2 May 2008

Mr Lyndon Rowe
Chairman
Economic Regulation Authority
PO Box 8469, Perth Business Centre
WA 6849

Attention: Mr Russell Dumas
Director – Gas and Rail Access

By email to: railnetworks@era.wa.gov.au

Dear Mr Rowe

The Australian Pipeline Industry Association (APIA) Response to the ERA Draft Decision: "2008 Weighted Average Cost of Capital for the Freight (WestNet Rail) and Urban (Public Transport Authority) Railway Networks" April 2008

The Australian Pipeline Industry Association (APIA) welcomes the opportunity to comment on the above Draft Decision. The APIA submission is attached.

While the Draft Decision and the rail infrastructure regulatory process do not affect APIA members directly, issues relating to the rate of return are of broader concern to regulated infrastructure industries, including the pipeline industry. We also note that the Authority has indicated that this rail infrastructure process is likely to be of interest to stakeholders involved in the gas access regimes.

APIA is particularly concerned that:

- general rate of return principles and methodologies may be established in the current process and inappropriately transferred to regulatory processes involving pipelines; and
- specific rate of return calculation input variables may be established in the current process and inappropriately transferred to the regulatory processes involving pipelines.

Contrary to the note in the Draft Decision that, in our December 2007 response to the Allen Consulting Group Report, *"APIA makes no direct submission on beta values. ..."(p20)*, APIA considers that substantial comments were provided on the issue of the equity beta in the response.

In this submission APIA again draws the attention of the Authority to three expert reports prepared in response to the empirical analysis of proxy betas conducted by ACG for the ESC Victorian Gas Access Arrangement Review. APIA urges the Authority to consider these three reports when considering whether the betas it chooses will adequately reflect the true cost of equity for the railways.

Yours sincerely

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The Australian Pipeline Industry Association (APIA) Response to the ERA Draft Determination: "2008 Weighted Average Cost of Capital for the Freight (WestNet Rail) and Urban (Public Transport Authority) Railway Networks" April 2008

Introduction

The Australian Pipeline Industry Association (APIA) welcomes the opportunity to comment on the ERA April 2008 Draft Decision on Weighted Average Cost of Capital for the Freight (WestNet Rail) and Urban (Public Transport Authority) Railway Networks (the "Draft Decision").

While the Draft Decision and the rail infrastructure regulatory process do not affect APIA members directly, issues related to the rate of return are of broader concern to regulated infrastructure industries, including the pipeline industry that APIA represents. It is also noted that the Authority has indicated that this rail infrastructure process is likely to be of interest to stakeholders involved in the gas access regime. On that basis, APIA is concerned that:

- general rate of return principles and methodologies may be established in the current process and inappropriately transferred to regulatory processes involving pipelines; and
- specific rate of return calculation input variables may be established in the current process and inappropriately transferred to the regulatory processes involving pipelines.

Given these concerns, APIA's comments are directed at matters of principle, rather than at the specifics of the determination for Western Australian railway infrastructure.

APIA has contributed its views to the debate on general rate of return principles in its December 2007 response to the report prepared by Allen Consulting Group (ACG)[1], so this response to the Draft Decision will focus on specific rate of return calculation input variables and methodologies.

Comment on WACC Input Variables

The Real Risk Free Rate of Return and Inflation

The Authority's Draft Decision obtains the real risk free rate by adjusting the observed yields on nominal bonds by an estimate of the long-term forecast rate of inflation. APIA supports both the methodology used by the Authority and the value ascribed to the long-term inflation rate.

The Authority's approach recognises the 'relative bias', or more generally, the unreliability of the yield on indexed Commonwealth Government Securities (CGS) as both proxy for the real risk free rate and the basis for forecasting inflation. The issue of the relative bias is strongly supported by financial experts including NERA[2], the

[1] ACG, Railways (Access) Code 2000: Weighted Average Cost of Capital, Report to the Economic Regulation Authority, October 2007 (ACG 2007a).
[2] NERA, Bias in Indexed CGS Yields as a Proxy for the CAPM Risk Free Rate, a Report for the ENA, March 2007.

Reserve Bank of Australia[3] and the Australian Treasury[4], and recognised by a number of Australian regulators including the Authority, the Australian Energy Regulator (AER), and the Victorian Essential Services Commission (ESC).

ACG's advice to the Authority on an appropriate estimate of forecast inflation did not make an explicit recommendation. It submitted that the Authority may consider a value as high as 3 per cent. The Authority has correctly rejected the ACG's implied value and made an assessment that the long term inflation rate should be 2.5 per cent. This value is supported by NERA[5] and CECG[6] who have recently completed rigorous analysis on an appropriate ten-year forecast of inflation. Both NERA and CECG demonstrated an appropriate estimate of inflation is 2.5 per cent to 2.6 per cent. APIA also notes that the 10-year historic average of inflation is 2.4 per cent, once the GST-spike is removed. The results of these analyses are in line with the midpoint of the RBA's target inflation band of 2 per cent to 3 per cent.

Debt Margin

APIA highlighted the recent significant increase in the cost of debt in its December 2007 response. APIA submitted that the predictive power of methodologies based on historical data may be reduced in light of this recent instability in the market for corporate bonds and that a degree of conservatism may be required[7].

The Draft Decision calculates a debt margin of 210 basis points for the freight network (based on an assumed credit rating of BBB+) and 190 basis points for the urban network (based on an assumed credit rating of A). The Authority has not clearly articulated the methodology it has used to determine these debt margins. However, it appears that the Authority has relied heavily on advice prepared by ACG for the ESC[8]. This advice determines a debt margin from CBASpectrum data, without making an explicit adjustment to the market data for the bias that has been demonstrated to exist in the yield on long rated (ten year), low rated (BBB+) bonds derived from the CBASpectrum service.

APIA supports the Authority's view that an allowance of 12.5 basis points in the cost of debt is an appropriate allowance for the costs associated with raising debt. APIA does not provide comment on the Authority's credit rating assumptions as they are specific to the nature of the regulated business or asset.

Bias in CBASpectrum data

In 2005, the Authority commissioned ACG[9] to test NERA's view that the methodology applied by CBASpectrum to predict fair value yields is statistically biased with respect

[3] RBA, Letter to ACCC, 9 August 2007.
[4] Australian Treasury, The Treasury Bond Yield as a Proxy for the CAPM Risk-free Rate, Letter to ACCC, 7 August 2007.
[5] NERA, ESC Draft Decision: Inflation Expectations, October 2007.
[6] CECG, A Methodology for Estimating Expected Inflation, October 2007
[7] APIA, Response to the Allen Consulting Group Report Railways (Access) Code 2000: Weighted Average Cost of Capital', December 2007, page 6.
[8] ACG, Gas Access Arrangement Review 2008: Updating Estimates of Debt Margin for 20 Trading to November 2007 and December 2007, Memorandum to the Essential Services Commission, January 2008.
[9] ACG, AGN Cost of Debt Margin, Memorandum to Peter Rixson, Economic Regulation Authority, July 2005 (ACG 2005).

to long dated, low rated issues, and understates the cost of issuing this debt by as much as 25.6 basis points.

The Authority was the first regulator to rigorously assess, and consequently recognise, the CBASpectrum bias. However, the Draft Decision relies on superficial and demonstrably incorrect analysis conducted by ACG that the bias may no longer exist. On this basis, the Draft Decision is that there 'is no empirical justification (in November and December 2007) for considering that CBASpectrum systematically under estimates yields'[10].

APIA draws to the Authority's attention criticism received on the ACG analysis. NERA[11] has investigated the ACG's rejection of the CBASpectrum bias. These findings have been submitted to the ESC by the Victorian gas distribution businesses in response to the ESC's Final Decision in this review. NERA states:

> *ACG's analysis of CBASpectrum data provides little evidence that the bias in the 10 year BBB+ fair value yields from CBASpectrum has been removed. NERA's 2005 paper found a bias in long dated/low rated fair value yields. The ACG analysis concludes that the bias has been removed after considering bonds with average term of 5.87 years not ten years. The conclusions of the ACG paper conflict with the findings of the AER which found that CBASpectrum was a poor proxy and under-predicted the Bloomberg BBB fair value yield over the 18 month sample. NERA confirms that the ACG analysis is insufficient to reject the allowance for the underestimation bias in CBASpectrum data.*[12]

APIA submits that the Authority should reconsider the weight it has placed on the evidence prepared by ACG in the ESC's review of the Victorian Gas Access Arrangements. ACG has rejected the existence of the CBASpectrum bias by assessing short term bonds, when the bias has been demonstrated to exist in long dated, low rated bonds. This evidence should therefore be given very little weight as there is no basis for rejecting the bias. The Authority has not provided any theoretical evidence that the source of the bias in the CBASpectrum methodology has been removed. Nor has there been any empirical evidence that the bias as previously observed has diminished or disappeared.

The Authority notes that 'in November and December 2007, Bloomberg was not publishing predictions of fair value yields on nine and ten year BBB+ rated corporate bonds in Australia due to a lack of the bonds in the market, limiting the reliance that can be placed on data from this service'[13]. The limited data reported by Bloomberg is the same limited data used to derive CBASpectrum's fair value yields. APIA submits that as CBASpectrum fair value yields are based on an extrapolated methodology, they are more likely to be unreliable than actual debt spreads reported by Bloomberg.

This situation was foreseen in ACG's advice to the Authority in 2005. ACG advised that:

> *In the future, unless more BBB+ 10 year bonds are issued in Australia, Bloomberg will be likely to reduce its offering of fair yield estimates to 8 years and then 7 years.*

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[10] ERA, Draft Determination - 2008 Weighted Average Cost of Capital for the Freight (WestNet Rail) and Urban (Public Transport Authority) Railway Networks, April 2008 (ERA Draft Decision 2008), page 15.
[11] NERA Preliminary Response to the ESC Final Decision; A Report Prepared for Multinet, Envestra and SP-AusNet, March 2008 (NERA 2008).
[12] NERA 2008 page 5.
[13] ERA Draft Decision 2008, page 15.

> *This could create future problems in estimating an accurate cost of debt in Australia. It is possible that CBASpectrum may in future truncate its offerings of fair yield estimates (as Bloomberg has done). If this is the case, it may in future be necessary to undertake a more complex 'tailor made' analysis to determine appropriate bond rates for BBB+ rated 10 year debt.*[14]

APIA submits that if the debt premium is derived using data from CBASpectrum, then an allowance of 25.6 basis points should be added to compensate for the underestimation bias on the BBB+ yield curve. This action is not likely to be required for obtaining the A-rated yield as the bias was demonstrated to exist in low rated bonds. Alternatively, a rigorous analysis of the current level of the bias in yields from the CBASpectrum service should be undertaken as was conducted by NERA in 2005.

Conclusion on Debt Margin

APIA notes that the cost of debt has recently risen significantly, this increase is largely attributed to the US subprime mortgage crisis. APIA urges the Authority to consider the recent difficulties involved in raising debt that may not be reflected in the illiquid bond market. Moreover, the CBASpectrum bias is likely to have increased due to the recent volatility in the cost of debt caused by the subprime crisis. Therefore, at the very least, an allowance of 25.6 basis points should be added to any data obtained from the CBASpectrum service.

Market Risk Premium (MRP)

The Draft Decision's point estimate of MRP of 6 per cent is within a reasonable range of MRP values, however APIA considers that that this value is towards the lower end of the range of the market risk premium, for the reasons put forward in APIA's December 2007 response to the Authority.

Financial Structuring

APIA has no comment on the financial structuring assumed except to note that the financial structuring assumed has a direct affect on the conversion of the asset beta to the equity beta.

For this reason APIA is concerned that some parties may use the equity betas derived in this rail system Draft Decision and inappropriately apply them to pipeline assets. Pipeline assets have substantially different financial structure to the structures assumed for rail systems in the Draft Decision, so any direct transfer of the equity betas would be incorrect.

Equity Beta

The Draft Decision ascribes a value of 0.92 for the equity beta of the freight network and an equity beta of 0.46 for the urban network. These values are consistent with the recommendations of ACG[15]. ACG's recommendations are based on the available US capital market evidence, adjusted for some problems that ACG identified with the comparator businesses[16].

[14] ACG 2005 page 2.
[15] ACG 2007a, page 31, 32.
[16] Ibid page 31.

APIA has provided comments on the issue of the equity beta in its December 2007 response. This contribution to the discussion can be found on pages 7 to 8 and in a separate attachment to the December 2007 response. This response highlighted the problems associated with relying on historical analyses of proxy betas to estimate the cost of equity. APIA supported this position with expert reports on equity beta from SFG[17], NERA[18], and CECG[19] that was developed as part of the gas distribution review currently in progress in Victoria.

The Draft Decision summarises APIA's comprehensive submission as follows:

> *APIA makes no direct submission on beta values other than to submit that there are significant differences of view on appropriate beta values to apply in a regulatory determination and the Authority should consider a broader range of evidence than that provided by the Allen Consulting Group.*[20]

This summary is only partial and does not address the methodological issues that are relevant to the estimation of the cost of equity, whether for railways, pipelines or any other infrastructure. The three expert reports were prepared in response to the empirical analysis of proxy betas conducted by ACG[21] and provided a more complete understanding of the value of equity beta than ACG's historical analysis of proxy betas alone. APIA urges the Authority to consider these three reports when considering whether the betas it chooses will adequately reflect the true cost of equity for the railways.

APIA's December 2007 submission questions whether the results of ACG's analysis of proxy betas can be relied on and highlights the inadequacies of the Sharpe CAPM when using an equity beta different to one. As the Authority's Draft Decision did not address these issues and acted solely on advice from ACG, APIA summarises some of the key findings of SFG, NERA and CECG and the relevance of these findings to this review below.

Statistical Reliability of Proxy Beta Estimates

The research of SFG (2007a) and NERA (2007) questioned the statistical meaningfulness of the beta estimate resulting from the ACG analysis provided in the Victorian gas access arrangement review[22]. Both reports demonstrate the importance of ensuring a sound understanding of the meaningfulness and extent to which proxy beta estimates can be relied on. In this respect we recommend that the Authority assess the statistical reliability of the ACG estimates.

Equity Beta of Less than One Understates the Cost of Equity

The SFG report provides a simple demonstration of why a low beta has significant potential to deliver returns that are equivalent to those for debt instruments and provides a strong indication that the resulting return on equity is equivalent to the return on debt and is therefore too low.

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[17] SFG, Equity Beta Estimates for Victorian Gas Distribution Businesses, October 2007 (SFG 2007a).
[18] NERA Equity Beta for Gas Distribution, October 2007 (NERA 2007).
[19] CECG, Estimating Relative Risk in the Market for Funds, October 2007 (CECG 2007).
[20] ERA, Draft Determination, page 18.
[21] ACG, Empirical Evidence on Proxy Beta Values for Regulated Gas Distribution Activities, June 2007 (ACG 2007b).
[22] ACG 2007b.

In its report NERA conducts a discount cash flow analysis of the nine US gas distribution and transmission businesses identified in ACG (2007b). ACG's historical analysis concluded that the US mean estimates were within a range of 0.53 to 0.76[23]. However, NERA's discount cash flow analysis demonstrated that these businesses have an average implied equity beta of 1.11 and a median implied equity beta of 1.05. The results of this discount cash flow analysis indicate that the historical analysis of proxy betas does not measure the full cost of equity. Further, NERA demonstrates that these results are consistent with US regulatory decisions. US regulatory precedent in the form of allowed rates of returns have a long term average implied equity beta of 1.15 and 1.17 for electricity and gas utilities respectively.[24]

The shortcomings of measuring the forward looking cost of equity from historical capital market returns are evident in the research from SFG and NERA, but are explained by CECG[25]. CECG explains that the CAPM as currently applied by regulators and regulated businesses is the original CAPM derived by William Sharpe in 1964. Since this time there have been improvements upon the Sharpe CAPM.

One of the first comprehensive tests of the CAPM was by Black, Jensen and Scholes (1972). This showed that the actual cost of equity is considerably higher for low beta stocks than predicted by the Sharpe CAPM (and much lower for high beta stocks). The work of Fama and Macbeth (1973) similarly came to the conclusion that application of the Sharpe CAPM resulted in material biases when equity beta was different from 1.0. Similar tests have been repeated over time with the same results observed.

The most advanced understanding of the CAPM has come from Merton (1973) which showed that the beta represents a portion (and probably a small portion) of the relative risk between individual equities and the whole market. The other more significant risk element relates to covariance with future investment opportunities in the equities market. This result flows from a relaxation of the unrealistic assumption in the Sharpe CAPM that all wealth is consumed on a single day in the future. Merton generalised the Sharpe CAPM from a single period model to a multi-period "inter-temporal" CAPM.

CECG demonstrates that the imperfections of the Sharpe CAPM are not evident and will not have significant consequences when using an equity beta of one. However, if equity beta is estimated to be well below one, the Sharpe CAPM will understate the cost of equity. Conversely, an equity beta of well above one will overstate the cost of equity.

The findings of CECG are particularly relevant to this review because the Authority has determined an equity beta well below one on the basis of a report by ACG. Further, the Authority has determined this value without considering APIA's previous submission that the Sharpe CAPM will understate the cost of equity when using an equity beta well below one. Nor has the Authority considered evidence from CECG that supports this position.

Appropriate Action for Equity Beta

The Authority is required to determine an appropriate WACC for the railway networks. However, by relying on the analysis of ACG, it has only estimated the

[23] ACG (2007b) page 71.
[24] NERA (2007) page 16.
[25] CECG 2007.

historical proxy beta value. APIA submits that the proxy beta analysis from ACG should be supplemented by the understanding about beta and the estimation of the true cost of equity provided by the reports from SFG, NERA and CECG.

These reports provide a compelling convergence of evidence that supports the view that proxy beta values do not provide an accurate estimate of the cost of equity. This means that beta estimates include adjustments to allow for (i) the fact that zero equity betas require a return above the Government Bond rate and (ii) an additional component for reinvestment risk, as explained by the intertemporal CAPM.

APIA suggests two options to at least partially deal with the shortcomings of proxy beta estimates:

- Option One: Apply a Blume adjustment[26] to ACG's historical analysis of proxy betas. This is crude but will partially correct for the unreliability of observed beta estimates.
- Option Two: Use a mechanism proposed by CECG applying the securities market line where the zero equity beta intercept is between 4.4 and 5.9% above the government bond rate

Asset Betas and Characteristics of Assets

APIA believes that, like the credit rating assumption, beta values are specific to the characteristics of the regulated business or asset. The Authority has recognised this in deriving separate and distinct equity beta estimates for the urban network and the freight network. This consideration will be relevant to other infrastructure asset classes such as pipelines where clearly different characteristics will imply betas specific to those characteristics.

Franking Credits

The Draft Decision values gamma at 0.5. Due to the diversity of views on this parameter, the Authority has retained the value determined by the Western Australian Independent Rail Access Regulator in the 2003 review of WACC[27]. APIA agrees that there are conflicting views on an appropriate value for gamma, ranging from no value (0) to full value (1). However, APIA has considered the evidence available and concluded that the best evidence points to a value of close to zero.

APIA notes that most of the evidence valuing gamma at 1.0 has been prepared by Martin Lally. Lally's estimates apply a CAPM framework that is not used by Australian regulators, rendering his valuations incompatible with the form of CAPM used by Australian regulators.

APIA is aware of new evidence prepared in the Victorian Gas Access Arrangement Review suggesting that a more appropriate gamma estimate lies between 0.0 and 0.4. SFG[28] has corrected two errors in the reports previously relied on by regulators from Hathaway and Officer[29] and Beggs and Skeels[30]. These are the omission of

[26] SFG 2007a page 53.
[27] Western Australian Independent Rail Access Regulator, Weighted Average Cost of Capital to Apply to Westnet Rail and the Western Australian Government Railways Commission, Determination, July 2003.
[28] SFG 2007, The Impact of Franking Credits on the Cost of Capital of Australian Companies, a Report Prepared for Envestra, Multinet and SP Ausnet, October 2007.
[29] Hathaway, N. and R. Officer, 2004, The Value of Imputation Tax Credits, Working Paper: Capital Research.

pre-2000 data and an error of inconsistency whereby different values are adopted for capital gains and cash dividends. The SFG report also updates the analysis to include the latest data. Once the errors are corrected and the data extended, the corrected value of franking credits equals or is close to zero, except in the case of the replication of the Officer and Hathaway approach to dividend drop-off test. In this case the estimate for gamma is 0.4.

APIA also brings to the Authority's attention another report by SFG[31] provided to ESCOSA in the South Australian Gas Access Arrangement Review. SFG's report reviews an ACG report provided to ESCOSA. SFG identifies and corrects a number of data errors that significantly changed the results. Once the data errors are corrected, SFG determines a gamma value of 0.33. SFG also identified significant methodological problems with the dividend drop-off method used by ACG in this report. SFG concludes that the *maximum* possible value for gamma based on the limited and problematic work of ACG is 0.33.

APIA is concerned that the Authority has not adequately assessed the latest expert evidence on the value of imputation credits and has relied on the 2003 determination. In APIA's view a reasonable estimate commensurate with the prevailing market for funds is a range from 0.0 to 0.4, with a strong weighting towards 0.0.

Conclusion

In its December 2007 response, APIA strongly urged the Authority to consider the best available information, rather than the views of one consultant. While the Authority has considered the most recent evidence for determining the real risk free rate and the inflation forecast, the Authority has not given due consideration to the new evidence available on the value of the equity beta and imputation credits. APIA submits that the new research should be adequately considered before the Authority makes its Final Decision. APIA urges the Authority to obtain these reports from the ESC's website[32] and give them full consideration in the Final Decision.

Further, APIA submits that the Authority has not adequately addressed the evidence that there is a bias in data obtained from the CBASpectrum service on long rated, low rated bonds.

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[30] Beggs T, D. and C.L. Skeels, 2006, Market Arbitrage of Cash Dividends and Franking Credits, The Economic Record, 82, 258, pages 239-252.
[31] SFG, Value of Distributed Imputation Credits Implied by Large, High-yield Firms from 2000-2005, Report Prepared for Envestra, August 2006 (SFG 2007b).
[32] These website address for these reports are:
SFG (2007a): http://www.esc.vic.gov.au/NR/rdonlyres/622790D4-E150-450F-8F0C-89DEA1DBF760/0/MultinetAtt31.pdf
NERA (2007): http://www.esc.vic.gov.au/NR/rdonlyres/B153FD28-E8CC-43C2-BFB4-48D751644B62/0/MultinetAtt20.pdf
CECG (2007): http://www.esc.vic.gov.au/NR/rdonlyres/6FDB811E-328C-43A2-843C-9EB98C949A90/0/MultinetAtt7.pdf
SFG (2007b) http://www.esc.vic.gov.au/NR/rdonlyres/20B130B0-B588-442B-8685-F937EC799425/0/MultinetAtt29.pdf