



Request for a Rule change

**Values of *Equity Beta* (β) and *Gamma* (γ)
prescribed in the National Electricity Rules**

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Request for a Rule change regarding the values of *Equity Beta* and *Gamma* prescribed in Chapters 6A and Appendix 1 of the Rules

Description of the proposed Rule

Existing provisions of the Rules relevant to the proposed Rule change

- 1 The revenue regulation of Transmission Network Service Providers (**TNSPs**) and Distribution Network Service Providers (**DNSPs**) (together **NSPs**) under the National Electricity Rules (**Rules**) is currently undergoing significant reform. In the past 18 months, the Rules have been amended to incorporate:
 - 1.1 A new Chapter 6A regarding the economic regulation of transmission services;
 - 1.2 An amended Chapter 6 regarding the economic regulation of distribution services; and
 - 1.3 Transitional provisions in Chapter 11 to govern the AER's distribution determinations in respect of the NSW and ACT DNSPs for the regulatory control period commencing on 1 July 2009.
- 2 Both Chapter 6 and Chapter 6A of the Rules require the AER to conduct a review of various parameters that are used in reaching transmission and distribution determinations including the relevant:¹
 - nominal risk free rate;
 - equity beta (β);
 - market risk premium;
 - maturity period and bond rates
 - ratio of the value of debt to the value of equity and debt;
 - credit rating level; and
 - assumed utilisation of imputation credits (γ).
- 3 The Rules provide that the AER must conduct:
 - 3.1 a review of these parameters used for the purpose of distribution determinations which must be concluded by 31 March 2009;² and
 - 3.2 a review of these parameters used for the purpose of transmission determinations which does not need to be initiated until 1 July 2009,³(together the **Parameter Reviews**).
- 4 As these Parameter Reviews will not be completed until 2009 at the earliest, there is a significant period of time prior to these reviews in which the AER is required to issue transmission and distribution determinations.
- 5 In the intervening period (ie until the AER completes its Parameter Reviews), the Rules set out values for each of these parameters. Specifically, rr6A.6.2(b) and 6A.6.4(a) in respect of transmission

¹ See rr 6.5.4(a), 6.5.4(d), 6A.6.2(f), 6A.6.2(i), 6A.6.4(b) and 6A.6.4(d).

² See rr6.5.4(a) and (b).

³ Rule 6A.6.2(g).

determinations, and rr6.5.2(b) and 6.5.3 of Appendix 1 in respect of the upcoming ACT and NSW distribution determinations, provide that:

- β is deemed to be equal to 1.0; and
- γ is deemed to be equal to 0.5,

(together **Current Parameter Values**).

- 6 This request for a Rule change (**Proposal**) is concerned with these Current Parameter Values (ie the current values of $\beta = 1.0$ and $\gamma = 0.5$ set out in Chapter 6A of the Rules and the 'transitional chapter 6' set out in Appendix 1 to the Rules).

Written description of proposed Rule

- 7 This Proposal requests that the values of β and γ set out in Chapters 6A and Appendix 1 of the Rules be amended to provide a better estimate of the true equity beta and the true utilisation of imputation credits.

Draft of the proposed Rule

- 8 The proposed Rule is as follows:

1. In rule 6A.6.2(b) replace:

'the equity beta, which is deemed to be 1.0'

with

'the equity beta, which is deemed to be 0.75'

2. In rule 6.5.2(b) of Appendix 1 to the Rules replace:

'(the equity beta) is deemed to be 1.0'

with

'(the equity beta) is deemed to be 0.75'

3. In rule 6A.6.4(a) replace:

'the assumed utilisation of imputation credits, which is deemed to be 0.5'

with

'the assumed utilisation of imputation credits, which is deemed to be 1.0'

4. In rule 6.5.3 of Appendix 1 to the Rules replace:

'(the assumed utilisation of imputation credits) is deemed to be 0.5'

with

'(the assumed utilisation of imputation credits) is deemed to be 1.0'

Statement of Issue

Problem with the existing Rules

- 9 The Current Parameter Values do not reflect the best estimate of the true value of these parameters. In consequence, the Current Parameter Values are likely to result in:
- 9.1 over-recovery of revenue as compared with the relevant economic cost (ie the 'efficient' level of revenue recovery) by any NSP that receives a revenue and / or price determination prior to the conclusion of the Parameter Reviews. This over-recovery will occur for the entire regulatory control period in respect of which such a revenue and / or price determination operates (ie typically for 5 years); and
 - 9.2 prices for electricity in the NEM being higher than the efficient level for the duration of regulatory control periods in respect of which such revenue and / or price determinations operate.
- 10 This, in turn, is likely to detract from the ability of the Rules to achieve the NEM objective set out in section 7 of the National Electricity Law (**NEL**), that is to promote efficient investment in, and efficient use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, reliability and security of supply of electricity and the reliability, safety and security of the national electricity system (**NEM Objective**).
- 11 The following sections set out:
- 11.1 The problem with the existing Rules - ie why the Current Parameter Values should but do not, reflect the best estimate of the true value of these parameters for an efficient NSP and are likely to result in inefficiently high prices for services provided by NSPs and, thus, for electricity; and
 - 11.2 A description of how the amendments set out in this Proposal would address the identified problem.

Why the Current Parameter Values should, but do not, reflect the best estimate of the true value of these parameters for an efficient NSP

- 12 For the purposes of the Parameter Reviews, the Rules provide that the values attributable to β and γ should be based on a benchmark efficient NSP (**Efficient NSP**).⁴
- 13 There exists a significant body of evidence that the Current Parameter Values are not the best estimate of:
- 13.1 the true value of the equity beta for an Efficient NSP; and
 - 13.2 the true value of the utilisation of imputation credits for an Efficient NSP.
- 14 Furthermore, the value of β was not set by estimating its true value. The AEMC Rule Determination - National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006 No. 18

⁴ See r6.5.4(e)(3) in respect of distribution determinations and r6A.6.2(j)(3) in respect of transmission determinations. The EUAA observes, however, that, while r6.5.4(d) and (e) specify that in reviewing the value of both β and γ for use in distribution determinations the AER must have regard to the benchmark efficient DNSP, Chapter 6A is silent on the manner in which the AER is to review the value of γ for use in transmission determinations. Rule 6A.6.2(j)(3) only specifies that β should be based on a benchmark efficient TNSP.

(**AEMC Rule Determination**) expressly observes that a number of submissions were received to the effect that setting the value of β at 1 was too high. However, at that time, those submissions did not contain sufficient evidence for the AEMC to come to a different view.⁵ In light of the difficulty of estimating β , the AEMC approached the matter on the basis that it should err on the side of caution.⁶

15 Since that AEMC Rule Determination:

15.1 The Australian Competition Tribunal (**Tribunal**) has considered the correct approach to setting the weighted average cost of capital (**WACC**) in the face of uncertainty over the true value of the relevant parameters. The Tribunal concluded that:

- despite the natural temptation to err on the side of caution (ie to ensure that the WACC is not underestimated in any particular regulatory control period), such an approach is not reasonable in any statistical or economic sense; and
- it is appropriate, in setting the WACC, to estimate the true value of that parameter;

15.2 Additional information has come to light in support of the fact that the true value of β for a benchmark efficient NSP is less than 1;

15.3 Additional information has been published by the Essential Services Commission of Victoria (**ESC**) in relation to gamma; and

15.4 A re-examination of the data used by the ESC in estimating gamma has revealed that the analysis upon which the ESC and, in turn, the AEMC, relied led to an under-estimation of gamma.

16 This proposed Rule Change turns first to the comments made by the Tribunal in establishing that the Current Parameter Values should reflect the best estimate of their true value, before setting out evidence which has recently come to light in respect of the true values of the parameters β and γ .

Approach of Tribunal

17 *Telstra Corporation Ltd (No 3)*⁷ concerned an appeal by Telstra Corporation Ltd (**Telstra**) of the Australian Competition and Consumer Commission's (**ACCC's**) decision to reject an undertaking proffered to it by Telstra regarding the terms and conditions upon which Telstra would supply access to its unconditioned local loop service (**ULLS**). In part, the appeal concerned the estimation of the relevant WACC. A copy of the decision is attached to this Proposal as Annexure A.

18 Telstra contended that significant social harm could flow from an underestimation of the WACC because the service may not be provided at all.⁸ The same argument could be made in relation to the provision of electricity services, namely that if the WACC is set too low, NSPs will not invest sufficiently in the provision of network services leading, for example, to consumers not having access to sufficient quantities of electricity, regular load shedding and potentially even blackouts. This has been used as a reason to justify why bodies responsible for setting the WACC have overestimated it, or erred on the side of caution to ensure that they do not underestimate the WACC.

⁵ AEMC Rule Determination page 87.

⁶ AEMC Rule Determination page 87.

⁷ *Telstra Corporation (No 3)* (2007) ATPR 42-160

⁸ *Telstra Corporation (No 3)* at [458].

19 However, the Tribunal concluded that despite this “natural temptation” to err on the side of caution (ie to ensure that the WACC is not underestimated in any particular regulatory control period), such an approach is not reasonable in any statistical or economic sense. Specifically, the Tribunal said:

'In this sense, we regard an estimate of the true WACC value, if it has been arrived at through a statistically-unbiased estimating process, as representing a figure that, on average, in the long run probabilistic sense in which all such estimates should be considered, would yield the true expected value of the variable in question. To add an amount artificially to such an estimate would in this correct statistical sense result in too high an estimate of the true average of the variable in question ... We are not satisfied that such a procedure is, in any statistical or economic sense, reasonable in the present circumstances.⁹

20 Furthermore, the Tribunal reached the view that although, as a theoretical matter, asymmetrical consequences may flow from setting the WACC too low or too high, which of these consequences would carry the greater social damage is not a theoretical question, but one to be considered on the basis of robust empirical examination.¹⁰ In the context of the WACC for NSP revenue and / or price determinations, this Proposal submits that there does not exist sufficient evidence to conclude that a greater social harm would flow from setting the WACC either too high or too low. In the absence of such evidence, this Proposal submits that it is not appropriate to approach the WACC on any other basis than adopting the best estimate of the relevant parameters.

21 Although the Tribunal's comments were directed to the WACC, these comments are equally applicable to the estimation of β and γ . This is because β is used in the calculation of the WACC, such that an overestimation of β would result in an overestimation of the WACC, while γ is used in calculating the NSP revenue requirements such that an underestimation of γ would result in an overestimation of required revenue.

The value of equity beta

22 β is a measure of the price volatility of a security or portfolio compared with the market as a whole.¹¹ As such, the estimation of β typically involves the analysis of stock market data over a substantial period of time. For a business listed on a stock market, β is commonly estimated by estimating an asset beta from observations of comparable listed entities and 're-levering' these into an equity beta.¹²

23 There have been a number of studies of the asset betas (β_a) of electricity utilities in the United States. In 2007, Martin Lally, an Associate Professor in the School of Economics and Finance at the Victoria University of Wellington, produced a paper entitled 'Review of parameters in the National Electricity Rules' (**Lally Paper**) which included a consideration of these United States studies in the context of Australia's National Electricity Market (**NEM**). A copy of the Lally Paper is attached as Annexure B to this Proposal.

24 In summary, the studies of the United States electricity utilities set out in the Lally Paper produced a range of estimates of the β_a for United States electricity utilities between 0.12 and 0.32 with a median

⁹ Telstra Corporation (No 3) at [468].

¹⁰ Telstra Corporation (No 3) at [457].

¹¹ Carew, Edna, *The Language of Money* 3, Allen and Unwin, 1996, page 31.

¹² ESC, Gas Access Arrangement Review 2008-2012 Draft Decision dated 28 August 2007, page 383.

- of 0.26 and an average of 0.25. On the basis of this data, the Lally Paper concludes that the β_a for United States electricity utilities is 0.3.¹³
- 25 The difference between β_a and β concerns financial gearing and taxation. Specifically, β takes account of the gearing of the relevant firm, ie the debt to equity ratio and a measure of taxation while β_a is a measure that assumes no gearing (ie a debt to equity ratio of zero).¹⁴ Therefore, data in relation to β_a can be used to estimate a value of β .
- 26 Specifically, the relationship between β_a and β is that set out in the formula created by Hamada (adjusted for the effect of imputation), which shows that β is a function of β_a , the relevant level of gearing and the imputation adjusted corporate tax rate.¹⁵ Each of these figures is fixed for the purposes of revenue and / or price determinations because:
- 26.1 the Rules provide that the gearing level (**Leverage**) is 60% (ie D/V, the market value of debt as a proportion of the market value of equity and debt);¹⁶
- 26.2 the Rules provide that the utilisation of imputation credits, γ is deemed to be 0.5;¹⁷ and
- 26.3 the *Income Tax Rates Act 1986 (Cth)* provides that the corporate tax rate (T_c) is 30%.¹⁸
- 27 On the basis of these values for Leverage, γ and T_c , the United States data on β_a suggests that β for electricity utilities should be set at 0.68. This is significantly lower than the value of β set out in the Rules of 1.0.¹⁹
- 28 This conclusion relies on there being no difference between the β_a of Australian electricity utilities and United States electricity utilities. However, this assumption is expressly considered and supported by the Lally Paper. Furthermore, it is accepted that Australian regulators may have regard to data from the United States in relation to the estimation of β for electricity revenue and / or price determinations.²⁰
- 29 Specifically, the Lally Paper concludes that although the regulatory regimes of Australia and the United States exhibit significant differences, each of those regimes has the effect of largely insulating electricity utilities from systematic risk. As a result, it is appropriate to estimate that the β_a of Australian electricity utilities is the same as the β_a of United States electricity utilities.²¹
- 30 Therefore, the Lally Paper provides strong support for a view that in estimating β , a value of 1.0 is far too high and that instead:
- if γ remains unchanged at 0.5, a more accurate estimate of β would be 0.68; or

¹³ Lally Paper, page 8.

¹⁴ Lally Paper, page 4.

¹⁵ The Hamada model (adjusted for the effects of imputation) sets out the relationship between β and β_a - See Lally Paper, page 5.

¹⁶ See rr6A.6.2(b) and 6.5.2 of Appendix 1.

¹⁷ See rr6A.6.4(a) and 6.5.3 of Appendix 1.

¹⁸ *Income Tax Rates Act 1986 (Cth)*, s23.

¹⁹ Lally Paper, page 8.

²⁰ For example, see ESC, Electricity Distribution Price Review 2006 -2010: October 2005 Price Determination as amended in accordance with a decision of the Appeal Panel dated 17 February 2006 Final Decision Volume 1 Statement of Purpose and Reasons, page 347.

²¹ Lally Paper, pages 6 and 8.

- if γ is increased to 1.0, as is proposed by the EUAA for the reasons discussed in more detail below, a more accurate estimate of β would be 0.75.

31 These estimates of β are consistent with the most recent findings of the ESC in relation to gas distribution businesses. The Gas Access Arrangement Review 2008-2012 Draft Decision dated 28 August 2007 concluded that for gas distributors in Victoria, β lies between 0.5 and 0.8.²² This decision appears to place significant weight on a report to the ESC by the Allen Consulting Group, 'Empirical evidence on proxy beta values for regulated gas distribution activities', dated June 2007 (**ACG Report**) which assessed Australian energy related securities (including securities involved in electricity and securities involved in gas) and found estimates in the range of 0.59 - 0.71 for β on the basis of monthly data for the longest period possible (ie 1991 - 1998 and 2002 - 2007).²³ A copy of the ACG Report is attached as Annexure C to this Proposal.

32 Thus, there is significant recent evidence, both in the Lally Paper and the ACG Report in support of the view that in estimating β , a value of 1.0 is far too high and that a value of 0.75 would more closely approximate the true value of β .

The value of gamma

33 The Rules provide that γ represents the assumed utilisation of imputation credits.

34 In estimating γ , it is necessary to consider two variables, namely the utilisation rate on imputation credits that have been attached to dividends, θ , and the attachment rate, ω .²⁴ This is because it is relevant to consider both whether investors utilise imputation credits that are attached to dividends and whether companies attach imputation credits to their dividends.

35 The relationship between these parameters is as follows:²⁵

$$\gamma = \theta \cdot \omega$$

where

- θ represents the average utilisation rate on imputation credits that have been attached to dividends. These utilisation rates vary across investors. For most Australian residents, the rate is 1. For foreigners, it is zero or close to zero;²⁶ and
- ω represents the proportion of the corporate tax paid by a company that is attached to dividends in the form of imputation credits.

²² ESC, Gas Access Arrangement Review 2008-2012 Draft Decision dated 28 August 2007, page 397.

²³ The ACG Report, page 22.

²⁴ ESC, Electricity Distribution Price Review 2006 -2010: October 2005 Price Determination as amended in accordance with a decision of the Appeal Panel dated 17 February 2006 Final Decision Volume 1 Statement of Purpose and Reasons, pages 400-401.

²⁵ Lally Paper, page 12.

²⁶ Lally Paper, pages 16-17.

- 36 The AEMC Rule Determination concludes, on the basis of a 2005 electricity distribution price review by the ESC (**ESC Decision**)²⁷, that the value of γ should continue to be set at 0.5. However, the AEMC Rule Determination expressly notes:
- submissions received by the AEMC that the value of 0.5 for γ is based on outdated information;²⁸ and
 - that the conclusion in the ESC Decision was merely that there was inadequate evidence to support changing the value of γ from 0.5.²⁹
- 37 On the basis of some more recent information and a re-examination of the data in the ESC Decision, the Lally Paper concludes that the value of both θ and ω is close to 1.0. This Proposal addresses each of these variables, in turn, in the sections below.
- 38 This additional information, and the conclusions of Associate Professor Lally, therefore support the view that a γ value of 0.5 is a significant underestimation of the true value of this parameter and that the Rules ought to be amended to increase the value of γ to 1.0.

The attachment rate, ω

- 39 The attachment rate, ω , represents the proportion of the corporate tax paid by a firm that is attached to dividends in the form of imputation credits. Thus, firms with low dividend yields (ie firms that retain their earnings) would tend to exhibit a low ω value. However, electricity utilities typically pay a large proportion of their earnings to investors in the form of dividends.³⁰
- 40 The ESC Decision considered the true value of ω but did not express a final view. Instead, it merely concluded that, as there is a substantial degree of imprecision involved in estimating γ and there was inadequate evidence available at that time to support a value of 1.0, it was appropriate to place substantial weight on previous decisions with the result that γ should continue to be set at 0.5.³¹
- 41 However, in its analysis of ω , the ESC Decision noted that:
- 41.1 The most recent research paper (in which the most recent values of ω were found to be very close to 0.8) concerns all Australian firms, not just electricity utilities;³²
 - 41.2 Utilities (ie electricity or gas) tend to make far higher dividend payments than the average firm;³³
 - 41.3 If the electricity industry standard dividend yield is achieved, there is no reason to expect that any credits should be left undistributed;³⁴ and

²⁷ ESC, Electricity Distribution Price Review 2006 -2010: October 2005 Price Determination as amended in accordance with a decision of the Appeal Panel dated 17 February 2006 Final Decision Volume 1 Statement of Purpose and Reasons.

²⁸ AEMC Rule Determination, page 88.

²⁹ AEMC Rule Determination, page 88.

³⁰ For example, see ESC Decision, page 412.

³¹ ESC Decision, page 413.

³² ESC Decision, page 411.

³³ ESC Decision, page 412.

³⁴ ESC Decision, page 412.

- 41.4 The Commission's modelling suggests that the Victorian electricity distributors could distribute all of the franking credits forecast to be created over the next regulatory period with only modest distributions (less than 40% of regulatory profit).³⁵
- 42 Furthermore, in its most recent review of this variable in the context of gas distributors, the ESC found that ω should be set at 1.0.³⁶ As gas and electricity distributors both have high dividend yields, the value of ω used for gas distributors would seem to be a good proxy for the true value of ω for electricity NSPs.
- 43 The Lally Paper re-examines the analysis in the ESC 2005 Decision and concludes that on the basis of the data set out in that Decision, the appropriate value for ω should be 1.0. Lally also notes that the ESC's own analysis supports a value of 1. In particular, their observation that all of the Victorian electricity distributors could distribute all of their forecast franking credits (as noted in paragraph 41.4 above) implies a value for ω of 1 rather than 0.80.³⁷
- 44 Thus, there exists significant evidence, and it is concluded in both the Lally Paper and the ESC's most recent consideration of the matter, that ω should be set at 1.0.

The utilisation rate, θ

- 45 The utilisation rate, θ represents the average utilisation rate on imputation credits that have been attached to dividends. These utilisation rates vary across investors. For most Australian residents, the rate is 1. For foreigners, it is zero or close to zero.³⁸ However, the capital asset pricing model (**CAPM**) adopted in the Rules assumes that national equity markets are completely segmented (ie that investors are precluded from purchasing foreign equities).³⁹
- 46 This assumption of complete segmentation plays a significant part in the determination of a number of the variables including:
- β , which reflects the volatility of a particular security compared with the market as a whole. The market for the purposes of this comparison is the Australian market, not a worldwide equity market.⁴⁰
 - the risk free rate, which is calculated by looking at the risk free rate in Australia, not the risk free rate overseas. It may be possible to calculate a worldwide risk free rate, but this value would likely be different from the Australian risk free rate.⁴¹
- 47 This assumption of complete segmentation of equity markets is not reflected in the real world. Thus, the Lally Paper notes the temptation to try to address this by adjusting certain variables to better reflect the real world.⁴² However, two wrongs do not necessarily make a right.
- 48 In estimating the variables forming components of the CAPM, assumptions made by that model should be uniformly applied. This includes, in particular, the assumption by the CAPM of complete

³⁵ ESC Decision, page 412.

³⁶ ESC, Gas Access Arrangement Review 2008-2012, Draft Decision, 28 August 2007, page 430.

³⁷ [Lally Paper, pages 12-13.](#)

³⁸ [Lally Paper, pages 16-17.](#)

³⁹ See Lally Paper, page 16, see also the ACG Report, page 9.

⁴⁰ The ACG Report, page 9.

⁴¹ Rules 6A.6.2 and 6.5.2 provide that the risk free rate for the purposes of revenue determinations is dependent on the yield on Commonwealth Government bonds.

⁴² Lally Paper, page 16.

segmentation of markets. The use of one set of assumptions to calculate some of the parameters relevant to the CAPM and another set of assumptions to calculate other parameters relevant to the CAPM creates a risk that one error will exacerbate other errors resulting in significant over or under recovery by NSPs.

- 49 The Lally Paper shows that setting $\theta = 0.6$ (consistent with a gamma value of 0.5) leads to this kind of perverse result, i.e., the cost of equity estimated using this parameter value of 0.6 is in excess of the range of estimates arising from complete segmentation and complete integration, when it should lie within that range.⁴³
- 50 The Lally Paper concludes that, in light of the CAPM adopted by the Rules (including the assumptions underlying that model), θ should be set at 1.0.⁴⁴
- 51 The Lally Paper also re-examines the data in the ESC Decision and concludes that this data supports a value of θ of 0.75, not 0.6.⁴⁵ The Lally Paper identifies an error in calculation in the ESC Decision which resulted in the conclusions reached by the ESC on the basis of this data constituting a significant underestimation of θ .⁴⁶
- 52 As such, there is strong support for a view that a value of 0.6 constitutes a significant underestimation of θ . This view is supported both by theoretical considerations and the analysis of the data contained in the ESC Decision. A more appropriate value for θ would be 1.0.
- 53 For the reasons set out above, there is strong support for a view that both θ and ω should be set at 1.0. This implies a θ value of 1. These findings suggest that setting γ at 0.5 is a significant underestimation and that the Rules should be amended by increasing the value of γ to 1.0.

Implications of the value of gamma for the estimation of the market risk premium

- 54 Having recognised that the estimated value of gamma has implications for estimating the value of equity beta, it is appropriate to also recognise that the utilisation rate for imputation credits that have been attached to dividends, that is θ , also has implications for the estimation of the market risk premium. The extent of the effect of a change in the value of gamma on the estimated value of the market risk premium depends upon the methodology used to estimate the market risk premium.
- 55 Prior to the enshrining of the WACC parameter values in the Rules, the AER's predecessor placed the most weight on the historical average return on stocks net of the risk free rate, in estimating the market risk premium for Australia.⁴⁷ The most comprehensive analysis of the estimation of the market risk premium using the historical average return on stocks net of the risk free rate is that of Brailsford et al.⁴⁸ A copy of the decision is attached to this Proposal as Annexure D. Brailsford et al generate estimates of the market risk premium based on the average return on stocks net of the risk free rate using a variety of historical periods⁴⁹.
- 56 Using the longest such historical period, of 1883-2005, and expressing the premium relative to long-term Commonwealth bonds, Brailsford et al estimate the market risk premium at 6.2% when

⁴³ [Lally Paper, pages 21-23.](#)

⁴⁴ Lally Paper, page 23.

⁴⁵ Lally Paper, page 15.

⁴⁶ Lally Paper, page 15.

⁴⁷ See ACCC, Statement of Principles for the Regulation of Transmission Revenues, 2004, section 8.4.

⁴⁸ Brailsford, Tim, Handley, John and Maheswaran, Krishnan, 'A Re-Examination of the Historical Equity Risk Premium in Australia', *Accounting and Finance*, forthcoming.

⁴⁹ These estimates appear in Tables 4 and 5 of Brailsford et al

imputation credits are ignored and 6.5% when they are fully valued (ie where the utilisation rate on distributed credits, θ , is assumed to be 100%). The latter estimate is consistent with gamma of 1. By contrast, with gamma of 0.50 and therefore a utilisation rate on distributed credits, θ , of 60%, the estimate of the market risk premium would be 6.38%.⁵⁰ Accordingly, the effect of raising the value of gamma from 0.50 to 1, and therefore raising the utilisation rate on distributed credits, θ , from 60% to 100%, would be to raise the estimate of the market risk premium from 6.38% to 6.50%, ie an increase in the market risk premium of 0.12%.

- 57 Using the shorter historical period of 1958-2005, Brailsford et al estimate a value of the market risk premium of 6.3% when imputation credits are ignored and 7.0% when the utilisation rate on distributed credits, θ , is assumed to be 100%. Accordingly, the effect of raising gamma from 0.50 to 1, and therefore raising the utilisation rate on distributed credits from 60% to 100%, would be to raise the estimate of the market risk premium from 6.72% to 7.0%, ie an increase in the market risk premium of 0.28%.
- 58 In summary, the discussion above suggests that raising the value of gamma from 0.5 to 1, and therefore raising the utilisation rate on distributed credits from 60% to 100%, would have the effect of increasing the value of the market risk premium by an amount approximating between 0.12% and 0.28% where the historical average return on stocks net of the risk free rate is used in estimating the market risk premium (as it was by the AER's predecessor before the WACC parameter values were enshrined in the Rules). Assuming that the market risk premium is estimated to the nearest 1%, it follows that raising the value of gamma from 0.5 to 1 should not necessitate any change to the value of the market risk premium of 6% currently prescribed by the Rules. Further support for this conclusion is provided by Lally's estimation of a market risk premium using a utilisation rate on distributed imputation credits of 1⁵¹, which estimate of the market risk premium was cited by the AER's predecessor in support of its estimate of the market risk premium of 6%.⁵²
- 59 The EUAA observes that Gray and Hall⁵³ have argued that a market risk premium of 6% cannot be reconciled with a gamma value of 0.5, and even less so with a gamma value of 1. However, Lally has demonstrated in a paper to be released and included as Annexure E that:
- the analysis of Gray and Hall presumes the use of a valuation model that is not generally employed by Australian regulators; and
 - if the valuation approach that is generally employed by these regulators is employed, a market risk premium of 6% can be reconciled with a gamma value of 0.5 or 1.⁵⁴

⁵⁰ See Lally Paper, page 12.

⁵¹ Lally, Martin, *The Cost of Capital Under Dividend Imputation*, 2002, report prepared for the AER (www.aer.gov.au).

⁵² ACCC, *Statement of Principles for the Regulation of Transmission Revenues*, 2004, p. 101.

⁵³ Gray, Stephen and Hall, Jason, 'The Relationship Between Franking Credits and the Market Risk Premium', *Accounting and Finance*, 2006, vol. 46, pages 405-428.

⁵⁴ Lally, Martin, 'The Relationship Between Franking Credits and the Market Risk Premium: A Comment', *Accounting and Finance*, forthcoming. A copy of this paper 'The Relationship Between Franking Credits and the Market Risk Premium: A Comment' is attached at Annexure E.

How the proposed Rule contributes to the NEM Objective

Why the Current Parameter Values are likely to result in inefficiently high prices for services provided by NSPs and, thus, for electricity

Statutory context

60 Pursuant to the Rules, NSPs are regulated businesses such that the AER is responsible for publishing revenue and / or price determinations setting out the revenues that they may earn from, and / or the prices that they may charge for, services that are the subject of regulation.⁵⁵

61 The Post Tax Revenue Model published by the AER in September 2007 (**PTRM**) states that, in accordance with r6A.5.4, the Maximum Allowed Revenue (**MAR**) that a TNSP may earn is based upon various building blocks including:⁵⁶

- a return on capital; and
- the estimated amount of corporate income tax payable.

62 The prices that TNSPs are permitted to charge for the provision of regulated services are based upon the aggregate annual revenue requirement (**AARR**) which is calculated by subtracting from the MAR any operating and maintenance costs and making other necessary adjustments pursuant to rr6A.7, 6A.8 and 6A.15.⁵⁷ As such, the prices that TNSPs are permitted to charge is based on the same building blocks as the MAR (ie including a return on capital and the estimated cost of corporate income tax).

63 The return on capital component is a significant portion of the MAR. This was recognised by the AEMC in its AEMC Rule Determination as follows:

‘The return on, and depreciation of, capital invested in the network by the regulated TNSP contributes a substantial component of its allowable revenue. The Commission has specified in the Rules the methodology to be applied and the value of certain parameters to be adopted by the TNSP and the AER in estimating the weighted average cost of capital (WACC) with a requirement for their periodic review every five years.’⁵⁸

64 The return on capital component of the MAR for each regulatory year is calculated by applying the weighted average cost of capital (**WACC**) for the relevant TNSP to the regulatory asset base (**RAB**) for that TNSP as at the beginning of that regulatory year.⁵⁹

65 Rule 6A.6.2(b) provides that the WACC is determined according to the following formulae:

$$WACC = k_e(E/V) + k_d(D/V)$$

$$k_e = r_f + \beta \cdot MRP$$

$$k_d = r_f + DRP$$

where

⁵⁵ See section 2 of the NEL.

⁵⁶ PTRM, page 3.

⁵⁷ See r6A.22.1.

⁵⁸ AEMC Rule Determination, page xx-xxi.

⁵⁹ See rr6A.6.2(a) and (b)

r_f is the risk free rate
 MRP is the market risk premium
 DRP is the debt risk premium
 E/V is the market value of equity
 D/V is the market value of debt

66 As such, it is clear that a relatively high value of β results in relatively high prices charged for transmission services by the relevant TNSP, all other things being equal. This is because, a relatively high value of β results in relatively high values for the cost of equity, the WACC, the return on capital, the MAR and the AARR.

67 The estimated cost of corporate income tax (ETC) component of a TNSP's MAR for each regulatory year is calculated in accordance with the following formula:⁶⁰

$$ETC = (ETI)(r_t)(1 - \gamma)$$

Where

ETI is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity

r_t is the expected statutory income tax rate

68 As such, it is clear that a relatively low value of γ results in relatively high prices charged for transmission services by the relevant TNSP, all other things being equal. This is because, a relatively low value of γ results in relatively high values of the estimated cost of corporate income tax, and thus the MAR and the AARR.

69 The above paragraphs are based upon the provisions of Chapter 6A which regulates transmission determinations. However, the AER is required to follow a similar process in respect of revenue and / or price determinations for distribution businesses. In consequence, the parameters β and γ have a similar effect on the revenue earned, and the prices that are charged by DNSPs, to their effect on TNSPs revenues and pricing.

70 As is apparent from the paragraphs above, the parameters β and γ have a significant effect upon revenue and / or price determinations. The Lally Paper sets out a real world example of the magnitude of that effect.

Effect upon an actual AER decision

71 Specifically, the Lally Paper takes as an example a transmission revenue determination made by the AER in 2007 and recalculates the MAR using the following values:⁶¹

- $\gamma = 1.0$; and
- $\beta_a = 0.3$.

72 On the basis of the Hamada formula, and leaving other variables unchanged, (ie the corporate tax rate remains at 30% and the Leverage remains at 60% as set out in the Rules) this results in a β value of 0.75. This is 0.25 lower than the value prescribed in the Rules of 1.0.⁶²

⁶⁰ See r6A.6.4.

⁶¹ Lally Paper, page 24.

- 73 In addition, as is evident for the formula for ETC, setting the value of $\gamma = 1.0$ has the effect of setting ETC to zero.
- 74 On the basis of the values $\beta = 0.75$ and $\gamma = 1.0$, but keeping all other variables constant (ie in accordance with the prescribed values in the Rules), the total 'unsmoothed revenue' over the 5 year regulatory control period is \$3,068.67m. This is a saving of \$265.34m (or 8%) compared with the total 'unsmoothed revenue' of \$3,334.01m calculated by the AER using the Current Parameter Values prescribed in the Rules.⁶³

Effect of β and γ in the context of the NEM

- 75 The Current Parameter Values may be adjusted by the AER following its Parameter Reviews. However, in respect of each revenue and / or price determination for an NSP proposal lodged prior to such Parameter Review, the overestimation of β and underestimation of γ result in prices for transmission and distribution services being set at a level significantly higher than the efficient level.
- 76 The Current Parameter Values have a significant effect upon the NEM for the following reasons:
- 76.1 The same values of β and γ are used in respect of distribution services and transmission services. Therefore, there is likely to be over-recovery (as compared with the efficient level) for each of these sets of services and the price for electricity will reflect these inefficiently high prices for both transmission services and distribution services;
- 76.2 The interconnected nature of the NEM may mean that the prices charged for transmission services affect not just consumers in the State in which the TNSP operates, but consumers throughout the NEM.
- 76.3 The Current Parameter Values of β and γ are to be used in respect of any revenue and / or price determinations for NSPs made prior to the completion of the Parameter Reviews. Therefore, an error in the Current Parameter Values of β and γ in the Rules would affect the price of transmission and distribution services charged by all of the NSPs with a revenue and / or price determination made during the period prior to the Parameter Reviews. The AER is required to make distribution determinations in respect of Actew AGL, Country Energy, Energy Australia and Integral Energy on or before 1 May 2009 and transmission determinations in respect of VENCORP, SP Ausnet, ElectraNet, and Transend prior to the end of 2009; and
- 76.4 The Rules prescribe that regulatory control periods are required by the Rules to be at least 5 years.⁶⁴ As such, the effect of an error in any revenue and / or price determination will affect consumers for at least 5 years.
- 77 For each of these reasons, the Current Parameter Values, if left unchanged, will result in over-recovery (as compared with the efficient level) by a varying number of NSPs for a period up until the end of the final revenue and / or price determination conducted using the Current Parameter Values. As the review of the Current Parameter Values under Chapter 6A is not initiated until after 1 July 2009, this over-recovery is likely to persist until at least 2014.

NEM Objective

- 78 The NEM Objective is set out in section 7 of the NEL. It provides:

⁶² Lally Paper, page 24.

⁶³ Lally Paper, page 25.

⁶⁴ See definition of regulatory control period in Chapter 10 of the NER.

'The national electricity market objective is to promote efficient investment in, and efficient use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, reliability and security of supply of electricity and the reliability, safety and security of the national electricity system.'

79 One way of promoting efficient investment in, and the efficient use of, electricity services, is to ensure that the prices for those services are set at an efficient level such that economic activity is not distorted by service providers earning revenues in excess of their economic costs. The AEMC recognised this issue in the AEMC Rule Determination. In respect of the objective of economic regulation of prices, the AEMC Rule Determination states:

'Economic regulation seeks to ensure the secure and reliable supply of services at efficient prices that do not distort downstream or potentially upstream economic activity.'⁶⁵

80 If the price of services provided by NSPs is above the efficient level, this may create various distortions in the economy such as:

80.1 Household consumers of electricity will face prices above the efficient level and are therefore likely to consume less electricity and/or consume less goods or services other than electricity, than they would if prices were at the efficient level (ie inefficiently low consumption of electricity services);

80.2 Business consumers of electricity will face input costs above the efficient level, and are therefore likely to price their products at a level higher (if they can do so), face a loss of competitive position *vis-à-vis* international competitors and/or set output at a level lower, than they would if prices were at the efficient level (ie inefficiently low consumption of electricity services);

80.3 Incentives for inefficient investment in generation plants to bypass transmission (ie inefficient investment in electricity services); and

80.4 Incentives for NSPs to undertake inefficient investment in network infrastructure (ie inefficient investment in electricity services).

81 The amendments to the Rules set out in this Proposal would contribute to the NEM Objective by providing parameter values that are closer to their true values for the AER to use in making revenue and / or price determinations and therefore ensuring that regulated NSP services, and electricity in the NEM, are priced at an efficient level.

82 Furthermore, this Proposal submits that amendment of the Current Parameter Values would not detract from the quality, reliability or security of supply that would otherwise be enjoyed by consumers of electricity over that period (and beyond) by replacing existing values for the equity beta and gamma with revised values. By ensuring an efficient allocation of resources the quality, reliability and security of electricity supply would not be compromised.

83 If the amendments to the Rules set out in this Proposal are not adopted, the prices of regulated NSP services, and the price of electricity in the NEM, are likely to be set at an inefficiently high level for a significant period with consequent over-pricing of network services and over investment.

84 The Current Parameter Values would be used in any revenue or pricing determination for NSPs made prior to the Parameter Reviews, with the result that the effect of the Current Parameter Values would continue for the duration of the regulatory control periods of those determinations. That is, the

⁶⁵ AEMC Rule Determination, page xii

Current Parameter Values would continue to have effect for some 5 or more years after the Parameter Reviews.

85 Secondly, it seems reasonable to assume that the Current Parameter Values could well continue in operation after the Parameter Reviews, if the requested Rule change is not made. In conducting the Parameter Reviews, the AER must have regard to the principle set out in rr6A.6.2(j)(4)(ii) and 6.5.4(e)(4)(ii) that:

'where the values attributable to the [relevant parameters] cannot be determined with certainty ... the need for persuasive evidence before adopting a value for that parameter that differs from the value that has previously been adopted for it.'

86 As such, although the AER is required to conduct the Parameter Reviews, if the Current Parameter Values were to remain in place at the time of the reviews, the principle set out above could establish a stronger presumption that the pre-existing parameter values be adopted by the AER absent 'persuasive evidence' to the contrary. As a result, if the Rule change requested in this Proposal is not made, the AER may be more inclined to adopt the Current Parameter Values in the Parameter Reviews in 2009.

87 Therefore, absent the requested Rule change, network and electricity pricing would be unnecessarily high for a period of at least 5 years and possibly significantly longer, which would constitute the 'long term' for the purposes of the NEM Objective. This would be contrary to the long term interests of electricity consumers and, thus, to the NEM Objective.

Description of how this proposal addresses the identified problem

88 The proposed Rule set out above addresses the identified problem by adjusting the Current Parameter Values for β and γ such that they more closely approximate the true values of these parameters. In so doing, the bias in the value of β currently prescribed by the Rules and expressly acknowledged by the AEMC in the AEMC Rule Determination will be remedied, in accordance with the views expressed by the Tribunal in *Telstra Corporation (No 3)*.

89 This will ensure that the Rules operate to:

89.1 Provide NSPs with appropriate recovery of their economic costs; and

89.2 Promote the long terms interests of consumers of electricity by:

89.2.1 Creating cost-reflective pricing for the supply of electricity;

89.2.2 Facilitating the efficient investment in, and efficient use of, electricity infrastructure and electricity services through the resultant appropriate price signals; and

89.2.3 Promoting prices and service levels in energy networks and the supply chain more broadly that are in the long term interests of consumers of electricity.

90 Furthermore:

90.1 The solution in this Proposal is straightforward to implement. As such, the administrative costs of making such a change would be quite minimal; and

90.2 The amendment would not detract from the flexibility that was introduced into the regulatory regime by the provision in the Rules allowing the AER to conduct periodic reassessments of the values of the certain parameters.

The expected costs and benefits and potential impacts of the proposed Rule

- 91 If implemented, this proposed Rule would be likely to have a number costs and benefits.
- 92 Benefits flowing from the implementation of this proposed Rule would be likely to include:
- 92.1 Reduction in the cost of electricity as demonstrated in the Lally Paper and discussed above; and
 - 92.2 Reduction in economic distortion flowing from the price of electricity.
- 93 Costs flowing from the implementation of this proposed Rule would be likely to include:
- 93.1 Possible regulatory uncertainty during the Rule change process for transmission and distribution companies with revenue resets scheduled in the near future; and
 - 93.2 Administrative costs connected to the implementation of a Rule change.
- 94 The EUAA considers that the benefits of implementing the proposed Rule outweigh the costs.
- 95 The implementation of this proposed Rule would be likely to affect NSPs and electricity consumers. In the view of the EUAA, the likely impact on these parties of implementation include:
- 95.1 NSPs are likely to:
 - 95.1.1 Fully recover, but not over recover, their efficient costs (as a result of the use of parameter values that are a better estimate of the true value of these parameters); and
 - 95.1.2 Undertake an efficient level of investment in respect of the provision of transmission and distribution services.
 - 95.2 Electricity consumers are likely to:
 - 95.2.1 Increase their welfare as a result of a more efficient allocation of resources flowing from electricity being priced at an efficient level.
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Annexure A

Telstra Corporation Ltd (No 3) [2007] ACompT 3

Australian Competition Tribunal

Annexure B

'Review of parameters in the National Electricity Rules'

Associate Professor Martin Lally

Annexure C

'Empirical evidence on proxy beta values for regulated gas distribution activities'

Allen Consulting Group

Annexure D

'A Re-examination of the Historical Equity Risk Premium in Australia

Tim Brailsford, John C. Handley and Krishnan Maheswaran

Annexure E

'The Relationship Between Franking Credits and the Market Risk Premium'

Associate Professor Martin Lally