates currently represent a biased estimate of the ten year real risk free rate. Rather than incorporating an upward adjustment to the observed real government bond yields (as proposed by distributors, in light of NERA's earlier work for the ENA on this issue), the ESC deducted an estimate of the "market-based expected rate of inflation" from the nominal ten year government bond rate. The 'market-based' inflation rate forecast used in this context was 3% which was derived from a sample of two year inflation rate forecasts ranging from 2.5% to 3.8%.

The methodology adopted by the ESC when estimating the real risk free rate is an acceptable alternative assuming there is no underlying bias in the nominal risk free rate. The method is also consistent with the Australian Competition Tribunal's (Tribunal) finding in the *Application by GasNet Australia (Operations) Pty Ltd* [2003] (GasNet decision) that there is no single correct method of estimating inflation and that the Fisher equation has no inherent superiority over other methods. The Tribunal's decision also contained the following relevant statement:

> A whole range of indicators can be used in practice to derive estimates of future inflation rates. This would normally involve taking a number of these estimates and determining an average value. Like the Fisher equation, this procedure is market based. It is no more or no less objective than the Fisher equation. Inflation forecasting is an inexact science.[4]

Notwithstanding the appropriateness of the methodology adopted by the ESC, there are a number of shortcomings with the 3% inflation rate forecast derived by the ESC in order to estimate the ten year real risk free rate. These shortcomings stem from:

- the ESC's decision to use of a two year inflation rate forecast horizon when deriving an effective ten year real risk free rate;
- the emphasis the ESC has placed on the upper bound of the Reserve Bank of Australia's (RBA) inflation target band when selecting the 3% inflation rate forecast; and
- the composition and size of the inflation rate forecast sample set developed by the ESC for the purposes of identifying the "market-based expectations of inflation".

The first two of these shortcomings are not mutually exclusive. Rather, the ESC's decision to adopt the upper bound of the RBA's inflation rate target band appears to be inextricably linked to its decision to utilise short term inflation rate forecasts.

Deducting a two year inflation rate forecast from a ten year nominal bond rate represents an internal inconsistency in the calculation of the ten year real risk free rate. To ensure consistency the inflation rate forecast horizon should match the term of the bond rate, ie, ten years. Current 'market-based expectations' for inflation over the impending ten years are closer to the middle of the RBA's target band than the upper bound utilised by the ESC and

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[4] *Application by GasNet Australia (Operations) Pty Ltd* [2003] ACompT 6 (23 December 2003), paragraph 59.

so the 3% estimate relied upon by the ESC overstates the inflation that is expected to prevail over the ten year period.

Overall the ESC's decision to adopt a short term forecast horizon has led it to adopt an inflation rate forecast that:

- does not represent the best estimate arrived at on a reasonable basis as required by section 8.2(e) of the Code; and
- results in the calculation of a ten year real risk free rate that does not deliver a rate of return that is commensurate with the prevailing conditions in the market for funds and the risk involved in delivering the reference service contrary to section 8.30 of the Code.

The remainder of this report outlines our specific concerns in relation to these issues.

3. Inflation Rate Forecast Horizon

The ESC's 3% inflation rate forecast has been calculated by reference to a sample of inflation rate forecasts developed for the period 2008 and 2009. The use of a two year inflation rate forecast horizon to estimate a ten year real risk free rate represents a significant departure from the prior regulatory practice (see Table 3.1) that has emerged amongst jurisdictional regulators, the Australian Competition and Consumer Commission (ACCC) and the Australian Energy Regulator (AER) following the Tribunal's finding in paragraph 48 of the GasNet decision:

> The Tribunal is satisfied that the use by GasNet of a ten year Commonwealth bond rate to determine a Rate of Return on equity under s 8.30 of the Code was a correct use of the CAPM and was in accordance with the conventional use of a ten year bond rate by economists and regulators where the life of the assets and length of the investment approximated thirty years in the MRP calculation and the risk-free rate. The use of the CAPM with these inputs in the Tribunal's view, produces a Rate of Return on equity which s 8.31 treats as one commensurate with the relevant market conditions and risk for the purposes of s 8.30.

Table 3.1
Jurisdictional decisions

Regulator	Inflation calculated as the difference between ten year indexed bonds and the ten year nominal bonds?
ERA 2005 review[1]	ü
ESC 2002 review[2]	ü
ESCOSA 2006 review[3]	ü
ICRC 2004 review[4]	ü
IPART 2005 review[5]	ü
QCA 2006 review[6]	ü
AER 2007 Dawson Valley Pipeline review [7]	ü
AER 2006 Roma to Brisbane Pipeline [8]	ü

1. ERA, Final Decision on Proposed Revisions to the Access Arrangement for the South West and Mid west Gas Distribution System, 12 July 2005, pg. 211.
2. ESC, Review of Gas Access Arrangements – Final Decision, October 2002, pg. 139.
3. ESCOSA, Proposed Revisions to the Access Arrangement for the South Australian Gas Distribution System – Final Decision, June 2006, pg. 67.
4. ICRC, Final Decision: Review of Access Arrangement for ActewAGL Natural Gas System in ACT, Queanbeyan and Yarrowlumla, October 2004, pg. 147.
5. IPART, Revised Access Arrangement for AGL Gas Networks - Final Decision, April 2005, pg. 95.
6. QCA, Final Decision: Revised Access Arrangement for Gas Distribution Networks – Envestra, May 2006, pg. 90.
7. AER, Dawson Valley Pipeline Access Arrangement – Final Decision, August 2007, pg. 46.
8. AER, Roma to Brisbane Pipeline Access Arrangement – Final Decision, December 2006, pg. 93.

Given the consensus that has emerged in this area, it is unclear why the ESC has sought to utilise a two year inflation rate forecast horizon for the purpose of estimating the ten year real risk free rate.

More important than the departure from prior regulatory practice is the fact that the two year forecast horizon adopted by the ESC overlooks the fundamental principle established by the Fisher equation that the nominal bond rate encapsulates the market's expectations of the inflation that is expected to prevail over the life of the security in question. While the Fisher

equation is usually expressed without regard to the holding period of the security it is generally accepted[5] that if these were incorporated then the equation could be expressed formulaically in the following manner:

$$(1 + \text{nominal risk free rate}_t^n) = (1 + \text{real risk free rate}_t^n) \times (1 + \text{expected inflation}_t^n)$$

In this context 'n' represents the term of the underlying security and so a ten year nominal risk free rate at time 't' will be a function of the ten year real risk free rate at time 't' and the inflation that is expected to prevail over the ten year life of the bond with the expectations formed at time 't'.

Viewed in this way it is clear that when seeking to estimate the ten year real risk free rate the relevant forecast horizon for inflation is ten years. If this principle is not maintained, and the two year inflation forecast is higher (lower) than the ten year real risk free calculated by reference to the former will understate (overstate) the true real risk free rate. An estimate of the ten year real risk free rate based on a two year inflation rate forecast horizon therefore has the potential to result in a rate of return that is contrary to section 8.30 of the Code. To ensure consistency the ten year real risk free rate should therefore be calculated by reference to a ten year inflation rate forecast horizon.

[5] See for instance, Chadha, J. and Dimsdale, N., *A Long View of Real Rates*, Oxford Review of Economic Policy, Vol. 15, No. 2, pg. 20 and Breedon, F. et al., *Long-Term Real Interest Rates: Evidence on the Global Capital Markets*, Vol. 15, No. 2, pg. 3.

4. Emphasis on the Upper Bound of RBA Target Band

The second shortcoming with the approach adopted by the ESC stems from the emphasis it places on the upper bound of the RBA's inflation rate target band. This decision appears to be related to its focus on a two year forecast period rather than a ten year forecast period. While we acknowledge that the RBA and other commentators expect inflation to push toward the upper bound of the RBA's target range over the next two years,[6] the relevant forecast horizon is ten years rather than two. In our opinion if a ten year forecast horizon is utilised then a more appropriate inflation estimate would range from 2.5% - 2.6%. Support for this view can be found in:

- statements made by both the RBA and the Commonwealth Treasury regarding the inflation rate that should be adopted when calculating the real risk free rate;
- the success the RBA has had in containing inflation within the 2% to 3% target band over the last 14 years; and
- the current consensus amongst financial and economic forecasters about the inflation that is expected to prevail over the next ten years.

4.1. Statements made by the RBA and the Commonwealth Treasury

In 2007 the ACCC sent letters to both the RBA and the Commonwealth Treasury requesting comments on the issues raised in NERA's report entitled "Bias in Indexed CGG Yields as a Proxy for the CAPM Risk Free Rate". In responding to the questions posed by the ACCC the RBA made the following relevant statement:[7]

> Given inflation expectations have been firmly anchored by the Bank's inflation-target regime for some time, a rough estimate of a real risk-free rate would be the nominal government bond yield less the centre of the inflation target band (ie the nominal yield less 2½ per cent).

The Commonwealth Treasury similarly concluded:[8]

> We therefore recommend that the ACCC uses the mid-point of the RBA's target band for inflation (i.e.: 2.5% per annum) as the best estimate of inflation.

These two statements support the view that the middle rather than the upper bound of the RBA target range should be utilised when calculating the ten year real risk free rate.

4.2. Success of the RBA

The RBA commenced using a 2% to 3% inflation rate target band as a medium term objective of monetary policy settings in 1993. Since the adoption of this target the RBA has

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[6] RBA (13 August 2007), Statement on Monetary Policy, pg.63.

[7] RBA, Letter to Joe Dimasi, 9 August 2007, pg. 3.

[8] Commonwealth Treasury, Letter to Joe Dimasi, 7 August 2007, pg. 5.

had considerable success in ensuring underlying inflation remains within the target band, with inflation averaging between 2.4% and 2.7% over this period.

This success can be seen in Table 4.1 which sets out the mean inflation rate over the period 1993 to 2007 and over the past five years.

Table 4.1:
Inflation Rate Estimates

	RBA Underlying Measures			CPI All Groups	
	CPI ex Volatile Items[9]	Weighted median[10]	Trimmed Mean[11]	Total	Ex GST[12]
1993 –2007					
Median	2.5%	2.5%	2.5%	2.5%	2.5%
Mean	2.7%	2.4%	2.5%	2.6%	2.4%
Range	0.9% - 5.8%	1.4% - 3.2%	1.6% - 3.4%	-0.3% - 6.1%	-0.3% - 5.1%
95% Confidence Interval	2.4% - 2.9%	2.3% - 2.5%	2.4% - 2.6%	2.2% - 3.0%	2.1% - 2.7%
2002 –2007					
Median	2.4%	2.8%	2.7%	2.7%	n.a.
Mean	2.5%	2.75%	2.7%	2.8%	n.a.
Range	1.8% - 3.3%	2.4% - 3.2%	2.3% - 2.9%	2.0% - 4.0%	n.a.
95% Confidence Interval	2.3% - 2.6%	2.7% - 2.8%	2.6% - 2.7%	2.6% - 3.0%	n.a.

Source: RBA, Table G01hist.xls

Reviewing this table it is apparent that irrespective of the measure utilised over the period 1993 to 2007:

- the median has been in line with the middle of the RBA's target band;
- the mean has ranged between 2.4% to 2.7%;
- the 95% confidence interval lies within the target band; and
- inflation does not always lie within the band, which reflects the fact that the target band is a medium term objective rather than a short term objective.

Similar conclusions can also be drawn from the inflation rate data over the last five years although, in this case, the mean and median appear to be closer to the upper bound of the third quartile (2.75%) than the mid point of the range.

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9 The 'CPI excluding volatile items – goods' is the CPI (all groups – goods component) less fruit, vegetables, automotive fuel, utilities and pharmaceuticals.

10 The 'Weighted median' and 'Trimmed mean' are calculated using the component level data of the consumer price index. Both measures exclude interest charges prior to the September quarter 1998 and are adjusted for the tax changes of 1999–2000. The 'Weighted median' is the price change in the middle of this ordered distribution, taking also expenditure weights into account.

11 The 'Trimmed mean' is calculated by ordering all the CPI components by their price change in the quarter and taking the expenditure-weighted average of the middle 70 per cent of these price changes.

12 The RBA has estimated that the GST resulted in a 3% increase in inflation over the four quarters extending from September 2000 to June 2001 (see page 3 of the August 2001 RBA Bulletin).

Overall these historic data demonstrate that the RBA has successfully constrained inflation to the 2% to 3% target band over the last 14 years. Moreover, they lend weight to the conclusion that the RBA will continue to constrain inflation to the target band going forward.

4.3. Consensus forecasts

Consensus Economics has recently published a bi-annual survey of the long term inflation forecasts for Australia through to 2017. The survey involves 17 financial and economic forecasters with operations in Australia including, amongst others, the Commonwealth Bank, Westpac, ANZ, Macquarie Bank, National Australia Bank, Access Economics and BIS Shrapnel. In addition to reporting the individual expectations of the forecasters this publication also contains a 'consensus' forecast which represents the mean of the individual forecasts.

The latest results of this survey show the mean inflation expectation of financial and economic forecasters over the impending ten years is 2.63%.[13] While the average over ten years is slightly higher than the mid point of the inflation band, these forecasts demonstrate the confidence that the survey participants have in the ability of the RBA to constrain inflation toward the middle of the target range. They further support the view that the 'market' expectations for inflation are closer to the 2.5% - 2.6% range we have proposed than the 3% utilised by the ESC.

Table 4.2:
Consensus Inflation Rate Forecasts (Mean)

2008	2009	2010	2011	2012	2013-2017	Average over 10 years
2.9%	2.7%	2.6%	2.5%	2.6%	2.6%	**2.63%**

Source: Consensus Economics, Asia Pacific Consensus Forecasts, October 2007, pg. 3.

[13] Consensus Economics, Asia Pacific Consensus Forecasts, October 2007.

5. Composition and Size of Sample Set

We also have a number concerns with the composition and size of the sample set developed by the ESC for the purposes of identifying the "market-based expectation of inflation".

Before elaborating on these concerns it is useful to review the sample set developed by the ESC for the purposes of developing a "market-based expected rate of inflation" and the descriptive statistics associated with this sample set.

Table 5.1:
ESC Inflation Rate Forecast Sample Set

Forecast Source	2007/08	2008/09
ANZ Economic and Financial Market forecasts	2.70%	2.90%
BIS Shrapnel	3.00%	3.00%
KPMG	3.08%	3.08%
The Melbourne Institute Survey of Consumer Inflationary Expectations	3.80%	n.a.
RBA Underlying Inflation	2.50%	2.50%-3.00%
Commonwealth Government	2.50%	2.50%
Victorian Government	2.50%	n.a.

Source: Table 10.4 ESC Draft Decision, pg. 382.

Table 5.2:
ESC Inflation Rate Forecast Sample Set - Descriptive Statistics

Descriptive Statistics	2007/08	2008/09	*2007/08-2008/09*
Minimum	2.50%	2.50%	2.50%
Maximum	3.80%	3.08%	3.80%
Mode	2.50%	2.50-3.00%	2.50%
Mean	2.87%	2.80-2.90%	2.84-2.88%
Median	2.70%	2.90-3.00%	2.80-2.95%

A number of observations can be made on the above, as follows:

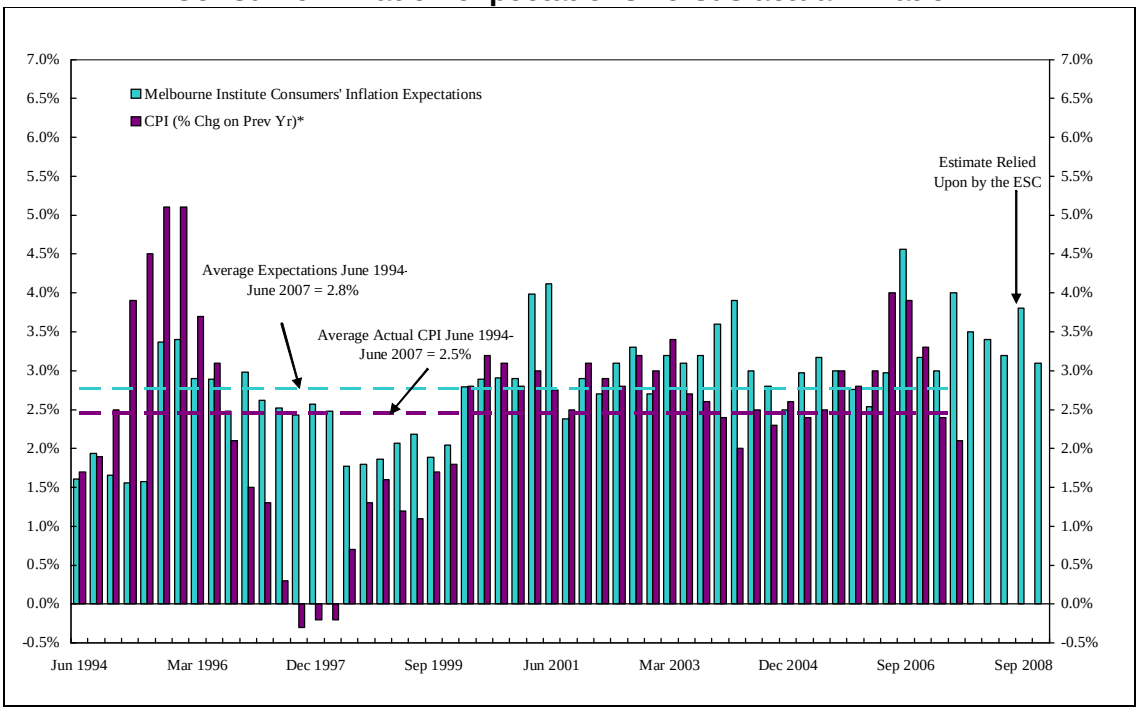
- the sample set is relatively small;
- the sample includes the Melbourne Institute's Survey of Consumer Inflationary Expectations, which is a clear outlier in the sample; and
- the sample mean, median and mode are all lower than the 3% inflation rate forecast adopted by the ESC.

5.1. Composition of the sample set

Our principal concern with the composition of the ESC's sample set is that it includes the Melbourne Institute's survey of consumers' expectations of inflation for the impending year. In our opinion the decision to include this in the sample is inappropriate in light of:

- the limited number of times that actual inflation has been in line with consumer expectations over the last 13 years (see Figure 5.1); [14] and
- the level of monthly variability exhibited by the series.

Figure 5.1:
Consumer inflation expectations versus actual inflation



* This data excludes the effect of the introduction of GST from the September 2000 to June 2001 quarters. The RBA has estimated that the GST accounted for approximately 3% of inflation over this period (see page 3 of the August 2001 RBA Bulletin) and thus 3% has been deducted from the year on year change in this quarter.
Source: Melbourne Institute Consumers' Inflations Expectations data and CPI All Groups data obtained from RBA Tables G04.xls and G01Hist.xls.

While it could be expected that there would be some level of deviation between forecast and outturn inflation, this chart demonstrates that over the period June 1994 to June 2007 the mean and median survey results have been 0.3% higher than the actual CPI. Even if one focuses on the last five years (June 2002 to June 2007) the survey results have been 0.4% higher than actual CPI. This difference is significant and becomes more exaggerated when using a single survey point as the ESC has sought to do by relying on the June 2007 survey expectations for June 2008. For example, in the second quarter of 2007 inflation expectations exceeded actual inflation by 1.9%. The magnitude of this difference is material and demonstrates that some caution should be exercised when using these data for the purposes of establishing the weighted average cost of capital that will prevail over the regulatory period.

[14] This figure has been constructed by matching the year-ahead forecast of consumer expectations with the inflation occurring in that year. For example the June 1993 survey data represents the expectation for June 1994 and so it has been compared with the year on year change in inflation for the June 1994 quarter.

Figure 5.1 also illustrates the variability in the survey results which is itself problematic given the need for a single point estimate forecast over a prolonged period. This problem is underlined when one compares the 3.8% survey result relied upon by the ESC (which was measured in June 2007) with survey results taken just three months later which indicated an inflation expectation of 3.1%.

In view of the inter-month variability exhibited by this series and the magnitude of the divergence between expectations and actual inflation, in our opinion little if any weight should be placed on this measure when deriving an inflation rate forecast for regulatory purposes. If this estimate were excluded from the ESC's sample set then the sample mean in 2007 would fall by 0.16% from 2.87% to 2.71% and the sample mean over the two year period (2007/08-2008/09) would fall from 2.86% to 2.80%.

In addition, we have been unable to verify the KPMG estimate that the ESC has referred to in Table 10.4. There is no direct reference to the 3.08% inflation estimate contained in the KPMG report and so we assume that it has been calculated as the implied difference between the 2.63% real risk free rate estimate contained in KPMG's report and the nominal bonds prevailing at the same time. Assuming this is the case, then the implied inflation rate forecast will be affected by the same bias that the exercise is seeking to avoid and so it should be excluded from the sample. There also appears to be an error in the reported 2008 BIS Shrapnel estimate. According to the "Outlook for wages to 2012/13" report prepared by BIS Shrapnel the estimate for 2009 is 2.9% rather than the 3% referred to in the table.

5.2. Limited size of the sample set

The sample set developed by the ESC was limited to six independent forecasts prepared by ANZ, BIS Shrapnel, KPMG, the RBA, the Commonwealth Government and the Victorian Government and the survey results from the Melbourne Institute Survey of Consumer Inflationary Expectations. Such a sample set is unnecessarily limited given that the ESC had access to another four independent forecasts prepared by professional economists at Access Economics, Westpac, the Commonwealth Bank and the OECD, which were set out in Table 2.2 of NERA's report entitled "Bias in Indexed GCG Yields as a Proxy for the CAPM Risk Free Rate". If these additional forecasts had been included in the sample set then the mean and median estimates set out in Table 5.2 would have been lower in each period.

Following the finalisation of NERA's earlier report a number of the inflation forecasts have been revised. We have therefore sought to update these forecasts while also collecting a larger sample of short and long term forecasts. These forecasts have to the extent possible been obtained from public sources. We have also purchased a subscription to the Consensus Economics' Asia Pacific Consensus Forecasts and so the table below also includes these forecasts. In keeping with our conclusions above the Melbourne Institute's survey results and the KPMG estimate have been excluded from this sample.

Table 5.3:
Extended Inflation Forecast Sample Set

Forecaster	Date	2008	2009	2010	2011	2012	2013-2017
RBA (Underlying and Total)	Aug 2007	3.0%	2.5-3.0%	n.a.	n.a.	n.a.	2.5%**
Commonwealth Budget	May 2007	2.5%	2.5%	2.5%	2.5%	n.a.	2.5%**
Victorian Budget	May 2007	2.5%	2.5%	2.5%	2.5%	n.a.	n.a.
OECD	May 2007	2.7%	n.a.	n.a.	n.a.	n.a.	n.a.
Banks							
Consensus Economics*	Oct 2007	2.9%	2.7%	2.6%	2.5%	2.6%	2.6%
Commonwealth Bank*	Oct 2007	2.7%	n.a.	n.a.	n.a.	n.a.	n.a.
Merrill Lynch Australia*	Oct 2007	3.0%	n.a.	n.a.	n.a.	n.a.	n.a.
Macquarie Bank*	Oct 2007	2.8%	n.a.	n.a.	n.a.	n.a.	n.a.
HSBC Australia*	Oct 2007	2.9%	n.a.	n.a.	n.a.	n.a.	n.a.
UBS*	Oct 2007	2.4%	n.a.	n.a.	n.a.	n.a.	n.a.
Goldman Sachs JB Were*	Oct 2007	2.4%	n.a.	n.a.	n.a.	n.a.	n.a.
BT Funds Management*	Oct 2007	2.8%	n.a.	n.a.	n.a.	n.a.	n.a.
RBC Capital Markets*	Oct 2007	3.1%	n.a.	n.a.	n.a.	n.a.	n.a.
Nomura Australia*	Oct 2007	3.0%	n.a.	n.a.	n.a.	n.a.	n.a.
Global Insight*	Oct 2007	2.6%	n.a.	n.a.	n.a.	n.a.	n.a.
Centre of Policy Studies*	Oct 2007	2.7%	n.a.	n.a.	n.a.	n.a.	n.a.
Moody's Economics*	Oct 2007	2.8%	n.a.	n.a.	n.a.	n.a.	n.a.
Econ Intelligence Unit*	Oct 2007	2.9%	n.a.	n.a.	n.a.	n.a.	n.a.
NAB*	Oct 2007	2.0%	n.a.	n.a.	n.a.	n.a.	n.a.
Westpac*	Oct 2007	3.0%	n.a.	n.a.	n.a.	n.a.	n.a.
ANZ Economics	Sep/Oct 2007	3.0%*	2.7%	2.8%	n.a.	n.a.	n.a.
St George	Sep 2007	2.4%	2.3%	n.a.	n.a.	n.a.	n.a.
Other							
Access Economics	Jul 2007	2.5%	2.6%	2.0%	2.4%	2.8%	n.a.
BIS Shrapnel	Jul/Oct 2007	3.3%*	2.9%	3.5%	3.4%	3.1%	n.a.
Descriptive Statistics							
Minimum		2.0%	2.3%	2.0%	2.4%	2.6%	2.5%
Maximum		3.3%	3.0%	3.5%	3.4%	3.1%	2.6%
Mode		3.0%	2.5%	2.5%	2.5%	n.a.	2.5%
Mean		**2.7%**	**2.7%**	**2.7%**	**2.7%**	**2.8%**	**2.5%**
Median		**2.8%**	**2.7%**	**2.6%**	**2.5%**	**2.8%**	**2.5%**

* This data has been obtained from the October 2007 Asia Pacific Consensus Forecasts.
** This data has been obtained from RBA, Letter to Joe Dimasi, 9 August 2007, pg. 3 and Commonwealth Treasury, Letter to Joe Dimasi, 7 August 2007, pg. 5.
The sources for this data are set out in Appendix A

Drawing on the data in this expanded set of forecasts we have estimated the mean and median inflation rates for both the two year forecast horizon utilised by the ESC and for the ten year forecast horizon that we consider to be appropriate should be utilised. These estimates are set out in the table below.

Table 5.4:
Descriptive statistics

	2007/08 to 2008/09	10 year average forecast
Minimum	2.0%	2.0%
Maximum	3.0%	3.5%
Mode	2.5-3.0%	2.5%
Mean	**2.71-2.72%**	**2.61-2.62%**
Median	**2.7%**	**2.57-2.58%**

The results in this table indicate that, even if one were to apply a two year inflation rate forecast horizon, the 3% estimate relied upon by the ESC is 0.3% higher than the average of the expanded sample set (2.7%) and is at the absolute upper bound of the range. If the ten year forecast horizon were utilised both the mean and median expectations over the expanded sample are approximately 2.6%.[15]

Overall, the expanded sample demonstrates that the 3% inflation forecast estimate relied upon by the ESC does not reflect 'market expectations' of the inflation rate that is expected to prevail over the next ten years. If one were to identify the best estimate arrived at on a reasonable basis as required by section 8.2(e) of the Code then the relevant inflation rate would be 2.6%.

[15] This estimate represents a simple average across the ten years. Although it could be argued that the expectations should be weighted by the expected coupon payments and the final principal payment in year ten this measure is inextricably linked to the yield to maturity which is likely to change between the ESC's draft and final decision. If this method were used the weighted average inflation expectation would be 2.57% which is broadly in line with the 2.6% estimated using a simple average.

6. Conclusion

In our opinion the 3% inflation rate forecast relied upon by the ESC overstates the market expectations surrounding inflation over the next ten years and so is inconsistent with the requirements of section 8.2(e) of the Code. By deducting an overstated inflation rate from the ten year nominal government bond rate, the ESC has effectively calculated a ten year real risk free rate that is lower than that implied by prevailing conditions in the market for funds as required by section 8.30 of the Code.

The material set out in this report shows that an inflation rate estimate of between 2.5% to 2.6% would accord with the current market expectations of the inflation rate that is expected to prevail over the next ten years and is consistent with the views of both the RBA and the Commonwealth Treasury.

Appendix A. Inflation Rate Forecast Sources

The following sources have been used to construct Table 5.3.

Forecaster	Date	Source
RBA	Aug 2007	RBA, Statement of Monetary Policy, August 2007
Commonwealth Budget	May 2007	Commonwealth Government, 2007-08 Budget Papers, Fiscal Strategy and Budget Priorities, pg. 1-5.
Victorian Budget	May 2007	Victorian Government, 2007-08 Budget Papers, Economic Conditions and Outlook, pg. 16.
OECD	May 2007	OECD, Economic Outlook No. 81, May 2007 http://www.oecd.org/dataoecd/5/47/2483871.xls
Banks		
Consensus Economics*	Oct 2007	Consensus Economics, Asia Pacific Consensus Forecasts, October 2007.
Commonwealth Bank	Oct 2007	ibid
Merrill Lynch Australia	Oct 2007	ibid
Macquarie Bank	Oct 2007	ibid
HSBC Australia	Oct 2007	ibid
UBS	Oct 2007	ibid
Goldman Sachs JB Were	Oct 2007	ibid
BT Funds Management	Oct 2007	ibid
RBC Capital Markets	Oct 2007	ibid
Nomura Australia	Oct 2007	ibid
Global Insight	Oct 2007	ibid
Centre of Policy Studies	Oct 2007	ibid
Moody's Economics	Oct 2007	ibid
Econ Intelligence Unit	Oct 2007	ibid
NAB	Oct 2007	ibid
Westpac	Oct 2007	ibid
ANZ Economics	Sep/Oct 2007	Consensus Economics, Asia Pacific Consensus Forecasts, October 2007 and ANZ, Economic Outlook, September 2007
St George	Sep 2007	St George, Monthly Economic Outlook, September 2007.
Other		
Access Economics	Jul 2007	Access Economics, Business Outlook, July 2007.
BIS Shrapnel	Jul/Oct 2007	Consensus Economics, Asia Pacific Consensus Forecasts, October 2007 and BIS Shrapnel Inflation Forecast Purchased in July 2007.

Appendix B. Curriculum Vitae

Gregory Houston

Director

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Overview

Gregory Houston has twenty years experience in the economic analysis of markets and the provision of expert advice in litigation, business strategy, and policy contexts. His career as a consulting economist was preceded by periods working in a financial institution and for government.

Greg Houston has directed a wide range of competition, regulatory economics and valuation-related assignments since joining NERA in 1989. His work in the Asia Pacific region principally revolves around the activities of the Australian Competition and Consumer Commission, the New Zealand Commerce Commission and other competition and regulatory agencies, many of whom also number amongst his clients. Greg has advised clients on merger clearance processes, on access to bottleneck facilities, and enforcement proceedings involving allegations of predatory pricing, anti-competitive bundling and price fixing. His industry experience spans the aviation, building products, electricity and gas, grains, payments networks, petroleum, ports, rail transport, retailing, scrap metal and telecommunications sectors. Greg Houston has acted as expert witness in antitrust, regulatory and valuation-related proceedings before the courts, in various arbitration and mediation processes, and before regulatory and judicial bodies in Australia, Fiji, New Zealand, the Philippines, Singapore and the United Kingdom.

In December 2005, Greg was appointed by the Hon Ian Macfarlane, Minister for Industry, Tourism and Resources, to an Expert Panel to advise the Ministerial Council on Energy on achieving harmonisation of the approach to regulation of electricity and gas transmission and distribution infrastructure in Australia.

Greg is member of the United States board of directors of National Economic Research Associates Inc. and head of NERA's Australian operations, which he founded after transferring from London in 1998.

Qualifications

1982 **UNIVERSITY OF CANTERBURY, NEW ZEALAND**
B.Sc.(First Class Honours) in Economics

Prizes and Scholarships

1980 University Junior Scholarship, New Zealand

Career Details

1987-89 **HAMBROS BANK, TREASURY AND CAPITAL MARKETS**
Financial Economist, London

1983-86 **THE TREASURY, FINANCE SECTOR POLICY**
Investigating Officer, Wellington

Project Experience

Competition Policy and Mergers

2007 **Meerkin & Apel/SteriCorp**
Damages assessment
Expert report in the context of an international arbitration on commercial damages arising through alleged non-performance of medical waste processing plant.

2007 **Australian Energy Market Commission, Australia**
Review of the Wholesale Gas and Electricity Markets and Implications for Retail Competition
Retained to provide an overview of the operation and structure of the wholesale gas and electricity markets within the National Electricity Market (NEM) jurisdictions and to identify the issues that the AEMC should consider when assessing the influence of the wholesale markets on competition within the retail gas market in each jurisdiction

2006-07 **Middletons/Confidential Client**
Damages assessment
Retained to provide an expert report on forecast demand and supply conditions and prices for gas, LPG, ethane and crude oil prices and over a ten year period.

2006-07 **Essential Services Commission of South Australia**

Competition assessment

Analysis of the effectiveness of competition in electricity and gas retail markets in South Australia.

2006-07 **Allens Arthur Robinson/Confidential Client**

Merger clearance

Retained to advise in relation to a proposed merger in the board packaging industry.

2006-07 **Johnson Winter & Slattery/Confidential Client**

Damages assessment

Assistance in the assessment of damages arising from alleged cartel conduct.

2006 **Minter Ellison/Confidential Client**

Misuse of market power

Expert economic advice in relation to an alleged breach of section 46 in the telecommunications industry.

2006 **DLA Phillips Fox/Donhad**

Merger clearance

Retained for advice on competition effects of proposed Smorgon/One Steel merger.

2006 **Johnson Winter & Slattery/Qantas Airways**

Competition effects of price fixing agreement

Assessed the competition effects of proposed trans-Tasman networks agreement between Air New Zealand and Qantas Airways.

2006 **Phillips Fox/ACCC**

Vertical foreclosure

Retained by the ACCC as economic expert in the context of proceedings before the Federal Court concerning the acquisition of Patrick Corporation by Toll Holdings. The proceedings were subsequently withdrawn following a S87B undertaking made by Toll.

2006 **Gilbert + Tobin/AWB**

Access to bottleneck facilities

Expert report and testimony in a private arbitration concerning the imposition of throughput fees for grain received at port in South Australia.

2006 **Qantas Airways, Australia/Singapore**

Assessment of Single Economic Entity

Advice to Qantas in relation to its Application for Decision to the Competition Commission of Singapore that the agreement between Qantas and Orangestar does not fall within the ambit of the price-fixing and market sharing provisions of the Singapore Competition Act.

2005-06 **Qantas Airways, Australia/Singapore**

Competition effects of price fixing agreement

Expert report submitted to the Competition Commission of Singapore evaluating the net economic benefits of a price fixing/market sharing agreement, in relation to an application for exemption from the section 34 prohibition in the Competition Act of Singapore.

2005-06 **Phillips Fox/Fortescue Metals Group, Western Australia**

Access to bottleneck facilities

Expert report and testimony in the Federal Court proceedings concerning access to the Mt Newman and Goldsworthy rail lines, serving iron ore export markets in the Pilbara.

2005-06 **Australian Competition Consumer Commission**

Electricity generation market competition

Advice on the competition effects under S50 of the Trade Practices Act of three separate proposed transactions involving the merger of generation plant operating in the national electricity market.

2005 **Gilbert + Tobin/Hong Kong Government, Hong Kong**

Petrol market competition

Director of a NERA team working with Gilbert + Tobin that investigated the extent of competition in the auto-fuel retailing market in Hong Kong.

2005 **Phillips Fox/National Competition Council, Western Australia**

Access and competition in gas production and retail markets

Retained as expert witness in the appeal before the WA Gas Review Board of the decision to revoke coverage under the gas code of the Goldfields pipeline. Proceedings brought by the pipeline operator were subsequently withdrawn.

2004-05 **Gilbert + Tobin/APCA, Australia**

Competition and access to Eftpos system

Retained as economic advisor to the Australian Payments Clearing Association in connection with the development of an access regime for the debit card/Eftpos system, so as to address a range of competition concerns expressed by the Reserve Bank of Australia and

the ACCC. This involved the provision of an expert report examining barriers to entry to Eftpos and the extent to which these can be overcome by an access regime.

2003-05 **Phillips Fox/Confidential Client, New South Wales**

Misuse of market power

Retained to assist with all economic aspects of a potential Federal Court action under S46 of the Trade Practices Act alleging misuse of market power in the rail freight market.

2004 **Clayton Utz/Sydney Water Corporation, New South Wales**

Competition in sewage treatment

Retained to assist with Sydney Water's response to the application to have Sydney's waste water reticulation network declared under Part IIIa of the Trade Practices Act, on the basis this will promote competition in the retail market for sewage collection services.

2004 **Blake Dawson Waldron/Boral, Australia**

Competition analysis of cement market

Directed a NERA team advising on Boral's proposed acquisition of Adelaide Brighton Ltd, a cement industry merger opposed in Federal Court proceedings by the ACCC. Boral subsequently decided not to proceed with the transaction.

2004 **MinterEllison/Singapore Power, Victoria**

Merger clearance

Advice on competition issues arising from the proposed acquisition of TXU's Australian energy sector assets by Singapore Power. This included the submission of an expert report to the ACCC.

2004 **Mallesons Stephen Jaques/Orica, New South Wales**

Competition in gas production and retail markets

Retained as expert witness in the appeal by Orica against the Minister's decision to revoke coverage under the gas code of the substantial part of the Moomba to Sydney gas pipeline. The case was subsequently settled.

2004 **Courts, Fiji**

Merger clearance, abuse of market power

Prepared a report for submission to the Fijian Commerce Commission on the competition implications of the Courts' acquisition of the former Burns Philip retailing business, and related allegations of abuse of market power. The Commission subsequently cleared Courts of all competition concerns.

2003-04 **Mallesons Stephen Jaques/Sydney Airport Corporation, NSW**

Competition in air travel market

Retained as principal expert witness in connection with proceedings before the Australian Competition Tribunal on economic aspects of the application by Virgin Blue for declaration of airside facilities at Sydney Airport under Part IIIa of the Trade Practices Act.

2003-04 **Bartier Perry/ DM Faulkner, New South Wales**

Alleged collusive conduct

Submitted an expert report to the Federal Court in connection with allegations under s45 of the Trade Practices Act of collusive conduct leading to the substantial lessening of competition in the market for scrap metal. The 'substantial lessening of competition' element of this case was subsequently withdrawn.

2002-04 **Essential Services Commission, Victoria**

Effectiveness of competition

Advisor on six separate reviews of the effectiveness of competition and the impact of existing or proposed measures designed to enhance competition in the markets for wholesale gas supply, port channel access services, liquid petroleum gas, retail electricity and gas supplies, and port services.

2003 **Gilbert + Tobin/AGL, Victoria**

Vertical integration in electricity markets

Prepared a report on the international experience of vertical integration of electricity generation and retailing markets, in connection with proceedings brought by AGL against the ACCC. This report examined the principles applied by competition authorities in assessing such developments, and evidence of the subsequent impact on competition.

2002-03 **National Competition Council, Australia**

Gas market competition

Expert report in connection with the application by East Australian Pipeline Limited for revocation of coverage under the Gas Code of the Moomba to Sydney Pipeline System. The report addressed both the design of a test for whether market power was being exercised through pipeline transportation prices substantially in excess of long-run economic cost, and the assessment of existing prices by reference to this principle.

2001-03 **Blake Dawson Waldron/Qantas Airways, Australia**

Alleged predatory conduct

Directed a substantial NERA team advising on all economic aspects of an alleged misuse of market power (section 46 of the Trade Practices Act) in Federal Court proceedings brought against Qantas by the

ACCC. The proceedings were withdrawn soon after responding expert statements were filed.

2002 **Phillips Fox/AWB Limited**

Access and competition in bulk freight transportation

Retained to provide an expert report and testimony on the pricing arrangements for third party access to the rail network and their impact on competition in the related bulk freight transportation services market, preparation for the appeal before the Australian Competition Tribunal of the Minister's decision not to declare the Victorian intra-state rail network, pursuant to Part IIIA of the Trade Practices Act. The case settled prior to the Tribunal hearings.

2002 **Australian Competition and Consumer Commission, Australia**

Anti-competitive bundling or tying strategies

Provided two (published) reports setting out an economic framework for evaluating whether the sale of bundled or tied products may be anti-competitive. These reports define the pre-conditions for such strategies to be anti-competitive, and discuss the potential role and pitfalls of imputation tests for anti-competitive product bundling.

2002 **Minter Ellison/SPI PowerNet, Victoria**

Merger clearance

Advice in connection with a bid for energy sector assets in Victoria on merger clearance under section 50 of the Trade Practices Act.

2001 **Gilbert + Tobin/AGL, New South Wales**

Gas market competition

Advised counsel for AGL in connection with the application by Duke Energy to the Australian Competition Tribunal for review of the decision by the National Competition Council to recommend that the eastern gas pipeline should be subject to price regulation under the national gas code.

2000 **One.Tel, Australia**

Competitive aspects of Mobile Number Portability

Advised on the competitive aspects of proposed procedures for Mobile Number Portability and whether these arrangements breached the Trade Practices Act in relation to substantial lessening of competition.

2000 **Baker & McKenzie/Scottish Power, Victoria**

Impact of consolidation on competition

Expert report submitted to the ACCC on the extent to which the acquisition of the Victorian electricity distribution and retail business, Powercor by an entity with interests in the national electricity market

may lead to a 'substantial lessening of competition' in a relevant market.

Regulatory and Financial Analysis

2007 **Ministerial Council on Energy, Australia**
Review of Chapter 5 of the National Electricity Rules
Retained to provide advice on the development of a national framework for connection applications and capital contributions in the context of the National Electricity Rules.

2007 **Powercor/CitiPower, South Australia**
Advice on Related Party Outsourcing Arrangements
Retained to provide advice on the manner by which regulatory concerns surrounding related party outsourcing arrangements may be ameliorated.

2007 **Multinet, Victoria**
Review of Outsourcing Infrastructure Asset Management Contracts
Retained to provide advice on the prudency of outsourcing contracts in the context of the National Gas Code and to benchmark operating margins levied by asset management service providers.

2006-07 **Ministerial Council on Energy, Australia**
Demand Side Response and Distributed Generation Incentives
Conducted a review of the MCE's proposed initial national electricity distribution network revenue and pricing rules to identify the implications for the efficient use of demand side response and distributed generation by electricity network owners and customers.

2006 **Ministerial Council on Energy, Australia**
Electricity Network Pricing Rules
Advice on the framework for the development of the initial national electricity distribution network pricing rules, in the context of the transition to a single, national economic regulator.

2005-06 **Australian Energy Markets Commission, Australia**
Transmission pricing regime
Advisor to the AEMC's review of the transmission revenue and pricing rules as required by the new National Electricity Law.

2002-07 **Orion New Zealand Ltd, New Zealand**

Electricity lines regulation

Advisor on all regulatory and economic aspects of the implementation by the Commerce Commission of threshold and control regime for the regulation of New Zealand electricity lines businesses. This role has included assistance with the drafting submissions, the provision of expert reports, and the giving of expert evidence before the Commerce Commission.

2001-07 **Auckland International Airport Limited, New Zealand**

Aeronautical price regulation

Provided various expert reports and advice in relation to the review by the Commerce Commission of the case for introducing price control at Auckland airport and, subsequently, a fundamental review of airport charges due for implementation in 2007.

1998-2006 **Essential Services Commission, Victoria**

Price cap reviews

Wide ranging advice to the Essential Services Commission (formerly the Office of the Regulator-General), on regulatory, financial and strategic issues arising in the context of five separate reviews of price controls applying in the electricity, gas distribution and water sectors in Victoria. This work has encompassed advice on the development of the Commission's work program and public consultation strategy for each review, direct assistance with the drafting of papers for public consultation, the provision of internal papers and analysis on specific aspects of the review, drafting of decision documents, and acting as expert witness in hearings before the Appeal Panel and Victorian Supreme Court.

2004-05 **Ministerial Council of Energy, Australia**

Reform of the national electricity law

Retained for two separate advisory roles in relation to the reform of the institutions and legal framework underpinning the national energy markets. These roles include the appropriate specification of the objectives and rule making test for the national electricity market, and the development of a harmonised framework for distribution and retail regulation.

2004-05 **Johnson Winter Slattery, ETSA Utilities, South Australia**

Price determination

Advice on a wide range of economic and financial issues in the context of ETSA Utilities' application for review of ESCOSA's determination of a five year electricity distribution price cap.

2000-07 **TransGrid, New South Wales**

National electricity market and revenue cap reset

Regulatory advisor to TransGrid on a range of issues arising in the context of the national electricity market (NEM), including: the economics of transmission pricing and investment and its integration with the wholesale energy market, regulatory asset valuation, the cost of capital and TransGrid's 2004 revenue cap reset by the ACCC.

2004 **Deacons/ACCC, Australia**

Implementation of DORC valuation

Prepared a report on the implementation of a cost-based DORC valuation, for submission to the Australian Competition Tribunal in connection with proceedings on the appropriate gas transportation tariffs for the Moomba to Sydney gas pipeline.

2003-04 **Natural Gas Corporation, New Zealand**

Gas pipeline regulation

Advisor in relation to the inquiry by the Commerce Commission into the case for formal economic regulation of gas pipelines. This role includes assistance with the drafting of submissions, the provision of expert reports, and the giving of evidence before the Commerce Commission.

2001-03 **Rail Infrastructure Corporation, New South Wales**

Preparation of access undertaking

Advised on all economic aspects arising in the preparation of an access undertaking for the New South Wales rail network. Issues arising include: pricing principles under a `negotiate and arbitrate' framework, asset valuation, efficient costs, capacity allocation and trading, and cost of capital.

2002 **Clayton Utz/TransGrid, New South Wales**

National Electricity Tribunal hearing

Retained as the principal expert witness in the appeal brought by Murraylink Transmission Company of NEMMCO's decision that TransGrid's proposed South Australia to New South Wales Electricity Interconnector was justified under the national electricity code's 'regulatory test'.

2001-02 **SPI PowerNet, Victoria**

Revenue cap reset

Advisor on all regulatory and economic aspects of SPI PowerNet's application to the ACCC for review of its revenue cap applying from January 2003. This included assistance on regulatory strategy, asset valuation in the context of the transitional provisions of the national

electricity code, drafting and editorial support for the application document, and the conduct of a `devil's advocate' review.

1999-2002 **Sydney Airports Corporation, New South Wales**

Aeronautical pricing notification

Directed all aspects of NERA's advice to Sydney Airports Corporation in relation to its notification to the ACCC of proposed aeronautical charges at Sydney Airport. This work involved the analysis and presentation of pricing and revenue determination principles and their detailed application, through to participation in discussion of such matters at SACL's board, with the ACCC, and in a public consultation forum.

2002 **Corrs Chambers Westgarth/Ofgar, Western Australia**

Economic interpretation of the gas code

Provision of expert report and sworn testimony in the matter of Epic Energy vs Office of the Independent Gas Access Regulator, before the Supreme Court of Western Australia, on the economic interpretation of certain phrases in the natural gas pipelines access code.

2001 **ACCC, Australia**

Determination of local call resale prices

Advised the ACCC regarding the determination of local call resale prices from Telstra's fixed line network. This included providing advice on how the cost of community service obligations should be allocated to competitors with wholesale access to local calls.

1999-2001 **ACCC, Australia**

Cost of capital

Undertook various assignments in relation to the cost of capital for regulated businesses. These included: an analysis of the approach taken by regulators overseas in relation to the treatment of taxation in estimating the WACC, and the use of pre-tax versus post-tax WACC formulations in regulation; and, a survey of regulatory decisions in relation to the cost of capital across a range of international jurisdictions. Two reports have been published by the ACCC.

2000 **Gilbert + Tobin/AGL, South Australia**

Vesting contract terms

Advised AGL SA in connection with its application to the ACCC for revocation and substitution of both vesting contract terms and network pricing provisions for the retail supply of electricity in South Australia.

2000 **Commonwealth Bank of Australia, Australia**

Access arrangements

Advised on the legislative framework for access to essential facilities in Australia in comparison to the frameworks used in the United States, United Kingdom and European Union. This included an assessment of the pricing policies regulators use when setting access tariffs, and relevant case studies from the electricity, telecommunications and transportation industries.

1998, 2000 **Rail Access Corporation, New South Wales**

Regulatory and pricing strategy

Advisor on regulatory and financial issues arising in the context of the 1998/99 IPART review of the NSW rail access regime. Subsequently, prepared two board papers on, first, the principles for commercially sustainable pricing in the context of the NSW access regime and, second, on issues and options for addressing the growing imbalance between costs and revenues, including the probable need to finance a significant increase in capital expenditure.

1998-9 **MWSS Regulatory Office, Philippines**

Regulation by concession

Advised the MWSS Regulatory Office on its response to applications for "extraordinary price adjustments" under the terms of the two, twenty five-year, water and wastewater concession agreements. This involved an assessment of the grounds for the applications, the associated financial impact, and the appropriate rate of return to be applied in determining the consequent price adjustment. Subsequently, provided expert testimony in the arbitration of one applicant's appeal of the Regulatory Office's decision.

Valuation and Cost Analysis

2006 **Confidential Client/Australia**

Valuation of digital copyright

Provided oral advice in relation to a negotiation for a licence for digital copyright. The advice included a theoretical discussion of the issues that should be considered in determining fees for a digital copyright licence, including the extent to which digital material should be valued differently to print material and whether the charging mechanism for print is appropriate for digital copyright.

2006 **Minter Ellison/Australian Hotels Association**

Valuation of copyright material

Expert report in the context of proceedings before the Copyright Tribunal concerning the appropriate valuation of the rights to play recorded music in nightclubs and other late night venues.

2005-06 **Minter Ellison and Freehills/Santos**

Gas supply agreement arbitrations

Principal economic expert in two separate arbitrations of the price to apply following review of a major gas supply agreement between the South West Queensland gas producers and, respectively, a large industrial customer and major gas retailer.

2002-03 **ActewAGL, ACT**

Consumer willingness to pay

Directed a one year study of consumers' willingness to pay for a range of attributes for electricity, gas and water services in the ACT. This study involved the use of focus groups, the development of a pilot survey and then the implementation of a stated preference choice modelling survey of household and commercial customer segments for each utility service.

2002-03 **National Electricity Market Management Co, Australia**

Participant Fee Determination

Advice to NEMMCO in the context of its 2003 Determination of the structure of Participant Fees, for the recovery of NEMMCO and NECA's costs from participants in the national electricity market.

2002 **Screenrights, Australia**

Non-market valuation methods

Advice on the range and suitability of revealed preference and stated preference survey methodologies for valuing the retransmission of free to air television broadcasts for the purposes of determining the 'equitable remuneration' to be paid for retransmission of copyright material contained in free-to-air television broadcasts.

2001-03 **Minter Ellison/Optus Networks, New South Wales**

Arbitration of market lease fee

Retained as expert witness in the mediation and then arbitration between Optus Networks and United Energy on the appropriate annual market fee for leasing electricity pole space for the attachment of HFC coaxial cable.

2001 **Gilbert & Tobin/One.Tel, Australia**

Arbitration on the local loop service

Advice on the pricing of Telstra's unconditioned local loop service (ULLS) for use in arbitration.

2001 **Department of Natural Resources and Environment, Victoria**

Efficient pricing of water services

Prepared a report setting out the principles for efficient pricing of urban water services, an evaluation of the structure of existing

wholesale and retail water tariffs in metropolitan Melbourne, and recommended reforms.

1998-2000 **TransGrid and EnergyAustralia, NSW**

Cost effectiveness study of transmission capacity augmentation

Directed a NERA team that conducted a cost effectiveness analysis of alternative options for augmenting transmission capacity to the Sydney CBD area. This included identification and evaluation of alternative transmission, generation and demand side management options, and application of the `regulatory test', as defined in the national electricity code.

Institutional and Regulatory Reform

2006 **Bulk Entitlement Management Committee, Melbourne**

Development of urban water market

Prepared a report for the four Melbourne water businesses on options for the devolution of the management of water entitlements from collective to individual responsibility.

2003-05 **Goldman Sachs/Airport Authority, Hong Kong**

Framework for economic regulation

Lead a team advising on the options and detailed design of the economic regulatory arrangements needed to support the forthcoming privatisation of Hong Kong Airport.

2003-04 **Ministry of Finance, Thailand**

Framework for economic regulation

Lead a team advising on the detailed design and implementation of a framework for the economic regulation of the Thai water sector in order to support the proposed corporatisation and then privatisation of the Metropolitan Water Authority of Bangkok.

2003 **Metrowater and Auckland City, New Zealand**

Water industry reform options

Provided a report on alternative business models for the Auckland City water services supplier, Metrowater, in the context of proposals for structural reform elsewhere in the industry. This report examined the long term drivers of water industry efficiency and the costs and benefits of alternative structural reform options.

2001 **Independent Pricing and Regulatory Tribunal (IPART), NSW**

Review of energy licensing regime

Directed a program of work for in the context of IPART's year-long review of the energy licensing regime in NSW. This review included

the identification - by reference to experience in other state and international jurisdictions - of the most effective regulatory model for the licensing of both network and retail functions in the electricity and gas sector, the development of a compliance monitoring and reporting framework, and an assessment of the need for and nature of minimum service standards.

1999 **Department of Treasury and Finance, Victoria**
Urban water market
Developed a comprehensive proposal for the introduction of tradeable rights for bulk water used to supply metropolitan Melbourne. This involved detailed design of the form and allocation of rights, the role of a weekly spot market to determine storage draw down decisions, the specification of a 'market model' and the institutional arrangements for rights registration, trading, and the operation of an open access transfer system.

1994 **Office of Water Reform, Victoria**
Water markets
Developed a conceptual framework and the detailed requirements for its application to create markets for the trading of water rights across the state of Victoria. The recommendations of this report have underpinned subsequent reforms undertaken by the Victorian government as recently as 2006.

Sworn Testimony, Transcribed Evidence

2006 **Expert report submitted to arbitration proceedings before Sir Daryl Dawson and David Jackson, QC, between Santos and others, and AGL**
Expert report, sworn evidence, November 2006

Expert Evidence before the Federal Court on behalf of Fortescue Metals Group in the matter of BHP Billiton vs National Competition Council and Others
Expert report, sworn evidence, November 2006

Expert report submitted to arbitration proceedings before Sir Daryl Dawson and David Jackson, QC, between Santos and Others, and Xstrata Queensland
Expert report, sworn evidence, September 2006

Expert evidence before the Copyright Tribunal on behalf of the Australian Hotels Association and others in the matter of PPCA vs AHA and Others
Expert report, sworn evidence, May 2006

Statement submitted to arbitration proceedings before Hon Michael McHugh, AC QC, on the matter of AWB Limited vs ABB GrainLimited
Expert report, sworn evidence, 24 May 2006

Statements submitted to the Appeal Panel, in the matter of the appeal by United Energy Distribution of the Electricity Price Determination of the Essential Services Commission
Expert report, sworn evidence, 10 February 2006

2005

Expert evidence on behalf of Orion NZ, at the Commerce Commission's Conference on its Notice of Intention to Declare Control of Unison Networks
Transcribed evidence, public hearings, Wellington, 17 November 2005

Expert evidence on behalf of Orion NZ, at the Commerce Commission's Conference on Asset Valuation choice and the electricity industry disclosure regime
Transcribed evidence, public hearings, Wellington, 11 April 2005

2004

Statements submitted to the Australian Competition Tribunal, in the matter of Virgin Blue Airlines vs Sydney Airport Corporation
Expert reports, sworn evidence, 19-20 October 2004

Expert evidence on behalf of Orion NZ, at a Commerce Commission's Conference on the ODV Handbook for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 26 April 2004

2003

Expert evidence on behalf of Orion NZ, in response to the Commerce Commission's draft decision on re-setting the price path threshold for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 5 November 2003

Expert evidence on behalf of NGC Holdings, in response to the Commerce Commission's draft framework paper for the gas control inquiry.
Transcribed evidence, public hearings, 3 September 2003

Affidavit submitted to the Federal Court, in the matter of ACCC vs DM Faulkner and Others
Expert report, Federal Court of Australia, May 2003

Expert evidence on behalf of Orion NZ, in response to the Commerce Commission's draft decision on a targeted control regime for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 25 March 2003

2002

Expert evidence on behalf of Orion NZ, in the Commerce Commission's review of asset valuation methodologies for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 25 November 2002

Expert evidence on behalf of Optus Networks and Optus Vision Ltd, in the matter of an arbitration with United Energy Ltd
Expert report, prior to settlement, 18 October 2002

Expert statement submitted to the National Electricity Tribunal, in the matter of Murraylink Transmission Company vs NEMMCO, TransGrid, and others
Sworn Testimony, National Electricity Tribunal, Melbourne, 26 August 2002

Expert evidence on behalf of Orion NZ, in the Commerce Commission's review of control regimes for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 21 August 2002

Affidavit submitted to Supreme Court of Western Australia, in the matter of Epic Energy vs Dr Ken Michael – Independent Gas Access Regulator
Sworn testimony, Supreme Court of Western Australia, November 2002

2001

Expert evidence on behalf of Auckland International Airport, in the Commerce Commission's review of airfield price control
Transcribed evidence, public hearings, Wellington, 4-5 September 2001

Expert evidence on behalf of Optus Networks, in the matter of Optus Networks vs United Energy
Mediation before Trevor Morling QC, Sydney, August and September 2001

	Expert evidence on behalf of Sydney Airports Corporation in the Productivity Commission's review of airport regulation Transcribed evidence, public hearings, Melbourne, 3 April 2001
	Affidavit submitted to Supreme Court of Victoria, in the matter of TXU vs Office of the Regulator-General Sworn testimony, Supreme Court of Victoria, 23-26 March 2001
2000	**Evidence on behalf of Sydney Airports Corporation in the aeronautical pricing determination by the ACCC** Transcribed evidence, public forum, Melbourne, 13 December 2000
	Expert Statement on Rural Risk and the Weighted Average Cost of Capital, in the matter of an appeal by Powercor Australia Ltd of the Office of the Regulator-General's Electricity Price Determination 2001-05 Sworn testimony before the Appeal Panel, Melbourne, 13 October 2000
1999	**Affidavit submitted in arbitration proceedings between the MWSS Regulatory Office and Manila Water Company on the cost of capital for the Manila water concession agreements** Sworn testimony, Manila, 20 August 1999
1998	**Expert evidence on behalf of Great Southern Networks in the gas access determination by IPART** Transcribed evidence, Sydney, 12 November 1998
1996	**Expert evidence before the Monopolies and Mergers Commission inquiry into the proposed merger of Wessex Water plc and South West Water plc** Transcribed evidence, London, August 1996
1995	**Expert evidence before the Monopolies and Mergers Commission inquiry into the proposed acquisition of Northumbrian Water plc by Lyonnaise des Faux** Transcribed evidence, London, March 1995

Speeches and Publications

2007

Assessing the Merits of Early Termination Fees, *Economics of Antitrust: Complex Issues in a Dynamic Economy,* Wu, Lawrence (Ed)
NERA Economic Consulting 2007

Trade Practices Workshop
Access to Monopoly Infrastructure Under the Trade Practices Act: Current Issues with Part IIIa and Section 46
Conference Paper Co-Author, Canberra, 22 July 2006

2005

Federal Court Judges' Conference
Use of Quantitative Methods in Competition Analysis
Paper and speech, Sydney, 20 March 2005

2004

ACCC Regulation Conference
Market Power in Utility Industries
Speech, Gold Coast, 29 July 2004

Australian Water Summit
Integrating Regional and Urban Water Management Strategies
Speech, Melbourne, 25 February 2004

2003

Assessing the Competitive Effects of Bundling: the Australian Experience, *Economics of Antitrust, New Issues, Questions and Insights,* Wu, Lawrence (Ed)
NERA Economic Consulting, 2004

Water Infrastructure Conference
Pricing to promote reuse and recycling – Why Pay More for Less?
Speech, Melbourne, 28 July 2003

ACCC Incentive Regulation and Implementation Seminar
To Index or Not to Index – Is that the Right Question?
Speech, Melbourne, 8 May 2003

Australian Water Summit
Establishing Water Markets Why? How? What Next?
Speech, Sydney, 27 February 2003

2002
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Australian Energy Users Association Conference
Emerging Themes in Energy Sector Reform – Global and Local
Speech, Melbourne, 15 October 2002

Australian Conference of Economists
Efficient Transmission: Where to from here?
Conference Paper, Adelaide, 3 October 2002

ACCC Conference
Foundation Contracts and Greenfields Pipeline Development – an Economic Perspective
Speech, Melbourne 26 July 2002

2001

IPART Conference, Incentive Regulation at the Crossroads
Incentive Regulation: at the Cross Roads or Back to the Future?
Speech, Sydney, 5 July 2001

World Bank Conference on Private Participation in Infrastructure
A Regulatory Perspective
Speech, Beijing, 15 November 2001

Airports Council International (ACI) World Conference
Role of prices in managing airport congestion
Presentation of paper, Montreal, 11 September 2001

NSW Power Conference
Electricity transmission pricing and investment
Presentation of paper, Sydney, 30 August 2001

ACCC Regulation and Investment Conference
International Comparison of Regulated Rates of Return
Speech and presentation of paper, Sydney 26 March 2001

Publicly Available Reports

2007

Review of the Effectiveness of Energy Retail Market Competition in South Australia
A report for the Essential Services Commission of South Australia, June 2007

2006	**Consistency of the Transmission Rules with the Competition Principles Agreement** A report for the Australian Energy Market Commission, December 2006
	Study of the Hong Kong Auto-fuel Retail Market A report for the Economic Development and Labour Bureau, Hong Kong, April 2006
	Expert Panel on Energy Access Pricing A report to the Ministerial Council on Energy, April 2006
2005	**Intention to Declare Control** A report for Orion, October 2005
	Efficient Investment in Transmission and its Alternatives A report for Mighty River Power, July 2005
	Wealth Transfers in Cost Benefit Analysis A report for Auckland International Airport, January 2005
2003	**Asset Valuation for the Gas Control Inquiry** A report for NGC Holdings, August 2003
	Estimating the Rate of Economic Profit for Electricity Lines Businesses A report for Orion, November 2003
	Inclusion of Competition Benefits in the Regulatory Test A report for TransGrid, April 2003
	Imputation Tests for Bundled Services A Report for the ACCC, January 2003
	Anticompetitive Bundling Strategies A Report for the ACCC, January 2003
2002	**The Hypothetical New Entrant Test in the Context of Assessing the Moomba to Sydney Pipeline Prices** A Report for the ACCC, September 2002
	A Comment on the Commerce Commission's Report: Regulation of Electricity Lines Businesses A Report for Orion, May 2002

Review of Energy Licensing Regimes in NSW: Compliance Monitoring and Reporting Framework
A Report for IPART, March 2002

Review of Energy Licensing Regimes in NSW: Minimum Service Standards
A Report for IPART, January 2002

2001

Review of Energy Licensing Regimes in NSW: Most Effective Regulatory Model
A Report for IPART, November 2001

A Review of Melbourne's Water Tariffs
Report for the Department of Natural Resources and Environment

A Critique of Price Control Study of Airfield Activities
A Report for Auckland International Airport Limited, August 2001

International Comparison of Utilities' Regulated Post Tax Rates of Return in North America, the United Kingdom and Australia
A Report for the Australian Competition and Consumer Commission (ACCC), March 2001

A Critique of Crew and Kleindorfer's Paper Comparing Single and Multi-till Pricing Methodologies
A Report for Sydney Airports Corporation, February 2001

Katherine Lowe

Consultant

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Overview

Katherine Lowe has five years experience as an economist working within the areas of energy, infrastructure regulation, competition, consumer protection, personal injury related liabilities and commercial macroeconomics.

Prior to joining NERA, Katherine was employed as an economist within the Economics Division of Macquarie Bank and the Compliance, Regulatory and Merger Divisions of the Australian Competition and Consumer Commission ('ACCC'). As a Research Assistant and Associate Economist in Macquarie Bank's Economic Division, Katherine examined macroeconomic trends within Australia and across Asia. In her capacity as an economist within the ACCC, Katherine's responsibilities included financial modelling, assessing asymmetric risks and rates of return, assessing forecast volumes, examining cost allocation methodologies and assessing anti-competitive practices.

Katherine has obtained a Bachelor of Business (majoring in Finance and Economics) from the University of Technology Sydney, a Master of Economics from the University of Sydney and a Master of Applied Finance from Macquarie University.

Qualifications

2003 - 2006	**MACQUARIE UNIVERSITY** Master of Applied Finance, majoring in Corporate Finance
2000-2001	**UNIVERSITY OF SYDNEY** Master of Economics
1994-1999	**THE UNIVERSITY OF TECHNOLOGY SYDNEY** Bachelor of Business Majoring in Finance and Economics

Career Details

2006-	**NERA ECONOMIC CONSULTING** Consultant, Sydney

2005 -2006	**NERA ECONOMIC CONSULTING** Consultant, New York
2002-2004	**AUSTRALIAN COMPETITION AND CONSUMER COMMISSION** Associate Director/Senior Gas Analyst – Gas Group (final position)
1998-2002	**Macquarie Bank** Associate Economist - Asia (final position), Sydney

Project Experience

2007 **Ministerial Council on Energy Smart Meter Working Group**

Cost Benefit Analysis of Proposed Smart Meter Infrastructure Rollout

Retained to provide advice on the consumer related effects of a smart meter and direct load control roll out. This entailed modelling the changes to the pattern of consumption and the overall level of demand flowing from the introduction of time of use tariffs, critical peak pricing and direct load control. Consideration was also given to the change in consumer surplus which was decomposed into the redistribution of surplus between consumers, retailers, generators and networks and the net societal loss or gain.

2007 **Australian Energy Market Commission**

Review of the Wholesale Gas and Electricity Markets and Implications for Retail Competition

Retained to provide an overview of the operation and structure of the wholesale gas and electricity markets within the National Electricity Market (NEM) jurisdictions and to identify the issues that the AEMC should consider when assessing the influence of the wholesale markets on competition within the retail gas market in each jurisdiction.

2007 **Ministerial Council on Energy**

Review of Chapter 5 of the National Electricity Rules

Retained to provide advice on the development of a national framework for connection applications and capital contributions in the context of the National Electricity Rules.

2007 **Freehills/Telstra**

Shareholder Class Action

Retained to provide advice on damages estimates for alleged failure of Telstra to disclose information to the ASX.

2007	**Powercor/CitiPower** **Advice on Related Party Outsourcing Arrangements** Retained to provide advice on the manner by which regulatory concerns surrounding related party outsourcing arrangements may be ameliorated.
2007	**Multinet** **Review of Outsourcing Infrastructure Asset Management Contracts** Retained to provide advice on the prudency of outsourcing contracts in the context of the National Gas Code and to benchmark operating margins levied by asset management service providers.
2007	**Envestra** **Review of Outsourcing Infrastructure Asset Management Contracts** Retained to provide advice on the prudency of outsourcing contracts in the context of the National Gas Code and to benchmark operating margins levied by asset management service providers.
2007	**Optus, Australia** **Development of a Special Access Undertaking** Provided advice on the pricing principles that should be incorporated into the Fibre to the Node Special Access Undertaking.
2006-07	**Middletons/Confidential Client** **Damages assessment** Retained to provide advice on forecast demand and supply conditions and prices for gas, LPG, ethane and crude oil prices and over a ten year period.
2006	**Freehills/South Australian Gas Producers, NSW and South Australia** **Gas supply agreement arbitration** Provided economic advice in an arbitration relating to the price that should apply following a price reset within a long term major gas supply agreement between the South Australian gas producers and a large retail customer in NSW and South Australia.
2006	**Australasian Railway Association** **Assistance with the development of a submission in response to the Productivity Commission's road and rail review** Assisted in the review and evaluation of the Productivity Commission's draft report investigating road and rail pricing.

2006 **Australian Energy Regulator**

Review revenue and tariff model submitted by gas transmission pipeline owner

Undertook an audit of the revenue and tariff model supplied by a gas transmission pipeline owner.

2006 **Australasian Railway Association**

Comparative assessment of road and rail regulatory regimes

Assisted in the drafting of a comparative study of the regulatory approaches, and institutional structures adopted within the road and rail sectors. The aim of the study was to draw out relevant features and inconsistencies between road and rail infrastructure in each of the key jurisdictions in Australia.

2005-06 **Mass Torts and Securities divisions**

Over 2005-06 Katherine worked within the New York office where she was involved in the examination of the expected personal injury related liabilities of major US companies. Her responsibilities included the construction of valuation models to measure the expected value of asbestos-related and welding rod related liabilities, as well as replicating the valuation models of other experts and drafting rebuttal reports to identify weaknesses in the assumptions and techniques employed by other experts.

In addition to the above, Katherine was responsible for the preparation of briefing material and presentations to be provided to both clients and counsel. She has also assisted in the drafting of expert reports and demonstratives to be relied upon in court.

2003-04 **Australian Competition and Consumer Commission**

Gas Transmission Pipeline Regulation Group

Katherine primarily worked on a decision relating to the terms and conditions of access to a regulated gas pipeline. As part of this role, Katherine carried out the financial modelling required to estimate the overall revenue requirement of the pipeline and the associated tariffs and was also involved in the research, assessment and drafting of several aspects of the ACCC's Final Decision and Final Approval.

Following the appeal of the ACCC's Final Approval to the Australian Competition Tribunal, Katherine was extensively involved in the preparation and briefing of the solicitors, counsel and the Tribunal.

While working in this Group, Katherine also assessed the Ring Fencing arrangements put in place by service providers to establish whether or not the arrangements complied with provisions within the Gas Code. In addition, Katherine co-authored a paper which evaluated

the level of responsibility to be taken by the CEO and Non-Executive Directors when signing Ring Fencing reports.

2002-03 **Australian Competition and Consumer Commission**

Mergers and Asset Sales Branch

Katherine was involved in the examination of proposed mergers to assess whether they would have the effect, or would be likely to have the effect, of substantially lessening competition. This role involved the practical assessment and application of economic theory to issues such as market definition, demand and supply side substitution possibilities, strategic and structural barriers to entry, countervailing power, and the likely effect of proposed mergers on prices and profit margins.

2002 **Australian Competition and Consumer Commission**

Transport and Prices Oversight Branch

Katherine predominantly worked on a price notification by Airservices Australia and also assisted in the assessment of a price notification by Australia Post. The Airservices Australia price notification required Katherine to assess the company's revenue requirements and the appropriate rate of return to be generated.

Katherine also assisted in drafting a chapter of the ACCC's Preliminary View entitled Australia Post's Productivity. This chapter examined Australia Post's historic and projected productivity growth to assess both the efficiency of Australia Post's current cost base and the reasonableness of its projected operating and maintenance costs. The chapter also examined the need to encourage Australia Post to continue to seek out efficiency gains and cost reductions by putting in place the necessary incentives.

1998-2002 **Macquarie Bank**

In her role at Macquarie Bank, Katherine assisted the Regional Economist, located in Hong Kong, with the research and analysis of commercially relevant economic and financial market information (such as GDP, inflation, unemployment, movements in currencies, stock markets, bond yields and structural reforms) and the preparation of reports for clients. Katherine also worked within a busy trading operation, as sole support to Foreign Exchange, Bullion and Base Metals dealers through the New York shift.

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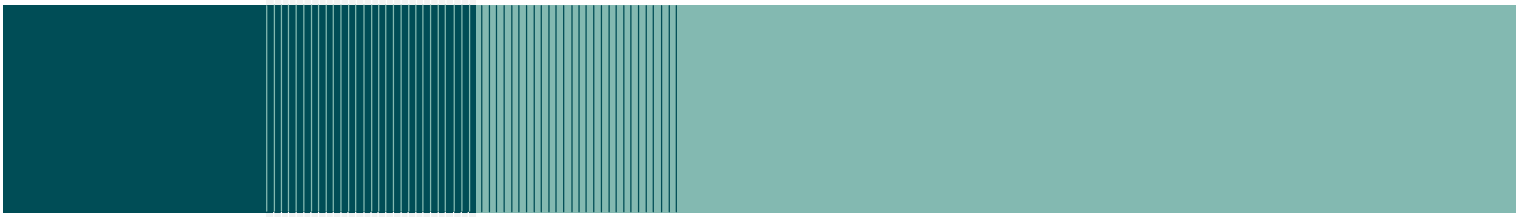
29 October 2007

Equity Beta for Gas Distribution

APIA, ENA and ETNOF



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Executive Summary

On the 28 August 2007 the Victorian Essential Services Commission (ESC) released its 2008-2012 Gas Access Arrangement Review Draft Decision (Draft Decision). The ESC's draft decision concluded that the equity beta of a regulated gas distribution business was in the range of 0.5 to 0.8 and so the Rate of Return should be calculated by reference to an equity beta of 0.7.

This decision is a departure from the relatively long standing finding of many Australian regulators that the best estimate of the equity beta for the purpose of making decisions on the tariffs to apply to energy network infrastructure businesses is 1.0. The benefits of regulatory stability as well as best regulatory practice suggest that a departure from previous findings by the ESC and others to be warranted it should be based on strong evidence that the alternative equity beta estimate is valid.

In our opinion the analysis of equity beta data undertaken in a report for the ESC by the Allen Consulting Group (ACG) has a sufficient number of flaws for there to be serious doubt as to whether it provides any support for a different equity beta estimate. The principal areas of deficiency in the ACG report are that:

- it relies exclusively on an ex-post examination of market returns and so does not consider other US-based ex-ante approaches for estimating the equity beta. If the ESC had considered a range of available methodologies for estimating the US equity beta it would observe:
  - historical *proxy* beta estimates suggest an equity beta of between 0.6 and 0.8;
  - that US regulatory decisions in the form of allowed rates of returns that have a long term average implied equity beta of 1.15 and 1.17 for electricity and gas utilities respectively; and
  - a DCF analysis of the nine US gas distribution and transmission businesses identified by ACG had an average implied equity beta of 1.12 and a median implied equity beta of 1.05;
- it includes in its sample a number of the traded securities that primarily or partially exhibit the characteristics of debt. Securities of this form will exhibit lower levels of correlation with the market portfolio than ordinary shares and so the inclusion of these securities in the sample will bias downward the resulting estimates of the systemic risk associated with operating the benchmark regulated business; and
- the period of analysis used by ACG includes times when the prices of some securities are likely to be influenced by potential mergers, management buy outs and acquisitions. During these periods a firm's share price will be more strongly influenced by the relevant market activity than its underlying business conditions and the associated risks involved in delivering the reference service, as required by section 8.30 of the Code.

If the issues we have identified in this report are addressed then:

- the best estimate of the equity beta of US energy utilities ranges between 0.60 and 1.17, with forward-looking estimates concentrated at the higher end of this range;

- the average equity beta for the Australian portfolio would increase from between 0.5 and 0.7 to between 0.7 and 0.9 for the longest data period, depending on the regression technique;
- the upper bound of the associated 95 per cent confidence exceeds 1.0 in eleven of the twelve regressions, as compared with just two of the twelve regressions in tables 1 and 2 of the ACG report; and
- the number of entities in the sample falls to just one for the period prior to the 'technology bubble' and to between two and four in the post 'technology bubble' period, and the total number of monthly observations falls to just 239.

This scarcity of data demonstrated by this latter point is particularly problematic. In our opinion, after adjustment for the above sample and data selection problems, there is insufficient data from the Australian capital markets to reach any reasonable conclusion as to the equity beta of a regulated gas distribution business, as required by section 8.2(e) of the Code. Regulatory stability and best practice require robust evidence to support any move away from past regulatory decisions as to the best estimate for the equity beta. In our view, the information relied on upon by the ESC is sufficiently uncertain for it not to support the change to equity beta that it has proposed in its Draft Decision.

In light of these shortcomings, in our opinion the ESC's conclusion that the equity beta lies between 0.5 and 0.8 is not supported by a reasonable interpretation of the *prevailing conditions in the market for funds and the risk involved in delivering the Reference Service'*. It follows that it is not consistent with the requirements of section 8.30 of the Code.

In circumstances where there is no compelling Australian market evidence as to the appropriate equity beta for a regulated gas distribution business, in our opinion the ESC should give greater weight to ensuring regulatory stability and consistency by adopting an equity beta that reflects its previous best estimates of this parameter.

1. Introduction

This report has been prepared at the request of a consortium of energy industry associations.[1] Its subject is the appropriateness of the equity beta estimate adopted by the Victorian Essential Services Commission's (ESC) in its 2008-2012 Gas Access Arrangement Review Draft Decision (the Draft Decision). The ESC's equity beta estimate is a critically important input[2] into its Draft Decision on the appropriate Rate of Return, as required under Section 8.30 of the National Third Party Access Code for Natural gas Pipeline Systems (the Code).

Specifically we have been asked to consider:

- the robustness of the analysis underpinning the ESC's decision to move toward historic market evidence when assigning a value to the equity beta.

The report is structured as follows:

- Chapter 2 outlines the reasoning behind the ESC's findings that its best estimate of equity beta was in the range of 0.5 and 0.8;
- Chapter 3 assesses the ESC's use of US evidence of equity beta for a regulated gas distribution business;
- Chapter 4 evaluates the strength of the Australian market evidence that the equity beta is less than one; and
- Chapter 5 sets out our conclusions as to whether the ESC's draft decision on the equity beta represents the best estimate arrived at on a reasonable basis.

This report has been prepared by both Greg Houston (Director) and Brendan Quach (Senior Consultant) of NERA Economic Consulting (NERA). We have both read the Guidelines for Expert Witnesses in Proceedings of the Federal Court of Australia and confirm that we have made all inquiries that we believe are desirable and no matters of significance that we regard as relevant have, to the best of our knowledge, been withheld in the preparation of this report. Copies of our Curricula Vitae are attached in Appendix B. We have been assisted in the preparation of this report by Katherine Lowe and Tara D'Souza. Notwithstanding this assistance, the opinions in this report are our own and we take full responsibility for them.

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[1] Australian Pipeline Industry Association (APIA), Electricity Networks Association (ENA) and the Electricity Transmission Network Owners Forum (ETNOF).

[2] A companion report by NERA addresses the appropriateness of the method by which the ESC has estimated the ten year real risk free rate, which is a further critical input in the ESC's determination of the appropriate rate of return to apply in the context of its Draft Decision.

2. The ESC's Equity Beta Finding

The ESC's Draft Decision in relation to the equity beta was based on what it considered to be a detailed review of market evidence of the equity beta, and drew the concluded that there was:[3]

> *"convincing evidence from capital markets that the value of the equity beta is substantially lower than the value of 1.0 that has previously been assumed in many determinations under the Code and, consistent with objectives of efficient prices for gas distribution, that this should be reflected in the Rate of Return applied in the access arrangements for the distributors."*

On the basis of this review, the ESC concluded that the:

> *"best estimate arrived at on a reasonable basis' for the beta that is consistent with 'prevailing conditions in the market for funds and the risk involved in delivering the Reference Service' lies between 0.5 and 0.8".*[4]

The ESC's decision to adopt an equity beta range of 0.5 to 0.8 is at odds with the distributors' proposals and a departure from the relatively long standing findings of many Australian regulators that the best estimate of the equity beta for the purpose of making decisions on the tariffs to apply to energy network infrastructure businesses is 1.0.

The benefits of regulatory stability as well as best regulatory practice suggest that a departure from previous findings by the ESC and others to be warranted it should be based on strong evidence that the alternative equity beta estimate is valid. However, in our view the analysis of equity beta data undertaken in a report[5] for the ESC by the Allen Consulting Group (ACG) has a sufficient number of flaws for there to be serious doubt as to whether it provides any support for a different equity beta estimate. The principal areas of deficiency in the ACG report are that:

- it relies exclusively on an ex-post examination of market returns and so does not consider other US-based ex-ante approaches for estimating the equity beta. Our analysis shows that these other approaches result in a significant change in the range of equity betas estimated;
- it includes in its sample a number of the traded securities that primarily or partially exhibit the characteristics of debt. Securities of this form will exhibit lower levels of correlation with the market portfolio than ordinary shares and so the inclusion of these securities in the sample will bias downward the resulting estimates of the systemic risk associated with operating the benchmark regulated business. A rate of return estimated by reference to such a sample would neither be commensurate with the prevailing conditions in the market for (the equity component of) funds nor the risk involved in

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[3] ECS, Draft Decision, page 416.

[4] ESC, Draft Decision, page 397.

[5] Allen Consulting Group, (ACG), *Empirical evidence on proxy beta values for regulated gas distribution activities*, June 2007.

delivering the reference service. It follows that a Rate of Return derived on this basis would not be consistent with the requirements of section 8.30 of the Code, and may be contrary to section 8.2(e) of the Code, which requires forecasts to represent best estimates arrived at on a reasonable basis; and

- the period of analysis used by ACG includes times when the prices of some securities are likely to be influenced by potential mergers, management buy outs and/or acquisitions. During these periods a firm's share price will be more strongly influenced by the relevant market activity than its underlying business conditions and the associated risks involved in delivering the reference service, as required by section 8.30 of the Code.

The ESC's decision on the value of the equity beta is required to be consistent with the following sections of the Code:

> *8.2(e) any forecasts required in setting the Reference Tariff represent best estimates arrived at on a reasonable basis.*
>
> *8.30 The Rate of Return used in determining a Reference Tariff should provide a return which is commensurate with prevailing conditions in the market for funds and the risk involved in delivering the Reference Service (as reflected in the terms and conditions on which the Reference Service is offered and any other risk associated with delivering the Reference Service).*

In our opinion, the evidence from the capital markets on which the ESC's Draft Decision relies is not sufficiently robust to form a reasonable basis to move away from the existing body of regulatory precedent that the equity beta is 1.0. It follows that the ESC's Draft Decision to set an equity beta of 0.7 is inconsistent with a Rate of Return that is commensurate with the prevailing conditions in the market for funds and the risk involved in delivering the gas distribution services as required by section 8.30 of the Code.

The remainder of this report examines the evidence presented by ACG and the ESC in relation to the equity beta and emanating from:

- US gas and electricity distribution and transmission firms; and
- the portfolio analysis of 'comparable' Australian firms.

3. US Evidence of the Equity Beta

In reaching its Draft Decision on the equity beta the ESC considered 'market evidence' from both Australia and the United States, but placed greater weight on estimates from Australian firms. Beta estimates of US firms were also calculated to extend the upper bound of the equity beta range.[6] In this section we examine the evidence of the equity beta from US energy distribution and transmission businesses considered by the ESC and whether it should have considered other methods for estimating US evidence of the equity beta.

In the Draft Decision the ESC concludes that:[7]

> *"the US evidence suggests that the beta is between 0.6 and 0.8."*

In reaching this conclusion the ESC relied solely on estimates derived from regression of the ex post returns of a number of US utilities by reference to the market. However, the ESC did not consider other available approaches for estimating the equity beta of US energy firms. If the ESC had had regard to alternative estimates it would observe that estimates derived from historical returns are significantly lower than those drawn from alternative, forward-looking methodologies. Consequently, in our opinion the ESC's finding that the US beta range lies between 0.6 and 0.8 does not represent a *best estimate arrived at on a reasonable basis* as required by section 8.2(e) of the Code.

The remainder of this chapter is structured as follows:

- section 3.1 sets out the role of the equity beta in the setting of the Rate of Return and outlines a number approaches for estimating this parameter;
- section 3.2 outlines the advantages and disadvantages of the approach adopted by ACG and the ESC to estimating the US equity beta;
- section 3.3 sets out an alternative approach for estimating the equity betas of comparable US firms through the use of regulatory decisions;
- section 3.4 summarises a second alternative approach for estimating the equity beta using discounted cash flow analysis; and
- section 3.5 sets out our conclusion of US evidence of the equity beta of a regulated gas distribution business.

3.1. Role of the Equity Beta

The equity beta is a parameter in the capital asset pricing model (CAPM).[8] The CAPM is widely used by Australian regulators to estimate the required rate of return on equity for

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6 ESC, *Gas Access Arrangement Review 2008-20012: Draft Decision*, 28 August 2007, page 396.

7 ESC, *Gas Access Arrangement Review 2008-20012: Draft Decision*, 28 August 2007, page 396.

8 The CAPM is used by the ESC to determine the required return on equity (R_e). The return in equity is a parameter in the weighted average cost of capital (WACC), ie:

$$WACC = R_e \frac{E}{E+D} + R_d \frac{D}{E+D}$$

where

regulated companies. The premise of the CAPM is that investors require higher returns in order to invest in more "risky" assets.

The risk of a specific investment refers to the expected variation in its returns. For example, an investment that has an equal probability of returning 8, 10 or 12 per cent, would be considered more risky than an investment with a certain return of 10 percent. Since investors must be compensated for risk, a rational investor will require a return greater than 10 percent to invest in an asset with expected returns that range between 8 to 12 percent.

However, investors are able to eliminate some of the expected variations in the returns associated with an investment by holding a diversified portfolio of investments, so that shortfalls in the returns on one stock are offset by excess returns on others. If expected variations in returns can be eliminated by holding a portfolio of investments then an investor need not be compensated for this avoidable (diversifiable) risk. In other words an investor should only be compensated for the undiversifiable (or systematic) element of risk in an investment.

The CAPM quantifies the undiversifiable risk of an investment by means of the equity beta parameter. The CAPM model employed by the ESC is sets out in the following formulae:[9]

$$R_e = R_f + b_e \times MRP$$

where

R_f is the real risk free rate;

MRP is the return in excess of the risk-free rate (the market risk premium) that investors would need to invest in a well diversified portfolio; and

β_e is the equity beta.

The equity beta is defined as the investor's *expected* covariance of returns on a stock with *expected* returns on the market portfolio as a proportion of the variance in *expected* returns on the market portfolio. Since the equity beta is determined by investor expectations it cannot be directly observed.

The inability to observe investor directly expectations requires one to *estimate* the rate of return on equity that is commensurate with the prevailing conditions in the market for funds and the risk of the firm.

One possible approach to estimating the equity beta of a firm is by means of an ex-post analysis of the historical covariance of the returns on a firm's share with the returns on the market portfolio. Since investors' ex-ante expectations cannot be measured by an ex-post regression of returns, this approach amounts to an historical *proxy* of the beta. This is the approach adopted by ACG and the ESC.

R_d is the required return on debt;

E is the assumed value of equity; and

D is the assumed value of debt.

[9] ESC, *Gas Access Arrangement Review 2008-20012: Draft Decision*, 28 August 2007, page 374.

The advantage of historical *proxy* betas is that they can be easily calculated since share and market returns can be observed over time. However, the use of historical *proxy* betas has important limitations, since they assume that investors form their expectations of future risk on the basis of past events. In the absence of information as to expectations regarding future returns, this historical approach might be expected to result in an unbiased estimate of the future equity beta.

However, there are alternative methods to estimate the equity beta. These include a consideration of historical regulatory decisions and/or direct estimation of expected returns (and so the extent to which theses differ from those for the market portfolio) using discounted cash flow (DCF) valuation models.

Over the past eleven and half years there have been over 400 regulatory determinations for energy utilities in the US. US regulators actively consider current market data in their determinations of required rates of return. Therefore, these decisions represent US regulators' best estimate of the current market conditions for funds and the risk associated with the provisions of regulated energy services in the US. The allowed returns on equity embodied in these decisions can then be used to calculate the implicit compensation for expected undiversifiable risk.

By contrast, DCF analysis directly estimates the equity beta by assuming that the amount that an investor is willing to pay for an equity share is equal to the present value of expected future distributed profits (ie, dividends). The discount rate that equates future dividends with the current price is the implicit compensation that investors require for expected undiversifiable risk.

The advantage of this approach is that the required rates of return are based on the explicit forward-looking expectations of investors. However, a DCF analysis is not possible for shares trading in all securities markets since it requires:

- a large number of comparable listed businesses; and
- a substantial number of investment analysts (whose earning projections are used as a proxy for investors' expectations of future earnings growth).

In the next section we examine the first of these approaches, ie, the use of historical *proxy* betas.

3.2. Historical *Proxy* Betas

In its Draft Decision the ESC refers to two analyses of the historical *proxy* betas of US energy utilities.

The first of these considers the average historical *proxy* beta of 12 energy distributors from January 1992 to beginning of 2007.[10] After adjusting the observed historical *proxy* betas for an assumed capital structure the ESC observed that:[11]

> *"the re-levered equity betas averaged across the sample of firms fluctuated within the range of approximately 0.6 to 0.8 prior to the impact of the 'technology bubble', equity betas declined during a period coincident with the 'technology bubble' before again recovering to levels with the range of 0.6 to 0.8."*

Second, the ESC relies on an ACG analysis of the historical proxy betas for nine US gas distribution and transmission businesses.[12] ACG's analysis of historical proxy betas concluded that, using data from the whole period, the equity beta is in the range of 0.44 to 0.60, depending on the regression technique used, with a corresponding range for the upper bound 95 per cent confidence interval of 0.61 to 0.76. Using the latest five year period the mean equity beta of the portfolio is in the range of 0.53 to 0.76, depending on the regression technique, with a corresponding range for the upper bound of the 95 per cent confidence interval of 0.81 to 1.12.

These two analyses lead the ESC to conclude that the equity beta for US energy utilities is in the range of 0.6 to 0.8. However, there are a number of limitations associated with simply adopting historical *proxy* beta calculations and caution should be exercised before drawing any inferences about the ex-ante expectations of investors.

3.2.1. Limitations of historical *proxy* betas

Historic *proxy* betas are simply regressions of the relationship between the returns on an individual stock and the market as a whole during specific periods. They are not measures of investors' *expectations* of risk, ie, they do not estimate the forward-looking equity beta directly. The limitation of this approach is that it assumes that investors form their expectations of future risk on the basis of past events. However, an investor's expectation of future risk is likely also to be influenced by other information available, such as its own analysis of the company's future activities and market developments.

The degree to which investors rely on historical market movements to determine their expectations of future risk would be diminished if:

- the historical *proxy* beta are unstable over time;
- the historical data incorporates events that are not expected to occur in the future; or
- there is reason to believe that the nature of the company or the market as a whole had changed.

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[10] US electricity utilities were: Centrepoint Energy; Clesco Corporation; DTE Energy Corporation; Empire District Electricity Company; El Paso Electric Corporation; Entergy Corporation; Elexon Corporation; FirstEnergy Corporation; FPL Croup; MGE Energy; Progress Energy; and Westar Energy.

[11] ESC, *Gas Access Arrangement Review 2008-20012: Draft Decision*, 28 August 2007, page 389.

[12] ACG sample of companies includes: AGL Resources; Atmos Energy; Laclede; NICOR; Northwest Natural Gas; Piedmont Natural Gas; South Jersey Industries; Southwest Gas; and WGL Holdings.

The greater the variation in historical *proxy* betas the less insight they will provide investors as to the future relative risks of a firm.[13] A further problem with relying solely on historical *proxy* betas is that observed variation is inconsistent with the assumption that the comparator companies have the characteristics of a regulated gas distribution business.

A regulated utility is assumed only to undertake the regulated activity and also to have a constant level of gearing over time. These assumptions suggest that the equity beta of a regulated business would exhibit minimal variation over time. Indeed, this was one of the reasons given by the ESC for rejecting the Blume adjustment.

The ESC's analysis concludes that the average equity beta of US electricity distributors oscillates from just over 0.8 (1996) to just under zero (2001) before climbing to 0.8 by the beginning of 2007.[14] If one were to accept the ESC's exclusive use of historical proxy betas as the basis for determining the appropriate Rate of Return then investors' expected return on equity for US electricity businesses first fell by 480 basis points and then by recovered a similar amount all within an eleven year period.[15] Such variation is extremely difficult to explain and is contradicted by alternative approaches for estimating required equity returns.

Caution with the use of historical *proxy* betas should also be shown when the historical data captures events that are unlikely to reoccur. One such example is the impact that the technology bubble had on the measured *proxy* betas of utility companies. The ESC and ACG have properly excluded this period from their assessments. Another example of an event that is unlikely to reoccur is the period leading up to a change of ownership of a listed firm, such as a merger, management buy out or when a business is being acquired. In these circumstances the share price no longer exclusively reflects the underlying business activity, but rather becomes influenced by the offer price as well as the potential for competing bids. This reason is presumably why ACG excluded Cascade Natural Gas, Kinder Morgan and Peoples Energy from its group of comparable US companies.

The third reason for placing little weight on historical *proxy* betas is when there is a reasonable belief that the nature of the company or the market as a whole has changed. Again in these situations investors' expectations of future risks are unlikely to place much weight on historical data. For example, in October 2006 AGL separated its regulated energy businesses from its retailing and generation assets. In the same transaction it sold its regulated energy business to Alinta. One consequence of this significant change in AGL's business portfolio is that investors are unlikely to use the historical *proxy* beta of the pre-October 2006 AGL to assess the risks of the new business.

Given these limitations of historical *proxy* betas, in our opinion, it is important to have regard to other methods for determining the equity beta for US energy utilities. Another approach

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[13] Under a regression analysis, greater variation in historical proxy betas would lead to higher standard errors. In the ACG report greater variation would turn up as large confidence intervals. For example, in table 5.13 of the ACG report the LAV of the portfolio mean could not reject a beta (with 95% confidence) between 0.26 and 1.12. In other words, this analysis could only reject a return on equity lower than 1.56% or higher than 6.72% above the risk free rate (assuming a MRP of 6%).

[14] See Table 10.2, ESC, *Gas Access Arrangement Review 2008-20012: Draft Decision*, 28 August 2007, page 390.

[15] Assuming a market risk premium of 6 per cent.

would be to have regard to the rates of return allowed by US regulators, which is discussed in the following section.

3.3. US Regulatory Precedent

There is a large database of US regulatory decisions on the cost of equity, as made by State and Federal regulators. In the past eleven and a half years there have been:

- 228 regulatory decisions on US electricity utilities; and
- 194 regulatory decisions on US gas utilities.

The allowed rate of return on equity is a central issue in these decisions. Given the maturity and size of the US financial sector, decisions on the required rate of return on equity are based on the testimony of financial experts that typically present market evidence on the appropriate sample of companies as well as the suitability of accepted approaches for determining the required return on equity from available market data.

Given the comprehensiveness of information presented to US regulatory commissions, their decisions provide valuable insights into the current opportunity cost of capital of this sector. Such estimates of the opportunity cost of capital only compensate investors for the undiversifiable (or systematic) risk of an investment. It is therefore possible to 'back out' the implied equity beta in these decisions by rearranging the CAPM formula, ie:

$$b_e = \frac{R_e - R_f}{MRP}$$

where

β_e is the implied equity beta;

R_e is the allowed return on equity;

R_f is the real risk free rate; and

MRP is the assumed return in excess of the risk-free rate (the market risk premium) that investors would need to invest in a well diversified portfolio.

3.3.1. Regulatory Precedent of US Electricity Utilities

The table below summarises all 228 decisions for electricity distribution businesses made between the end of 1996 and mid 2007. Table 3.1 reveals that the average return on equity allowed by US regulators for electricity utilities over the period was 10.90 per cent.

If one takes the implied market risk premium to be 6 per cent and the risk free rate as the average return to the 10 year US Treasury security yields then the average implied equity beta over that period is 0.98.[16] When one adjusts for the ESC's assumed capital structure of

[16] Note that the greater diversification possibilities in the US would suggest that the MRP for the US market should be less than in Australia. The implicit equity betas shown in the table are conservative estimates as the use of an MRP less than 6 per cent would result in a higher implicit equity betas.

60% debt the average implied equity beta of US regulatory decisions for electricity utilities increases to 1.15.

Table 3.1
Implied US Equity Beta for Electricity Utilities from Regulatory Decisions†

Period		Authorised equity returns (average)	Number of decisions	Average 10y Treasury Security yield‡	Equity as Percentage of Capital Structure	Implied equity beta (assuming an MRP of 6%)	Implied equity beta (60% debt ratio)
1996	Full Year	11.39	22	6.44	44.34	0.82	0.91
1997	Full Year	11.40	11	6.35	48.79	0.84	1.03
1998	Full Year	11.66	10	5.26	46.14	1.07	1.23
1999	Full Year	10.77	20	5.72	45.08	0.84	0.95
2000	Full Year	11.43	12	5.98	48.85	0.91	1.11
2001	Full Year	11.09	18	5.02	47.20	1.01	1.19
2002	Full Year	11.16	22	4.61	46.27	1.09	1.26
2003	Full Year	10.97	22	4.01	49.41	1.16	1.43
2004	Full Year	10.75	19	4.27	46.84	1.08	1.26
2005	1st Quarter	10.51	7	4.30	44.55	1.03	1.15
	2nd Quarter	10.05	7	4.16	48.30	0.98	1.19
	3rd Quarter	10.84	4	4.22	43.58	1.10	1.20
	4th Quarter	10.75	11	4.49	48.55	1.04	1.27
	Full Year	10.54	29	4.29	46.73	1.04	1.22
2006	1st Quarter	10.38	3	4.58	50.25	0.97	1.21
	2nd Quarter	10.69	5	5.07	45.40	0.94	1.06
	3rd Quarter	10.06	7	4.89	46.86	0.86	1.01
	4th Quarter	10.39	10	4.63	50.29	0.96	1.21
	Full Year	10.36	25	4.80	48.67	0.93	1.13
2007	1st Quarter	10.27	8	4.68	47.80	0.93	1.11
	2nd Quarter	10.27	10	4.85	46.03	0.90	1.04
	Average	**10.90**	**228**			**0.98**	**1.15**

† The data is an extension of those contained in the 30 January 2007, Regulatory Research Associates, Inc. entitled *Major Rate Case Decisions – January 2005- December 2006 Supplemental Study*.

‡ Quarter average of the 10 year US Treasury Securities. The Federal Reserve Board, Statistics: Table H.15 Selected Interest Rates - last release, Tuesday October 02, 2007. http://www.federalreserve.gov/Releases/H15/default.htm.

3.3.2. Regulatory Precedent of US Gas Utilities

The table below summarises all 194 decisions for US gas utilities made between the end of 1996 and mid 2007. Table 3.2, reveals that the average return on equity allowed by US regulators for the period was 10.86 per cent for gas utilities.

Again, taking the implied market risk premium to be 6 per cent and the risk free rate as the average return to the 10 year US Treasury security yields then the average implied equity

beta over that period is 0.97.[17] When this is adjusted for the assumed capital structure of 60% debt the average implied equity beta of US regulatory decisions for gas utilities increases to 1.17.

Table 3.2
Implied US Equity Beta for Gas Utilities from Regulatory Decisions†

Period		Authorised equity returns (average)	Number of decisions	Average 10y Treasury Security yield‡	Equity as Percentage of Capital Structure	Implied equity beta (assuming an MRP of 6%)	Implied equity beta (60% debt ratio)
1996	Full Year	11.19	20	6.44	47.69	0.79	0.94
1997	Full Year	11.29	13	6.35	47.78	0.82	0.98
1998	Full Year	11.51	10	5.26	49.50	1.04	1.29
1999	Full Year	10.66	9	5.72	49.06	0.82	1.01
2000	Full Year	11.39	12	5.98	48.59	0.90	1.10
2001	Full Year	10.95	7	5.02	43.93	0.99	1.09
2002	Full Year	11.03	21	4.61	48.29	1.07	1.29
2003	Full Year	10.99	25	4.01	49.93	1.16	1.45
2004	Full Year	10.59	20	4.27	45.90	1.05	1.21
2005	1st Quarter	10.65	2	4.30	43.00	1.06	1.14
	2nd Quarter	10.54	5	4.16	47.69	1.06	1.27
	3rd Quarter	10.47	5	4.22	49.54	1.04	1.29
	4th Quarter	10.40	14	4.49	49.03	0.99	1.21
	Full Year	10.46	26	4.29	48.66	1.03	1.25
2006	1st Quarter	10.63	6	4.58	51.18	1.01	1.29
	2nd Quarter	10.50	2	5.07	44.38	0.90	1.00
	3rd Quarter	10.45	3	4.89	47.19	0.93	1.09
	4th Quarter	10.14	5	4.63	44.28	0.92	1.02
	Full Year	10.43	16	4.80	47.43	0.94	1.11
2007	1st Quarter	10.44	10	4.68	48.33	0.96	1.16
	2nd Quarter	10.15	5	4.85	51.01	0.88	1.13
	Average	**10.86**	**194**			**0.97**	**1.17**

† The data is an extension of those contained in the 30 January 2007, Regulatory Research Associates, Inc. entitled *Major Rate Case Decisions – January 2005- December 2006 Supplemental Study*.

‡ Quarter average of the 10 year US Treasury Securities. The Federal Reserve Board, Statistics: Table H.15 Selected Interest Rates - last release, Tuesday October 02, 2007. http://www.federalreserve.gov/Releases/H15/default.htm.

3.3.3. Summary of US regulatory precedent

The above analysis shows that estimates of the equity beta derived from US regulatory precedent is appreciably higher than those inferred from historical *proxy* betas. The re-levered average equity beta for electricity and gas utilities is 1.15 and 1.17 respectively.

[17] Note that the greater diversification possibilities in the US would suggest that the MRP for the US market should be less than in Australia. The implicit equity betas shown in the table are conservative estimates as the use of an MRP less than 6 per cent would result in a higher implicit equity betas.

It can also be observed is that the implied equity betas display little variation over time and, unlike historical *proxy* betas, do not seem to have been affected by the 'technology bubble'. This most likely reflects the fact that US regulatory commissions place relatively little reliance on historical *proxy* betas when setting the rates of return for energy utilities.

A second alternative approach to estimating the equity beta is to do so my means of a discounted cash flow analysis of comparable US energy utilities.

3.4. DCF of Identified US Gas Utilities

In the US, there is sufficient information on investors' expected future earnings to apply 'discounted cash flow' (DCF) analysis to estimate the expected rate of return on equity directly. In a DCF analysis the required return on equity is equal to the discount rate necessary to equate in present value terms the current price of a share with its future expected dividend stream.[18]

Unlike regressions of historical market outcomes such DCF based analyses can be described as an ex-ante approach in that it incorporates the current market price of a security and investors' expectations of future dividends. In this sense, the DCF approach represents "*prevailing conditions in the market for funds and the risk involved in delivering the Reference Service"* as required by section 8.30 of the Code.

This approach can be illustrated by reference to the Federal Energy Regulatory Commission's (FERC) application of the DCF methodology. FERC uses a constant growth DCF model as set out in its Southern California Edison Company (SoCal) decision.[19]

The SoCal model is set out in the Commission's order, and states:[20]

> *"DCF methodology determines the ROE by summing the dividend yield (with an adjustment for the quarterly payment of dividends) and expected growth rate. The resulting formula is D/P (1+.5g)+g=k, where "D/P" is the dividend yield, "g" is the sustainable growth rate of dividends per share, and "k" is the resulting ROE. The sustainable growth rate is calculated by the formula: g=br+sv, where "b" is the expected retention ratio, "r" is the expected earned rate of ROE, "s" is the percent of common equity expected to be issued annually as new common stock, and "v" is the equity accretion rate."*

The dividend yield (D/P) is directly observable from financial markets for all listed companies. While the sustainable growth rate of dividends is the sum of expected growth from future retained earnings ("br" growth) and expected future growth from the sale of common stock above book value (called "sv" growth).

The growth from future retained earnings is composed of the expected retention rate "b" and the expected return on common equity "r". The expected retention rate is calculated from

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[18] This approach is also commonly referred to as a 'dividend growth model'.

[19] Southern California Edison Company, 92 FERC¶61,070, 26 July 2000, page 20-21.

[20] SoCal in note 37 refers to *Connecticut Light and Power Co.*, 45 FERC¶61,370 at 62,161, n 15. (1988).

forecasts of earnings per share and dividends per share (ie, $b = 1 - \frac{DPS}{EPS}$). The value of "r" is taken from surveys of investment analysts.[21]

At face value, his may appear to involve a degree of 'circularity' since expected earnings ("r") are used to determine the regulatory rate of return – which will in turn influence expected earnings. However, this is not the case since expected earnings are also capitalised into the current market price of equity ("P"), and so any mismatch between investors' required returns and that allowed by the regulator would be reflected in an up or downward adjustment to the value of its equity.

Growth from the sale of common stock is composed of the expected increase in the average number of issued shares "s" and the market to book ratio "v". The market to book ratio is normally calculated by the following formula:

$$v = \left(1 - \frac{BookValue}{MarketValue}\right)$$

where

Book Value is the book value of net assets owned by the firm

Market Value is the market value of the outstanding shares

The first step in applying this type of analysis is to choose the sample of comparable companies and, for the purpose of this report, we have selected the nine US gas transmission and distribution businesses identified by ACG.

To obtain a proxy for investor expectations we have relied on the forecasts published by Value Line, an independent research organisation. Value Line forecasts have been used in DCF analysis for a number US regulatory decisions.[22]

Table 3.3 sets out the results of our DCF analysis. The average (and median) return on equity of the nine US gas utilities is 9.70 per cent (9.66 percent).

[21] Given the depth of the investment analyst market, these published forecasts of expected earnings are generally accepted as unbiased.

[22] See, Southern California Edison Company, 92 FERC¶61,070, 26 July 2000.

Table 3.3
Return on Equity of US Gas Utilities
Using a FERC DCF Analysis

Company	Dividend Yield (%)[a]	Adjusted Dividend yield (%)[b]	"br" Growth (%)[c]	"sv" Growth (%)[d]	Sustainable Growth in Dividends (g) (%)[e]	Implied Cost of Capital (%)[f]
Atmos Energy (ATO)	4.6	4.70	4.04	0.29	4.33	9.03
Laclede Group (LG)	4.6	4.70	3.19	0.96	4.15	8.85
North West Natural Gas (NWN)	3.2	3.28	4.82	0.39	5.21	8.49
WGL Holdings (WGL)	4.1	4.17	3.56	0.08	3.64	7.82
AGL Resources (ATG)	4.1	4.23	5.87	0.28	6.15	10.38
NICOR Inc (GAS)	4.4	4.50	4.66	0.00	4.66	9.16
Piedmont Natural Gas (PNY)	3.8	3.87	3.97	-0.33	3.64	7.51
South Jersey Industries (SJI)	3.0	3.15	8.97	0.87	9.84	12.99
South West Gas (SWX)	3.0	3.11	7.00	0.33	7.33	10.44
Average	3.9	3.98	5.18	0.55	5.73	9.70
Median	4.1	4.21	5.03	0.42	5.45	9.66

Notes:

(a) Current dividend yield - The Value Line Investment Survey (14 September 2007).

(b) Dividend yield adjusted for one-half years' growth: [Dividend yield*{1+0.5*Growth in Dividends}]

(c) See Appendix [A] for the calculation of "br" growth.

(d) See Appendix [A] for the calculation of "sv" growth.

(e) Sustained growth in dividends: ["br' +"sv"]

(f) Implied cost of equity: [Adjusted Dividend Yield + Growth in Dividends]

Table 3.4 backs out the equity beta implied by this DCF analysis using the rearranged CAPM formula, an assumed MRP of 6 per cent and the observed risk free rate.[23] When one adjusts for the assumed capital structure of 60% debt the average (median) implied equity beta of the nine US gas utilities identified by ACG is 1.12 (1.05).

[23] The assumed MRP of 6 per cent is conservative as the greater diversification possibilities in the US would suggest that the MRP for the US market should be less than in Australia. Consequently, the implicit equity betas shown in the table are conservative estimates as the use of an MRP less than 6 per cent would result in a higher implicit equity betas.

Table 3.4
Implied Return on Equity of US Gas Utilities
Resulting from a FERC DCF Analysis

Company	Implied Cost of Capital (%)	Average 10y Treasury Security yield (%)[i]	Equity as Percentage of Capital Structure (%)[ii]	Implied equity beta (assuming an MRP of 6%)[iii]	Implied equity beta (assuming 60% debt ratio)[iv]
Atmos Energy (ATO)	9.03	4.76	49.00	0.71	0.87
Laclede Group (LG)	8.85	4.76	51.00	0.68	0.87
North West Natural Gas (NWN)	8.49	4.76	52.00	0.62	0.81
WGL Holdings (WGL)	7.82	4.76	65.50	0.51	0.83
AGL Resources (ATG)	10.38	4.76	51.00	0.94	1.19
NICOR Inc (GAS)	9.16	4.76	67.00	0.73	1.23
Piedmont Natural Gas (PNY)	7.51	4.76	51.30	0.46	0.59
South Jersey Industries (SJI)	12.99	4.76	57.50	1.37	1.97
South West Gas (SWX)	10.44	4.76	46.00	0.95	1.09
Average	9.70	4.76	54.48	0.82	1.12
Median	9.66	4.76	51.30	0.82	1.05

Notes:

(i) Federal Reserve Board: Table H.15 Selected Interest Rates - last release, Tuesday October 02, 2007.

(ii) Expected Common Equity Ratio - The Value Line Investment Survey (14 September 2007).

(iii) Implied Equity Beta: $b_e = \frac{RoE - R_f}{MRP}$

where

RoE is the Implied Cost of Capital from the DCF analysis

R_f is the risk free rate assumed to equal the average 10yr Treasure Security Yield (1 January 2007 to 30 June 2007)

MRP is conservatively assumed to 6.00 per cent.

(iv) Re-levered Equity Beta: $b_a = b_e \times \frac{E}{V}$

where

β_a is the securities un-levered beta

β_e is the securities levered equity beta

E/V is the Equity as a proportion of the Capital Structure

The implied equity beta derived from a DCF analysis of US gas utilities is consistent with those derived from regulatory precedent but again is appreciably higher than those inferred from historical *proxy* betas.

3.5. Conclusion

The equity beta parameter compensates investors' for the undiversifiable risk of holding a share or asset. It is defined by reference to investors' expectations, and cannot be directly observed from market data.

In assessing and giving weight to US data, in our opinion the ESC should have considered the results of all available methods for estimating the equity beta of US energy utilities. However, in reaching its conclusion that US evidence suggests that the equity beta lies between 0.6 and 0.8 the ESC has only considered one technique, ie, historical *proxy* betas.

As with any approach to estimating an unobserved parameter, historical *proxy* betas have acknowledged limitations. The principal limitation is the assumption that investors form their expectations of future risk on the basis of past events. However, this assumption is unlikely to strictly hold since an investor's expectation of future risk will also be influenced by all other information available, such as its own analysis of the company's future activities, others' analysis of the company's future activities and market developments.

In our opinion, in reaching a conclusion on the US evidence the ESC should consider all available methods for estimating the equity beta. In this chapter we have described two additional methods for estimating the equity beta. Once these are taken into account, the evidence of US equity betas should be broadened to include:

- historical *proxy* beta estimates that suggest an equity beta of between 0.6 and 0.8;
- US regulatory precedent in the form of allowed rates of returns that have a long term average implied equity beta of 1.15 and 1.17 for electricity and gas utilities respectively; and
- a DCF analysis of the nine US gas distribution and transmission businesses identified by ACG which had an average implied equity beta of 1.12 and a median implied equity beta of 1.05.

When this wider set of estimates is taken into account, the plausible range of the equity beta of US energy utilities lies between 0.60 and 1.17, with the weight of forward-looking evidence suggesting a figure at the top of this range. In light of this much wider range of evidence than that referred to by the ESC, there is no reasonable basis to support the ESC's decision to move away from previous decisions to the effect that the best estimate of the equity beta is 1.0.

4. Australian Evidence of Equity Beta

The ESC's Draft Decision states that there is general agreement between the ESC's and distributor's experts that:[24]

> *"most weight should be placed upon estimates of the beta for Australian firms, although some weight should also be placed on beta estimates of US firms."*

On the empirical evidence of comparable Australian firms presented by ACG, the ESC concluded that the *range for the beta extends below 0.5 and not above 0.7*.

Although the ESC has claimed the empirical evidence before it is 'convincing', in our opinion the analysis undertaken by ACG in developing this empirical evidence is not sufficiently robust to support a different decision from those the ESC has previously made on this issue. The principal shortcomings with ACG's analysis are as follows:

- a number of the traded securities incorporated in ACG's sample primarily or partially exhibit the characteristics of debt. Securities of this form will exhibit lower levels of correlation with the market portfolio than ordinary shares and so the inclusion of these securities in the sample will bias downward the resulting estimates of the systemic risk associated with operating the benchmark regulated business. A rate of return estimated by reference to such a sample would neither be commensurate with the prevailing conditions in the market for (the equity component of) funds nor with the risk involved in delivering the reference service contrary to section 8.30. It follows that a rate of return derived on this basis would not be consistent with the requirements of section 8.2(e) of the Code, which requires forecasts to represent best estimates arrived at on a reasonable basis; and
- the period of analysis includes times when the prices of some securities are likely to be influenced by potential mergers, management buy outs and/or acquisitions. During these periods a firm's share prices will more be strongly influenced by the relevant market activity than its underlying business conditions and the associated risks involved in delivering the reference service as required by section 8.30 of the Code.

When each of these shortcomings is addressed the mean equity beta estimate of the Australian portfolio increases from between 0.5 and 0.7 to between 0.7 and 0.9 for the longest data period, depending on the regression technique. The associated 95 per cent confidence interval upper bound similarly increases from between 0.75 and 1.17 to between 0.90 and 1.43, again depending on the regression technique.

Of greater concern is, after adjustment for the above sample and data selection problems, one is left with insufficient data from the Australian capital markets to reach any reasonable conclusion as to the equity beta of a regulated gas distribution business, as required by section 8.2(e) of the Code. Regulatory stability and best practice requires the ESC to provide strong evidence in support of changing past decisions as to the best estimate for the equity

[24] ESC, Draft Decision, page 395.

beta. In our view, the information relied on upon by the ESC is sufficiently uncertain for it not to support the change to equity beta it has proposed.

In the absence of any robust market evidence as to the value of the equity beta, the ESC should give greatest weight to the benefits of regulatory stability by adopting its an estimate that accords with the previous decisions of itself and others as to the best estimate of the equity beta for gas distribution businesses.

The remainder of this section discusses the two principal shortcomings in the market data relied on by the ESC.

4.1. The Characteristics of the Traded Security

One of the most important tasks when undertaking a study such as that carried out by ACG is to ensure that the sample of companies included in the study are representative of the benchmark regulated entity. To this end, the selection of comparable entities should take into account the extent to which:

- the activities of the potential comparator give rise to comparable levels of systematic risk as that which the benchmark regulated entity is assumed to face; and
- the potential comparator's traded security reveals the risks associated with equity ownership in the underlying activities of the firm.

The importance of this second criterion is underlined when one takes into account that the objective of the study is to establish a benchmark return on *equity*. An essential criterion of a comparator will therefore be that the traded security reflects the risks of owning equity in the underlying business.

Before examining this latter issue more closely in the context of ACG's sample, it is helpful to understand the alternative types of securities traded on the Australian Stock Exchange (ASX) and how the nature of the distributions payable may give rise to differences in the perceived level of risk associated with the security's future distributions and in turn the correlation of the security's returns with the market.

4.1.1. Securities Traded on the ASX

Securities traded on the Australian Stock Exchange (ASX) can take a number of forms, which may exhibit very different attributes. The most prominent form of security traded on the ASX is the ordinary share which entitles the shareholder to a residual claim on the company's assets and income. While it is possible that a company may undergo a capital restructure program whereby ordinary shareholders receive a return on capital, companies generally reward their ordinary shareholders by paying franked or unfranked dividends. Since an ordinary share only entitles holders to a residual claim on the entity, dividends are not guaranteed. The price that investors' are prepared to pay for a share reveals the risks associated with their residual claim on the entity.

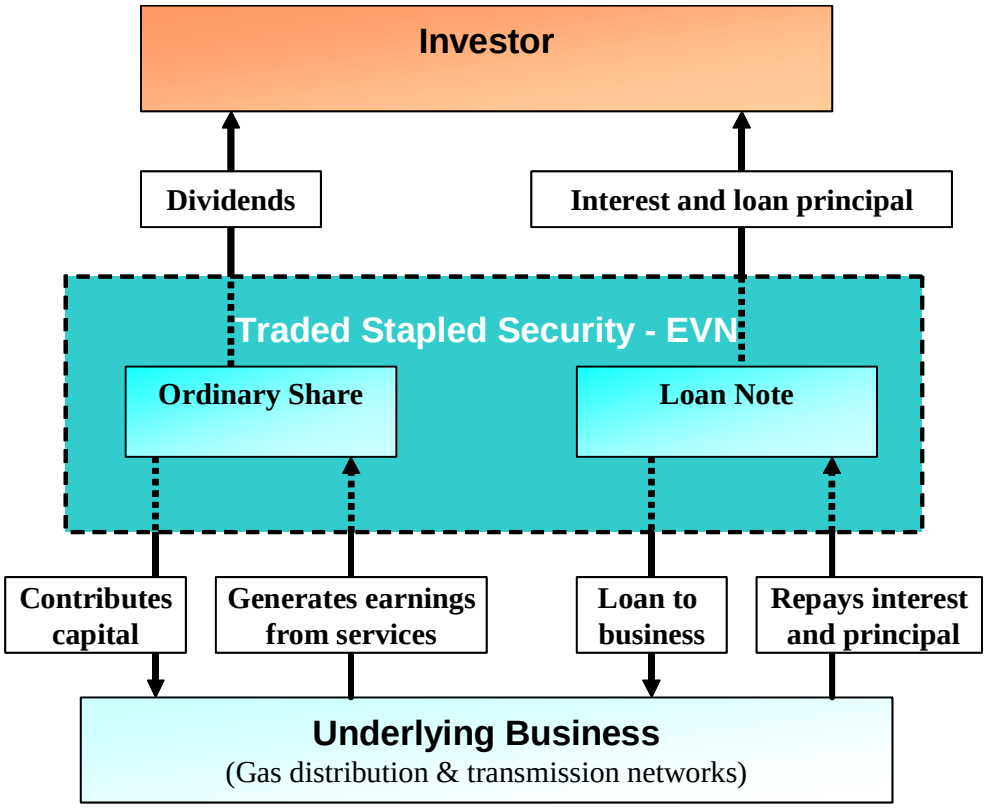
One alternative to the ordinary share is a stapled security. These are complex financial instruments and can take a variety of forms. Two of the more prominent forms entail

'stapling' a loan note to an ordinary share or alternatively 'stapling' a trust vehicle to a company.

Stapled securities that incorporate both a loan note and an ordinary share have attributes of both debt and equity. In other words, under the terms of a loan note the security holder will be entitled to interest payments and a repayment of the loan principal while the ordinary share component of the security entitles the security holder to a residual claim on the company and the receipt of franked or unfranked dividends if such dividends are paid. The nature of the distribution paid under these types of securities is likely to change over time. For instance, when the security is initially listed, emphasis may be placed on repaying the loan element of the security and so the very little (if any) of the distribution will consist of dividend payments. As the loan element of the security is paid down then the dividend component of the distribution will become more prominent. Once the loan is repaid then the stream of distributions will relate solely to the ordinary share. Viewed in this way it is apparent that the distributions of such stapled securities will exhibit both debt and equity characteristics, and the mix between the two may change over time.

An example of such a stapled security is that issued by Envestra. Figure 4.1 provides a simplified illustration of the relevant arrangement. It indicates that the distributions from Envestra's stapled securities are a mix of dividends, interest payments required in accordance with the terms of the loan note, and repayments of the loan principal.

Figure 4.1
EVN Stapled Security



The advantage of this type of structure is encapsulated in the following statements taken from the SP AusNet prospectus:[25]

> *"As a result of adopting a stapled trust and company structure, distributions to Security holders will not be limited to the accounting profits of SP AusNet."*[26]
>
> *"SP AusNet aims to deliver sustainable, stable and predicable distributions to Security Holders"* [27]

Given the combination of debt and equity like features of these stapled securities their distributions do not properly reflect the risks associated with a simple equity interest in the underlying business. In particular, stapled securities whose distributions are predominately expected to be composed of interest and loan repayments are likely to exhibit a correlation with market returns that more closely resembles debt rather than equity ownership. In other words, the volatility is likely to be a lot less than that one would expect from an ordinary share.

Stapled securities that involve a trust can potentially pay dividends from the company element of the security and make distributions from the income and capital gains derived from the assets contained in the trust. Trusts can also pay tax deferred distributions, which are sometimes referred to as a 'return of capital' of the unit trust. Tax deferred distributions from a trust are limited by the quantum of the initial capital contribution. If the return of capital component is a substantial element of the distribution then the security will almost certainly exhibit less volatility than an equivalent ordinary share.

This analysis shows that stapled securities are likely to exhibit very different characteristics from those of ordinary shares. In view of these different characteristics and the potential for them to change over time, extreme caution must be exercised when ascertaining whether to include such securities in a sample that is designed to estimate a benchmark value for the systemic risk associated with equity ownership. In our opinion the decision on what securities are appropriate to include in a sample designed to estimate the equity beta should be guided by the principle that:

> **entities that make distributions that incorporate either debt (interest or principal) or a return of capital element should be excluded from the sample until such time as the distributions can be determined as being governed solely by the risks associated with the return on equity.**

To the extent this principle is not adhered to, then the historic proxy beta estimated for the entire sample will not reflect the systemic risk associated with an equity security and will in turn give rise to a downward bias in any derived estimate of the required rate of return. In

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[25] SP AusNet has a similar structure as Envestra in that the traded security staples ordinary shares with a trust that receives loan income which can be distributed to security owners.

[26] SP AusNet prospectus and Product Disclosure Statement, 14 November 2005, page 5.

[27] SP AusNet prospectus and Product Disclosure Statement, 14 November 2005, page 2.

our opinion, the use of such biased estimates to derive the rate of return over the access arrangement period would be contrary to both sections 8.2(e) and 8.30 of the Code.

In the following section we review the characteristics of the traded securities included in ACG's sample of comparable securities.

4.1.2. ACG's sample of comparable securities

ACG's sample of comparable securities used to estimate the equity beta of a regulated gas distribution business includes:

- AGL (the listed security of Australian Gas and Light);
- ENV (the listed security of Envestra);
- ALN (the listed security of Alinta);
- APA (the listed security of Australian Pipeline Trust);
- GAS (the listed security of GasNet);
- DUE (the listed security of DUET);
- HDF (the listed security of Hastings Diversified Fund);
- SPN (the listed security of SP AusNet); and
- SKI (the listed security of Spark Infrastructure).

4.1.2.1. AGL

The AGL security is an ordinary share and so the distributions to shareholders (dividends) depend exclusively on the profitability and risks faced by the business.

4.1.2.2. Envestra (ENV)

As noted above, Envestra's listed security (ENV) is a stapled security comprising an ordinary share and a loan note that cannot be traded separately. According to the prospectus underlying the original listing of this security on the ASX, the distributions from ENV were to comprise both interest under the loan note and dividends, although it was noted in the prospectus that "dividends are not expected to be paid for many years".[28] A further prospectus published in 1999, which underpinned a 1 for 4 rights issue, indicated that higher distributions of both interest payable under the loan note and repayments of the loan principal were forecast.

Since listing on the ASX the distributions of ENV have been composed of:

- repayments of the loan principal – 60% ($0.5423 per security);
- interest on loan – 39% ($0.3531 per security); and
- dividends – 1% ($0.0093 per security).

[28] Envestra, Prospectus, 28 July 1997, pg.46.

As of May 2007 the remaining loan principal was $0.12 per security.[29] It was only in November 2006 that dividends accounted for any portion of the distribution made to security holders.[30] While the loan note has been the predominant source of distributions to date, one would expect this position to change in the future. In other words, once the principal on the loan note is repaid and all interest payments have been made the distribution will simply reflect dividend payments that reflect the profitability of the business.

4.1.2.3. Alinta (ALN)

Similar to Envestra, the Alinta listed security (ALN) was at the relevant time a stapled security comprising both an ordinary share and a loan note. Under the Loan Note Trust Deed (which was held by Perpetual as Trustee) there were no interest payments and so forecast (and actual) distributions simply relate to the repayment of the principal.[31] We understand this loan note was repaid by year end 30 June 2001 (which is prior to its inclusion in ACG's sample) and that all subsequent distributions have been dividends.[32]

4.1.2.4. APA Group (APA)

APA represents the listed stapled securities of Australian Pipeline Trust and APT Investment Trust. Australian Pipeline Trust was formed by AGL and was listed on the ASX in 2000. In 2004 Australian Pipeline Trust underwent a restructure and set up an additional trust to be traded in conjunction with (stapled to) the original trust. The new trust, APTIT, is an investment trust that takes security-holders' funds and invests for the purpose of direct distribution.

We understand that all income earned by the Trust is distributed to security holders and that no company tax is paid because it does not retain profits. APTIT acquired part of GasNet Australia in January 2007 following the successful takeover of GasNet by the APA group in 2006.

Since listing on the ASX the distributions APA have consisted of:

- returns of capital –13% ($0.144 per security); and
- dividends – 87% ($0.9910 per security)

We note that as of 31 December 2006 the remaining capital base from which returns of capital are made was:

- $1.0352 in APT; and
- $0.6898 in APTIT.

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29 Ibid.

30 Envestra listed on the 29 August 1997, while the November 2006 distribution of $0.057 per security included its first dividend of $0.0047 per security.

31 Alinta, Public Offer Document 2000, pg.8

32 Alinta, Annual Financial Report 2001, pg.5

4.1.2.5. GasNet (GAS)

Before it was purchased by APA at the end of 2006, GasNet's listed security (GAS) was a stapled security comprising the initial unit trust and two additional trusts that were stapled in mid 2003.[33] In mid 2003 GasNet underwent a restructure to preserve the tax attributes and to enable it to diversify the business. A consequence of this restructure is that two additional trusts were stapled to the security.

GAS distributes both income and capital.[34] Between March 2004 and March 2006, GAS distributions consisted of:

- return of capital - 53% ($0.27 per security); and
- dividends – 47% ($0.24 per security).

4.1.2.6. DUET (DUE)

DUE is the listed security of DUET (Diversified Utilities and Energy Trust) and is a traded stapled security consisting of two trusts (DUET 1 and DUET 2). The equity raised by DUET was invested into Asset Holding Companies as equity. DUET also borrowed money from Powers which was in turn lent to the Asset Holding Companies as subordinated debt.

Since the money raised from the listing of DUE on the ASX was invested in the Asset Holding Companies as equity, we have assumed that distributions from DUE represent dividend payments.

4.1.2.7. Hastings (HDF)

HDF is the listed security of Hastings Diversified Utilities Fund (HDUF) which is a managed investment fund (unit trust) consisting of the following stapled group of trusts: HDUF Epic Trust; HDUF Finance Trust; and HDUF Further Investments Trust. Hastings is the responsible entity for the fund and distributes income generated from the trusts to unit holders. Quarterly distributions were paid in financial years 2005 and 2006 (not in 2004).[35]

Unit holders of HDF receive distributions from the income generated by the HDUF. We have therefore assumed that all distributions represent the return on equity of the underlying utility assets.

4.1.2.8. SP AusNet (SPN)

SPN is a traded stapled entity of SP AusNet which consists of:

- one share in SP AusNet Transmission;
- one share in SP AusNet Distribution; and

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[33] GasNet, Initial Disclosure Document, 27 November 2001 (as provided on the ASX Announcements)

[34] GasNet, Annual Reports

[35] Description drawn from Hastings Diversified Utilities Fund, Product Disclosure Statement, 29 October 2004 and Annual Reports.

- one a unit in the SP AusNet Finance Trust.

Reflecting its stapled security status, neither of the components can be traded, transferred or sold separately.

The prospectus underlying this security states that "distributions are expected to be a combination of returns of capital and interest payments from SP AusNet Finance Trust and partly or fully ranked dividends from SP AusNet Transmission and SP AusNet Distribution."[36]

Since listing on the ASX SP AusNet's distributions have consisted of:

- return of capital – 66% ($0.05829 per security);
- interest payments – 27% ($0.02399 per security); and
- dividends – 7% ($0.00657 per security).

We understand that the outstanding value of the loan note is $0.45 per security.[37]

4.1.2.9. Spark Infrastructure (SKI)

SKI is a traded stapled security of Spark Infrastructure which consists of:

- one unit in the Trust;
- one Loan Note issued by the Responsible Entity as trustee of Spark Infrastructure Trust;
- an ordinary share in each of Spark Infrastructure Company 1 and 2; and
- one CHESS Depository Interest over one share in Spark Infrastructure Company 3.

These securities are stapled together and cannot be separately traded, transferred or sold. The prospectus underpinning this security provides some insight into the distributions to be paid under the security:

> *"distributions paid on the Stapled Securities will be comprised of interest income on the Loan Notes, distributors from Spark Infrastructure Trust, returns of capital on units and dividends from the Stapled Companies. It is expected that the majority of the distributions to Holders will be made via interest paid on the Loan Notes."*[38]

Since listing, the distributions of SKI have consisted of:

- return of capital – 11% ($0.0160 per security); and
- interest payments – 89% ($0.1362 per security).

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[36] SP AusNet, Prospectus and Product Disclosure Statement, 14 November 2005, pg.5.

[37] SP AusNet's 2007 Annual Report, states that the outstanding loan amount is $0.94 billion while there were 2.09 billion issued securities.

[38] Spark Infrastructure, Prospectus and Product Disclosure Statement, 18 November 2005, sec.7.7

The remaining loan note is $1.22 per share.[39]

4.1.2.10. Summary

Table 4.1 summarises the distributions that have been made over the sample period by those companies relied upon by ACG as well as ACG's estimated betas for these entities.

Table 4.1
Review of comparable Traded Securities

Security	Security Type	Distributions‡		Remaining loan value	ACG Equity Beta Mean Estimate*
		Dividend	Non-Dividend		
AGL	Ordinary Share	100%	n.a.	n.a.	0.69-0.93
ALN	Ordinary Share†	100%	n.a.	$0.00 per security	0.65-0.98
DUE	Two trusts	100%	n.a.	n.a.	0.25-0.29
HDF	Three trusts	100%	n.a.	n.a.	0.57-0.73
APA	Two trusts	87%	13%	$1.725 per security	0.31-0.91
GAS	Two trusts	47%	53%	n.a.	0.31-0.38
ENV	Share + Loan note	1%	99%	$0.12 per security	-0.01-0.13
SPN	Two shares + finance trust	7%	93%	$0.45 per security	-0.48-0.20
SKI	Unit trust + Loan note + Share + CHESS Depository Interest	0%.	100%	$1.22 per security	-0.21-0.08

Notes: ‡ Distributions during the assessment period from June 1991 – June 1998 and January 2002 to January 2007.
† ALN is a stapled security, however, the loan note was repaid in 2001 before the period assessed by ACG.
** Data obtained from Table 1 of ACG report.*

Drawing on the data contained in this table the following observations can be made:

- only two out of the nine companies included in the sample have traded securities that take the form of an ordinary share;
- over half of the sample (five securities) has made some form of non-dividend distribution. The higher the proportion of the distribution that is of a non-dividend nature, the greater the influence one would expect it to have on the overall volatility of the security and, in turn, the more likely is its estimated beta to be at the lower end of the sample range; and
- one third of the companies included in the sample (ENV, SPN and SKI) have made distributions that have almost exclusively been either interest payments or repayments of loan principal. Given the debt-like nature of these distributions it is not surprising that the returns on these securities would exhibit a lower degree of correlation with the return on the market, as demonstrated by the fact that the equity beta estimates for these entities are at the lower end of the range of betas estimated across the sample.

Overall this analysis demonstrates that a number of entities in the sample have complex financial structures that allow them to make distributions that are not constrained by the profitability of the underlying activity and in many cases exhibit debt like characteristics.

[39] Spark Infrastructure's 2006 Annual Report, states that the outstanding loan amount is $1.23 billion while there were 1.01 billion issued securities.

Given the ability of these structures to deliver stable and predicable distributions, irrespective of the underlying profitability of its activities, one would expect the correlation with the market portfolio for these forms of securities to be lower than shares. It follows that any sample that includes securities of this form as the basis for estimating the equity beta will in all likelihood underestimate the risks associated with equity ownership and therefore be downwardly biased. In our opinion, to estimate the equity beta by reference to these securities would mean:

- that the forecasts do not represent best estimates arrived at on a reasonable basis (contrary to section 8.2(e) of the Code); and
- more importantly, will give rise to an estimated rate of return that underestimates the *risk involved in delivering the Reference Service* and so is not commensurate with prevailing conditions in the market for funds (contrary to section 8.30 of the Code).

4.1.3. Removing the Entities that Make Non-Dividend Related Distributions from ACG's Analysis[40]

To examine the extent to which these entities may have affected the historical proxy beta estimated by ACG we have rerun ACG's analysis after excluding those entities that have provided security holders with non-dividend distributions. The effect of removing these entities from the sample used to estimate historical *proxy* betas is set out in summary form in the table below.

Table 4.2
Comparison with the ACG Analysis

	Portfolio Median Estimates	Portfolio 95% Upper bound Estimates
ACG Table 1	0.59 to 0.71	0.83 to 1.17
ACG Table 2	0.53 to 0.64	0.75 to 0.87
Modified Table 1[†]	0.74 to 0.98	1.03 to 1.59
Modified Table 2[‡]	0.71 to 0.90	0.99 to 1.14

Notes: [†] *See table 4.3 below.*
[‡] *See table 4.4 below.*

Drawing on the data contained in this table the following observations can be made:

- removing securities with non dividend distributions increases the estimated equity beta above the range of portfolio median estimates included in the ACG report; and
- in eleven of the twelve regressions the upper bounds for the 95 per cent confidence interval of beta estimates for securities with exclusively dividend distributions is greater than 1.0.

[40] We to replicate the gearing ratios applied used by ACG, our calculation have instead relied on the UBS based gearing ratios provided by ACG. We observe that the equity beta estimates derived using the UBS gearing ratios is generally slightly lower than that reported by ACG.

The data underlying these summary tables is set out in the following two tables.

Table 4.3 illustrates the effect of removing ENV, SPN, SKI, APA and GAS from the sample. Their removal increases the portfolio mean estimate significantly, with the new mean ranging between 0.74 and 0.97 depending on the regression technique utilised. The 95 per cent confidence interval for all three regression techniques also increases, with the upper bound for each regression technique ranging between 1.03 and 1.59. It is clear that including securities that are able to make distributions that are unrelated to the underlying profitability of the firm depresses the equity beta estimates.

Table 4.3
Australian Energy Related Securities: Full Monthly Beta Estimates
(1991-1998 and 2002-2007)

Stock	N	OLS			RW OLS			LAV		
		L	M	H	L	M	H	L	M	H
Australian Gas Light Company	142	0.42	**0.81**	1.2	0.35	**0.68**	1.02	0.21	**0.92**	1.63
Alinta Ltd	61	-0.16	**0.81**	1.78	-0.01	**0.87**	1.75	-0.57	**0.57**	1.71
DUET	29	-0.02	**0.28**	0.57	-0.02	**0.27**	0.55	-0.2	**0.24**	0.68
Hastings Diversified Utilities	25	-0.15	**0.63**	1.42	-0.09	**0.66**	1.41	-0.11	**0.81**	1.73
Portfolio of the average returns	145	0.44	**0.78**	1.12	0.45	**0.74**	1.03	0.44	**0.97**	1.51
Portfolio of the median returns	145	0.45	**0.80**	1.14	0.46	**0.76**	1.06	0.38	**0.98**	1.59

Table 4.4 similarly removes the five entities listed above but utilises the Gray and Officer (without the Blume Adjustment) approach for dealing with outliers. Applying the Gray and Officer approach results in portfolio mean estimates of the equity beta of between 0.71 and 0.90 depending on the regression technique utilised. The associated 95 per cent confidence interval for all three regression techniques has an upper bound of between 0.99 and 1.14.

Table 4.4
Australian Energy Related Securities: Full Monthly Beta Estimates
Using Gray and Officer Methodology without Blume Adjustment
(1991-1998 and 2002-2007)

Stock	N	OLS:2SE			OLS:1.5SE			OLS:1SE		
		L	M	H	L	M	H	L	M	H
Australian Gas Light Company	142	0.33	**0.66**	0.98	0.37	**0.68**	0.99	0.7	**0.98**	1.27
Alinta Ltd	61	0.09	**0.89**	1.69	-0.18	**0.52**	1.22	0.1	**0.68**	1.25
DUET	29	-0.04	**0.22**	0.47	-0.09	**0.12**	0.34	0.02	**0.20**	0.37
Hastings Diversified Utilities	25	-0.01	**0.70**	1.41	0.06	**0.70**	1.34	0.27	**0.70**	1.14
Portfolio of the average returns	145	0.49	**0.78**	1.07	0.44	**0.71**	0.99	0.65	**0.90**	1.14
Portfolio of the median returns	145	0.51	**0.80**	1.10	0.51	**0.78**	1.05	0.62	**0.87**	1.12

4.2. Periods of Market Activity

A second shortcoming with the analysis undertaken by ACG is that over the sample period a number of the entities included in the sample were subject to mergers, management buyouts or acquisitions, or speculation regarding these forms of activities.

For the purposes of this analysis we have simply focused on those mergers that have actually occurred rather than those that were simply the source of speculation. One would expect that during those periods where a merger is contemplated and an offer is actually made then the share price (and by extension the monthly returns) of the security in question will be more strongly influenced by the relevant market activity than its underlying business conditions. In particular, the price of a traded security during the period that a takeover offer is effective will be strongly influenced by the likelihood that the offer will be successful, or the potential that a competing bid will be offered, rather than the underlying risk of owning equity in the business. For these reasons investors are unlikely to include assessments of systematic risk that include periods of past takeovers into their expectations of future risks.

The problems associated with calculating historical *proxy* betas during takeover periods were explicitly acknowledged by ACG in its selection of comparable US firms:[41]

> *"Nine companies have been included, and five companies have been excluded, generally on the grounds that they have been subject to recent merger or acquisition activity or management buy-outs."*

During the period assessed by ACG the Australian utilities sector experienced a number of significant mergers and acquisitions, including:

- the merger between AGL and Alinta in 2006; and
- the purchase of GasNet by APA in 2006.

The first of these mergers involved AGL and Alinta. This transaction was originally proposed by Alinta on 21 February 2006.[42] Prior to announcing the merger Alinta purchased 10 per cent of AGL's issued capital, and proposed to acquire the remaining 90 per cent of AGL shares it did not already own by way of an exchange of shares.[43] The two companies completed the merger on the 25 October 2006.[44] The share prices of both AGL and Alinta were affected by merger proposals during this period.

To remove the effect of this merger proposal from the historical *proxy* beta estimates, one should exclude AGL and Alinta data for the months of February to October 2006.

Before delisting in November 2006, GasNet was subject to a takeover offer from Australian Pipeline Trust (APT). APT announced its first offer jointly with Babcock and Brown Infrastructure (BBI) on the 9 June 2006, and then subsequently offered an unaccompanied alternative bid on the 22 August 2006. To remove the impact of this acquisition from the historical *proxy* beta estimates generated by ACG, one should exclude GasNet data for the months of June to December 2006.

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41 ACG, *Empirical evidence on proxy beta values for regulated gas distribution activities*, June 2007, page 57.

42 Alinta, News Release entitled *Alinta Acquires 10% of AGL: Will put Merger Proposal to AGL Board*, 21 February 2006.

43 Note that AGL made a counter merger offer on the 13 March 2006.

44 Alinta, News Release entitled *Alinta and AGL Schemes Implemented*, 25 October 2006.

The result of removing these periods from the estimation of historical *proxy* betas is set out in summary form in the table below.

Table 4.5
Comparison with the ACG Analysis

	Portfolio Median Estimates	Portfolio 95% Upper bound Estimates
ACG Table 1	0.59 to 0.71	0.83 to 1.17
ACG Table 2	0.53 to 0.64	0.75 to 0.87
Modified Table 1[†]	0.71 to 0.86	1.00 to 1.43
Modified Table 2[‡]	0.64 to 0.89	0.90 to 1.13

Notes: [†] *See table 4.6 below.*
[‡] *See table 4.7 below.*

Drawing on the data contained in this table the following observations can be made:

- limiting the analysis to securities that made dividend distributions only and to periods when the security was not affected by a market offer increases the estimated equity beta above the range of portfolio median estimates included in the ACG report; and
- in eleven of the twelve regressions the upper bound of the 95 per cent confidence interval for securities with exclusively dividend distributions is greater than 1.0.

The data underlying this summary table is set out in the following two tables.

Table 4.6 demonstrates the effect of removing the relevant merger affected periods from a sample that also excludes those companies that have made non-dividend distributions over the sample period, ie, ENV, SPN, SKI, APA and GAS. This table indicates that the portfolio mean estimates derived from the four pure equity securities range from between 0.71 to 0.86, depending on the regression technique. Furthermore, the 95 per cent confidence intervals for all three regression techniques have an upper bound of between 1.00 and 1.43. The results set out in Table 4.6 below show that excluding periods when the security is affected by a market offer reduces the estimated equity beta. However, these estimates continue to be significantly higher than those contained in the ACG report.

Table 4.6
Australian Energy Related Securities: Full Monthly Beta Estimates
Excluding periods of Takeovers
(1991-1998 and 2002-2007)

Stock	N	OLS			RW OLS			LAV		
		L	M	H	L	M	H	L	M	H
Australian Gas Light Company	133	0.37	**0.76**	1.14	0.38	**0.71**	1.04	0.27	**0.95**	1.63
Alinta Ltd	52	-0.36	**0.70**	1.76	-0.26	**0.73**	1.73	-0.92	**0.08**	1.08
DUET	29	-0.02	**0.28**	0.57	-0.02	**0.27**	0.55	-0.20	**0.24**	0.68
Hastings Diversified Utilities	25	-0.15	**0.63**	1.42	-0.09	**0.66**	1.41	-0.11	**0.81**	1.73
Portfolio of the average returns	145	0.41	**0.75**	1.08	0.42	**0.71**	1.00	0.32	**0.86**	1.41
Portfolio of the median returns	145	0.43	**0.77**	1.10	0.44	**0.73**	1.02	0.27	**0.85**	1.43

Table 4.7 reproduces the Gray and Officer (without the Blume Adjustment) approach for dealing with outliers. Applying the Gray and Officer approach results in portfolio mean estimates of between 0.64 and 0.89 depending on the regression technique. Furthermore, the 95 per cent confidence intervals for all three regressions have an upper bound of between 0.90 and 1.13. Table 4.7 shows that excluding periods when the security is affected by a market offer leads to a slight reduction in the estimated equity beta. However, these estimates continue to be significantly higher than those contained in the ACG report.

Table 4.7
Australian Energy Related Securities: Full Monthly Beta Estimates
Using Gray and Officer Methodology without Blume Adjustment
Excluding periods of Takeovers
(1991-1998 and 2002-2007)

Stock	N	OLS:2SE			OLS:1.5SE			OLS:1SE		
		L	M	H	L	M	H	L	M	H
Australian Gas Light Company	133	0.36	**0.69**	1.01	0.36	**0.66**	0.97	0.69	**0.97**	1.26
Alinta Ltd	52	-0.08	**0.78**	1.63	-0.28	**0.46**	1.20	-0.08	**0.53**	1.14
DUET	29	-0.04	**0.22**	0.47	-0.09	**0.12**	0.34	0.02	**0.20**	0.37
Hastings Diversified Utilities	25	-0.01	**0.70**	1.41	0.06	**0.70**	1.34	0.27	**0.70**	1.14
Portfolio of the average returns	145	0.47	**0.75**	1.04	0.37	**0.64**	0.90	0.65	**0.88**	1.12
Portfolio of the median returns	145	0.48	**0.77**	1.06	0.49	**0.75**	1.01	0.65	**0.89**	1.13

4.3. Conclusions

The analysis underlying ACG's historical proxy beta estimates has a number of shortcomings. It follows that great some caution should be exercised if this empirical evidence is to form the basis for the ESC's decision on the equity beta. In our opinion, in their present form, ACG's estimates do not represent and should not be used to derive best estimates arrived at on a reasonable basis. Specifically, ACG's equity beta estimates give rise to a downward bias in any estimate of the systemic risk associated with operating the benchmark regulated gas distribution business. Reliance on them will therefore result in a rate of return that is not commensurate with the prevailing conditions in the market for funds and the risk involved in delivering the reference service, contrary to the requirements of section 8.30 of the Code.

If the issues we have identified in this chapter are addressed then:

- the average equity beta for the Australian portfolio would increase from between 0.5 and 0.7 to between 0.7 and 0.9 for the longest data period, depending on the regression technique;
- the associated upper bound of the 95 per cent confidence interval would increase so as to be in excess of 1.0 in eleven of the twelve regressions, as compared with just two of the twelve regressions in tables 1 and 2 of the ACG report; and
- the number of entities in the sample falls to just one for the period prior to the 'technology bubble', to between two and four in the post 'technology bubble' period, and in total the number of monthly observations falls to 239.

The scarcity of data demonstrated by this latter point is particularly problematic if one is to rely upon Australian empirical evidence as the basis for estimating the equity beta. In this context we note that the ESC has previously recognised the need to have a substantive sample of market date before any weight is placed on the empirical evidence. Specifically, the ESC has previously stated in the context of the 2003-2007 Gas Access Arrangement that:[45]

> *"However, as the Commission noted in the Draft Decision, additional evidence from the capital markets should be available at future reviews of both the Victorian gas and electricity distributors. Barring mergers or other such activities, equity beta estimates for six comparable entities – AGL, Envestra, United Energy, Australian Pipeline Trust, AlintaGas and GasNet – using a full four years of observations will be available for all of these companies by the time of the 2008 gas access arrangement review. At that time, the Commission would envisage placing far more weight on the latest empirical estimates than it has at the current review."*

In our opinion, a sample based on one stock alone for the period prior to the technology bubble, and between two and four companies for the subsequent period, has significantly less depth than that implied by six comparable securities for a period of four years, as cited by the ESC. In our view the scarcity of data coupled with the deficiencies identified in ACG's analysis should lead the ESC to conclude that the current Australian empirical evidence does not constitute a *reasonable basis* for estimating the equity beta. Reliance on such data would therefore be contrary to the requirements of section 8.2(e) of the Code. In these circumstances greater weight should be placed on ensuring regulatory stability and consistency by reference to past decisions as to the best estimate for the equity beta.

[45] ESC, Review of Gas Access Arrangements: Final Decision, October 2002, page 356.

5. Conclusion

The ESC concluded in its Draft Decision that the distributors' proposed betas and beta ranges do not meet the requirements of the Code. The reason given by the ESC was that:

> *"None of the point estimates that the Commission* [ESC] *has considered extend as high as 1, and few of the 95 per cent confidence intervals for the beta estimates extend as high as 1."*

On the market evidence considered by the ESC it concluded that the:

> '*best estimate arrived at on a reasonable basis' for the beta that is consistent with 'prevailing conditions in the market for funds and the risk involved in delivering the Reference Service' lies between 0.5 and 0.8'.*

This conclusion was primarily based on the analysis provided by ACG of data from the Australian and US capital markets. Perhaps significantly, ACG was not asked to advise the ESC on the appropriate interpretation of this market data in determining the equity beta to use for a regulated gas distribution business.[46] Rather, these matters were left for the ESC to interpret.

However, the ESC's discussion and conclusion on the equity beta suggests that the question of the robustness of the market evidence was not given serious consideration. Rather, it appears that the ESC's conclusion that equity beta lies between 0.5 and 0.8 was reached primarily by reference to mean beta estimates produced by ACG.

The lack of robustness of Australian market data for the equity beta is well known, with Mr Balchin (a Director of ACG) having observed in the same context but a different jurisdiction that:[47]

> *the direct Australian evidence "on equity betas of energy companies is deficient", that at "face value" the market evidence "suggests a value of an equity beta for Envestra of substantially less than one and possible [sic] in the order of 0.5 ..."*

Given the deficiencies in the market evidence ACG concluded in that same context that:

> *a reasonable person could examine this same data and conclude that the beta was anywhere between 0.80 and 1.10.*[48]

Our analysis highlights that the deficiencies in the market data are greater than previously acknowledged. Specifically:

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[46] ACG, *Empirical evidence on proxy beta values for regulated gas distribution activities*, June 2007, page 25.

[47] Envestra Ltd v Essential Services Commission of South Australia (No. 2) [2007] SADC 90 (27 September 2006), para 57.

[48] Ibid.

- that there are a number of inherent limitations with estimation methods that rely on ex-post regressions of historical market data to estimate the investors' ex-ante expectations today. Furthermore, when compared with alternative, forward-looking approaches available and applied in the US, historical proxy beta estimates significantly underestimate the compensation investors require to invest in US energy utilities;
- the group of Australian traded securities used to estimate the equity beta included in ACG's sample primarily or partially exhibit the characteristics of debt; and
- the period of analysis includes times when the security prices are have been influenced by mergers, management buy outs and/or acquisitions.

If the issues that we have identified in this report are addressed then:

- the best estimate of the equity beta of US energy utilities ranges between 0.60 and 1.17, with forward-looking estimates concentrated at the higher end of this range;
- the average equity beta for the Australian portfolio would increase from between 0.5 and 0.7 to between 0.7 and 0.9 for the longest data period, depending on the regression technique;
- the upper bound of the associated 95 per cent confidence exceeds 1.0 in eleven of the twelve regressions, as compared with just two of the twelve regressions in tables 1 and 2 of the ACG report; and
- the number of entities in the sample falls to just one for the period prior to the 'technology bubble' and to between two and four in the post 'technology bubble' period, with the total number of monthly observations falling to 239.

This final point on the scarcity of Australian data is a particularly problematic if one is seeking to rely upon empirical evidence as the basis for estimating the equity beta. In our view the scarcity of data coupled with the deficiencies that we have identified in ACG's analysis should lead the ESC to conclude that the current Australian empirical evidence does not constitute a *reasonable basis* for estimating the equity beta and so does not comply with the requirements of section 8.2(e) of the Code.

In light of these shortcomings in our opinion the ESC's conclusion that the equity beta lies between 0.5 and 0.8 is not supported by a reasonable interpretation of the *prevailing conditions in the market for funds and the risk involved in delivering the Reference Service'* It follows that the ESC's Draft Decision is not consistent with the requirements of section 8.30 of the Code.

In circumstances where there is no compelling Australian market evidence as to the appropriate equity beta for a regulated gas distribution business, in our opinion the ESC should give greater weight to ensuring regulatory stability and consistency by adopting an equity beta that reflects its previous best estimates of this parameter.

Appendix A. Sustainable Growth of US Gas Utilities

Company	Earning per share ($US)[1]	Dividends per Share ($US)[2]	Retention Ratio - (b) (%)[3]	Expected Return on Equity (%)[4]	"br" Growth (%)[5]	2010-12 Shares outstanding ('million)[6]	2007 Shares outstanding ('million)[7]	Annual growth in Shares (s) (%)[8]	Book Value per share 2010-12 ($/per share)[9]	Current price ($)[10]	Market to book ratio (v)[11]	"sv" Growth (%)[12]
Atmos Energy (ATO)	2.45	1.35	44.90	9.0	4.04	107.00	89.50	4.57	26.35	28.16	0.06	0.29
Laclede Group (LG)	2.35	1.60	31.91	10.0	3.19	25.50	21.50	3.84	24.50	32.64	0.25	0.96
North West Natural Gas (NWN)	3.20	1.86	41.88	11.5	4.82	28.00	27.00	0.91	26.35	46.07	0.43	0.39
WGL Holdings (WGL)	2.30	1.52	33.91	10.5	3.56	50.00	49.50	0.25	22.70	33.34	0.32	0.08
AGL Resources (ATG)	3.10	1.80	41.94	14.0	5.87	80.00	78.00	0.63	22.50	40.11	0.44	0.28
NICOR Inc (GAS)	2.90	1.86	35.86	13.0	4.66	45.00	45.00	0.00	23.05	42.08	0.45	0.00
Piedmont Natural Gas (PNY)	1.70	1.16	31.76	12.5	3.97	71.80	73.80	-0.68	13.60	26.46	0.49	-0.33
South Jersey Industries (SJI)	2.85	1.20	57.89	15.5	8.97	32.00	29.75	1.84	17.95	34.02	0.47	0.87
South West Gas (SWX)	2.70	0.90	66.67	10.5	7.00	47.50	43.00	2.52	25.25	29.11	0.13	0.33
Average	2.60	1.47	43.74	11.80	5.18	54.00	50.78	1.56	22.47	34.67	0.35	0.55
Median	2.70	1.52	43.70	11.50	5.03	47.50	45.00	1.36	23.05	33.34	0.31	0.42

Notes:

(1) Expected earnings per share 2010-12 - The Value Line Investment Survey (14 September 2007).

(2) Expected dividends per share 2010-12 - The Value Line Investment Survey (14 September 2007).

(3) Retained earnings per share: [{Earnings per share – Dividends per share}/Earnings per share].

(4) Expected return on common equity 2010-12 - The Value Line Investment Survey (14 September 2007).

(5) "br" Growth: [Retention ratio × Expected return on equity].

(6) Common shares outstanding 2010-12 - The Value Line Investment Survey (14 September 2007).

(7) Common shares outstanding 2007 - The Value Line Investment Survey (14 September 2007).

(8) Annual growth in shares: [{Shares outstanding 2010 to 12 / Shares outstanding 2007}^(1/4)-1].

(9) Book value per share 2010-12 - The Value Line Investment Survey (14 September 2007).

(10) Recent price - The Value Line Investment Survey (14 September 2007).

(11) Market to book ratio: [1 – Book value per share/ Recent price].

(12) "sv" Growth [Annual growth in shares × market to book value].

Appendix B. Curriculum Vitae

Gregory Houston

Director

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Overview

Gregory Houston has twenty years experience in the economic analysis of markets and the provision of expert advice in litigation, business strategy, and policy contexts. His career as a consulting economist was preceded by periods working in a financial institution and for government.

Greg Houston has directed a wide range of competition, regulatory economics and valuation-related assignments since joining NERA in 1989. His work in the Asia Pacific region principally revolves around the activities of the Australian Competition and Consumer Commission, the New Zealand Commerce Commission and other competition and regulatory agencies, many of whom also number amongst his clients. Greg has advised clients on merger clearance processes, on access to bottleneck facilities, and enforcement proceedings involving allegations of predatory pricing, anti-competitive bundling and price fixing. His industry experience spans the aviation, building products, electricity and gas, grains, payments networks, petroleum, ports, rail transport, retailing, scrap metal and telecommunications sectors. Greg Houston has acted as expert witness in antitrust, regulatory and valuation-related proceedings before the courts, in various arbitration and mediation processes, and before regulatory and judicial bodies in Australia, Fiji, New Zealand, the Philippines, Singapore and the United Kingdom.

In December 2005, Greg was appointed by the Hon Ian Macfarlane, Minister for Industry, Tourism and Resources, to an Expert Panel to advise the Ministerial Council on Energy on achieving harmonisation of the approach to regulation of electricity and gas transmission and distribution infrastructure in Australia.

Greg is member of the United States board of directors of National Economic Research Associates Inc. and head of NERA's Australian operations, which he founded after transferring from London in 1998.

Qualifications

1982 **UNIVERSITY OF CANTERBURY, NEW ZEALAND**
B.Sc.(First Class Honours) in Economics

Prizes and Scholarships

1980 University Junior Scholarship, New Zealand

Career Details

1987-89 **HAMBROS BANK, TREASURY AND CAPITAL MARKETS**
Financial Economist, London

1983-86 **THE TREASURY, FINANCE SECTOR POLICY**
Investigating Officer, Wellington

Project Experience

Competition Policy and Mergers

2007 **Meerkin & Apel/SteriCorp**
Damages assessment
Expert report in the context of an international arbitration on commercial damages arising through alleged non-performance of medical waste processing plant.

2007 **Australian Energy Market Commission, Australia**
Review of the Wholesale Gas and Electricity Markets and Implications for Retail Competition
Retained to provide an overview of the operation and structure of the wholesale gas and electricity markets within the National Electricity Market (NEM) jurisdictions and to identify the issues that the AEMC should consider when assessing the influence of the wholesale markets on competition within the retail gas market in each jurisdiction

2006-07 **Middletons/Confidential Client**
Damages assessment
Retained to provide an expert report on forecast demand and supply conditions and prices for gas, LPG, ethane and crude oil prices and over a ten year period.

2006-07	**Essential Services Commission of South Australia** **Competition assessment** Analysis of the effectiveness of competition in electricity and gas retail markets in South Australia.
2006-07	**Allens Arthur Robinson/Confidential Client** **Merger clearance** Retained to advise in relation to a proposed merger in the board packaging industry.
2006-07	**Johnson Winter & Slattery/Confidential Client** **Damages assessment** Assistance in the assessment of damages arising from alleged cartel conduct.
2006	**Minter Ellison/Confidential Client** **Misuse of market power** Expert economic advice in relation to an alleged breach of section 46 in the telecommunications industry.
2006	**DLA Phillips Fox/Donhad** **Merger clearance** Retained for advice on competition effects of proposed Smorgon/One Steel merger.
2006	**Johnson Winter & Slattery/Qantas Airways** **Competition effects of price fixing agreement** Assessed the competition effects of proposed trans-Tasman networks agreement between Air New Zealand and Qantas Airways.
2006	**Phillips Fox/ACCC** **Vertical foreclosure** Retained by the ACCC as economic expert in the context of proceedings before the Federal Court concerning the acquisition of Patrick Corporation by Toll Holdings. The proceedings were subsequently withdrawn following a S87B undertaking made by Toll.
2006	**Gilbert + Tobin/AWB** **Access to bottleneck facilities** Expert report and testimony in a private arbitration concerning the imposition of throughput fees for grain received at port in South Australia.

2006 **Qantas Airways, Australia/Singapore**

Assessment of Single Economic Entity

Advice to Qantas in relation to its Application for Decision to the Competition Commission of Singapore that the agreement between Qantas and Orangestar does not fall within the ambit of the price-fixing and market sharing provisions of the Singapore Competition Act.

2005-06 **Qantas Airways, Australia/Singapore**

Competition effects of price fixing agreement

Expert report submitted to the Competition Commission of Singapore evaluating the net economic benefits of a price fixing/market sharing agreement, in relation to an application for exemption from the section 34 prohibition in the Competition Act of Singapore.

2005-06 **Phillips Fox/Fortescue Metals Group, Western Australia**

Access to bottleneck facilities

Expert report and testimony in the Federal Court proceedings concerning access to the Mt Newman and Goldsworthy rail lines, serving iron ore export markets in the Pilbara.

2005-06 **Australian Competition Consumer Commission**

Electricity generation market competition

Advice on the competition effects under S50 of the Trade Practices Act of three separate proposed transactions involving the merger of generation plant operating in the national electricity market.

2005 **Gilbert + Tobin/Hong Kong Government, Hong Kong**

Petrol market competition

Director of a NERA team working with Gilbert + Tobin that investigated the extent of competition in the auto-fuel retailing market in Hong Kong.

2005 **Phillips Fox/National Competition Council, Western Australia**

Access and competition in gas production and retail markets

Retained as expert witness in the appeal before the WA Gas Review Board of the decision to revoke coverage under the gas code of the Goldfields pipeline. Proceedings brought by the pipeline operator were subsequently withdrawn.

2004-05 **Gilbert + Tobin/APCA, Australia**

Competition and access to Eftpos system

Retained as economic advisor to the Australian Payments Clearing Association in connection with the development of an access regime for the debit card/Eftpos system, so as to address a range of competition concerns expressed by the Reserve Bank of Australia and

the ACCC. This involved the provision of an expert report examining barriers to entry to Eftpos and the extent to which these can be overcome by an access regime.

2003-05 **Phillips Fox/Confidential Client, New South Wales**
Misuse of market power
Retained to assist with all economic aspects of a potential Federal Court action under S46 of the Trade Practices Act alleging misuse of market power in the rail freight market.

2004 **Clayton Utz/Sydney Water Corporation, New South Wales**
Competition in sewage treatment
Retained to assist with Sydney Water's response to the application to have Sydney's waste water reticulation network declared under Part IIIa of the Trade Practices Act, on the basis this will promote competition in the retail market for sewage collection services.

2004 **Blake Dawson Waldron/Boral, Australia**
Competition analysis of cement market
Directed a NERA team advising on Boral's proposed acquisition of Adelaide Brighton Ltd, a cement industry merger opposed in Federal Court proceedings by the ACCC. Boral subsequently decided not to proceed with the transaction.

2004 **MinterEllison/Singapore Power, Victoria**
Merger clearance
Advice on competition issues arising from the proposed acquisition of TXU's Australian energy sector assets by Singapore Power. This included the submission of an expert report to the ACCC.

2004 **Mallesons Stephen Jaques/Orica, New South Wales**
Competition in gas production and retail markets
Retained as expert witness in the appeal by Orica against the Minister's decision to revoke coverage under the gas code of the substantial part of the Moomba to Sydney gas pipeline. The case was subsequently settled.

2004 **Courts, Fiji**
Merger clearance, abuse of market power
Prepared a report for submission to the Fijian Commerce Commission on the competition implications of the Courts' acquisition of the former Burns Philip retailing business, and related allegations of abuse of market power. The Commission subsequently cleared Courts of all competition concerns.

2003-04 **Mallesons Stephen Jaques/Sydney Airport Corporation, NSW**

Competition in air travel market

Retained as principal expert witness in connection with proceedings before the Australian Competition Tribunal on economic aspects of the application by Virgin Blue for declaration of airside facilities at Sydney Airport under Part IIIa of the Trade Practices Act.

2003-04 **Bartier Perry/ DM Faulkner, New South Wales**

Alleged collusive conduct

Submitted an expert report to the Federal Court in connection with allegations under s45 of the Trade Practices Act of collusive conduct leading to the substantial lessening of competition in the market for scrap metal. The 'substantial lessening of competition' element of this case was subsequently withdrawn.

2002-04 **Essential Services Commission, Victoria**

Effectiveness of competition

Advisor on six separate reviews of the effectiveness of competition and the impact of existing or proposed measures designed to enhance competition in the markets for wholesale gas supply, port channel access services, liquid petroleum gas, retail electricity and gas supplies, and port services.

2003 **Gilbert + Tobin/AGL, Victoria**

Vertical integration in electricity markets

Prepared a report on the international experience of vertical integration of electricity generation and retailing markets, in connection with proceedings brought by AGL against the ACCC. This report examined the principles applied by competition authorities in assessing such developments, and evidence of the subsequent impact on competition.

2002-03 **National Competition Council, Australia**

Gas market competition

Expert report in connection with the application by East Australian Pipeline Limited for revocation of coverage under the Gas Code of the Moomba to Sydney Pipeline System. The report addressed both the design of a test for whether market power was being exercised through pipeline transportation prices substantially in excess of long-run economic cost, and the assessment of existing prices by reference to this principle.

2001-03 **Blake Dawson Waldron/Qantas Airways, Australia**

Alleged predatory conduct

Directed a substantial NERA team advising on all economic aspects of an alleged misuse of market power (section 46 of the Trade Practices Act) in Federal Court proceedings brought against Qantas by the

ACCC. The proceedings were withdrawn soon after responding expert statements were filed.

2002 **Phillips Fox/AWB Limited**

Access and competition in bulk freight transportation

Retained to provide an expert report and testimony on the pricing arrangements for third party access to the rail network and their impact on competition in the related bulk freight transportation services market, preparation for the appeal before the Australian Competition Tribunal of the Minister's decision not to declare the Victorian intra-state rail network, pursuant to Part IIIA of the Trade Practices Act. The case settled prior to the Tribunal hearings.

2002 **Australian Competition and Consumer Commission, Australia**

Anti-competitive bundling or tying strategies

Provided two (published) reports setting out an economic framework for evaluating whether the sale of bundled or tied products may be anti-competitive. These reports define the pre-conditions for such strategies to be anti-competitive, and discuss the potential role and pitfalls of imputation tests for anti-competitive product bundling.

2002 **Minter Ellison/SPI PowerNet, Victoria**

Merger clearance

Advice in connection with a bid for energy sector assets in Victoria on merger clearance under section 50 of the Trade Practices Act.

2001 **Gilbert + Tobin/AGL, New South Wales**

Gas market competition

Advised counsel for AGL in connection with the application by Duke Energy to the Australian Competition Tribunal for review of the decision by the National Competition Council to recommend that the eastern gas pipeline should be subject to price regulation under the national gas code.

2000 **One.Tel, Australia**

Competitive aspects of Mobile Number Portability

Advised on the competitive aspects of proposed procedures for Mobile Number Portability and whether these arrangements breached the Trade Practices Act in relation to substantial lessening of competition.

2000 **Baker & McKenzie/Scottish Power, Victoria**

Impact of consolidation on competition

Expert report submitted to the ACCC on the extent to which the acquisition of the Victorian electricity distribution and retail business, Powercor by an entity with interests in the national electricity market

may lead to a 'substantial lessening of competition' in a relevant market.

Regulatory and Financial Analysis

2007 **Ministerial Council on Energy, Australia**
Review of Chapter 5 of the National Electricity Rules
Retained to provide advice on the development of a national framework for connection applications and capital contributions in the context of the National Electricity Rules.

2007 **Powercor/CitiPower, South Australia**
Advice on Related Party Outsourcing Arrangements
Retained to provide advice on the manner by which regulatory concerns surrounding related party outsourcing arrangements may be ameliorated.

2007 **Multinet, Victoria**
Review of Outsourcing Infrastructure Asset Management Contracts
Retained to provide advice on the prudency of outsourcing contracts in the context of the National Gas Code and to benchmark operating margins levied by asset management service providers.

2006-07 **Ministerial Council on Energy, Australia**
Demand Side Response and Distributed Generation Incentives
Conducted a review of the MCE's proposed initial national electricity distribution network revenue and pricing rules to identify the implications for the efficient use of demand side response and distributed generation by electricity network owners and customers.

2006 **Ministerial Council on Energy, Australia**
Electricity Network Pricing Rules
Advice on the framework for the development of the initial national electricity distribution network pricing rules, in the context of the transition to a single, national economic regulator.

2005-06 **Australian Energy Markets Commission, Australia**
Transmission pricing regime
Advisor to the AEMC's review of the transmission revenue and pricing rules as required by the new National Electricity Law.

2002-07 **Orion New Zealand Ltd, New Zealand**

Electricity lines regulation

Advisor on all regulatory and economic aspects of the implementation by the Commerce Commission of threshold and control regime for the regulation of New Zealand electricity lines businesses. This role has included assistance with the drafting submissions, the provision of expert reports, and the giving of expert evidence before the Commerce Commission.

2001-07 **Auckland International Airport Limited, New Zealand**

Aeronautical price regulation

Provided various expert reports and advice in relation to the review by the Commerce Commission of the case for introducing price control at Auckland airport and, subsequently, a fundamental review of airport charges due for implementation in 2007.

1998-2006 **Essential Services Commission, Victoria**

Price cap reviews

Wide ranging advice to the Essential Services Commission (formerly the Office of the Regulator-General), on regulatory, financial and strategic issues arising in the context of five separate reviews of price controls applying in the electricity, gas distribution and water sectors in Victoria. This work has encompassed advice on the development of the Commission's work program and public consultation strategy for each review, direct assistance with the drafting of papers for public consultation, the provision of internal papers and analysis on specific aspects of the review, drafting of decision documents, and acting as expert witness in hearings before the Appeal Panel and Victorian Supreme Court.

2004-05 **Ministerial Council of Energy, Australia**

Reform of the national electricity law

Retained for two separate advisory roles in relation to the reform of the institutions and legal framework underpinning the national energy markets. These roles include the appropriate specification of the objectives and rule making test for the national electricity market, and the development of a harmonised framework for distribution and retail regulation.

2004-05 **Johnson Winter Slattery, ETSA Utilities, South Australia**

Price determination

Advice on a wide range of economic and financial issues in the context of ETSA Utilities' application for review of ESCOSA's determination of a five year electricity distribution price cap.

2000-07 **TransGrid, New South Wales**

National electricity market and revenue cap reset

Regulatory advisor to TransGrid on a range of issues arising in the context of the national electricity market (NEM), including: the economics of transmission pricing and investment and its integration with the wholesale energy market, regulatory asset valuation, the cost of capital and TransGrid's 2004 revenue cap reset by the ACCC.

2004 **Deacons/ACCC, Australia**

Implementation of DORC valuation

Prepared a report on the implementation of a cost-based DORC valuation, for submission to the Australian Competition Tribunal in connection with proceedings on the appropriate gas transportation tariffs for the Moomba to Sydney gas pipeline.

2003-04 **Natural Gas Corporation, New Zealand**

Gas pipeline regulation

Advisor in relation to the inquiry by the Commerce Commission into the case for formal economic regulation of gas pipelines. This role includes assistance with the drafting of submissions, the provision of expert reports, and the giving of evidence before the Commerce Commission.

2001-03 **Rail Infrastructure Corporation, New South Wales**

Preparation of access undertaking

Advised on all economic aspects arising in the preparation of an access undertaking for the New South Wales rail network. Issues arising include: pricing principles under a `negotiate and arbitrate' framework, asset valuation, efficient costs, capacity allocation and trading, and cost of capital.

2002 **Clayton Utz/TransGrid, New South Wales**

National Electricity Tribunal hearing

Retained as the principal expert witness in the appeal brought by Murraylink Transmission Company of NEMMCO's decision that TransGrid's proposed South Australia to New South Wales Electricity Interconnector was justified under the national electricity code's 'regulatory test'.

2001-02 **SPI PowerNet, Victoria**

Revenue cap reset

Advisor on all regulatory and economic aspects of SPI PowerNet's application to the ACCC for review of its revenue cap applying from January 2003. This included assistance on regulatory strategy, asset valuation in the context of the transitional provisions of the national

electricity code, drafting and editorial support for the application document, and the conduct of a `devil's advocate' review.

1999-2002 **Sydney Airports Corporation, New South Wales**

Aeronautical pricing notification

Directed all aspects of NERA's advice to Sydney Airports Corporation in relation to its notification to the ACCC of proposed aeronautical charges at Sydney Airport. This work involved the analysis and presentation of pricing and revenue determination principles and their detailed application, through to participation in discussion of such matters at SACL's board, with the ACCC, and in a public consultation forum.

2002 **Corrs Chambers Westgarth/Ofgar, Western Australia**

Economic interpretation of the gas code

Provision of expert report and sworn testimony in the matter of Epic Energy vs Office of the Independent Gas Access Regulator, before the Supreme Court of Western Australia, on the economic interpretation of certain phrases in the natural gas pipelines access code.

2001 **ACCC, Australia**

Determination of local call resale prices

Advised the ACCC regarding the determination of local call resale prices from Telstra's fixed line network. This included providing advice on how the cost of community service obligations should be allocated to competitors with wholesale access to local calls.

1999-2001 **ACCC, Australia**

Cost of capital

Undertook various assignments in relation to the cost of capital for regulated businesses. These included: an analysis of the approach taken by regulators overseas in relation to the treatment of taxation in estimating the WACC, and the use of pre-tax versus post-tax WACC formulations in regulation; and, a survey of regulatory decisions in relation to the cost of capital across a range of international jurisdictions. Two reports have been published by the ACCC.

2000 **Gilbert + Tobin/AGL, South Australia**

Vesting contract terms

Advised AGL SA in connection with its application to the ACCC for revocation and substitution of both vesting contract terms and network pricing provisions for the retail supply of electricity in South Australia.

2000 **Commonwealth Bank of Australia, Australia**
Access arrangements
Advised on the legislative framework for access to essential facilities in Australia in comparison to the frameworks used in the United States, United Kingdom and European Union. This included an assessment of the pricing policies regulators use when setting access tariffs, and relevant case studies from the electricity, telecommunications and transportation industries.

1998, 2000 **Rail Access Corporation, New South Wales**
Regulatory and pricing strategy
Advisor on regulatory and financial issues arising in the context of the 1998/99 IPART review of the NSW rail access regime. Subsequently, prepared two board papers on, first, the principles for commercially sustainable pricing in the context of the NSW access regime and, second, on issues and options for addressing the growing imbalance between costs and revenues, including the probable need to finance a significant increase in capital expenditure.

1998-9 **MWSS Regulatory Office, Philippines**
Regulation by concession
Advised the MWSS Regulatory Office on its response to applications for "extraordinary price adjustments" under the terms of the two, twenty five-year, water and wastewater concession agreements. This involved an assessment of the grounds for the applications, the associated financial impact, and the appropriate rate of return to be applied in determining the consequent price adjustment. Subsequently, provided expert testimony in the arbitration of one applicant's appeal of the Regulatory Office's decision.

Valuation and Cost Analysis

2006 **Confidential Client/Australia**
Valuation of digital copyright
Provided oral advice in relation to a negotiation for a licence for digital copyright. The advice included a theoretical discussion of the issues that should be considered in determining fees for a digital copyright licence, including the extent to which digital material should be valued differently to print material and whether the charging mechanism for print is appropriate for digital copyright.

2006 **Minter Ellison/Australian Hotels Association**
Valuation of copyright material
Expert report in the context of proceedings before the Copyright Tribunal concerning the appropriate valuation of the rights to play recorded music in nightclubs and other late night venues.

2005-06 **Minter Ellison and Freehills/Santos**

Gas supply agreement arbitrations

Principal economic expert in two separate arbitrations of the price to apply following review of a major gas supply agreement between the South West Queensland gas producers and, respectively, a large industrial customer and major gas retailer.

2002-03 **ActewAGL, ACT**

Consumer willingness to pay

Directed a one year study of consumers' willingness to pay for a range of attributes for electricity, gas and water services in the ACT. This study involved the use of focus groups, the development of a pilot survey and then the implementation of a stated preference choice modelling survey of household and commercial customer segments for each utility service.

2002-03 **National Electricity Market Management Co, Australia**

Participant Fee Determination

Advice to NEMMCO in the context of its 2003 Determination of the structure of Participant Fees, for the recovery of NEMMCO and NECA's costs from participants in the national electricity market.

2002 **Screenrights, Australia**

Non-market valuation methods

Advice on the range and suitability of revealed preference and stated preference survey methodologies for valuing the retransmission of free to air television broadcasts for the purposes of determining the 'equitable remuneration' to be paid for retransmission of copyright material contained in free-to-air television broadcasts.

2001-03 **Minter Ellison/Optus Networks, New South Wales**

Arbitration of market lease fee

Retained as expert witness in the mediation and then arbitration between Optus Networks and United Energy on the appropriate annual market fee for leasing electricity pole space for the attachment of HFC coaxial cable.

2001 **Gilbert & Tobin/One.Tel, Australia**

Arbitration on the local loop service

Advice on the pricing of Telstra's unconditioned local loop service (ULLS) for use in arbitration.

2001 **Department of Natural Resources and Environment, Victoria**

Efficient pricing of water services

Prepared a report setting out the principles for efficient pricing of urban water services, an evaluation of the structure of existing

wholesale and retail water tariffs in metropolitan Melbourne, and recommended reforms.

1998-2000 **TransGrid and EnergyAustralia, NSW**
Cost effectiveness study of transmission capacity augmentation
Directed a NERA team that conducted a cost effectiveness analysis of alternative options for augmenting transmission capacity to the Sydney CBD area. This included identification and evaluation of alternative transmission, generation and demand side management options, and application of the `regulatory test', as defined in the national electricity code.

Institutional and Regulatory Reform

2006 **Bulk Entitlement Management Committee, Melbourne**
Development of urban water market
Prepared a report for the four Melbourne water businesses on options for the devolution of the management of water entitlements from collective to individual responsibility.

2003-05 **Goldman Sachs/Airport Authority, Hong Kong**
Framework for economic regulation
Lead a team advising on the options and detailed design of the economic regulatory arrangements needed to support the forthcoming privatisation of Hong Kong Airport.

2003-04 **Ministry of Finance, Thailand**
Framework for economic regulation
Lead a team advising on the detailed design and implementation of a framework for the economic regulation of the Thai water sector in order to support the proposed corporatisation and then privatisation of the Metropolitan Water Authority of Bangkok.

2003 **Metrowater and Auckland City, New Zealand**
Water industry reform options
Provided a report on alternative business models for the Auckland City water services supplier, Metrowater, in the context of proposals for structural reform elsewhere in the industry. This report examined the long term drivers of water industry efficiency and the costs and benefits of alternative structural reform options.

2001 **Independent Pricing and Regulatory Tribunal (IPART), NSW**
Review of energy licensing regime
Directed a program of work for in the context of IPART's year-long review of the energy licensing regime in NSW. This review included

the identification - by reference to experience in other state and international jurisdictions - of the most effective regulatory model for the licensing of both network and retail functions in the electricity and gas sector, the development of a compliance monitoring and reporting framework, and an assessment of the need for and nature of minimum service standards.

1999 **Department of Treasury and Finance, Victoria**
Urban water market
Developed a comprehensive proposal for the introduction of tradeable rights for bulk water used to supply metropolitan Melbourne. This involved detailed design of the form and allocation of rights, the role of a weekly spot market to determine storage draw down decisions, the specification of a 'market model' and the institutional arrangements for rights registration, trading, and the operation of an open access transfer system.

1994 **Office of Water Reform, Victoria**
Water markets
Developed a conceptual framework and the detailed requirements for its application to create markets for the trading of water rights across the state of Victoria. The recommendations of this report have underpinned subsequent reforms undertaken by the Victorian government as recently as 2006.

Sworn Testimony, Transcribed Evidence

2006 **Expert report submitted to arbitration proceedings before Sir Daryl Dawson and David Jackson, QC, between Santos and others, and AGL**
Expert report, sworn evidence, November 2006

Expert Evidence before the Federal Court on behalf of Fortescue Metals Group in the matter of BHP Billiton vs National Competition Council and Others
Expert report, sworn evidence, November 2006

Expert report submitted to arbitration proceedings before Sir Daryl Dawson and David Jackson, QC, between Santos and Others, and Xstrata Queensland
Expert report, sworn evidence, September 2006

Expert evidence before the Copyright Tribunal on behalf of the Australian Hotels Association and others in the matter of PPCA vs AHA and Others
Expert report, sworn evidence, May 2006

Statement submitted to arbitration proceedings before Hon Michael McHugh, AC QC, on the matter of AWB Limited vs ABB GrainLimited
Expert report, sworn evidence, 24 May 2006

Statements submitted to the Appeal Panel, in the matter of the appeal by United Energy Distribution of the Electricity Price Determination of the Essential Services Commission
Expert report, sworn evidence, 10 February 2006

2005

Expert evidence on behalf of Orion NZ, at the Commerce Commission's Conference on its Notice of Intention to Declare Control of Unison Networks
Transcribed evidence, public hearings, Wellington, 17 November 2005

Expert evidence on behalf of Orion NZ, at the Commerce Commission's Conference on Asset Valuation choice and the electricity industry disclosure regime
Transcribed evidence, public hearings, Wellington, 11 April 2005

2004

Statements submitted to the Australian Competition Tribunal, in the matter of Virgin Blue Airlines vs Sydney Airport Corporation
Expert reports, sworn evidence, 19-20 October 2004

Expert evidence on behalf of Orion NZ, at a Commerce Commission's Conference on the ODV Handbook for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 26 April 2004

2003

Expert evidence on behalf of Orion NZ, in response to the Commerce Commission's draft decision on re-setting the price path threshold for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 5 November 2003

Expert evidence on behalf of NGC Holdings, in response to the Commerce Commission's draft framework paper for the gas control inquiry.
Transcribed evidence, public hearings, 3 September 2003

Affidavit submitted to the Federal Court, in the matter of ACCC vs DM Faulkner and Others
Expert report, Federal Court of Australia, May 2003

Expert evidence on behalf of Orion NZ, in response to the Commerce Commission's draft decision on a targeted control regime for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 25 March 2003

2002

Expert evidence on behalf of Orion NZ, in the Commerce Commission's review of asset valuation methodologies for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 25 November 2002

Expert evidence on behalf of Optus Networks and Optus Vision Ltd, in the matter of an arbitration with United Energy Ltd
Expert report, prior to settlement, 18 October 2002

Expert statement submitted to the National Electricity Tribunal, in the matter of Murraylink Transmission Company vs NEMMCO, TransGrid, and others
Sworn Testimony, National Electricity Tribunal, Melbourne, 26 August 2002

Expert evidence on behalf of Orion NZ, in the Commerce Commission's review of control regimes for electricity lines businesses
Transcribed evidence, public hearings, Wellington, 21 August 2002

Affidavit submitted to Supreme Court of Western Australia, in the matter of Epic Energy vs Dr Ken Michael – Independent Gas Access Regulator
Sworn testimony, Supreme Court of Western Australia, November 2002

2001

Expert evidence on behalf of Auckland International Airport, in the Commerce Commission's review of airfield price control
Transcribed evidence, public hearings, Wellington, 4-5 September 2001

Expert evidence on behalf of Optus Networks, in the matter of Optus Networks vs United Energy
Mediation before Trevor Morling QC, Sydney, August and September 2001

	Expert evidence on behalf of Sydney Airports Corporation in the Productivity Commission's review of airport regulation Transcribed evidence, public hearings, Melbourne, 3 April 2001
	Affidavit submitted to Supreme Court of Victoria, in the matter of TXU vs Office of the Regulator-General Sworn testimony, Supreme Court of Victoria, 23-26 March 2001
2000	**Evidence on behalf of Sydney Airports Corporation in the aeronautical pricing determination by the ACCC** Transcribed evidence, public forum, Melbourne, 13 December 2000
	Expert Statement on Rural Risk and the Weighted Average Cost of Capital, in the matter of an appeal by Powercor Australia Ltd of the Office of the Regulator-General's Electricity Price Determination 2001-05 Sworn testimony before the Appeal Panel, Melbourne, 13 October 2000
1999	**Affidavit submitted in arbitration proceedings between the MWSS Regulatory Office and Manila Water Company on the cost of capital for the Manila water concession agreements** Sworn testimony, Manila, 20 August 1999
1998	**Expert evidence on behalf of Great Southern Networks in the gas access determination by IPART** Transcribed evidence, Sydney, 12 November 1998
1996	**Expert evidence before the Monopolies and Mergers Commission inquiry into the proposed merger of Wessex Water plc and South West Water plc** Transcribed evidence, London, August 1996
1995	**Expert evidence before the Monopolies and Mergers Commission inquiry into the proposed acquisition of Northumbrian Water plc by Lyonnaise des Faux** Transcribed evidence, London, March 1995

Speeches and Publications

2007

Assessing the Merits of Early Termination Fees*, Economics of Antitrust: Complex Issues in a Dynamic Economy,* Wu, Lawrence (Ed)
NERA Economic Consulting 2007

Trade Practices Workshop
Access to Monopoly Infrastructure Under the Trade Practices Act: Current Issues with Part IIIa and Section 46
Conference Paper Co-Author, Canberra, 22 July 2006

2005

Federal Court Judges' Conference
Use of Quantitative Methods in Competition Analysis
Paper and speech, Sydney, 20 March 2005

2004

ACCC Regulation Conference
Market Power in Utility Industries
Speech, Gold Coast, 29 July 2004

Australian Water Summit
Integrating Regional and Urban Water Management Strategies
Speech, Melbourne, 25 February 2004

2003

Assessing the Competitive Effects of Bundling: the Australian Experience*, Economics of Antitrust, New Issues, Questions and Insights*, Wu, Lawrence (Ed)
NERA Economic Consulting, 2004

Water Infrastructure Conference
Pricing to promote reuse and recycling – Why Pay More for Less?
Speech, Melbourne, 28 July 2003

ACCC Incentive Regulation and Implementation Seminar
To Index or Not to Index – Is that the Right Question?
Speech, Melbourne, 8 May 2003

Australian Water Summit
Establishing Water Markets Why? How? What Next?
Speech, Sydney, 27 February 2003

2002
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Australian Energy Users Association Conference
Emerging Themes in Energy Sector Reform – Global and Local
Speech, Melbourne, 15 October 2002

Australian Conference of Economists
Efficient Transmission: Where to from here?
Conference Paper, Adelaide, 3 October 2002

ACCC Conference
Foundation Contracts and Greenfields Pipeline Development – an Economic Perspective
Speech, Melbourne 26 July 2002

2001

IPART Conference, Incentive Regulation at the Crossroads
Incentive Regulation: at the Cross Roads or Back to the Future?
Speech, Sydney, 5 July 2001

World Bank Conference on Private Participation in Infrastructure
A Regulatory Perspective
Speech, Beijing, 15 November 2001

Airports Council International (ACI) World Conference
Role of prices in managing airport congestion
Presentation of paper, Montreal, 11 September 2001

NSW Power Conference
Electricity transmission pricing and investment
Presentation of paper, Sydney, 30 August 2001

ACCC Regulation and Investment Conference
International Comparison of Regulated Rates of Return
Speech and presentation of paper, Sydney 26 March 2001

Publicly Available Reports

2007

Review of the Effectiveness of Energy Retail Market Competition in South Australia
A report for the Essential Services Commission of South Australia, June 2007

2006	**Consistency of the Transmission Rules with the Competition Principles Agreement** A report for the Australian Energy Market Commission, December 2006
	Study of the Hong Kong Auto-fuel Retail Market A report for the Economic Development and Labour Bureau, Hong Kong, April 2006
	Expert Panel on Energy Access Pricing A report to the Ministerial Council on Energy, April 2006
2005	**Intention to Declare Control** A report for Orion, October 2005
	Efficient Investment in Transmission and its Alternatives A report for Mighty River Power, July 2005
	Wealth Transfers in Cost Benefit Analysis A report for Auckland International Airport, January 2005
2003	**Asset Valuation for the Gas Control Inquiry** A report for NGC Holdings, August 2003
	Estimating the Rate of Economic Profit for Electricity Lines Businesses A report for Orion, November 2003
	Inclusion of Competition Benefits in the Regulatory Test A report for TransGrid, April 2003
	Imputation Tests for Bundled Services A Report for the ACCC, January 2003
	Anticompetitive Bundling Strategies A Report for the ACCC, January 2003
2002	**The Hypothetical New Entrant Test in the Context of Assessing the Moomba to Sydney Pipeline Prices** A Report for the ACCC, September 2002
	A Comment on the Commerce Commission's Report: Regulation of Electricity Lines Businesses A Report for Orion, May 2002

Review of Energy Licensing Regimes in NSW: Compliance Monitoring and Reporting Framework
A Report for IPART, March 2002

Review of Energy Licensing Regimes in NSW: Minimum Service Standards
A Report for IPART, January 2002

2001

Review of Energy Licensing Regimes in NSW: Most Effective Regulatory Model
A Report for IPART, November 2001

A Review of Melbourne's Water Tariffs
Report for the Department of Natural Resources and Environment

A Critique of Price Control Study of Airfield Activities
A Report for Auckland International Airport Limited, August 2001

International Comparison of Utilities' Regulated Post Tax Rates of Return in North America, the United Kingdom and Australia
A Report for the Australian Competition and Consumer Commission (ACCC), March 2001

A Critique of Crew and Kleindorfer's Paper Comparing Single and Multi-till Pricing Methodologies
A Report for Sydney Airports Corporation, February 2001

Brendan Quach

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Overview

Brendan Quach has six years experience as an economist, specialising in network economics, and competition policy in Australia, New Zealand and Asia Pacific. Since joining NERA in 2001, Brendan has advised clients on the application of competition policy in Australia, in such industries as aviation, airports, electricity, rail and natural gas. Brendan specialises in regulatory and financial modelling and the cost of capital for network businesses. Prior to joining NERA, Brendan worked at the Australian Chamber of Commerce and Industry, advising on a number of business issues including tax policy, national wage claims and small business reforms.

Qualifications

1991-1995	**AUSTRALIAN NATIONAL UNIVERSITY** Bachelor of Economics. (High Second Class Honours)
1991-1997	**AUSTRALIAN NATIONAL UNIVERSITY** Bachelor of Laws.

Career Details

2001 -	**NERA ECONOMIC CONSULTING** Economist, Sydney
1998-1999	**AUSTRALIAN CHAMBER OF COMMERCE AND INDUSTRY** Economist, Canberra
1996	**AUSTRALIAN BUREAU OF STATISTICS** Research Officer, Canberra

Project Experience

Industry Analysis

2005-06 **Freehills/South Australian Gas Producers, NSW and South Australia**

Gas supply agreement arbitration

Assisted in the development of an economic expert report in the arbitration of the price to apply following review of a major gas supply agreement between the South Australian gas producers and a large retailer in NSW and South Australia.

2005-2006 **Australian Energy Market Commission (AEMC), Australia**

Advised the AEMC on its review of the Electricity Rules relating to transmission revenue determination and pricing, which included providing briefing papers to the Commission on specific issues raised by the review.

2005-2006 **Minter Ellison/ South West Queensland Gas Producers, Queensland**

Gas supply agreement arbitration

Advised Minter Ellison and the Producers in an arbitration of the price to apply following review of a major gas supply agreement between the South West Queensland gas producers and a large industrial customer.

2005 **International Utility, Queensland**

Generator sale, due diligence

Part of the due diligence team acting on behalf of a large international utility in the purchase of two coal fired generators in Queensland, Australia. Provided advice on the features of the Australian electricity market and regulatory environment.

2003 **Auckland City Council, New Zealand**

Rationalisation Options Study

Conducting a rationalisation options study to examine alternative business models for Metrowater. Our report assessed different vertical and horizontal integration options for Metrowater.

2003 **Metrowater, New Zealand**

Institutional Restructuring

Prepared advice for the board of the Auckland City Water and wastewater service provider, Metrowater on options for institutional and regulatory reform of the entire Auckland regional water sector.

2002 - 2003 **Rail Infrastructure Corporation, Australia**

Research to RIC on their proposed access undertaking.

Provided research and advice into various components of RICs proposed access undertaking with the ACCC including the cost of capital, asset valuation and pricing principles.

2002 **Argus Telecommunications, Australia**

Critique of CIE's bandwidth pricing principles.

Provided a critique of a CIE report on bandwidth pricing principles for the fibre optic networked run owned by Argus Telecommunications.

2001 **Screenrights, Australia**

Advice on valuing retransmission of local TV

A review and analysis of different methodologies in valuing retransmission of local television on pay TV services.

Regulatory and Financial Analysis

2007- **Babcock and Brown Infrastructure, Qld**

Review of Regulatory Modelling

Providing advice to Babcock and Brown Infrastructure on the regulatory modelling of revenues and asset values of the Dalrymple Bay Coal Terminal (DBCT). DBCT has undertaken a substantial capital investment to increase the capacity of the port. Brendan's role has been to advise DBCT on variety of issues including the calculation of interest during construction, appropriate finance charges, cost of capital and regulatory revenues which were submitted to the Queensland Competition Authority (QCA).

2007- **ActewAGL, ACT**

Transition to National Electricity Regulation

Providing on-going advice to ActewAGL, the ACT electricity distribution network service provider, on its move to the national energy regulation. The advice covers the revenue and asset modelling, the new incentives for efficient operating and capital expenditure and processes for compliance, monitoring and reporting of its regulatory activities.

2005- **TransGrid, NSW**

Review of Regulatory Systems

Providing strategic advice to TransGrid, the NSW electricity transmission network service provider, on its current regulatory processes. The advice covers TransGrid's internal systems and processes for compliance, monitoring and reporting of its regulatory activities.

2006 **Electricity Transmission Network Operators Forum, National**
Submission to application by Stanwell to change the national Electricity Rules (Replacement and Reconfiguration investments)
Developed and drafted a submission to the AEMC on the appropriateness of the draft Rule change that extended the application of the regulatory test to replacement and reconfiguration investments.

2006 **Electricity Transmission Network Operators Forum, National**
Submission to application by MCE to change the national Electricity Rules (Regulatory Test)
Developed and drafted a submission to the AEMC on the appropriateness of the draft Rule change which changed the Regulatory Test as it applies to investments made under the market benefits limb.

2006 **Office of the Tasmanian Energy Regulator**
Implications of the pre-tax or post-tax WACC
Provided a report to OTTER on the potential implications of changing from a pre-tax to a post-tax regulatory framework.

2006 **Babcock Brown Infrastructure**
Regulatory Modelling of Dalrymple Bay Coal Terminal
Developed the economic model used to determine revenues at Dalrymple Bay Coal Terminal. This included updating the model for capital expenditure to upgrade capacity at the terminal, account for intra-year cash flows, and the proper formulation of the weighted average cost of capital and inflation.

2006 **Queensland Competition Authority, Queensland**
Review of Regulatory Revenue Models
Advised the QCA on the financial and economic logic of its revenue building block model that projects the required revenue for the Queensland gas distribution businesses and tariffs for the next 5 years.

2006 **Envestra, South Australia**
Review of RAB Roll Forward Approach
Assisted Envestra in responding to the Essential Services Commission of South Australia's consultation paper on Envestra's 2006/07 to 2010/11 gas access proposal. This involved reviewing Envestra's RAB roll forward modelling and the Allen Consulting Group's critique thereof.

2006 **Transpower, New Zealand**
Review of Regulatory Systems
Provided assistance to Transpower, the sole electricity company in New Zealand, in responding to the New Zealand Commerce

Commission's announcement of its intention to declare control of Transpower. This involved developing an expert report commenting on the Commission's methodology for analysing whether Transpower's has earned excess profits in the context of New Zealand's "threshold and control" regime.

2006 **Pacific National**

Rail industry structure and efficiency

Assisted with the development of a report which examined options for addressing issues arising in vertically-separated rail industries. This involved examining a number of case study countries including the UK, US and Canada.

2005 **Australian Energy Markets Commission, Australia**

Transmission pricing regime

Advisor to the AEMC's review of the transmission revenue and pricing rules as required by the new National Electricity Law.

2005 **Queensland Rail, Australia**

Weighted Average Cost of Capital

Provided a report for Queensland Rail on the appropriate weighted average cost of capital for its regulated below rail activities.

2004-2005 **ETSA Utilities**

Review of Regulatory Modelling

Advised ETSA Utilities on the financial and economic logic of ESCOSA's regulatory models used to determine the regulatory asset base, the weighted average cost of capital, regulatory revenues and distribution prices.

2003- 2005 **TransGrid, NSW**

Review of Regulatory Revenues

Assisted TransGrid in relation to its application to the ACCC for the forthcoming regulatory review which focused on asset valuation and roll forward, cost of capital and financial/regulatory modelling.

2004 **Prime Infrastructure, Australia**

Weighted Average Cost of Capital

Provided a report for Prime Infrastructure on the appropriate weighted average cost of capital for its regulated activities (coal shipping terminal).

2004 **PowerGas, Singapore**

Review of Transmission Tariff Model

Advised the Singaporean gas transmission network owner on the financial and economic logic of its revenue building block model that

projects PowerGas' revenue requirements and tariffs for the next 5 years.

2003 **ActewAGL, ACT**

Review of Regulatory Revenues

Provided strategic advice to ActewAGL in developing cost of capital principles, asset valuation and incentive mechanisms as part of their current pricing reviews for their electricity and water businesses.

2003 **Orion Energy, New Zealand**

Threshold and Control Regime in the Electricity Sector

Provided advice and assistance in preparing submissions by Orion to the Commerce Commission, in relation to the Commission's proposed changes to the regulatory regime for electricity lines businesses. Issues addressed included asset valuation, and the form of regulatory control.

2003 **EnergyAustralia, NSW**

Pricing Strategy Under a Price Cap

Advised EnergyAustralia on IPART's financial modelling of both regulated revenues and the weighted average price cap.

2002-03 **TransGrid, NSW,**

Advice in Relation to the Regulatory Test

Modelled the net present value of a range of investment options aimed at addressing a potential reliability issue in the Western Area of New South Wales. This work was undertaken in the context of the application of the ACCC's "regulatory test" which is intended to ensure only *efficient* investment projects are included in the regulatory asset base.

2002 **Rail Infrastructure Corporation (RIC), Australia**

Review of the Cost of Capital Model

Provided advice to RIC and assisted in drafting RIC's submission to the Australian Competition and Consumer Commission (ACCC) on the appropriate cost of capital. This included building a post-tax revenue model of RIC's revenues in the regulatory period.

2002 **PowerGrid, Singapore**

Review of Transmission Tariff Model

Advised the Singaporean electricity transmission network owner on the financial and economic logic of its revenue building block model that projects PowerGrid's revenue requirements and tariffs for the next 10 years.

2002 **EnergyAustralia, Australia**

Review of IPART's Distribution Tariff Model

Advised EnergyAustralia, a NSW distribution service provider, on the economic logic of the revenue model that projects EnergyAustralia's revenue requirements and tariffs for the 2004-2009 regulatory period.

2002 **Essential Services Commission of South Australia**

Review Model to Estimating Energy Costs

Reviewed and critiqued a model for estimating retail electricity costs for retail customers in South Australia for 2002-2003.

2002 **National Competition Council (NCC), Australia**

Exploitation of Market Power by a Gas Pipeline

Provided a report to the NCC in which we developed a number of tests for whether current transmission prices were evidence of the exploitation of market power by a gas transmission pipeline. Also provided a separate report that applied each of the tests developed. This analysis was relied on by the NCC in determining whether to recommend the pipeline in question be subject to regulation under the Australian Gas Code.

2002 **Australian Gas and Lighting, Australia**

Report on South Australian Retail Tariffs

An independent assessment on the cost components of regulated retail tariffs in South Australia that will be used by AGL in the next review.

2002 **New Zealand Telecom, New Zealand**

Report on the application of wholesale benchmarks in NZ

A report on the application of international benchmarks of wholesale discounts to New Zealand Telecom.

2002 **ENEL, Italy**

Survey of Retailer of Last Resort in NSW

Provided research into the retailer of last resort provisions in the NSW gas sector of an international review for the Italian incumbent utility.

2002 **ENEL, Italy**

Survey of Quality of Service provisions in Victoria and South Australia

Provided research into quality of service regulation for electricity distribution businesses in Victoria and South Australia of an international review for the Italian incumbent utility.

2002 **Integral Energy, Australia**
Provided Advice on the Cost of Capital for the 2004 – 2008 Distribution Network Review
Provided analysis and strategic advice to Integral Energy on the possible methodologies that IPART may use to calculate the cost of capital in the next regulatory period.

2001 **IPART, Australia**
Minimum Standards in Regulation of Gas and Electricity Distribution
Advised the NSW regulator on the appropriate role of minimum standards in regulatory regimes and how this could be practically implemented in NSW.

2001 **TransGrid, Australia**
Advice on ACCC's Powerlink WACC decision
Provided a report critically appraising the ACCC's decision regarding Powerlink's weighted average cost of capital (WACC).

Competition Policy

2005 **Confidential, Australia**
Merger Analysis
Provided expert opinion as well as strategic guidance to the merging firms on the competitive implications of that merger.

2004 **Mallesons Stephen Jaques / Sydney Airports Corporation, Australia**
Appeal to declare under Part IIIA
Provided strategic and economic advice on aspects of Virgin Blue's appeal for the declaration of airside facilities at Sydney Airport under Part IIIA of the Trade Practices Act. This cumulated in the production of an expert witness statement by Gregory Houston.

2003 **Sydney Airports Corporation, Australia**
Application to declare under Part IIIA
Expert report to the National Competition Council in connection with the application by Virgin Blue to declare airside facilities at Sydney Airport under Part IIIA of the Trade Practices Act, and the potential impact on competition in the market for air travel to and from Sydney.

2002 - 2003 **Blake Dawson Waldron/ Qantas Airways, Australia**
Alleged predatory conduct
NERA was commissioned to provide advice in relation to potential allegations of anticompetitive behaviour. Developed a paper

examining the economic theory behind predation and the way courts in various jurisdictions determine whether a firm has breached competition law.

2002 **Phillips Fox and AWB Limited**

Declaration of the Victorian Intra-State Rail Network

Advised law firm Phillips Fox (and AWB Limited) in its preparation for an appeal (in the Australian Competition Tribunal) of the Minister's decision not to declare the Victorian intra-state rail network, pursuant to Part IIIA of the Trade Practices Act. This included assisting in the preparation of testimony relating to pricing arrangements for third party access to the rail network and their likely impact on competition in related markets, including the bulk freight transportation services market.

2002 **Singapore Power International (SPI)**

Impact of acquisition of a Victorian distributor on competition

Provided analysis to a company interested in acquiring CitiPower (a Victorian electricity distribution/retail business). Including an assessment of the extent to which the acquisition of CitiPower would lead to a 'substantial lessening of competition' in a relevant energy markets, given the company's existing Australian electricity sector assets. The NERA report was submitted to the ACCC as part of the pre-bid acquisition clearance process.

Other

1999-2000 **Australian Chamber of Commerce and Industry, Australia**

Alienation of Personal Service Income

Involved in analysing the effects of the proposed business tax reform package had on a number of industries which advocated a number of recommendations to the Federal Government. The package also included the provisions to change the definition of personal service income.

1998-2000 **Australian Chamber of Commerce and Industry, Australia**

Various economic policy issues

Provided analysis on economic trends and Government policies to business groups. This covered issues such as industrial relations reform, taxation changes, business initiatives, and fiscal and monetary settings. Also compiled ACCI surveys on business conditions and expectations.

1996 **Australian Bureau of Statistics, Australia**

Productivity Measures in the Public Health Sector

Involved in a team that reported on the current methods used to measure output in the public health sector and analysed alternative methods used internationally. This was in response to the ABS investigating the inclusion of productivity changes in the public health sector.

Publicly Available NERA Reports

September 2002 **Hypothetical New Entrant Test in the Context of Assessing the Moomba to Sydney Pipeline Prices**

A report for the Australian Competition and Consumer Commission which applied the hypothetical new entrant (HNE) test to the Moomba to Sydney Pipeline. The report also compared HNE prices with those actually charged for use of the MSP.

March 2002 **Minimum Service Standards**

Report for IPART which assessed the need for minimum performance standards for energy sector licensees and advised on the appropriate process and practical implementation issues associated with introducing any such standards.

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