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ESC Draft Decision: Inflation Expectations APIA, ENA and ETNOF

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Executive Summary

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 work¹ 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.

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 associations² 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.

² Australian Pipeline Industry Association (APIA), Energy 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

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 accepted⁵ 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

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.

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:

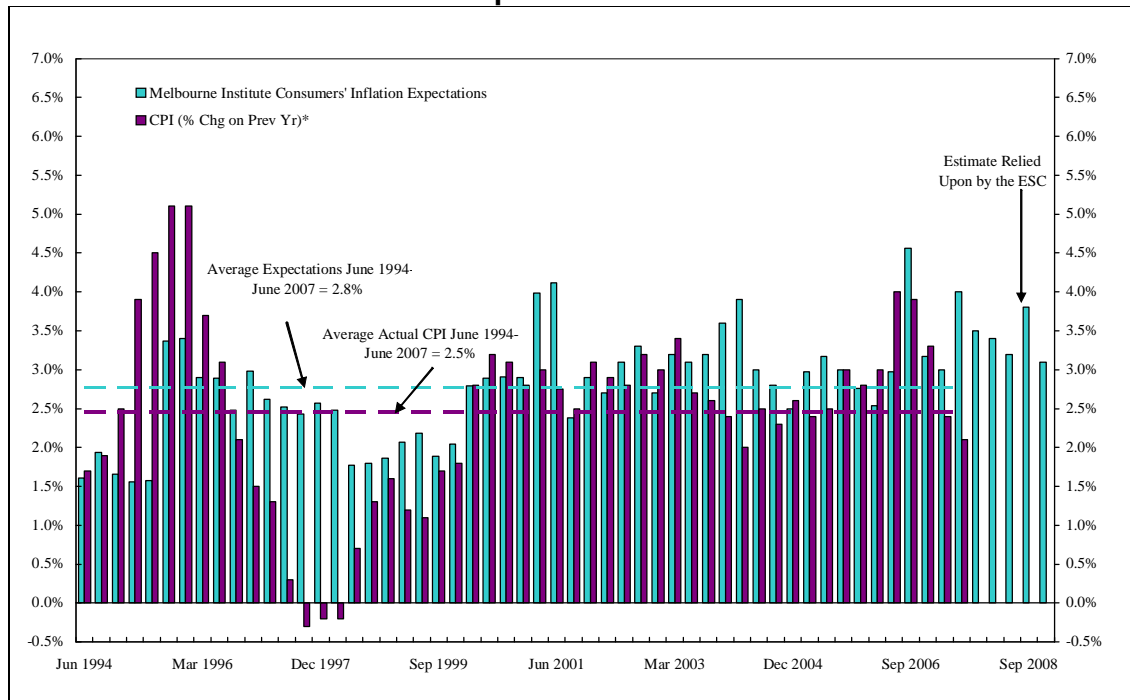
- § the sample set is relatively small;
- § the sample includes the Melbourne Institute’s Survey of Consumer Inflationary Expectations, which is a clear outlier in the sample; and
- § the sample mean, median and mode are all lower than the 3% inflation rate forecast adopted by the ESC.

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' Inflation 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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 Sydney NSW 2000
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 Fax: +61 2 8864 6549
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 Website: www.nera.com



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 prudence 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 Grain Limited

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 Eaux**
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** **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 <u>Consultant</u> , Sydney
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- 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 prudence 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 prudence 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.

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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