

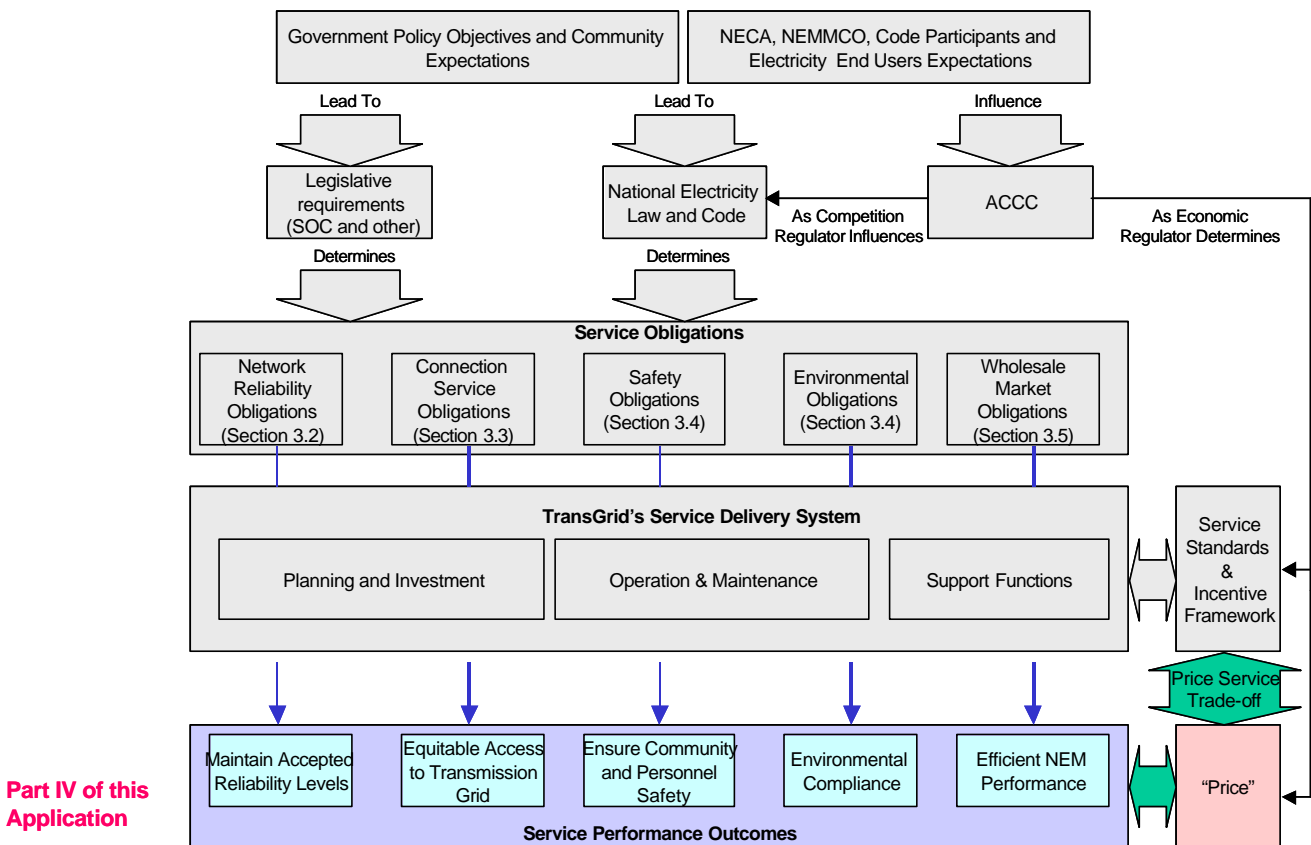
PART IV: PRICING THE SERVICE

Part IV of this Application outlines TransGrid's approach to determining the amount for each building block component of the PTRM, including opening RAB as at 1 July 2004, depreciation, working capital, tax, WACC, and pass-throughs, to support the required MAR.

There are three Chapters in this Part as follows:

- Chapter 8: Pricing the Service – Valuing the Assets.
- Chapter 9: Pricing the Service – Return on Capital.
- Chapter 10: Pricing the Service – Managing the Risks.

Figure 2-1: Framework for Business Operations and Service Delivery



8 Pricing the Service – Valuing the Assets

8.1 Introduction

This Chapter sets out TransGrid's proposed opening asset base for the 2004/05 to 2008/09 regulatory period.

TransGrid is the first TNSP to go through a second regulatory review by the Commission. As a result, this is the first time that the basis for establishing the opening asset base for the second regulatory period has been considered.

There is little formal guidance on the approach to be taken to establishing the opening regulatory asset base for a second review. The Code leaves open the possibility that the opening asset base will be based on a revaluation. An alternative approach, adopted by other regulators, is to roll forward the RAB from the previous period after adjusting for actual events.

TransGrid has sought guidance from the Commission as to its preferred approach. The Commission has notified TransGrid that the opening asset base is to be determined on the basis of a roll-forward of the previous opening asset base. TransGrid has therefore undertaken a roll-forward of the initial asset base determined by the Commission in its previous determination. We note that the principles in this regard are still evolving and the final decision will need to be reviewed in the light of the public consultation process.

8.2 Code Requirements

The Code sets out the objectives for the transmission regulatory regime to be administered by the Commission (clause 6.2.2) and principles for the regulation of transmission aggregate revenue (clause 6.2.3).

The Code states that the Commission must have regard to providing a fair and reasonable risk-adjusted cash flow return to Transmission Network Service Providers on efficient investment. In relation to Asset Valuation, clause 6.2.3(d)(4) of the Code sets out the following principles:

- Assets created at any time under a take or pay contract are valued in a manner consistent with the provisions of that contract.
- Assets created at any time under a network augmentation determination made by NEMMCO are valued in a manner that is consistent with that determination.
- Assets in existence and generally in service on 1 July 1999 (also known as 'sunk assets') are valued at the value determined by the Jurisdictional Regulator or consistent with the regulatory asset base established in the participating jurisdiction, provided that the value of these existing assets must not exceed the *deprivation value* of the assets.
- Valuation of assets brought into service after 1 July 1999 (new assets), any subsequent revaluation of any new assets and any subsequent revaluation of assets existing and generally in service on 1 July 1999 is to be undertaken on a basis to be determined by the Commission. In determining the basis of asset valuation to be used, the Commission must have regard to:

- the agreement of the Council of Australian Governments (“COAG”) of 19 August 1994, that deprival value should be the preferred approach to valuing network assets;
 - any subsequent decisions of the Council of Australian Governments; and
 - such other matters reasonably required to ensure consistency with the objectives specified in clause 6.2.2.
- Benchmark returns to be established by the Commission are to be consistent with the method of valuation of new assets and revaluation, if any, of existing assets and consistent with achievement of a commercial economic return on efficient investment.

The initial valuation of TransGrid’s regulatory asset base at the time of the previous Commission Decision was determined under derogation from the above provisions.

The Code therefore provides for both an initial valuation of sunk assets (under 6.2.3(d)(4)(iii)) and for subsequent revaluations (under 6.2.3(d)(4)(iv)). The basis for any subsequent revaluation is to be determined by the Commission, having regard to the agreements by COAG.

8.3 Regulatory Principles

The Commission discusses its intended approach to asset valuation and to revaluation in its Draft SORP.

In its draft SORP, the Commission advocates the use of a DORC approach in determining the maximum value of the regulatory asset base.¹⁸ This valuation may then be adjusted downwards as a result of any perceived threat of bypass or any evidence that the asset base exceeds the ODV of the system.

The draft SORP also considers revaluations of the regulatory asset base.¹⁹ The Commission comments that the Code does not preclude the regulator from periodically revaluing the regulatory asset base according to a valuation methodology such as DORC, and that revaluing the asset base at DORC has a number of benefits.

The Commission comments that either of two components may trigger a revaluation of the asset base:

- changes in replacement costs; and/or
- an increasing redundancy of assets.

However, in its discussion the Commission noted that a DORC revaluation could result in a windfall capital gain or loss to the business that is not intended. To address this concern the Commission commented that it intended to adjust the depreciation allowance over time.²⁰

In practice, the Commission in its decision in relation to ElectraNet adopted an approach of rolling-forward the initial regulatory asset base previously determined for ElectraNet.

The draft SORP separately considers the valuation of easements. The Commission noted that it would be improper for the regulator to deny a reasonable return on easements. However, the

¹⁸ Draft Statement of Regulatory Principles, Section 4.3 An Asset Valuation Methodology, Page 48

¹⁹ Draft Statement of Regulatory Principles, Section 4.4 Revaluation of the Regulatory Asset Base, Page 49

²⁰ Commission, Draft, Statement of Principles for the Regulation of Transmission Revenue, May 1999, Page 29.

Commission noted that it considered that a change in the valuation of easements should be reflected in depreciation.²¹

Subsequent to the draft SORP, the Commission has adopted a revised approach to the valuation of easements in its Decisions in relation to Sydney Airports Corporation and for SPI PowerNet. The approach adopted by the Commission is one of valuing easements at a deemed historic purchase cost.

In relation to depreciation, TransGrid notes that the Commission has revised the position contained in the draft SORP and has adopted straight-line depreciation in its Determinations in relation to other electricity TNSPs.

TransGrid contends that either a roll-forward of the initial asset base determined at the time of the previous review or the use of DORC to revalue its asset base (with the exception of easements) would be consistent with the regulatory framework.

8.4 Opening Asset Base for the 1999/00-2003/04 Regulatory Period

The opening asset base determined by the Commission for TransGrid at the time of the previous regulatory determination was \$1,935 million (as at 1 July 1999).

At the time of the previous regulatory review, the NSW Treasury commissioned Gutteridge Haskin and Davey Pty Ltd, Worley International Ltd and Arthur Andersen ("GHD") to undertake a DORC valuation for TransGrid's system assets. The GHD DORC valuation was \$2,064 million (December 1998).

This valuation was independently reviewed by Sinclair Knight Merz ("SKM") for the Commission. SKM's revised DORC valuation, which also included non-system assets, was \$2,103 million (December 1998).

The Commission Determination in relation to TransGrid's opening asset base was based on SKM's DORC valuation. However, the Commission adjusted this valuation to account for a deferral in the re-optimisation of 500kV assets (a reduction of approx. \$70 million)²² and the addition of work in progress relating to outstanding past Capex. The Commission also valued easements at their rolled-forward deemed historic purchase cost, rather than their DORC valuation.²³

8.5 Opening Asset Base for the 2004/05-2008/09 Regulatory Period

TransGrid proposes an opening asset base for the 2004/05 to 2008/09 regulatory period of \$3,047.4 million (as at 1 July 2004).

This opening asset base is based on a roll-forward of the opening asset base determined for TransGrid by the Commission at the time of the last review. The previous opening asset base has been rolled forward on the basis of actual Capex subsequent to the valuation.

²¹ Draft Statement of Regulatory Principles, Proposed Statement S4.2 and discussion p.45-46.

²² Note that the re-optimised value for the 550kV assets was instead included as part of the capex projections the Commission allowed for TransGrid over the current regulatory period (in 2001/02).

²³ Commission Decision, NSW and ACT Transmission Network Revenue Caps, 1999/00-2003/4, p. 64.

The remainder of this section discusses the approach that has been taken to rolling forward the asset base.

8.5.1 Rolling-Forward the 1999 Opening Asset Valuation

Under the roll-forward approach, the opening RAB from the previous review is used as a starting point and then actual capital expenditure, additions, disposals and indexation are combined with either forecast or outturn depreciation to calculate the opening RAB for the current review.

This methodology is similar to that used to calculate the RAB during the initial regulatory review, i.e. in each year the opening RAB is adjusted for:

$$\text{Opening RAB}_t + \text{CAPEX}_t + \text{ADD}_t - \text{DEP}_t - \text{DIS}_t + \text{IND}_t = \text{Closing RAB}_t$$

Where:

| | |
|--------------------------|---|
| Opening RAB _t | is the opening RAB in period t |
| CAPEX _t | is the capital expenditure in period t less customer contributions |
| ADD _t | is any additions to the network during period t |
| DEP _t | is depreciation in period t |
| DIS _t | is disposals in period t |
| IND _t | is indexation in period t |
| Closing RAB _t | is the closing RAB in period t and is equal to the opening RAB in period t+1. |

In the previous regulatory Decision for TransGrid, the Commission estimated each of the above variables in order to establish a closing RAB for TransGrid at 30 June 2004. However, this estimate of the closing RAB at 30 June 2004 at the time of the previous Decision will differ from the roll forward RAB determined as part of the forthcoming review, due to differences between forecast and outcomes over the current period, including:

- differences between forecast and outturn inflation;
- spending on investment in new capital by TransGrid which differs (in timing and/or amount) from that included in determining the previous revenue requirement;
- unforeseen additions and disposals; and
- differences in depreciation, due to unexpected changes in the RAB.

To roll forward the RAB, TransGrid has recalculated the RAB for each year of the previous regulatory period. In the sections below we discuss each of the key components of the roll forward.

8.5.2 Starting Point for the Roll-Forward

The starting point for the roll-forward is the asset value determined by the Commission at the time of the previous determination, i.e. \$1,935 million (as at 1 July 1999).

8.5.3 Capital Expenditure

The roll-forward then takes into account actual capital expenditure over the 1999/00-2002/03 period and projected expenditure for 2003/04. Additions and disposals of assets have been incorporated into the roll-forward at the time at which the assets were acquired or disposed.

Actual capital expenditure undertaken by TransGrid in the current regulatory period has been discussed in Chapter 4. Actual capital expenditure on an annual basis is set out in Table 8-1 below. This expenditure includes spending on easements and land acquisitions.

Table 8-1: Actual Capital Expenditure

| Financial Year | 1999/00 (\$ million) | 2000/01 (\$ million) | 2001/02 (\$ million) | 2002/03 (\$ million) | 2003/04 (\$ million) | Total (\$ million) |
|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-----------------------|
| Actual Capital Expenditure (on an as incurred basis) | 187.8 | 155.2 | 229.2 | 243.2 | 251.3 | 1,066.7 |

Note: The Capital Expenditure is exclusive of interest during construction and includes approximately \$70 million in 2001/2002 for re-optimisation of 500kV transmission assets.

TransGrid has rolled-forward its RAB on the basis of capital expenditure 'as incurred', rather than 'as commissioned'.

All of the above capital expenditure relates to the provision of regulated services. TransGrid's asset register identifies both regulated and non-regulated assets and capital expenditure between the two is determined on the basis of prescribed cost allocation guidelines.

As discussed in Chapters 4 and 5, the differences between the regulatory allowance and actual capital expenditure were due to a combination of factors, notably variations to accommodate environmental and community considerations that became apparent during the public consultation and detailed design phases, changes in the market for supply of equipment, and 'latent' conditions that came into effect during the construction phase.

Therefore, the capital expenditure undertaken is considered prudent and TransGrid has incorporated actual capital expenditure in rolling forward its asset base. TransGrid notes that the roll-forward on the basis of prudent expenditure is consistent with the approach taken by the Commission in its determination for ElectraNet and is consistent with the approach adopted by other regulators, including the ESC in Victoria, SA and IPART in NSW.

Achieving completion deadlines may sometimes involve the acceptance of increased costs in order to ensure the early or timely delivery of significant benefits, including ensuring adequate network reliability or reduced wholesale market prices.

The re-optimisation of the 500kV assets affected by QNI has been treated in the roll-forward as Capex in 2001/02, in line with the Commission's previous Determination. The value of the SMHEA transmission assets have been incorporated into TransGrid's asset base at the end of 2002/03, rolled-forward on the basis of the Commission's Determination in relation to those assets.

8.5.4 Allowance for Returns Yet to be Recouped in the Current Regulatory Period

As noted above, TransGrid has incurred additional prudent Capex in the current regulatory period above that included the Commission's previous Decision. Chapter 4 highlighted that TransGrid will only have a continuing incentive to undertake such prudent expenditure in excess of levels determined by the regulator if it is not penalised for doing so. Specifically, the return

which TransGrid has not been able to receive on that capital expenditure in the current regulatory period needs to be explicitly recognised and provisions needs to be made for TransGrid to recover this foregone return.

In rolling forward the asset base, TransGrid has therefore made explicit allowance for the foregone return by capitalising the return on expenditure above the levels incorporated in the Commission's previous regulatory Decision. Specifically, the foregone return on capital expenditure in excess of the levels incorporated in the previous Decision has been calculated for each year on the basis of the real, pre-tax WACC calculated by the Commission in its previous Decision, adjusted for actual inflation.²⁴ The resulting amount has been rolled into the asset base at the end of the current regulatory period, to form part of the opening RAB for the forthcoming regulatory period. As a result, TransGrid will recover the foregone return over the life of the assets.

8.5.5 Depreciation

In the Commission's Post-Tax Revenue Model the depreciation allowance is calculated by straight-line depreciation net of inflation, i.e., the depreciation netted against the expected nominal increase in the RAB. However, in determining a roll forward it is conceptually simpler to consider depreciation and indexation independently.

The roll-forward of the asset base could be done either on the basis of the amount of depreciation given in the Commission's previous decision, or depreciation could be recalculated to reflect the actual outturn Capex, additions/disposal and inclusions/exclusions during the regulatory period.

The choice between these two approaches is essentially one in relation to the time profile of the return of capital to asset owners.

TransGrid has rolled-forward on the basis of the depreciation allowed in the previous determination. This approach has the advantage of simplicity and is consistent with that adopted by other regulators. If depreciation were to be recalculated, allowable revenues in the new regulatory period would also need to reflect the extent of the adjustment, in order to avoid any windfall gains/losses by TransGrid.

Specifically, the roll-forward of the RAB has adopted the depreciation amounts set out in the Commission's previous decision, adjusted to reflect the difference between the CPI assumed in the Commission's decision and actual out-turn CPI.²⁵

8.5.6 Indexation

In the previous regulatory review the Commission estimated that inflation would average 3.15 per cent over the regulatory period.²⁶ In rolling forward the asset base, outturn inflation has been used, rather than estimated inflation. Specifically, TransGrid in rolling-forward its asset base has used the actual headline CPI rate for the March Quarter 1999-2003 and an estimate for March 2004.

March Quarter CPI has been used for consistency with the CPI rate which has been used to adjust TransGrid's MAR over the regulatory period. The estimate of the CPI rate for March

²⁴ The real-pre tax WACC determined by the Commission in the previous period was 7.35 per cent (Commission, *NSW and ACT Transmission Network Revenue Cap 1999-2004*, January 2000, page 43). This has been converted to a nominal, pre-tax WACC for each year on the basis of the actual CPI increase. A pre-tax rather than a post-tax WACC has been used to provide compensation for tax.

²⁵ Depreciation amounts used are those set out on p.106 of the Commission's Decision.

²⁶ Commission, *NSW and ACT Transmission Network Revenue Cap 1999-2004*, January 2000, p. 19.

2004 has been based on the difference between current Treasury Coupon Bonds and Treasury Capital Indexed Bonds, with the closest maturity date to March 2004.

During the last regulatory period the Commonwealth Government introduced a Goods and Services Tax ("GST"). The effect of the GST was to cause a one off increase in inflation over the 2000/2001 financial year. In its Decision regarding ElectraNet, the Commission indicated that it considered that regulated asset prices should escalate at a rate less than the headline CPI to remove the effects of the GST, and the Commission removed 2.5 percentage points from the headline CPI in rolling forward ElectraNet's asset base.

Excluding the effects of the GST in this way results in a fall in the real value of the RAB. In the absence of sufficient compensation through the rate of return, asset owners would suffer a windfall loss under this approach. As a result, TransGrid contends that it would be incorrect to adjust the headline 2000/01 CPI rate for the impact of GST in rolling forward the asset base. Specifically, the adjustment made to TransGrid's allowed MAR in 2000/01 was not predicated on an assumption that TransGrid's asset base would be reduced in this manner.

8.5.7 Revised DORC Valuation

TransGrid has adopted a roll-forward of the 1999/2000 asset valuation in determining its opening asset base for the 2004/05 - 2008/09 regulatory period. The opening asset value determined on the basis of the roll-forward approach is \$3,048.06 million (as at 1 July 2004).

For comparison, TransGrid has also undertaken a detailed, ground-up revaluation of its existing asset base, using the latest costing information. The revaluation has been undertaken on a DORC basis, with the exception of easements, where the previous valuation has been rolled-forward (consistent with the Commission's approach to the treatment of easements for other regulated businesses). The revaluation has been independently reviewed by Meritec. The implied opening asset base for the 2004/5-2008/9 regulatory period under the revaluation approach is \$3,062 million (as at 1 July 2004).

8.6 Rolling-Forward the Asset Base Over the 2004/5-2008/9 Period

Having established the opening asset base for the 2004/05 –2008/09 regulatory period, TransGrid proposes that this asset value be 'rolled forward' over that period on the basis of expected capital expenditure during the period, straight-line depreciation (based on standard asset lives) and projected disposals.

In order to determine how the asset base is expected to change during the regulatory period, it is proposed that forecast Capex be added to the regulatory asset base in the year in which it is expected to be spent, and on the basis of estimated costs. Forecast Capex over the regulatory period is described in Chapter 5.

TransGrid's proposed approach to depreciation is discussed more fully below.

8.7 Depreciation

The majority of assets in the regulatory asset base to be depreciated on a straight-line basis over the life assigned to the assets when constructed or acquired. The exceptions are a small group of assets for which TransGrid is seeking application of accelerated depreciation.

An important issue in applying straight-line depreciation to the opening value (as at 1 July 2004) of existing assets is the method used for assessing the remaining lives for depreciation purposes.

8.7.1 Determining Remaining Asset Lives for Depreciation Purposes

It is understood that the Commission's current approach is to divide regulatory depreciation into two components and to separately determine depreciation on initial opening assets and on new capital expenditure. Depreciation on the initial opening asset base is calculated by reference to the average asset lives in each of a limited number of asset categories at the beginning of the regulatory period. Depreciation on new capital expenditure over the forthcoming regulatory period is determined in relation to the Commission's standard asset lives.

For the purpose of calculating regulatory depreciation on existing assets, therefore, it is necessary to calculate an average remaining life for each asset category as at 1 July 04. The adoption of average asset lives simplifies the calculation of depreciation but comes at the cost of precision. This is because assets within each category that are older than the average are depreciated over a period longer than their remaining economic life, while assets younger than the average are depreciated over a period shorter than their remaining economic life. It is not possible to derive a formula for 'average remaining' life that ensures these two effects always cancel out.

For the purposes of this Application, TransGrid has adopted an approach to deriving the average asset life for existing assets under which average remaining asset lives are rolled forward from the 1999 Decision to 1 July 2004, using the depreciated values to weight the average asset lives within each asset category. This approach reduces the influence of inflation and age of assets on the calculated depreciation rate, as the weights applied to remaining lives are equal to the (inflation adjusted) value of the assets. This approach is set out in detail in Attachment 9.

Although this method has been used in formulating this Application it is not the only possible method available and is not necessarily endorsed by TransGrid at the time of making this Application. However, it does provide a reasonable reference point for developing the appropriate regulatory principles to apply to this aspect of transmission revenue regulation.

8.7.2 Depreciation of New Assets Established During the Next regulatory Period

For new assets projected to be built over the 2004/5-2009/10 regulatory period, TransGrid has followed standard practice in calculating depreciation by assigning a regulatory life to assets that equate to their expected economic or technical life. In general, the regulatory, economic and technical lives of an asset coincide. The lives applied to the assets are set out in Table 8-2 below.

Table 8-2: Asset classes and lives

| Asset Class | Years of Useful Life |
|-----------------------------------|-----------------------------|
| Transmission Lines | 50 |
| Underground Cables | 45 |
| Substations | 40 |
| SCADA and Communication Equipment | 15 |
| Easements and Land | N/A |
| Other | 10 |

However, as noted above, TransGrid is seeking to have some new assets subjected to accelerated depreciation.

8.7.3 Accelerated Depreciation

TransGrid is in the process of replacing lines in some areas with higher capacity lines. These assets are being replaced (rather than assets being constructed in addition) in order to re-use line routes. Examples of such replacement are:

- Tuggerah-Sterland line.
- Yass- Wagga line.
- Yass 330kV substation.
- Orange 132kV substation.

TransGrid proposes to accelerate the depreciation of the assets that have been replaced. In total these assets have a value of around \$8 million.

8.7.4 Clarifying the Regulatory Principles to Apply to Depreciation

As discussed in Chapter 4, TransGrid is mindful of the possible implications for transmission prices resulting from large irregular network investments over time. It may be considered appropriate to smooth the price impact arising from these investments over more than one regulatory period.

However, to the extent that regulated returns may be reduced from current levels and/or become more uncertain over time, TransGrid would consider it most inappropriate to simultaneously be compelled to delay the recovery of its capital. There is clearly an important link between the approach taken by the Commission to regulated returns and depreciation in the context of providing incentives for efficient investment in transmission.

In light of these considerations, and in the context of settling the Commission's Statement of Regulatory Principles in this area, TransGrid seeks further dialogue with the Commission on depreciation profile options ahead of the Commission's draft determination of TransGrid's MAR.

8.8 Working Capital

In addition to its regulatory asset base, TransGrid contends that it should also be permitted to earn a return on the working capital required for it to maintain its business.

Working capital is the capital required to provide for timing differences between cash inflows (revenues) and cash outflows (expenses) over the operating cycle of the entity and is universally accepted as a necessary and efficient cost incurred by business as part of their ordinary activities.

TransGrid believes that the justification for a return on working capital is no different to the requirement for a return on capital assets. In both cases, investors commit funds at a point in time, have their funds returned at some time in the future, and in the meantime require a return to compensate for the opportunity cost of the capital employed. Unlike the value of physical assets, the value of working capital fluctuates depending on the level of receivables outstanding.

The inclusion of working capital in the revenue requirement recognises the capital committed to receivables and other normal business activities at any one point in time. TransGrid believes

that the value of this committed capital should earn the same regulated return as capital invested in the system assets, as it is an intrinsic aspect of running a business, regulated or otherwise. TransGrid therefore contends that the Commission should include an allowance for working capital in calculating the revenue requirement, in order to align with commercial practice and ensure financial capital maintenance. We note that IPART includes an allowance for working capital for NSW Distribution Network Service Providers.

In determining its total revenue requirement for the forthcoming period TransGrid has therefore calculated its working capital and applied the cost of capital derived in the following section in order to determine the appropriate return on working capital which it should be allowed to recover in the forthcoming regulatory period.

8.9 Tax

TransGrid has estimated the asset lives and asset values for tax depreciation purposes and has included these in Appendix 1 of this Application for use by the Commission in the Commission's Post-Tax Revenue Model. This model is expected to estimate tax deductions for regulatory purposes on the basis of:

- TransGrid's actual tax depreciation; and
- the interest costs derived consistent with the CAPM parameters set out in the discussion of the WACC.

This is consistent with the Commission's approach in other decisions.

However, TransGrid considers that this approach effectively results in a loss of value to its shareholders (the people of NSW) relative to those of privately owned businesses – such as gas transmission and distribution businesses in NSW. This also has the effect of creating competitive non-neutralities as between gas and electricity as competing energy sources.

TransGrid notes that alternative approaches exist that may have considerable merit. On further reflection and consultation with the Commission, TransGrid may adopt an alternative approach in its submission on the Commission's draft determination.

8.9.1 Non-Neutralities in the Commission's Standard Approach

A core principle of competition policy is to establish a level playing field between private and state owned business. In this respect it is important that the Commission maintains competitive neutrality when estimating the cost of tax for different energy transmission and distribution businesses.

In this context, it should be noted that privately owned energy transmission and distribution businesses would tend to have considerably lower tax value of assets relative to their regulatory asset base. The primary reason for this is that the tax asset base in such businesses is set in historical terms and, hence, is not adjusted for inflation.

In contrast, when TransGrid was corporatised in December 1998, a NSW Treasury endorsed decision was taken to base the tax value of assets on the optimised depreciated replacement cost ("ODRC") of assets at that time. Unlike the tax value of assets for privately owned businesses, ODRC adjusts for inflation from the time the asset was installed and uses economic rather than taxation life to estimate the current value of that asset. In industries with long-lived assets and accelerated tax depreciation (and moderate to high inflation over the life of most assets), this is likely to mean that ODRC values are several multiples of tax values.

The affect of this is that TransGrid will have a higher level of tax depreciation (owing to its higher tax values based on ODRC) than would privately owned energy businesses. The fact that ownership in gas industries has historically been more heavily weighted to private ownership (especially in NSW) means that this issue goes not just to competitive neutrality between private and government owned businesses, but also between electricity and gas industries.

The above non-neutralities have only become an issue since regulators began adopting a post-tax approach to the calculation of the return on assets. Prior to this, all businesses, whatever their ownership structure and history, received the same compensation for tax as a proportion of their regulatory asset base (assuming they had the same WACC). This is because the compensation for tax was embedded in the pre-tax WACC that was applied to the regulatory asset base.

8.9.2 An Alternative Approach

An alternative approach which may be more appropriate in the current circumstance would be to adopt, in the calculation of the cost of tax, the tax value of assets that would have existed had all assets been depreciated for tax purposes since the time they were installed ready for use. This approach has the advantage that it gives the same tax value of assets for a business no matter what its ownership history (i.e. the tax value of assets is not dependent on whether the asset was publicly or privately owned). This would reduce the potential distortion in prices between gas and electricity transmission and distribution – given the different ownership histories in these sectors.

8.9.3 Other Regulatory Precedents

The Victorian Essential Services Commission (“ESC”) (previously the Victorian Office of the Regulator General (“ORG”)) has adopted an approach not dissimilar to the alternative set out above. In their 2000 electricity distribution decision, the ORG ignored the actual tax values of Victorian electricity distributors and instead the tax value of assets for regulatory purposes was calculated by:

- assuming the tax value of assets to be equal to the regulatory asset base as at 1 July 1994; and
- then adjusting this value forward to account for tax depreciation since then and additional capital expenditure - using a number of benchmark tax rates of depreciation, which were provided by the ORG’s tax experts.

It is likely that the value so calculated was substantially less than the actual tax asset values of distributors – thereby increasing their compensation for tax. This is because the businesses were privatised prior to 4 August 1997 and were therefore able to value assets for tax purposes at their purchase price - which in the case of the Victorian electricity businesses was substantially higher than the regulatory value of assets at 1994 prices.

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9 Pricing the Service – Return on Capital

9.1 Introduction

The highly capital intensive nature of electricity transmission means that the return on capital comprises around 50% of TransGrid's total costs of operation. Consequently, the regulated return on capital is a critical variable in determining the commercial outcomes for TransGrid associated with meeting service obligations, as well as the commercial incentives to sponsor the development of interconnection in the NEM.

This Chapter of the Application has the following structure:

- Section 9.2 addresses 'big picture' framework issues such as the role of the regulated cost of capital in influencing TransGrid's business decisions.
- Section 9.3 addresses technical issues in the estimation of Capital Asset Pricing Model (CAPM) parameters.
- Section 9.4 addresses the debate over the use of 'the international' versus 'the domestic' CAPM that is evident from previous regulatory decisions and the expert papers commissioned by the Commission.
- Section 9.5 provides a brief summary of TransGrid's conclusions and the final CAPM parameters used to estimate the cost of capital.

9.2 Framework Issues

In order to understand the role and importance of the regulated return on capital it is important to have a clear view of the business environment within which regulated transmission companies operate. In particular, the benefits of investment in transmission (or the costs of insufficient investment) and the institutional framework within which investment projects receive recognition for revenue setting purposes are key considerations.

9.2.1 *Asymmetric Costs Of Under/Over Investment*

The benefits of transmission investment in terms of delayed generation investment, reduced generation market power and increased network reliability can be significant. Similarly, the costs of under investing in transmission can be catastrophic. While the causes of the recent North East America blackout affecting some 50 million people are still uncertain, a number of commentators have singled out long periods of under-investment in transmission as a probable factor. This system failure comes hard on the heels of the energy crisis in California where insufficient transmission capacity from other US States was a significant contributory factor.

The Californian energy crisis provides a useful counterpoint to the North East American system failure as it illustrates the costs of insufficient transmission investment even when system collapse can be avoided. In California, transmission system collapse was avoided via the introduction of rolling blackouts that, nonetheless, caused great economic and social dislocation. Had sufficient transmission capacity from other States existed, these rolling blackouts could have been avoided or at least been significantly reduced.

Closer to home, the experience in Auckland New Zealand in 1998 when power was lost to the CBD for a period of five weeks have already been discussed. That this calamity, and the associated consequences, was due to a transmission failure illustrates the asymmetric cost of under-investment in, and maintenance of, transmission assets. More recently, also in New

Zealand, transmission congestion, due to lack of investment to relieve transmission constraints, has contributed to material increases in energy costs to many electricity users.

The Productivity Commission focused on these costs in its March 2001 Position Paper on its inquiry into the National Access Regime:

“The possible disincentives for investment in essential infrastructure services are the main concern. In essence, third party access over the longer term is only possible if there is investment to make these services available on a continuing basis. Such investment may be threatened if inappropriate provision of access, or regulated terms and conditions of access, lead to insufficient returns for facility owners. While the denial or monopoly pricing of access also imposes costs on the community (see above), they do not threaten the continued availability of the essential services concerned. Thus, over the longer term, the costs of inappropriate intervention in this area are likely to be greater than the costs of not intervening when action is warranted. The substantial information and other difficulties that confront regulators in establishing access terms and conditions, make this asymmetry in the benefits and costs of access regulation even more important in a policy context.”²⁷

9.2.2 The Role Of The Regulated Return On Capital

The regulated cost of capital is an important instrument in ensuring that the costs of under investment in transmission assets are avoided. However, it is important to note that the level of the regulated return on capital required to ensure sufficient investment depends on the nature of the regulatory approval process.

The National Electricity Code provides for what can be termed a ‘proponent-auditor’ model and it relies on the transmission company as proponent (‘champion’) of investment proposals and on the regulator and other public scrutiny procedures as ‘reality checks’ on the reasonableness of the transmission company’s proposals. Under this process new transmission investments require navigation through the mechanism of the regulatory test, associated consultation processes, environmental approval processes, and possible legal appeals by affected parties. In the event that the Commission is not satisfied that the outcome is prudent it can consider reducing the value of the asset in question for regulatory purposes.

Major transmission investments will always create winners and losers, with the losers generally having a strong incentive to ensure that all avenues to prevent investment are exploited – as we have seen recently with repeated appeals against the SNI interconnector. In this institutional setting it is insufficient to set the regulated cost of capital equal to the ‘true cost of capital’. This is because setting the reward for investment equal to the cost of investment risks leaving the transmission company indifferent between proposing and not proposing the investment. In such circumstances, the transmission company would have little reason to ‘champion’ one level of investment over another – and no obvious incentive to identify the ‘optimal’ level of investment. If there are costs associated with the approval process that are not included in the regulated capital base of the investment (such as the costs of defending a project in legal appeals) then setting the regulated cost of capital equal to the actual cost of capital will create a disincentive for the transmission company to champion new investment.

Put simply, if the regulatory approval process requires the transmission company to act as the proponent for new investment it must provide the company with sufficient incentive to ensure that *at least* the optimal level of investment is proposed. If the regulated cost of capital is set equal to the actual cost of capital there is little or no financial incentive for the regulated transmission propose any new investments let alone the optimal level investment. Consequently, a small margin above the actual cost of capital can ensure that the proponent-auditor regulatory approval model is capable of ensuring sufficient investment occurs. Of course, in such a model, it is possible that the transmission company may propose greater than

²⁷

Productivity Commission, Review of the National Access Regime, Position Paper, page xviii – xix.

optimal levels of investment in order to benefit from the higher regulated cost of capital. However, provided that the 'auditor' functions of the public approvals process are adequate this will not result in inefficiently high levels of actual investment by the transmission company. Indeed the risk that non-prudent capital expenditure will not be included in the regulatory asset base at each regulatory reset is an integral part of the NEM transmission regulatory reset process. Thus the incentives to avoid the economic costs of inefficient transmission investment are in place and material.

The margin above the actual cost of capital under such a model should be viewed as a necessary cost in financing the efficient running of the approval process. This cost of the approval process is likely to be significantly lower than the cost of establishing an external network planning body with the expertise, information and incentive to identify optimal network investments. Furthermore, it is consistent with the resource allocation mechanisms of a competitive market – where new investment is only attracted to an industry requiring investment when the expected rate of return in that industry rises *above* the actual cost of financing that investment.

Of course, if the regulated cost of capital is set *below* the true cost of capital then there will be strong incentives for transmission companies not to invest in transmission assets irrespective of the regulatory approval processes.

The remainder of this Application attempts to determine the actual cost of capital for an efficient transmission business. However, we believe that the Commission should also include a margin above this in the regulated cost of capital as an explicit recognition of the cost of funding an efficient approval process and ensuring that the asymmetric costs of under investment versus over investment are adequately recognised. This will help ensure that TransGrid has adequate incentive to 'champion' an efficient level of projects over regulatory approval hurdles, negotiate demanding public consultation processes, manage environmental approval processes, defend any legal challenges and take on the ownership risks associated with those assets.

9.2.3 Cost of Capital Framework

As part of the upcoming revenue reset, TransGrid has developed a benchmark estimate Weighted Average Cost of Capital ("WACC") for the company's regulated transmission services. The approach adopted here is to estimate the actual cost of capital necessary to make TransGrid indifferent between investing and not investing in additional transmission assets. For the reasons described above, we consider that the regulated cost of capital should be set above this level.

The following estimate of the WACC adheres to the definition in Schedule 6.1 (Clause 2.1) of the Code for a:

"rate of return required by investors in a privately-owned company with a risk profile similar to that of the network company."

The methodology broadly follows the approach adopted by the Commission in its previous revenue cap decisions for electricity transmission entities. The parameter values that we have adopted in the WACC formula are considered as the minimum appropriate level for TransGrid over the period 1 July 2004 to 30 June 2009.

9.2.3.1 Adoption of the post tax Capital Asset Pricing Model

The cost of equity in this Application is calculated in accordance with the international Capital Asset Pricing Model (CAPM). Consistent with finance theory the data on which CAPM parameters are sourced are derived from domestic Australian observations.

TransGrid has adopted the Commission's PTRM where cash flows are defined in nominal terms with the effects of tax expressed explicitly as a revenue building block. The PTRM adopts a nominal "vanilla" WACC, defined as:

$$\text{WACC} = R_e \cdot (E/V) + R_d \cdot (D/V)$$

where

- R_e = nominal cost of equity;
 R_d = nominal cost of debt;
 E/V = proportion of the asset base financed by equity; and
 D/V = proportion of the asset base financed by debt.

9.3 CAPM Parameters

9.3.1 Risk free rate of return

The risk free rate is the fundamental element in the WACC as it is used to determine both equity and debt costs. It is normally proxied by the rate of return on Commonwealth government issued debt.

9.3.1.1 Term of the risk free rate

TransGrid believes that the term of the risk free rate should be set equal to a period that is consistent with investors' investment horizon. TransGrid believes that this is best proxied by the yield on a ten-year Commonwealth Government security. However, the Commission has recently moved to use the yield on five-year Commonwealth bonds as a proxy for the risk free rate of return. This is a departure from past Commission practice and the practice of other regulators who use the ten-year government bond rate as the proxy for the risk free rate of return in the CAPM model.

In the event that the Commission continues to adopt this approach TransGrid considers that the Commission must consistently apply the five-year rate in the calculation of other parameters in the WACC. A further implication is that comparisons of WACC parameters adopted in other regulatory decisions can be misleading unless adjustments are made to account for the duration of the risk free rate adopted.

For the purposes of this Application TransGrid has adopted a nominal risk free rate of 5.01% and real risk free rate of 2.87%. These yields are based on the yields on 10-year Commonwealth bonds as at 30 June 2003²⁸ as reported by the Reserve Bank of Australia. Using the Fisher transformation, this implies an expected inflation rate of 2.08.

9.3.1.2 Sampling period for the risk free rate

TransGrid accepts the Commission's use of a 10-day sample in the *Victorian transmission network decision 2002*. The Commission estimated the risk free rate by reference to the moving average bond rate over the 10-day period immediately prior to the final decision.

This provides a compromise between ensuring that the sample is not contaminated by superseded news and the removal of possible market aberrations.

²⁸ The reference date for setting these parameters is subject to variation as set out in Section 9.3.1.2 of this Application. The choice of this date is simply, for administrative convenience, to align the date of WACC parameters with the base date for data used elsewhere in this Application which is 30 June 03.

9.3.2 Gearing

The capital structure is not a controversial decision in Australian regulatory decisions with a benchmark gearing ratio of 60 per cent generally applied. This reflects the Modigliani-Miller proposition that a company's value is invariant with changes in its capital structure. That is, the underlying risk of the asset remains unchanged within a reasonable range of gearing levels so that both the debt margin and equity beta will adjust to maintain a constant cost of capital. TransGrid supports the use of a gearing ratio of 60 per cent, which is consistent with recent regulatory decisions.

9.3.3 Systemic Risk - Beta Values

We support the Commission's continued practice of calculating the return on equity by reference to the CAPM. In the following sections we will estimate the appropriate equity beta for TransGrid and the current market risk premium for the Australian market. Beta values measure the additional systematic risk that an investor is exposed to by investing in the regulated business. As is discussed above, and in Attachment 16, this approach is consistent with the recognition that Australian equity markets are integrated with the rest of the world.

9.3.3.1 Equity Beta

Equity betas compensate the owners of equity for the riskiness of owning the business. As equity owners are the last to receive payments from cash flows, equity is significantly more risky than debt ownership. The level of riskiness increases with the level of debt gearing in the company. Given the regulatory decisions on the debt gearing, asset and debt betas, the tax rate and gamma, it is possible to calculate the equity beta for TransGrid.

The Commission has calculated the equity beta by reference to the Monkhouse formula:

$$b_e = b_a + (b_a - b_d) \times \left\{ 1 - \frac{R_d}{1 + R_d} \times (1 - g) \times T \right\} \times \frac{D}{E}$$

where:

- β_e = equity beta;
- β_a = asset beta;
- β_d = debt beta;
- D = market value of debt;
- E = market value of debt and equity;
- T = company tax rate;
- γ = value of imputation credits; and
- Rd= is the cost of debt.

Recent regulatory decisions on beta values are set out in the Table 9-1 below.

Table 9-1: Beta values in recent regulatory decisions

| Decision | Industry | Asset Beta | Equity Beta | Debt Beta |
|--|-----------------------------|------------|-------------|-----------|
| Victorian Revenue Cap Commission (2002) | Electricity Transmission | 0.40 | 1.00 | 0.00 |
| SA Revenue Cap Commission (2002) | Electricity Transmission | 0.40 | 1.00 | 0.00 |
| Queensland Revenue Cap Commission (2001) | Electricity Transmission | 0.40 | 1.00 | 0.00 |
| QCA (2001) | Electricity Distribution | 0.45 | 0.71 | 0.28 |
| Offgar (2003) | Gas Transmission | 0.60 | 1.20 | 0.20 |
| ESC (2000) | Electricity Distribution | 0.40 | 1.00 | 0.00 |
| IPART (1999) | Electricity Distribution | 0.35-0.50 | 0.78-1.14 | 0.06 |
| GasNet Commission (2003) | Gas Transmission | 0.50 | 1.00 | 0.18 |
| ESC (2002) ²⁹ | Gas Distribution | 0.40 | 1.00 | 0.00 |

For TransGrid, where there is no time series of market returns to estimate betas, we have used a variety of sources to estimate the appropriate beta for TransGrid's regulated network business. The sources that we have relied on include:

- recent regulatory decisions; and
- estimates from listed network businesses.

A breakdown of recent regulatory decisions on the asset beta is listed above. From that table it can be seen that recent regulatory decisions by the Commission have consistently given an asset beta of 0.4 for electricity transmission businesses, while other energy distribution regulators consider that the appropriate range is between 0.35-0.50 for electricity distribution and 0.40-0.65 for gas distribution and transmission.

This suggests that the Commission's decisions in relation to the asset beta have been at the low end of regulatory decisions. In its Powerlink and ElectraNet decisions the Commission based its estimate of the *equity beta* on the average equity beta in the Infrastructure and Utilities group on the Australian Stock Exchange. TransGrid considers that the approach of benchmarking against this index is reasonable given the lack of available data for businesses with identical activities to TransGrid.

However, the Commission makes no adjustment for the fact that the average gearing ratio for businesses in that index is around 40 percent³⁰ which is much lower than the 60 percent used in

²⁹ The ESC considered both the case with $B_a=0.4$, $B_D=0$, and $B_a=0.54$, $B_D=0.23$.

³⁰ In 1998 IPART estimated the average gearing rate for companies in this index to be 37% see IPART, *The Rate of Return for Electricity Distribution Networks*, Discussion Paper, DP-26, November 1998, p. 20. More recently NECG

regulatory decisions. The Commission recognises the need to adjust gearing when comparing equity beta's early in its ElectraNet decision.

“A change in the gearing will change the level of financial risk borne by the equity holders and therefore the equity beta. A common approach to enable betas to be compared across companies with different capital structures is to derive the beta that would apply if the firm were financed with 100 per cent equity. This is known as the asset or ‘unlevered beta’ and can then be used to calculate the equivalent equity beta for a particular level of gearing (known as ‘re-levering’ the asset beta).”
(Page 34)

However, in the Commission's conclusion on ElectraNet's equity beta it states:

“The Commission traditionally uses the infrastructure and utilities group average, which currently lies just below 1.0. ... Therefore, for the purposes of this final decision, the Commission will adopt an asset beta of 0.4 and a debt beta of zero, which equates to an equity beta of approximately 1.0.”

De-levering an equity beta of 1.0 with a gearing ratio of 0.4³¹ results in an asset beta of 0.60. Re-levering this with a gearing ratio of 0.6 gives an equity beta of 1.5. This is the appropriate figure to use when comparing the average equity beta in the Infrastructure and Utilities group with TransGrid's equity beta (assuming a gearing ratio of 0.6).

Another source of asset beta estimates is listed companies with comparable business activities as listed in Table 9-2 below.

Table 9-2: Beta estimates of listed Australian gas and electricity companies

| Firm | Primary Business | Equity Beta | Leverage (%) | Asset Beta |
|---------------|--------------------------------|-------------|--------------|------------|
| United Energy | Electricity distribution | 0.9 | 53 | 0.42 |
| AGL | Gas distribution and retailing | 0.7 | 30 | 0.49 |

Source, NECG report 'Analysis of the Weighted Average Cost of Capital for ElectraNet SA' April 11 2002.

In light of the above analysis, TransGrid considers that a range for the asset beta between 0.45 and 0.6 is appropriate. This range reflects regulatory precedent and market data, including on the average equity beta in the Infrastructure and Utilities group on the ASX (0.60). TransGrid has adopted an asset beta at the extreme lower end of this range, namely, 0.45.

Levering the asset beta applying the Commission's standard assumptions of a zero debt margin, a 50% value of tax credits, a 30% corporate tax rate, and a gearing ratio of 0.6, results in an equity beta of 1.12.

On this basis TransGrid is seeking the adoption of an equity beta of 1.12.

9.3.3.2 Debt beta

TransGrid supports the Commission's conclusion, in the *Powerlink*, *ElectraNet* and *SPI PowerNet* decisions, that the appropriate debt beta is equal to zero. However, TransGrid notes that the Commission's ElectraNet decision³² may be read as suggesting that zero debt beta is conservative – i.e. tends to result in an overestimate of the WACC.

has estimated the index ratio at 40% and 38% in 1999-00 and 2000-01 see *Analysis of the weighted average cost of capital for ElectraNet SA*, April 2002.

³¹ with a debt beta of zero, a value of gamma equal to 0.5, and a corporate tax rate of 30%.

³² Page 37

“The Commission considers that an appropriate value for the debt beta for this decision is zero. The Commission notes that this is also biased in favour of the service provider and it may be more appropriate to incorporate a positive debt beta in its future electricity regulatory decisions.”

TransGrid has asked NERA to advise on whether adopting a zero debt beta is conservative on the part of the Commission and NERA’s advice is outlined at Attachment 16.

In summary, NERA advises that adopting a positive debt beta within the CAPM framework would increase the estimated WACC rather than reduce it. NERA advises that this is because any observed equity beta will result in a higher asset beta when assuming a positive debt beta. In addition, a higher debt beta also results in a higher debt margin. The only circumstance where NERA envisages a higher debt beta reducing the estimated WACC is where an asset beta has been directly observed and is then re-levered to estimate the equity beta. However, NERA does not consider that this scenario is of significant interest as it is impossible to directly observe a firm’s asset beta.

On the basis of this advice TransGrid is conservatively proposing a value of zero for the debt beta for the purposes of this Application.

9.3.4 Market Risk Premium

The market risk premium (MRP) is a parameter in the CAPM that captures the premium above the risk free rate of return that investors expect to earn on a well diversified portfolio. The Commission has in recent decisions claimed that the market risk premium (“MRP”) has fallen in recent years. They have used this as a justification to suggest reducing the effective MRP below 6 percent.³³ The following sections:

- assess the long run MRP in Australian market;
- investigate the claim that the MRP has fallen in recent years; and
- scrutinise the effect of the Commission’s use of a five-year risk free rate.

9.3.4.1 Measuring long run market risk premiums

The MRP is expressed by the formula:

$$\text{MRP} = R_m - R_f$$

where:

$$R_m = \text{expected future return on the market portfolio;}$$

and

$$R_f = \text{return on the risk free rate.}$$

The risk free rate is easily measured with analysts near universally using as a proxy the yield on a 10-year Commonwealth bond. As expected future returns are not directly observable in the market, analysts make a number of assumptions on investor characteristics to estimate future expectations.

³³ This has been achieved by adopting 5-year risk free rate without increasing the measured MRP.

The analysis of an appropriate MRP has mainly focused on the following two approaches to calculating the expected future return on the market:

1. use of historical data; and
2. forward looking measures.

9.3.4.2 Historic data

Australian regulators commonly use historic data to estimating the forward-looking return on the market. Historical data is used as past market performance influences investors' expectations of the future MRP. From an historical evidence of market returns, the Table 9-3 below suggests that the Australian MRP is between 6 to 8 percent.

Table 9-3: Historic estimates of market risk premiums

| Source | MRP (%) |
|---|---------|
| Grey (2001) (based on 1883-2000) ³⁴ | 7.3 |
| Officer (2002) (based on 1882-2001) ³⁵ | 6.0 |
| NEC (based on 1952 to 2003) ³⁶ | 6.6 |
| AGSM (1999) (based on 1964-95, including October 1987) ³⁷ | 6.2 |
| AGSM (1999) (based on 1964-95, excluding October 1987) ³⁸ | 8.2 |
| Lally (2002) (based on 1900-2000 without the effects of imputation) ³⁹ | 7.0 |
| Officer (1989) (based on 1882-1987) ⁴⁰ | 7.9 |

9.3.4.3 Forward looking measures

The dividend growth model ("DGM") is the leading alternative approach to estimating the MRP. DGM uses expectations of future dividend growth combined with current equity prices and dividend payouts to estimate market returns.

Professor Kevin Davis (1998)⁴¹ a consultant for the Commission first proposed the use of DGM to estimate MRP in Australian regulatory decisions. He suggested:

'An alternative approach is to apply a valuation technique such as the dividend growth model to the market as a whole to derive the implied required rate of return. For example, the dividend growth model relates current price (P_0) to next

³⁴ Grey S., 'Issues in Cost of Capital Estimation' submission to the ESC, 2001.

³⁵ Officer R., 'A weighted Average Cost of Capital for a Benchmarked Australian Electricity Transmission Business', *A Report for SPI PowerNet*, February 2002, p27.

³⁶ National Electricity Code, schedule 6.1, section 3.2.

³⁷ IPART, 'Regulation of New South Wales Electricity Distribution Networks,' table5.2, December 1999, p36.

³⁸ Ibid.

³⁹ Lally M., 'The Cost of Capital Under Dividend Imputation', Prepared for the Commission, June 2002, p 22.

⁴⁰ Officer R., 'Rates of Return to Shares, Bond Yields and Inflation Rates: An Historical Perspective,' in *Share Market and Portfolio Theory*, 2nd ed, 1989 University of Queensland Press, St Lucia 1989, pp 207-211.

⁴¹ Davis K., 'The Weighted Average Cost of Capital for the Gas Industry', a report of the Commission and ORG, 1998, p14.

period's dividend (D_1) and the required return (r) and expected dividend growth in perpetuity (g) as:

$$P_0 = D_1 / (r - g)$$

which can be rearranged as:

$$\begin{aligned} r &= D_1 / P_0 + g \\ &= D_1 / P_0 + g_y + g_p \end{aligned}$$

where D_1/P_0 is the (prospective) annual dividend yield, and g (the annual growth rate of dividends) is assumed to match the growth rate of GDP divided into its components of expected real growth (g_y) and expected inflation (g_p)'

Professor Davis estimated that the use of the DGM suggested that the forward-looking MRP was in the range of:⁴²

'4.5 to 7.0 percent with figures at the lower end of that range more applicable.'

The large range in the MRP is due to the broad estimates of dividend yields, expected future real growth and expected inflation used by Professor Davis. In a more recent DGM study,⁴³ Grey estimated that the MRP in Australia was 5.93% if average market dividend yields from 1995-2000 were used. Updating the Grey study using dividend yields of 5.1 percent⁴⁴ and current tax rates of 30 per cent increases the estimate to 6.7 percent.

The variance in estimates out of the DGM can be attributed to the necessity to estimate three volatile series of dividend yields, inflation and GDP growth. Grey suggests DGM should not be used as a definitive measure of MRP as the long-term standard error from DGM is 3.12% p.a. This is substantially higher than estimates using historical data where the standard error is 1.59% p.a.⁴⁵

9.3.4.4 The Commission claim that MRP has been falling in Australia

The Commission, in recent decisions, have expressed the view that the MRP has fallen in recent years. In the *Victorian Transmission decision* the Commission relied on a consultancy report from Professor Kevin Davis. Professor Davis argued that the MRP was in the lower end of 4.5 percent and 7.0 percent.

It will always be highly contentious and problematic to argue that MRP has changed from its long run historical value. In essence, all such arguments come down to an argument about what MRP investors *should* demand (say given lower than historical inflation, more sophisticated investors etc.) rather than the MRP they have historically demanded. However, it is well documented in the finance literature that the MRP demanded by investors has been continually above the MRP finance theory suggests it *should* be. This phenomenon has been dubbed the "equity puzzle" in the literature.⁴⁶

Given this experience, and the importance of ensuring correct incentives for investment in transmission as discussed earlier, it is difficult to justify regulated businesses earning less than a historically normal rate of return. Using as the basis for reducing returns that theoretical

⁴² Ibid.

⁴³ Grey S., 'Issues in Cost of Capital Estimation' submission to the ESC, 2001, p10.

⁴⁴ Dividend yield of the All Ords from Comsec, 14/03/2003.

⁴⁵ Grey S., 'Issues in Cost of Capital Estimation' submission to the ESC, 2001, p8.

⁴⁶ See Mehra, "[Equity Premium Puzzle](#)", in *Mastering Investments*, ed. by James Pickford, FT-Prentice Hall, London, 2002.

reasoning suggests that the historical data is an overestimate of what investors *should* demand rather than what they actually do demand, is courageous indeed. Doing so would simply mean that that investors would have a strong incentive to desert that industry in favour of unregulated industries who will continue to offer the MRP demanded by investors.

DGM attempts to overcome potential biases in using historical data but, as demonstrated above, DGM is not precise enough to give definitive estimates the MRP. In any event, use of DGM currently provides estimates not significantly different from 6%. In addition, any focus on recent periods may reflect market volatility rather than changes in the MRP. Volatility in market prices will affect all methods used to estimate the MRP. For example, short-term falls in market prices will decrease those estimates that rely on historic data while increasing estimates that rely on DGM.

9.3.4.5 The use of a five year risk free rate

As previously noted all available historical and forward-looking estimates of the MRP are based on the differences in estimates of future market returns and the 10-year Commonwealth bond yield. The Commission's current policy of using a 5-year risk free rate with a MRP calculated using a 10-year risk free rate is problematic.

The Commission's *Statement of Principles for the Regulation of Transmission Revenues* defines the CAPM as:

$$R_e = R_f + B_e(R_m - R_f) \quad (\text{Eqn 6.1, p 73})$$

This equation states that the risk free rate used in the CAPM is the same as the risk free rate used to calculate the MRP. The MRP is defined this way to capture the additional compensation above the risk free rate that is necessary for equity investors to accept the risk of investing in the market. It follows that by decreasing the risk free rate without increasing the MRP the Commission has implied that market returns have fallen. Evidence of this proposition has not been made and the Commission is now out of step with most other Australian regulators.

The Table 9-4 below shows that most other regulators have used a MRP of 6 per cent with the exception of IPART, which gave a range of 5 to 6 percent. All other regulators in Australia use a 10-year bond rate. The difference between the five and ten year bond rates is approximately 0.2 percent.⁴⁷ The implication is that the MRP chosen based on historical estimates against the ten-year bond rate must be increased by 0.2 percent when using the five-year bond rate as the risk free rate.

Table 9-4: Market risk premiums in recent regulatory decisions

| Decision | Industry | MRP (%) |
|--------------|---------------------------------|---------|
| QCA (2001) | Electricity Distribution | 6.00 |
| IPRC (1999) | Electricity, water and sewerage | 6.00 |
| ESC (2000) | Electricity Distribution | 6.00 |
| IPART (1999) | Electricity Distribution | 5.0-6.0 |
| ESC (2002) | Gas Distribution | 6.00 |

9.3.4.6 Conclusion

⁴⁷ Lally M., 'Determining the Risk Free Rates for Regulated Companies', a report for the Commission, August 2002, p 12.

TransGrid strongly believes that the risk free rate must be set by reference to the ten year bond rate to better match the investment horizon of investors in long lived transmission assets. This gives rise to an appropriate MRP estimate of 6.0 percent. However, in recognition of the Commission's recent adoption of the five-year bond rate, we note that the appropriate market risk premium is 6.2 percent when measured against the five-year bond rate. This is consistent with the lower range of historical estimates that suggest that the Australian MRP is between 6.2 – 8.2 percent when compared to the 5-year bond rate. It is also necessary, for consistency with regulatory practice in other jurisdictions, that use the ten-year bond rate as the risk free rate.

On the basis of this analysis TransGrid is seeking the acceptance of a MRP of 6.0 consistent with its use of the ten-year bond yield as a proxy for the risk free rate. While TransGrid does not accept the use of the 5-year bond rate as the appropriate rate as the proxy for the risk free rate, in the event that the Commission adopts this position the MRP should be set to be consistent with this choice at a minimum of 6.2.

9.3.5 The Debt Margin

The Commission, in recent decisions, has separated the calculation of the cost of debt into three segments of the risk free rate, the debt margin and transaction costs. The risk free rate has been discussed previously. In the following section, TransGrid estimates that a debt margin of between 125 and 150 basis points would be appropriate for a benchmarked network business with a debt-gearing ratio of 60 per cent. To provide reasonable confidence of adequate debt funding for new transmission investment at interest rate levels that do not require subsidisation by equity holders, this section proposes that the mid point of this range be adopted for TransGrid's next reset period i.e. 137 basis points.

The difference between the yield on debt issued by the entity and the risk free rate of the same term is called the debt margin. The debt margin compensates the owners of debt for the risk of default on the debt issued by the entity.

One of the most important determinates of the risk of default is the capital structure of the entity, that is the degree that debt rather than equity is used to finance the investments of the firm. The greater the proportion of assets financed by debt the greater the risk of default and therefore, the greater the debt margin required to attract the owners of debt. To maintain consistency the debt margin must be estimated as though the entity is financed with the same proportion of debt as is assumed in the WACC formula. In this Application, consistent with standard practice, the assumed ratio of debt to total financing is 60 per cent.

TransGrid accepts the methodology adopted by the Commission in the *Victorian Networks Revenue Caps 2003-2008*. The Commission methodology is to benchmark a credit rating for a transmission business, rather than using the actual credit rating of TransGrid. This benchmarked credit rating is then used to estimate the debt margin from current market data on corporate debt of a comparable term to the risk free rate.

In the application of this methodology the Commission has made a number of implicit assumptions that are potentially problematic for the following reasons:

- the sample group includes companies with government ownership; and
- no account has been made for differences between the actual gearing ratios of the sample companies and the assumed ratio of 60 per cent (including adjusted gearing ratio to exclude inter-company loans).

9.3.5.1 Credit Ratings used by Commission in the Victorian Transmission Decision

Table 9.5 below sets out the credit ratings used by the Commission in its previous determination for SPI PowerNet.

Table 9-5: Credit rating used by the Commission for SPI PowerNet

| Company | Long-term rating | Ownership | Gearing Ratio ⁴⁸ |
|--------------------|------------------|------------|-----------------------------|
| Country Energy | AA | Government | 72.7% |
| ElectraNet | BBB+ | Private | N/A |
| ETSA Utilities | A- | Private | N/A |
| Energy Australia | AA | Government | 60.7% |
| Ergon Energy | AA+ | Government | 46.8% |
| Integral Energy | AA | Government | 62.4% |
| SPI PowerNet | A+ | Private | 84.8% ⁴⁹ |
| United Energy | A- | Private | 48.8% |
| CitiPower Trust | A- | Private | N/A |
| Powercor Australia | A- | Private | 61% ⁵⁰ |

On the basis of the above Table the Commission derived an A credit rating for SPI PowerNet.

9.3.5.2 Ownership structure

Schedule 6.1, Clause 2.1 of the NEC requires that the cost of capital be measured by the:

“rate of return required by investors in a privately-owned company with a risk profile similar of that of the network company.”

It follows that the inclusion of companies, without any adjustment for Government ownership is both inappropriate and misleading. Companies owned by governments, including SPI PowerNet, which is owned by the Singaporean Government, are likely to have a higher credit rating than privately owned companies as:

“an element of government support is factored into the company’s rating”⁵¹

The highest credit rating in the above sample for privately owned utilities is A-.

9.3.5.3 Capital structure

The gearing ratio assumed in regulatory decisions is 60 percent debt and 40 percent equity; the Commission’s debt margin benchmark should therefore be consistent with this structure. From the above Table the gearing ratios of the sample of benchmark companies as reported in their audited accounts ranges from 46.8 per cent to 72.7 per cent. Given that this range is in the vicinity of 60 percent it may be reasonable to assume that the impact would be small.

⁴⁸ Sourced from the companies 2001 –2002 annual report, unless otherwise indicated.

⁴⁹ Extracted from a Standard and Poor’s Credit rating published on 28 December 2001.

⁵⁰ Extracted from a Standard and Poor’s Credit rating published on 10 September 2001.

⁵¹ Standard and Poor’s Report in Snowy Hydro Ltd, 30 Jan 2003.

The Table 9-6 below highlights recent regulatory decisions with respect to the debt margin for regulated companies. The debt margin shown in the Table is the compensation the regulator has given for default risk rather than the headline rate given in the decision. The Commission in the *SPI PowerNet*, *ElectraNet*, and *GasNet* decisions includes in the headline debt margin rate the transaction costs of issuing debt.

Table 9-6: Debt margin parameters adopted in recent regulatory decisions

| Decision | Industry | Debt Margin (basis points) | Questions Raised by NERA Regarding Methodology ^b |
|--|--------------------------|----------------------------|---|
| Victorian Revenue Cap Commission (2002) | Electricity Transmission | 109.5 ^a | Yes |
| SA Revenue Cap Commission (2002) | Electricity Transmission | 111.5 ^a | Yes |
| Queensland Revenue Cap Commission (2001) | Electricity Transmission | 120.0 ^a | Yes |
| ESC (2000) | Electricity Distribution | 150.0 | No |
| IPART (1999) | Electricity Distribution | 80-100 | Yes |
| GasNet Commission (2003) | Gas Transmission | 146.5 ^a | Yes |
| ESC (2002) | Gas Distribution | 165.0 | No |

^a Calculated by reference to a 5-year bond rate, for all others the margin given over a 10-year bond rate.

^b IPART and the Commission used benchmark data that included government owned business to determine the credit rating.

On the basis of the above analysis TransGrid believes that an appropriate credit rating is a credit rating based on the privately owned businesses in the Commission benchmarking sample. The average credit rating for these businesses is between BBB+ and A-.

TransGrid considers that a conservative approach is to adopt a credit rating of A-. Westpac have advised TransGrid that the debt margin, excluding transaction costs, as at the 18th August 2003 for A- rated debt was 125 basis points. On this basis TransGrid believes a debt margin, excluding transaction costs, of at least 125 basis points is an appropriate minimum. Based on the debt margins provided for gas transmission by the Commission, and decisions by the ESC in relation to gas and electricity distribution it is arguably higher. It would also be higher if the average credit rating for businesses were closer to BBB+.

For the purposes of this Application, TransGrid proposes the adoption of a debt margin, excluding transaction costs, of between 125 and 150 basis points. Adopting the mid-point of this range, a debt margin of 137 basis points, provides reasonable confidence of adequate debt funding for new transmission investment at interest rate levels that do not require subsidisation by equity holders and is consistent with the data available.

9.3.6 Transaction Costs

The Commission has recognised in recent decisions that there are significant transaction costs to regulated firms in raising capital. These are legitimate business expenses that can be compensated in either a higher WACC or additional operating cost allowances.

9.3.6.1 Debt raising costs

Debt financing requires the debtor to incur transactions costs in the issuing of corporate debt. These costs are not accounted for in the standard analysis of debt margins, however, in recent decisions the Commission has recognised these legitimate costs and included a specific margin to the costs of debt.

The recent decision for the *Victorian Transmission Network 2002* the Commission cited industry analysts in order to assess the validity of debt raising costs and to acquire market estimates for these expenses. Westpac Institutional Bank identified the following categories of costs:⁵²

- Agency fee.
- Arranger fee.
- Credit rating fees.
- Dealer swap margin.
- Legal fees.
- Placement fee.

Westpac estimated that transaction costs represented approximately 10.5 to 12.5 basis points of the total debt raised. The Commission relied upon the Westpac estimate of debt refinancing costs in the GasNet decision and subsequently in the Victorian and South Australian transmission decisions. In recent decisions, listed in the Table 9-7 below, the Commission has increased the cost of debt by a margin of between 10.5 to 12.5 basis points for the cost of debt financing.

Table 9-7: Debt refinancing costs in recent regulatory decisions

| Decision | Industry | Refinancing Costs (basis points) |
|--|--------------------------|-------------------------------------|
| Victorian Revenue Cap Commission (2002) | Electricity Transmission | 10.5 |
| SA Revenue Cap Commission (2002) | Electricity Transmission | 10.5 |
| Queensland Revenue Cap Commission (2001) | Electricity Transmission | 0 |
| ESC (2000) | Electricity Distribution | 0 |
| IPART (1999) | Electricity Distribution | 0 |
| GasNet Commission (2003) | Gas Transmission | 12.5 |
| ESC (2002) | Gas Distribution | 5.0 |

⁵² Commission, Final Decision: GasNet access arrangements, December 2002, p 147.

TransGrid considers that a value for transaction costs in the middle of the range provided by Westpac is appropriate (i.e. 11.5 basis points). Consistent with this TransGrid has adopted a debt margin including transaction costs of 148.5 basis points (137 +11.5).

9.3.6.2 Transaction costs of equity

As with debt raising costs, the Commission has in recent decisions provided compensation for benchmarked transaction costs for equity raising. Unlike debt transaction costs, compensation for equity raising costs is provided by additional operating cost allowances rather than a higher WACC. The Commission has compensated for costs paid to equity arrangers for services such as structuring the issue, preparing and distributing information and undertaking presentations to prospective investors.

In the Table 9-8 below the Commission relied on recent Australian infrastructure equity issues to estimate the equity raising costs.

Table 9-8: Equity raising costs⁵³

| | Date of offer | Details of offer | Raising costs (\$m) | Total offer (\$m) | Fees as % of total offer |
|--|---------------|---|---------------------|-------------------|--------------------------|
| United Energy | March 1998 | IPO-stapled securities | 20 ^a | 968.2 | 2.1 |
| Macquarie Communication Infrastructure Group | July 2002 | IPO-stapled securities | 13 | 310 | 4.2 |
| Australian Pipeline Trust | May 2000 | IPO-units | 12 | 488 | 2.5 |
| Envestra | July 1999 | Rights offer, convertible notes and placement issue | 10.1 ^b | 310 | 3.258 |
| GasNet | October 2001 | IPO-units | 15 ^c | 260.16 | 5.77 |
| Average | | | 14.02 | 467.27 | 3.548 |

^a Includes underwriter fees, selling fees, advisory fees, legal fees, accounting fees, printing, advertising and other expenses.

^b Underwriting fees, advisory fees, legal fees, accounting fees, printing, advertising, stand duty and other expenses.

^c Includes the Joint Lead Manager's commissions and fees, accounting fees, legal fees, lodgment fees, listing fees, fees for other advisers, prospectus design, printing and other miscellaneous expenses (including taxes and other government charges).

On the basis of the above, TransGrid has adopted an average transaction cost of raising equity of 3.55 percent in this Application. Amortising this cost in perpetuity at a real Vanilla WACC of 6.367 percent results in an annual cost of 0.23 percent of equity.

This cost should be included in the operating cost component of this Application (i.e. 0.23% of the equity portion of the average RAB in each period).

9.4 Debate on International Versus Domestic CAPM Parameters

There has been much debate concerning the appropriate treatment of international investors within the CAPM. The cost of tax is treated in this Application as an operating cost, which is not directly relevant to the calculation of the post tax WACC used in modelling the return on assets. However, the value of imputation credits (gamma or ' γ ') is an important component of the cost of tax and it is not possible to determine the value of gamma outside the CAPM framework. For this reason we examine the appropriate value of gamma in this Chapter of the Application.

TransGrid has asked National Economic Research Associates "(NERA)" to address this issue. NERA's report is provided at Attachment 16. NERA's discussion and findings are summarised below. TransGrid has also asked Professor Grundy⁵⁴ to provide a critique on the empirical literature examining the value of gamma. Professor Grundy's report is provided at Attachment 17. His main findings are also summarised below.

9.4.1 NERA's Summary Of The Theoretical Debate

Commentators and regulated businesses in favour of ascribing a low value to imputation credits have tended to argue it is inappropriate to ignore the internationalisation of equity markets when determining the value for gamma. This argument generally takes the following logical form:

- Australian capital markets rely on foreign investment in order for businesses' capital requirements to be met. Evidence of this is given by:
 - the fact that around 30% of Australian equities are held by foreign investors; and
 - that Australia runs a persistent current account deficit that averages around \$20-30 billion per year. That is, the Australian economy relies on \$20-30 billion of foreign investment each year in order to meet investment requirements.
- Furthermore, reliance on foreign capital to fund domestic investment has been strong throughout the last century, with net external borrowing averaging 3.5/26.6 percent of GDP/Fixed Private Capital Investment (non dwelling) over the period 1950 to 2002 and 2.6/59.0 percent over the period 1900 to 1950. That is, borrowing from the rest of the world accounted for around twice as much private business investment in the first half of the last century than in the second half.
- Australian equities comprise only 1% of the value of world equities suggesting that suppliers of Australian equities are 'price takers' in the international equity market.
- This suggests that in order to finance their capital requirements Australian businesses must offer a rate of return equal to that required by foreign investors.
- Foreign investors do not receive any value from imputation credits therefore the correct approach to determining the regulatory WACC is to set the value of γ at zero.

Commentators supporting a higher value of γ have tended to:

- accept that Australian capital markets are highly integrated and that this tends to suggest that the value of γ should be low or close to zero (although some have argued that there is some capacity for international investors to 'sell imputation credits' to domestic investors and that foreign investors gain some value through these means);
- nonetheless, it is argued that recognising integration would also require a reduction in the assumed market risk premium from the currently applied 6% (based on historical estimates). This is because it is argued (often implicitly) that integration has only

⁵³ Commission, 'Victorian transmission network revenue cap: decision', December 2002, p 86

⁵⁴ Professor Grundy is the Ian Potter Professor of Financial Studies at the Melbourne Business School, University of Melbourne. He is currently an Associate Editor of the *Journal of Finance*.

occurred recently and, consequently, a resulting fall in the MRP has not had time to be reflected in historical estimates;

- It is therefore argued that selectively setting the value of γ at zero or close to zero to reflect the importance of the international investor would amount to 'cherry picking' and that if gamma was set to zero then an international market risk premium and an international beta should be adopted within the CAPM; and
- It is argued that if this were done then the value of gamma may well be zero but that the impact of this on the WACC would be more than offset by falls in the market risk premium and the value of the equity beta – with the net impact of adopting the international investor as the appropriate benchmark being to reduce rather than increase the WACC.

9.4.2 NERA's Advice

NERA advises that there is little or no serious doubt that global equity markets are highly integrated and that Australian companies compete for capital in an international market. This view is consistent with the fact that Australia has run a current account deficit (i.e. has been a net importer of capital) almost every year of this century and currently imports around \$26 billion of capital per annum.⁵⁵ Consequently, NERA considers that it is appropriate to estimate its cost of capital within an international CAPM framework.

However, it is important to be clear that this does not mean that only historical estimates of the return on an international market portfolio, and covariance against that portfolio, are relevant under an 'international CAPM'. Rather it is only necessary that, if equity markets are truly integrated, then the CAPM framework employed must reflect this. That is, the derived estimate of the cost of capital must be an unbiased estimate of the true cost of capital for the business. As discussed below, it does not mean that domestic data on the MRP and equity betas should be altered. NERA argues that estimating the cost of equity using domestic data on MRP and equity beta will not lead to any *a priori* bias even if international markets are fully integrated.

NERA examines the appropriate interpretation of domestic data on the market risk premium, equity betas and the value of 'gamma' when using an international CAPM. In summary, NERA considers that:

- there is no *a priori* theoretical reason to expect the adoption of country specific data to result in a biased estimate of the cost of equity, even if it is known that world equity markets are integrated – unless integration is a recent phenomenon not fully captured in domestic data;
- the Australian capital market has been integrated with world capital markets for most of its existence as evidenced by Australia's persistently high current account deficit this century;
- it therefore follows that the use of country specific data does not require the assumption that domestic markets are fully segregated (as implied by Lally);
- indeed, an assumption of perfect segregation is entirely *inappropriate*;
- even with full international integration, there is no single marginal investor and theory tells us that the equilibrium value of gamma will be determined by the relative elasticity of supply/demand of foreigner investors/residents for Australian equities; and
- the size of the Australian market suggests that foreigner investors will have a much greater elasticity of supply than domestic residents elasticity of demand. Consequently, a shift in the demand for Australian equities by Australians (due to the introduction of

⁵⁵

The average over the last five years. See:

www.abs.gov.au/ausstats/abs@.nsf/0/74633FA58AE158A1CA256CBF0017217E?Open

imputation credits) is unlikely to have a significant impact on the price of Australian equities. That is, gamma is likely to be significantly less than 1.

NERA also addresses the analysis of Associate Professor Lally in his June 2002 paper for the Commission entitled "*The Cost of Capital Under Dividend Imputation*" (the Lally Paper). NERA considers that Associate Professor Lally's analysis of the internationalisation issue is based on a number of problematic assumptions, namely:

- That integration of international equity markets has not occurred recently enough to have **any** affect on the estimates of the MRP based on domestic data. NERA considers this assumption extreme.
- That integration would result in an appropriate premium on Australian assets falling from 6.0% to around 2.8%. NERA has applied Lally's methodology with what they believe to be equally valid alternative empirical estimates to derive increases in the observed Australian market risk premium following integration.
- That assuming zero integration (gamma=1) and adopting an MRP of 6.0% will result in an overestimate of the cost of equity and regulated prices compared to a true integration scenario. NERA argues that this is only true in Lally's extreme scenario of a 2.8% equity premium **and** an infinitely lived asset **and** escalating prices. Importantly, for any equity premium above 3.3% this does not hold. For any equity premium above 4.2% this does not hold even if gamma is also set at 0.6.

For these reasons, NERA considers that a value of gamma above 0 needs further justification. Furthermore, the appropriate MRP and equity beta can be calculated based on domestic historical data without any inconsistency with the use of a value for gamma of less than 1.

9.4.3 Professor Grundy's Advice On The Empirical Literature

Professor Grundy is the Ian Potter Professor of Financial Studies at the Melbourne Business School, University of Melbourne. He is also currently an Associate Editor of the *Journal of Finance*. Professor Grundy advises that the empirical literature on the value of gamma must be divided between studies based on pre 1997 data and studies based on post 1997 data. This is because in 1997 tax laws were changed to preclude share-trading strategies that enabled foreign residents to receive some value from imputation credits.

Professor Grundy's analysis of the literature suggests that prior to 1997 there was evidence that the value of gamma was significantly above zero and perhaps as high as 0.5. However, on the basis of post 1997 data Professor Grundy concludes that the best available empirical evidence is that the value of gamma is zero.

"Australian residents may well enjoy the tax credit, but post 1997 they have not had to pay any more for a dollar of franked dividends (i.e., dividends with attached tax credits) than they must pay for a dollar of unfranked dividends. The implication for Australian companies raising equity capital is clear. To raise capital Australian companies must price the issue so that it is potentially attractive to overseas investors; i.e., to investors who do not qualify for imputation credits. Thus the best available empirical evidence on the value of gamma under the current tax law is that gamma is zero." Page 5

Professor Grundy is also critical of Associate Professor Lally's analysis on this issue:

"One cannot answer both the fundamental and the follow-up question simply by assuming an answer. This is the approach taken in Lally (2002). Lally (2002) observes that franking credits would be worth as much as franked dividends if investors who could not take advantage of imputation credits had no influence on the prices of Australian shares. Given this observation Lally assumes that

*Australian shares are priced as if this were true. Lally then concludes that gamma must be unity.”*Page 3

These comments by Professor Grundy are consistent with NERA’s analysis that shows that in order to derive a value of 1 for gamma it is necessary to believe that foreign investors have accepted a reduction in the return they receive on Australian equity equal to the value of imputation credits. Put another way, foreign investors must have accepted a rise in the value of Australian equities equal to the full value of all future imputation credits – without any substitution away from Australian equities. This does not appear a credible theoretical assumption (as noted by NERA) nor consistent with the empirical facts (as noted by Professor Grundy).

On the basis of the above TransGrid is proposing the adoption of a value for gamma of 0 for the purposes of this Application and considers that levels above this would require further independent justification.

9.5 Summary

In the light of the foregoing analysis TransGrid considers that the Table 9-9 below comprises the best available estimate of the CAPM parameters and the associated **actual cost of capital to an efficient transmission business**.

Table 9-9: Summary of CAPM WACC parameter values

| Parameter | Proposed value |
|--|----------------|
| Nominal Risk Free Rate (ten year) | 5.01% |
| Real Risk Free Rate (ten year) | 2.87% |
| Expected Inflation Rate | 2.08% |
| Debt as a Long-term Portion of Total Funding | 60.00% |
| Cost of Debt Margin Over Risk Free Rate | 1.485% |
| Market Risk Premium (relative to ten year bond rate) | 6.00% |
| Corporate Tax Rate | 30.00% |
| Effective Tax Rate for Equity | 30.00% |
| Franking Credits | 0% |
| Asset Beta | 0.45 |
| Debt Beta | 0.0 |
| Equity Beta | 1.12 |
| Nominal Vanilla WACC | 8.59% |
| Real Vanilla WACC | 6.35% |
| Post Tax Nominal Return on Equity | 11.73% |
| Post Tax Nominal WACC | 7.42% |
| Pre-Tax Real WACC | 8.35% |

The above Table represents the regulated cost of capital that would leave TransGrid indifferent between investing and not investing in further transmission assets. However, as described in the framework section above, TransGrid believes that the asymmetrically higher costs of under investment than over investment and the nature of the investment approval process suggest that it would be appropriate for the Commission to place a modest positive margin of around 50 basis points on the above when determining the regulated cost of capital.

The extent to which this margin may be need to be varied depends on, among other matters, the extent to which the Commission addresses the uncertainties that presently exist regarding recognition of past capital expenditure for inclusion in the regulated asset base of a TNSP. It also depends on other aspects of the incentive framework being settled, including the levels of revenue to be placed at risk in relation to operational performance incentives.

For the avoidance of doubt, TransGrid **has not** included such a margin in its calculation of the above WACC values, but requests the Commission to give explicit consideration to this proposal, both in relation to this Application and the settling of the regulatory principles to apply to transmission revenue regulation generally.

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10 Pricing the Service – Managing the Risks

10.1 Code Requirements

The Code requires that the Commission have regard to the risk adjusted cash flow rate of return which is required by investors in commercial enterprises that face similar business risks to those faced by TransGrid in the provision of its service (clause 6.2.4(c)(4)). The Commission must also consider the allocation of risk that has been agreed between a TNSP and its network users (clause 6.2.3(d)(3)).

10.2 Regulatory Principles

Reiterating the Code, S6.1 provides that the MAR should be commensurate with the risks involved in delivering the transmission network service. Risk is to be factored into the calculation of the projected cash flows for a project (i.e. the operating and capital costs), as well as the commercial return on assets. (S6.4, S6.5).

10.3 Addressing the Risk of Unexpected Cost Changes During the Regulatory Period

The MAR for TransGrid is expected to be set on the basis of expected costs over the regulatory period.

There will always be some aspects of a business's costs that are difficult (or even impossible) to project. Where such costs are outside of the business' control, such uncertainty regarding future cost changes affects the risk that the business faces. During the regulatory period TransGrid's allowed revenue cap is fixed, resulting in unexpected changes in costs representing a windfall gain or loss to the business. The question therefore arises as to how best to address the risk associated with such uncertain costs within the overall regulatory regime.

As noted above, both the Code and the draft Statement of Regulatory Principles require that the regulated revenue stream set for the business reflects the risks it faces.

TransGrid believes that, in a world where regulated incomes are set for five years but where risk profiles can change overnight (as evidenced by September 11, 2001), the current limited opportunities within a regulatory period to review MAR to reflect these impacts are impractical and place unnecessary and inefficient risks on the regulated business.

Several alternatives exist for addressing the risk of uncertain cost changes:

- A projection of likely costs can be incorporated into the expenditure forecasts (however 'rough' this forecast is). This would result in prices being higher than they would otherwise be, if the event did not occur.
- Estimates of uncertain costs can be excluded from the expenditure forecast, with the business being compensated for the increased risk it faces as a result through a higher WACC. This approach would again result in prices being higher than they otherwise might be, if the event does not occur.
- An allowance could be made at the subsequent review for differences between projected and actual costs resulting from external cost drivers, including an allowance for the financing cost of any additional expenditure required during the period. This approach may lead to cash flow issues for the business, and there would inevitably be

uncertainty that additional expenditure will actually be allowed at the subsequent reset.

In addition, passing-through the cumulative impact of all external cost changes over the period in one go may result in a price-shock for customers; or

- A 'pass-through mechanism' can be adopted which allows the regulated business to pass-through the costs of certain defined events during the regulatory period if, and when, such events occur. Such an approach would be subject to an appropriate review mechanism.

TransGrid believes that the adoption of a pass-through mechanism represents the most appropriate approach to addressing the risk associated with uncertain changes in costs that are beyond its control. Such an approach allows tariffs to remain lower, if the uncertain costs are not in fact incurred, and avoids customers being exposed to a cumulative price impact.

TransGrid notes that the Commission in its Decision adopted the cost pass-through approach for TransGrid for the current regulatory period, with respect to material changes in third party insurance costs.⁵⁶ The Commission concluded that these costs were too uncertain for a sufficiently accurate estimate to be included in the operating cost projections.

The Commission has also approved cost pass-through arrangements for an expanded range of events in its more recent Decisions for SPI PowerNet, GasNet and Powerlink and in its Preliminary View in relation to Murraylink's Application for regulated status. Indeed, the Commission has endorsed the pass-through approach as an appropriate means of addressing risk for events that are outside of the TNSPs control.⁵⁷ In its recent Preliminary View in relation to Murraylink, the Commission further elaborated on the characteristics required for pass-through events.⁵⁸

The jurisdictional regulators in Victoria and South Australia have also adopted cost pass-through approaches.

The remainder of this Chapter describes TransGrid's experience in the current regulatory period and sets out the type of costs that TransGrid believes should be eligible to trigger for pass-through. Attachment 13 sets out the details of the pass-through arrangement proposed by TransGrid, and describes the precedents that exist from other regulated businesses.

TransGrid notes that its estimate of the WACC proposed in Chapter 9 is based on an expectation that the Commission will endorse its proposals for a cost pass-through mechanism.

10.3.1 Experience in the Current Regulatory Period

The current regulatory regime is characterised by inflexibility that has locked in adverse financial outcomes for TransGrid, without the opportunity to address the situation until the end of the regulatory period. As detailed in Chapters 4 and 6, TransGrid has faced a number of increases in external costs that it has not been able to pass-through into charges (with the exception of third-party insurance costs). These external cost increases have included:

- Increasingly stringent environmental requirements.
- New obligations on TNSPs arising from changes in NEM requirements, including over 60 packages of amendments to the Code.

⁵⁶ Commission, NSW and ACT Transmission Network Revenue Caps: Decision, January 2000, p.89.

⁵⁷ See Australian Competition and Consumer Commission, Victoria Transmission Network Revenue Caps 2003-2008, 11 December 2002, p.81.

⁵⁸ Commission, Preliminary View, Murraylink Transmission Company Application for Conversion and Maximum Allowed Revenue, 14 May 2003, p.86.

- Increased regulatory compliance costs, arising both from legislative changes and additional Commission requirements (including requirements in relation to information disclosure and ring-fencing).
- Revised bushfire management plans as a result of bushfires in NSW and ACT during December 2002.
- Insurance cost increases driven by the wider insurance market.
- Costs associated with protracted dispute processes.
- Enhanced security provisions following 11 September 2001.

All of these costs have been outside the control of TransGrid and have been far outside the ability of TransGrid to accurately predict in its expenditure forecasts. These changes in cost have directly impacted our ability to keep within the operating budget on which our allowed revenue has been set.

TransGrid believes that the inflexible framework it has faced in this regulatory period places an inappropriate level of risk on regulated businesses and exposes customers to the potential for price shocks at each subsequent review. It therefore proposes that this risk be addressed through extended pass-through provisions in the next regulatory period, in line with those that the Commission has approved for other regulated electricity transmission businesses.

10.3.2 Pass-Through Mechanism

A cost pass-through mechanism allows the regulated business to apply for an adjustment to allowed revenues during the regulatory period, to reflect material and unexpected increases or decreases in external cost drivers. The Regulator as well as the regulated business can trigger cost pass-through provisions.

The costs that can be passed through under the pass-through mechanism need to be clearly and closely defined, so as not to undermine the general incentive properties of the CPI-X regime.

Cost pass-through events are, by their very nature, not expected to occur in every regulatory period. However, by providing explicit guidance in advance on the circumstances in which a cost-pass through may be permitted during the regulatory period, and the process that would be followed in respect of such applications, the certainty and predictability surrounding the future operations of the regulatory regime is increased.

The types of costs that have typically been included in pass-through regimes can be considered under three main categories:

- Cost changes which is the result of changes in Statutory or Code requirements, such as increases in service standards, or changes to Accounting Standards.
- Cost changes due to unexpected or very rare and easily identifiable events, such as terrorism events.
- Cost changes due to significant changes in (non-Statutory) cost drivers, such as insurance costs.

TransGrid has defined several categories of events that could trigger an application for a cost pass-through during the forthcoming regulatory period. These categories are in line with those approved by the Commission for other regulated businesses, and comprise:

- A Change in Taxes Event.
- A Service Standard Event.
- An Insurance Event.

- An Unforeseen External Event.
- Grid Support Payments.

To the extent that changes in Accounting Standards, such as those foreshadowed in Section 4.3.5 that lead to changes in reported operating costs, are not addressed by these categories, then these also need to be treated as an event that can trigger an application for cost pass-through.

In addition, we have also set out a process with respect to an application for a pass-through amount, and a mechanism whereby approved pass through amounts can be translated into tariff charges. Attachment 13 details our proposals.

Accordingly, TransGrid asks that a pass-through mechanism (subject to appropriate review processes) be incorporated during the regulatory period as detailed in Attachment 13.

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