Draft Decision

NSW and ACT Transmission Network Revenue Caps - TransGrid 2004/05-2008/09

Date: 28 April 2004

File No:
M2003/287

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Contents

Glossary ..... **iv**

Executive Summary **1**

1 Introduction 1
2 Process of this review 2
3 Existing regulatory framework 3
4 ACCC's Decision on opex 5
5 ACCC's Decision on capex 6
6 ACCC's Decision on cost of capital 10
7 ACCC's Decision on Service Standards 11
8 Determination of Maximum Allowable Revenue 11

1. Introduction **15**

1.1 Code requirements 15
1.2 Process issues 17
1.3 Structure 19
1.4 Overview of TransGrid's network 20

2 Operating and maintenance expenditure **23**

2.1 Introduction 23
2.2 Opex regulatory framework 23
2.3 TransGrid's Application 25
2.4. Submissions from interested parties 27
2.5. Analysis of GHD's report to the ACCC 27
2.6 ACCC's Draft Decision 28
2.7 Benchmarking 33
2.8 Conclusion 38

3 Asset base roll forward calculation **39**

3.1 Introduction 39
3.2 Regulatory framework 40
3.3 TransGrid's proposal 40
3.4 The ACCC's Decision on the roll-forward calculation 41
3.5 Application of the ACCC's Decision to determine the closing RAB. 44
3.6 Further issues for consideration 45

4 Historic Capital Expenditure **46**

4.1 Introduction 46
4.2 Overview of the regulatory framework for transmission investment 46
4.3 Comparison of actual expenditure to 2000 Revenue Cap Decision 51
4.4 Consultant Review 52
4.5 Submissions by interested parties 55
4.6 ACCC's consideration of the prudency of TransGrid's capital expenditure from 1999 to 2004 57
4.7 Impact of the prudency assessment on the opening RAB on 1 July 2004 67

5. Forward Capital expenditure 69

5.1 Overview of the current approach to assessing capital expenditure 69
5.2 Options for the reform of transmission investment regulation 70
5.3 Implications for TransGrid's revenue reset 70
5.4 A timetable for assessment of TransGrid's future capex application 71
5.5 Conclusion 72

6. Cost of Capital 73

6.1 Introduction 73
6.2 The capital asset pricing model 74
6.3 Estimate of the risk-free interest rate 77
6.4 Expected inflation rate 80
6.5 Cost of debt 80
6.6 Debt and equity raising costs 83
6.7 Market risk premium 84
6.8 Value of franking credits 86
6.9 Gearing 88
6.10 Other issues 94
6.11 Treatment of taxation 95
6.12 Conclusion 95

7. Total Revenue 97

7.1 Introduction 97
7.2 The accrual building block approach 97
7.3 TransGrid's proposal 98
7.4 ACCC assessment of building blocks 98
7.5 Conclusion 103

8. Service standards 104

8.1 Introduction 104
8.2 TransGrid's Application 106
8.3 Submissions from interested parties 107
8.4 GHD's Review 108
8.5 ACCC's considerations 114
8.6 Conclusion 115

Appendix 1 Submissions in response to TransGrid's Application 116

Appendix 2 Prudency assessment of TransGrid's historic capex 117

2.1 Queensland – New South Wales Interconnector 117
2.2 Kempsey-Nambucca-Coffs Harbour 132 kV 118
2.3 Central Coast development: Tuggerah – Sterland 330kV line duplication 122
2.4 Molong 132/66kV substation and 132kV line 125
2.5 Miscellaneous items 129
2.6 Telecommunications 133
2.7 Yass substation 134
2.8 Sydney West Static Var Compensator 135
2.9 Other Sydney Projects 138

2.10 Information Technology (IT) Expenditure 138
2.11 Motor Vehicles 141
2.12 South Australia – NSW Interconnector 141

Appendix 3 Pass through rules 142

3.1 Introduction 142
3.2 General operation of pass through mechanisms 142
3.3 TransGrid's pass through rules as originally proposed 143
3.4 Submissions by interested parties on TransGrid's Application 144
3.5 ACCC's considerations 144

Appendix 4 Financial indicators 147

4.1 Code requirement 147
4.2 Previous financial indicator analysis 147

Appendix 5 Calculating the financial incentive 150

Appendix 6 Forecast indicative timetable for the assessment of TransGrid's Application and Supplementary Application 156

Glossary

ACCC	Australian Competition and Consumer Commission
ACG	Allen Consulting Group
ASX	Australian Stock Exchange
Capex	Capital Expenditure
CAPM	Capital Asset Pricing Model
COAG	Council of Australian Governments
Code	National Electricity Code
CPI	Consumer Price Index
DAC	Depreciated Actual Cost
DCST	Double Circuit Steel Tower
Discussion Paper On DRP	Review of the Draft Statement of Principles for the Regulation of Transmission Revenues –Discussion Paper 2003
DRP	Draft Regulatory Principles (for the Regulation of Transmission Revenues)
DSM	Demand Side Management
EAG	Energy Action Group
EBDIT	Earnings Before Depreciation Interest and Taxes
ESAA	Electricity Supply Association of Australia
ESC	Essential Services Commission
EUAA	Energy Users Association of Australia
EUCV	Energy Users Coalition of Victoria
Gamma (γ)	Likely Utilisation of Imputation Credits
Guidelines	Information Requirements Guidelines
ICTP	International Comparison of Transmission Performance
IPART	Independent Pricing and Regulatory Tribunal

kV	Kilovolt
MAR	Maximum Allowed Revenue
MRP	Market Risk Premium
MVA	Mega Volt Ampere
MW	Mega Watt
NCC	National Competition Council
NECA	National Electricity Code Administrator
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NPV	Net Present Value
ODRC	Optimised Depreciated Replacement Cost
ODV	Optimised Deprival Value
OFGEM	Office of Gas and Electricity Markets
Opex	Operating and Maintenance Expenditure
ORC	Optimised Replacement Cost
PB Associates	Parsons Brinckerhoff Associates
PTRM	Post Tax Revenue Model
QCA	Queensland Competition Authority
RBA	Reserve Bank of Australia
Regulatory Principles	Statement of Principles for the Regulation of Transmission Revenues
Historic Capex	Historic Capital Expenditure
SCST	Single Circuit Steel Tower
SKM	Sinclair Knight Merz Pty Ltd
SMHEA	Snowy Mountain Hydro-Electric Authority

TNSP	Transmission Network Service Provider
TUoS	Transmission Use of System
VENCorp	Victorian Energy Networks Corporation
WACC	Weighted Average Cost of Capital

Executive Summary

1 Introduction

This document is the Australian Competition and Consumer Commission's (ACCC) Draft Decision on TransGrid's revenue cap for the period 1 July 2004 to 30 June 2009. TransGrid is one of two Transmission Network Service Providers (TNSP) in New South Wales. It is the biggest TNSP in the NEM and its central location between Victoria and Queensland means that TransGrid's network plays a key role in facilitating wholesale competition in the National Electricity Market (NEM).

This Revenue Cap Decision, along with EnergyAustralia's Revenue Cap Decision, is the first of the "second round" Revenue Cap Decisions. In the conduct of this review the ACCC has needed to clarify the detail of the existing regulatory framework, particularly in respect of capital investment. In particular, this has required the development and implementation of an approach to the ex-post assessment of the prudency of investment during the current regulatory period. This has been particularly important since TransGrid has invested around 25 percent more than the prudent investment that was forecast in the ACCC's 2000 Decision.

In parallel with the conduct of this review, the ACCC has been developing important elements of the regulatory regime to strengthen efficiency and service incentives. These include: possible reform of the approach to the regulation of capital investment; the refinement of an efficiency incentive mechanism for operating and maintenance expenditure (opex); and the development of service standard incentives. The details of the regime in each of these areas are yet to be fully developed and consulted upon. Therefore, this Draft Decision does not reflect the implementation of any of the proposed changes.

The rest of this executive summary is set out as follows:

- Section 2 explains the process of this review;
- Section 3 describes the existing regulatory framework and explains how the ACCC has implemented its duties under this framework;
- Sections 4 and 5 set out the ACCC's Decision on opex and capex respectively;
- Section 6 deals with the determination of the cost of capital;
- Section 7 is the ACCC's Decision on service standards; and
- Section 8 expresses the outcome of this review in terms of the Maximum Allowed Revenue (MAR) for each year from 2004 to 2009.

2 Process of this review

On 26 September 2003, TransGrid submitted its Application to re-set its revenue cap under clause 6.2.4(b)[1] of the Code, for the period 1 July 2004 to 30 June 2009. On receipt of all attachments to TransGrid's Application, the Application was placed on the ACCC's web page and submissions from interested parties were called for.

GHD Pty Ltd (GHD) was engaged to assist the ACCC in the review of TransGrid's Application. GHD's report to the ACCC on TransGrid's Application was emailed to interested parties on 8 April and placed on the ACCC's web site on 14 April 2004, and submissions from interested parties were invited.

During the course of the review, the need for a deeper examination of aspects of TransGrid's historic and future capital expenditure (capex) arose. As a result, Parsons Brinckerhoff Associates (PB Associates) were retained to assist in the review of historic capex. Furthermore throughout the course of the review, Mountain Associates and Dr Darryl Biggar have been engaged as internal consultants to assist the ACCC. Mountain Associates has produced a specific report on the prudency of TransGrid's investment in the MetroGrid project and interested parties will have an opportunity to comment on this report during the period between the release of the ACCC's Draft Decision and Final Decision.

In parallel with the development of this review, the ACCC has suggested fundamental changes to the regulation of capital investment as set out in a recent supplementary discussion paper. The full specification of the revised regulatory arrangement is yet to be developed and the ACCC has yet to decide whether to implement these changes. However, in view of the likelihood of the changes and their likely significant implications for the control of capex, TransGrid has proposed to resubmit its capex application once these changes have been finalised. The ACCC has agreed to TransGrid's proposal and will work to ensure the finalisation of changes to the regulatory regime by August 2004 so that TransGrid is able to resubmit its future capex application no later than the end of October 2004. The result of this process will be a Final Decision incorporating an assessment of TransGrid's forecast capex under the ex-ante approach as well as the ACCC's findings on the other parts of TransGrid's Application unaffected by the future capex application.

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[1] In applying the form of economic regulation specified in clause 6.2.4(a), the ACCC is to set a revenue cap to apply to each Transmission Network Owner and/or Transmission Network Service Provider (as appropriate) for the regulatory control period which is to be a period of not less than 5 years. A description of the process and timetable for re-setting the revenue cap must be published by the ACCC at a time which provides all affected parties with adequate notice to prepare for, participate in, and respond to that process, prior to the commencement of the regulatory control period to which that revenue cap is to apply. The revenue cap re-setting process must provide all affected parties with a reasonable opportunity to prepare for, participate in, and respond to that process.

3 Existing regulatory framework

The Draft Statement of Regulatory Principles for the Regulation of Transmission Revenue (DRP) was produced in May 1999. TransGrid's revenue cap was finalised in February 2000 shortly after the publication of the DRP. The framework established in that document, and the ACCC's Code obligations, define how the ACCC should assess TransGrid's performance over the current regulatory control period.

Regulation of operating expenditure

Dealing first with the regulation of operating expenditure (opex), the regulatory regime established a fixed ex-ante cap on opex. No arrangement was made for an efficiency carry-over mechanism and there was no scope for an ex-post review of the actual opex. TransGrid expects its actual opex to exceed the allowance determined in the 2000 Revenue Cap Decision. If indeed this turns out to be the case, then the existing regime explicitly requires that such an overrun be absorbed by TransGrid and not be passed on to its customers.

Regulation of capital expenditure

With regard to the regulation of capex, the existing regulatory regime envisaged a two-step process: first the development of an ex-ante forecast of capex for the coming regulatory control period; and second an ex-post prudency review, so that only expenditure determined to be prudent should be included in the Regulatory Asset Base (RAB). While this two-step process may suffice as a very high level summary of the current regime, the details of the current regime and how the ACCC has interpreted its obligations, merit more detailed explanation.

The core obligation of the ACCC in relation to the regulation of capital investment by TNSPs is set out in Clause 6.2.3(d) of the Code. This holds that the regulatory regime to be administered by the ACCC must have regard to the need to (inter alia):

> provide a fair and reasonable risk-adjusted cash flow rate of return to … Transmission *Network Service Providers* on efficient investment given efficient operating and maintenance practices on the part of the … *Transmission Network Service Providers*.

The DRP elaborated on how the ACCC interprets its Code obligations to regulate capital investment. The basic design of this arrangement is that:

- The ACCC would determine an allowance for capex based on a forecast at the start of the regulatory period; and
- At the end of the period (after the investment had been made) the ACCC would assess the prudency of capital on those projects the actual cost of which exceeded the forecast cost.

The test of prudent investment was "…the amount that would be invested by a prudent TNSP acting efficiently in accordance with good industry practice …"[2] A defining characteristic of the regime outlined in the DRP is that it requires the assessment of prudency ex-post. That is, the assessment of prudent investment and the amount of expenditure to be included in the RAB is to be determined after the investment has been made. The determination of the capex forecast at the start of the period is designed to provide TNSPs with sufficient cash-flow to finance their expected investment program. While this forecast is based on a reasonable assessment of likely investment over the period of the revenue control, it is not intended to represent a definitive assessment of efficient investment.

By implication, any difference between the actual expenditure and the forecast expenditure can not simply be attributed to efficiency being higher than expected (if actual capital expenditure is below forecast capex) or lower than expected (if actual expenditure is above forecast expenditure).

TransGrid developed at least forty individual transmission reliability or augmentation projects, and several hundred maintenance, replacement and "support-the-business" investments were made. The practical challenge of assessing the prudency of several hundred investment projects has required the use of discretion in developing an ex-post assessment approach that maximises the performance of the ACCC's Code obligations within its resource constraints and in view of the time available to complete the review. This discretion has been applied in the following way:

- If a project was included in the capex forecast in the Commission's 2000 Decision, and if the actual expenditure on that project turned out to be equal to or less than the forecast, then a lower standard of ex-post prudency assessment has been applied to that investment, on the basis that the prudency of that investment was in effect approved through its inclusion in the 2000 Decision. However this should not be taken to mean that inclusion in the 2000 Decision necessarily implies that the amount approved was "prudent";

- There has been no specific re-examination of the prudency of projects that were included in the capex forecast in the ACCC's 2000 Decision, but which TransGrid did not develop. Consistent with proposed statement 5.3 of the DRP, the cost of such a project has been removed from the RAB;

- A "process-based" evaluation (an evaluation of the prudency of the investment selection and delivery processes used by the TNSP during the regulatory

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[2] This is taken from proposed statement 5.1 on page 63 of the "Statement of Principles for the Regulation of Transmission Revenues", May 1999. The full text of this statement also required that one of three other conditions be satisfied for investment to be deemed prudent. The first condition was that incremental revenue generated by the capital expenditure exceeds the investment cost". This condition is obviously circular – as long as the ACCC determines that the investment is prudent the present value of revenues will be greater than the investment cost.

control period) has influenced the assessment of the prudency of maintenance and replacement capex;

- Best endeavours have been made to minimise the amount of network capital expenditure characterised as "miscellaneous" (for example "miscellaneous transmission lines and substations" or "miscellaneous current transformers"). However, some amount of investment has remained under these categories and the ACCC has sought to evaluate this investment primarily through process-based assessments; and

- A much higher standard of prudency assessment has been applied to large projects the actual cost of which has turned out to be materially higher than its forecast costs.

The role of the Regulatory Test in the prudency assessment also merits specific explanation. The Regulatory Test was promulgated in December 1999 under clause 5.6.5(q) of the Code (as it then was). The relevant provisions dealing with the Regulatory Test are established in clause 5.6.5A of the Code.

The role of the Regulatory Test and the ACCC's determination of prudent investment has changed over time. Before the "Network and Distributed Resources" (NDR) Code changes in March 2002, the ACCC was required to automatically roll-in to a TNSP's RAB any investment that had passed the Regulatory Test as applied by NEMMCO in a network augmentation determination under clause 5.6.5. Since the NDR Code changes, NEMMCO's power to make such a determination has been removed. Therefore, there is no explicit link between the outcome of the Regulatory Test and amount of the investment to be rolled-in to the RAB. The ACCC is not expressly bound to accept the outcome of the Regulatory Test as the definitive statement on the amount to be rolled-in to the RAB. Nevertheless, the ACCC has adopted the Regulatory Test as the starting point for assessing the prudency of TransGrid's capex as foreshadowed in the 2000 Decision.

4 ACCC's Decision on opex

The ACCC has determined a total opex allowance for the period 2004 to 2009 (in constant 2004 dollars) of $568.22 million compared to TransGrid's request of $658.35 (in constant 2004 dollars) and the ACCC's allowance in the 2000 Decision for the period 1999 to 2004 of $563.65 million (in constant 2004 dollars).

The main reasons for the difference between TransGrid's Application and the ACCC's Decision relate to the choice of the starting point and the extent of sustained productivity improvements. During the coming regulatory period, TransGrid chose a starting point on the basis of a forecast of actual opex for the year ending 30 June 2004 that is 20 percent higher than its opex in the first 3 years of the current control period. The ACCC chose a starting point based on the last year for which audited data is available and then excluded some one-off opex costs arising in that year.

On the evolution of opex costs over the rest of the control period, TransGrid assumed that the majority of its costs would increase on the basis of a Wage Cost Index (WCI) which was substantially higher than the historic evidence of this index. The ACCC

has assumed the WCI will continue at its average annual over the last five years. In addition, the ACCC has included a 2 percent compound reduction in opex over the coming period on the basis of evidence presented by TransGrid, consistent with international evidence on productivity improvements that have been achieved by similar network businesses that have been subject to comparable opex incentives.

The principles of the ACCC's analysis of opex have also been reflected in GHD's independent report to the ACCC on prudent opex. The ACCC's and GHD's estimates of a prudent opex allowance generally concur, although there are some differences, for example on the exclusion of some self-insurance costs.

The ACCC has also approved TransGrid's Application for all "pass through events" except for: Unforseen External Events (other than Terrorist Events); Change in Accounting Standards; and Easement Risk.

5 ACCC's Decision on capex

Historic capex (1999 to 2004)

The ACCC's 2000 Decision provided a capex allowance of $885.6 million for the regulatory period ending 30 June 2004. This amount was stated in 2000 dollars and included the return on investment at the allowed WACC. In 2004 dollars the ACCC's 2000 Decision capex allowance is $906.17 million.

TransGrid's Application claimed an actual spend of $1,066.9 million over the previous regulatory period. This has since been increased to $1,107.4 million mainly on account of increases in the cost of the MetroGrid project and SNI. On a comparable basis to the ACCC's Decision the actual capex including return on investment is $1,194.9 million also in 2004 dollars. This results in an overspend of $288.7 million in constant currency terms compared to the 2000 Decision allowance. This represents the present value of the additional capex plus the accumulated return on that capex which TransGrid seeks to recover from customers through inclusion in the RAB.

As described earlier, the ACCC is required to assess the prudency of capex on the basis of an ex-post prudency assessment. The purpose of this is to ensure that the cost of inefficient investment is not passed on to consumers. The ACCC has implemented its prudency assessment in a three-stage process. This approach is applied whether or not the Regulatory Test has been conducted. The process is outlined below:

- First, to assess whether there is a justifiable need for an investment;
- Second, to assess whether TransGrid proposed the most efficient investment to meet that need; and
- Third, to assess whether TransGrid efficiently delivered the chosen solution.

After completing its prudency review, the Commission has decided to exclude $126.75 million of a total investment from 1999 to 2004 of $1,107.4 million, from TransGrid's RAB. The breakdown of this amount into various projects is set out in Table 1.

Table 1: Analysis of ex-post prudency adjustments

	Actual spend over 1999/2004 ($m nominal)	ACCC 2004 Decision allowance for 1999/2004 ($m nominal)	Prudency adjustment ($m nominal)
Augmentation			
Kempsey-Nambucca-Coffs Harbour 132kV	56.3	54.15	2.15
Bayswater 500 kV	70	0	70
Sydney City CBD	276.5	232.5	44
Non-augmentation: replace/refurbishment			
Telecommunication assets	41.7	38.5	3.2
Other Sydney Projects	11.1	4.6	6.5
Support the business			
Motor vehicles	37.4	36.5	0.9
Other projects	614.4	614.4	n/a
Total	**1,107.4**	**980.65**	**126.75**

The two major adjustments are for the Bayswater 500kV transmission line and the MetroGrid project.

Bayswater 500 kV

In its 2000 Decision, the ACCC re-included in the RAB in 2001 the amount optimised by Independent Pricing Authority Regulatory Tribunal (IPART) ($70 million) anticipating that the Bayswater line would be operating at 500 kV during the current regulatory period.

The $70 million optimisation was first implemented by IPART in 1996. IPART wrote-down the value of the Bayswater line to take account of the fact that the line had been built to 500 kV but had only ever operated at 330 kV. The effect of the ACCC's 2000 Decision was to re-include in the RAB the $70 million on the basis that its inclusion would be subject to an assessment in the next regulatory period.

The ACCC made clear in its 2000 Decision that it would "not hesitate" to exclude the optimised amount, if the Bayswater line operated at a level below 500 kV.
The ACCC understands that the Bayswater line continues to operate at 330 kV despite the fact that the Queensland – New South Wales Interconnector (QNI) has been commissioned and additional generation in the Hunter Valley has come on stream. Therefore, consistent with the 2000 Decision, the ACCC has excluded the re-optimised amount from TransGrid's RAB.

It should be emphasised that this adjustment does not relate to an investment made by TransGrid over the current regulatory period. The Bayswater line was commissioned in the 1980s and early 1990s.

MetroGrid project

The MetroGrid project entailed the construction of a cable and substation in the Sydney metropolitan area. The Regulatory Test assessment of the cost of this project was $142.5 million (in 1999 dollars). The actual cost of the project is now estimated to be $276.5 million (nominal) excluding claims against TransGrid that total around $40 million (although the actual pay-out on these claims is likely to be much lower).

The ACCC's opinion is that for the MetroGrid project, TransGrid conducted inadequate analysis of the investment choices available to efficiently meet the investment need. In addition, TransGrid failed to respond appropriately to information that the actual project would cost considerably more than envisaged at the time of the Regulatory Test assessment. Therefore, TransGrid did not demonstrate that all of the investment in the MetroGrid project was prudent.

The ACCC considered a number of ways to calculate a prudency adjustment. On balance, the chosen approach is based on excluding the return that TransGrid would have earned on its investment in this project during the course of its construction. Accordingly the cash expenditure on this project has been written-down by $44 million. This equates to 84 percent of the current estimate of the total (nominal) cost of the project.

In addition, as this project is not yet complete, the ACCC has decided to apply an incentive on TransGrid to manage the remaining costs of this project. The principle of this incentive is to extend the prudency adjustment to the remaining expenditure on this project. A simple way to do this is to allow TransGrid to include in the RAB only 84 per cent of the remaining capital costs.[3] This provides an incentive to TransGrid to minimise such costs since for every additional dollar spent, in present value terms, TransGrid only recovers 84 cents. It should be noted that this incentive applies only to capex on this project, as operating expenditure is already subject to a fixed ex-ante incentive. The ACCC does not envisage that a specific mechanism will be needed to implement this incentive. Rather, the impact of the incentive on the determination of the closing RAB in 2009 will be calculated at the time of the next regulatory reset.

The ACCC has not come to a final view on the prudency of TransGrid's investments on a number of significant projects. In these cases, for the purposes of this Draft Decision the ACCC's approach has been to roll-in the full amount of the expenditure into the RAB. Further analysis will be conducted on these projects in time for the Final Decision.

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[3] This percentage has been calculated by translating the $51 million adjustment on the carried-forward value of the project to an equivalent adjustment to the underlying capital cost of the project, based on the profile of historic spending on the project. This adjustment which equals $44 million, stated as a percentage of the capital cost of the project, is 16 per cent which means that 84 per cent of the historic expenditure is recoverable.

Finally, an important issue for this review is how the closing RAB should be established. TransGrid proposed an approach consistent with the approach used in the calculation of the RAB in the ACCC's Post Tax Revenue Model (PTRM). The ACCC reviewed TransGrid's model after which some relatively minor adjustments were made. For the purpose of the Draft Decision, the ACCC has used TransGrid's model, after adjustments, to calculate the closing RAB at the end of the current regulatory period. However, the ACCC is still considering whether an approach that relates the closing RAB to the opening RAB and the present value of actual opex, capex, tax and revenue ("the cash flow approach") would be more advantageous. The ACCC's current view is that the approach suggested by TransGrid and the "cash flow" approach would deliver very similar results.

Future capex (2004 to 2009)

The ACCC is currently considering changes to the capex regulatory regime to place greater weight on a firm ex-ante investment cap. This would involve the ACCC setting a firm cap at the start of the regulatory period, which would enable a TNSP to decide which investments it would make within this allowance. The main features of the proposed ex-ante cap are set out in more detail in Chapter 5 – Forward Capital Expenditure, and in a supplementary paper to the Discussion Paper on the DRP.[4]

The full specification of the revised regulatory arrangements is yet to be developed and the ACCC has yet to decide whether to implement these changes. However, in view of the likelihood of the changes and their likely significant implications for the control of capital expenditure, TransGrid has proposed to resubmit its capital expenditure once these changes have been finalised. The ACCC has agreed to TransGrid's proposal and will work to ensure the finalisation of changes to the regulatory regime by August 2004 so that TransGrid is able to resubmit its future capex application no later than the end of October 2004. The result of this process will be a Final Decision incorporating an assessment of TransGrid's forecast capex under the ex-ante approach as well as the ACCC's findings on the other parts of TransGrid's Application unaffected by the future capex application.

However, to enable TransGrid to set transmission prices by 15 May 2004 for the financial year beginning 1 July 2004, it is necessary to make assumptions on future capex. To do this, the ACCC has simply used the figures provided in TransGrid's initial Application. However, following advice provided by TransGrid, the future capex program will not include the SNI proposal which TransGrid has estimated at a cost of $94.47 million. The future capex to be assumed for the purpose of the price path projection is therefore $1,308.4 million over the period 2004 to 2009. However, the ACCC's Final Decision by May 2005 may result in a higher or lower amount than this, and the use of TransGrid's Application for the purposes of this Draft Decision should not in any way be construed to represent acceptance of that Application.

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[4] ACCC, *Review of the Draft Statement of Principles for the Regulation of Transmission Revenues, Capital Expenditure Framework*, 10 March 2004.

Revenues and hence prices will need to be adjusted for the remainder of the regulatory control period to take account of the Final Decision.

6 ACCC's Decision on cost of capital

The Code requires the ACCC to provide TNSPs with a fair and reasonable rate of return on efficient investment. The ACCC uses the capital asset pricing model (CAPM) to estimate a fair rate of return on equity. The rate of return is then applied in the ACCC's post-tax revenue model.

Table 2 contains the parameters used to determine the weighted average cost of capital (WACC). It compares the parameters proposed by TransGrid in its Application with the ACCC's Draft Decision.

Table 2: Comparison of WACC parameters

Parameter	Application (%)	Draft Decision (%)
Nominal risk-free interest rate (R_f)	5.01	5.89
Expected inflation rate (F)	2.08	2.44
Debt margin (over R_f)	1.485	0.87
Cost of debt $R_d = R_f$ + debt margin	6.495	6.76
Market risk premium (MRP)	6.00	6.00
Gearing ratio	60	60
Value of imputation credits (γ)	0	50
Asset beta (β_a)	0.45	0.40
Debt beta (β_d)	0.00	0.00
Equity beta (β_e)	1.12	1.00

Some of the parameters in Table 2, such as the expected risk-free rate and inflation rate will be revised for the Final Decision to reflect the most recent information available at that time. The parameters have been calculated in accordance with the ACCC's DRP and are consistent with the ACCC's previous Decisions.

Table 3 compares the WACC proposed by TransGrid with the WACC calculations consistent with the parameters in Table 2. The main difference in the values proposed by TransGrid and adopted in the ACCC Draft Decision relates to the debt margin, equity beta and gamma. The ACCC considers that it is appropriate to benchmark a debt margin based on A rated corporate bonds with a maturity of ten years. The ACCC notes that an equity beta of 1.0 is biased towards the service provider if exclusive reliance on market data is used. However, the ACCC would like to be confident that the market-derived beta will not systematically under compensate TNSPs and therefore, the ACCC is proposing an equity beta of 1.0 for TransGrid. The ACCC also proposes a value of 0.5 for gamma.

Table 3 Comparison of the WACC

	Application (%)	Draft Decision (%)
Nominal post-tax return on equity	11.73	11.87
Post-tax nominal WACC	7.42	7.03
Pre-tax real WACC	8.35	6.75
Nominal vanilla WACC	**8.59**	**8.80**

7 ACCC's Decision on Service Standards

The ACCC engaged GHD to recommend an appropriate service standard incentive for TransGrid. GHD compared TransGrid's proposed service standards to its actual performance in the 1999-2004 regulatory period to evaluate the reasonableness of the proposed measures and found that it would deliver a bonus to TransGrid at its current level of performance. Therefore GHD recommended an adjusted incentive scheme that is revenue-neutral based upon TransGrid's historic performance. Therefore, an improvement on historic performance in any of the measured areas under this incentive scheme would result in a bonus for TransGrid. Conversely, if no improvement occurs, TransGrid will incur neither a bonus nor a penalty. The ACCC accepts GHD's proposed changes.

8 Determination of Maximum Allowable Revenue

Table 4 below summarises the ACCC's Decision on the opening RAB, aggregate forecast capex and opex in real terms, and the cost of capital.

Table 4: Summary of ACCC Decisions on opening RAB, aggregate forecast opex and capex (constant 2004 dollars) and WACC

	TransGrid's Initial Application ($ m)	Draft Decision ($ m)
RAB at 1 July 2004	3047.40	2923.25
Forecast capex aggregate	1,402.87[5]	1,308.40
Forecast opex aggregate	647.60	568.22
Nominal Vanilla WACC	8.59%	8.80%

Total revenue and CPI-X Smoothing in nominal terms

Based on the various elements of the building block approach, the ACCC proposes a smoothed revenue allowance that increases from $432.8 million for 1 July 2004 to 30 June 2005 to $458.7 million, $486.2 million, $515.4 million, and $546.3 million in the subsequent financial years (Table 5). These figures incorporate revenue smoothing based on an X smoothing factor of 3.5 per cent. That is, the MAR will increase by CPI plus 3.5 per cent in each year of the regulatory period.

[5] TransGrid requested that the capital expenditure proposed for SNI should be excluded from the forecast capex program. The forecast amount for SNI is $94.47 million.

Table 5: TransGrid's MAR from 1 July 2004 to 30 June 2009 ($ million, nominal)

	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
Return on capital	257.32	268.32	286.44	312.93	336.63
Return of capital	50.54	58.29	66.21	68.36	75.33
Operating expenses	118.19	120.26	122.47	124.71	125.26
Estimated taxes payable	13.42	15.60	18.56	22.16	28.98
Less value of franking credits	6.71	7.80	9.28	11.08	14.49
Raw revenue	432.75	454.68	484.40	517.09	551.71
Smoothed revenue	**432.75**	**458.70**	**486.21**	**515.36**	**546.27**

Comparison of TransGrid's Initial Application and the ACCC's Draft Decision

Revenue comparison in constant 2004 dollars

TransGrid applied for revenue in real terms of $463.46 million in the year 2004/05 to $482.92 million, $506.13 million, $529.09 million, and $555.87 million in the subsequent full financial years of the regulatory period. Based on the various elements of the building block approach, the ACCC proposes a smoothed revenue allowance in real terms of $422.45 million in the year 2004/05 to $437.13 million, $452.32 million, $468.03 million, and $484.29 million in the subsequent full financial years of the regulatory period. Table 6 compares the ACCC's MAR and TransGrid's MAR over the regulatory period.

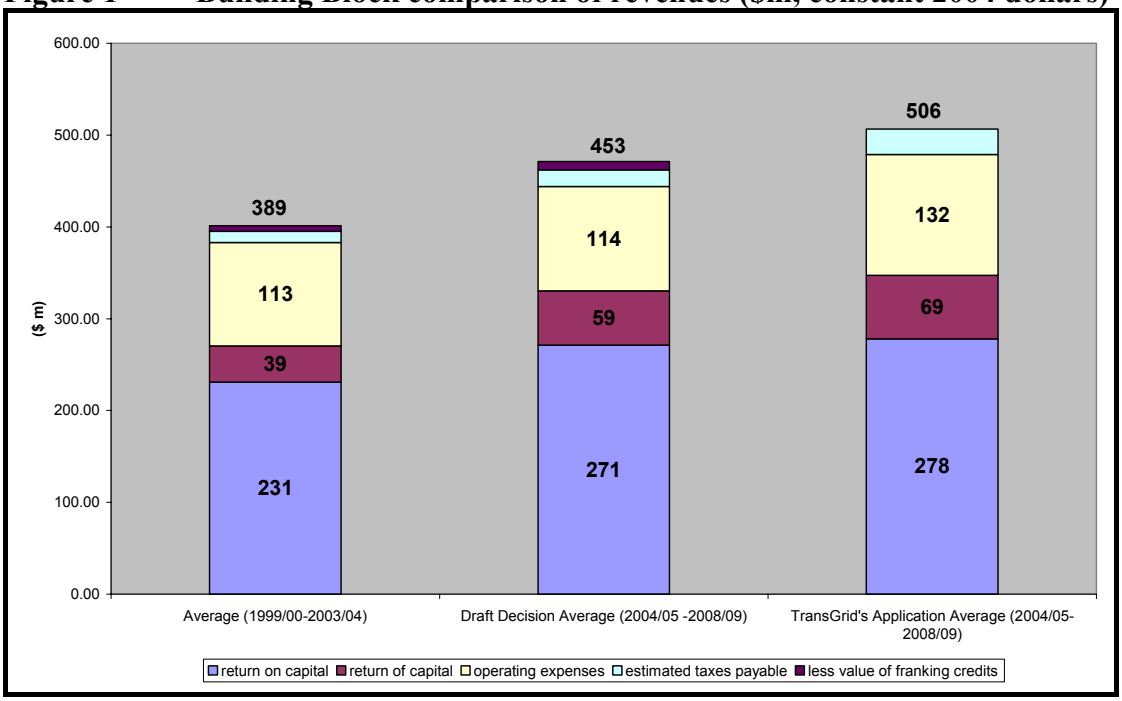
Table 6: Comparison of MAR 2005/05 – 2008/09 ($ million, constant 2004 dollars)

	2003/04(f)	2004/05	2005/06	2006/07	2007/08	2008/09
ACCC's 2000 Decision	399.41					
TransGrid's Initial Application		463.46	482.92	506.13	529.09	555.87
Draft Decision		422.45	437.13	452.32	468.03	484.29

The revenue set by the ACCC for this Draft Decision is on average 14.02 per cent below that sought by TransGrid. Figure 1, outlined below, is a comparison of the building block revenues of the ACCC's 2000 Revenue Cap Decision, TransGrid's proposed revenue, and the ACCC's Draft Decision for the regulatory period 2004/05 to 2008/09.[6]

[6] This comparison is based on TransGrid's initial Application and unsmoothed revenues.

Figure 1 Building Block comparison of revenues ($m, constant 2004 dollars)



Impact on transmission charges

Table 7 below, illustrates how, based on forecast energy demand in New South Wales over the regulatory period, TransGrid's initial Application translates into real price changes. The overall effect is that the Draft Decision results in a 2.67 percent increase in prices in the first year of the regulatory period and on average increases by around 1 percent in the subsequent years of the regulatory period. The modest price increases arising from the Draft Decision compare to TransGrid's proposed price increase in the first year of 12.64 percent and an increase of around 2 percent in subsequent years.[7]

Table 7 Impact on transmission prices (constant 2004 dollars/MWh)

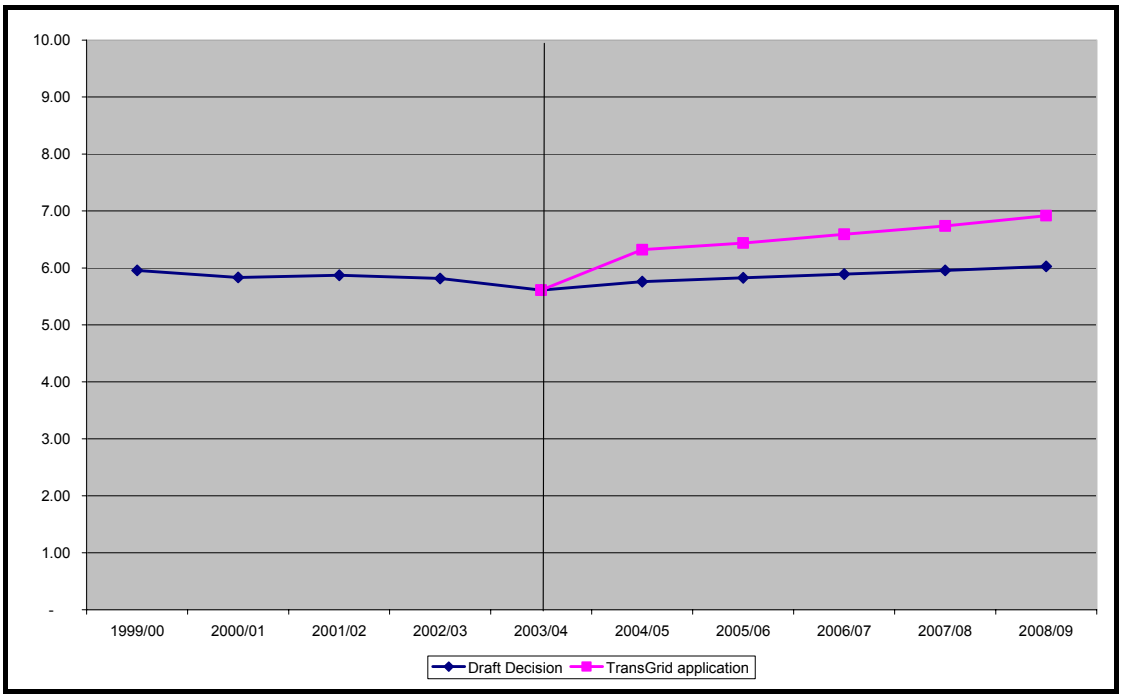
	2004/05	2005/06	2006/07	2007/08	2008/09
TransGrid's Initial Application	12.64	1.85	2.40	2.20	2.69
Draft Decision	2.67	1.14	1.10	1.16	1.14

The increase in prices has been a result of growing demand and the need to accommodate efficient investment to ensure a reliable supply of electricity to NSW.

[7] The transmission prices have been calculated by dividing the real smoothed revenue by the Energy demand (MWh) for that respective year. The ACCC has used the MWh forecast from the NEMMCO Statement of Opportunities 2003.

Figure 2 shows the resulting price path of this Decision over the regulatory period compared to TransGrid's Application, and the ACCC's 2000 Decision.

Figure 2 Illustrative price path 2002-03 to 2008-09 (constant 2004 dollars /MWh)



1. Introduction

TransGrid is a state owned corporation of the New South Wales (NSW) government with over 12,400 kilometres of high voltage transmission line and 81 substations and switching stations with a total asset value of approximately $3 billion.

Under the National Electricity Code (Code), the Australian Competition and Consumer Commission (ACCC) has been the regulator of the revenues of the transmission networks in New South Wales and the Australian Capital Territory (ACT) since 1 July 1999.

In June 1999, the NSW Government announced that it would delay the date on which the ACCC's transmission Revenue Cap Decisions would come into effect. The NSW derogations had the impact that TransGrid was permitted to earn revenues in accordance with the pre-existing prices for the period between 1 July 1999 and 31 January 2000. For the period 1 February 2000 to 30 June 2004, the NSW transmission network earned revenues in accordance with the ACCC's Decision.

On 26 September 2003, TransGrid submitted to the ACCC its Application in relation to the re-set of TransGrid's revenue cap under clause 6.2.4(b) of the Code for the period 1 July 2004 to 30 June 2009. TransGrid and the transmission part of EnergyAustralia were the first transmission network to have their Maximum Allowable Revenues (MAR) determined by the ACCC and so are the first of the "second round" MAR determinations by the ACCC.

This Chapter sets out:

- the ACCC's Code requirements in relation to the form of regulation to be applied to each TNSP's revenue (section 1.1);
- the review and public consultation process followed by the ACCC in reaching its Decision (section 1.2);
- the structure of this document (section 1.3); and
- an overview of TransGrid's network (section 1.4).

1.1 Code requirements

The core obligation of the ACCC in relation to the broad from of regulation to be applied to each TNSP's revenue is set out in clauses 6.2.2 to 6.2.5 of the Code. These provide that the regulatory regime to be administered by the ACCC must achieve outcomes that are:

> *...efficient and cost effective; are incentive based that share efficiency gains between network users and owners and provide a reasonable rate of return to network owners; foster efficient investment, operation, maintenance and use of network assets; recognise pre-existing government policies on asset values, revenue paths and prices; promote competition; and are reasonably accountable, transparent and consistent over time".*

The Code requires the ACCC to implement a revenue cap with a CPI-X incentive mechanism and a regulatory control period of no less than five years. Other than these broad requirements the Code grants the ACCC the flexibility to use alternative methodologies providing they are consistent with the Code's objectives and principles. For example the Code requires the ACCC to set a revenue cap for TNSPs. However, if the ACCC considers that there is sufficient competition to warrant a more light handed regulatory approach it may determine and apply such an approach.

Draft Regulatory Principles

The May 1999 Statement of Draft Regulatory Principles (DRP) elaborated on how the ACCC interprets its Code obligations in setting a CPI-X revenue cap. The basic design of this arrangement is that the ACCC would adopt a building block approach which adds up the expected efficient costs at the start of the regulatory period to determine a MAR.

The building block approach calculates the Allowed Revenue (AR) as the sum of the return on capital, the return of capital, operating and maintenance expenditure and taxes. The building block formula is:

AR = return on capital + return of capital + opex + tax
= (WACC * WDV) + D + opex + tax

Where:

AR	=	allowed revenue
WACC	=	post-tax nominal weighted average cost of capital
WDV	=	written down (depreciated) value of the asset base
D	=	depreciation
opex	=	operating and maintenance expenditure
tax	=	expected business income tax payable

However, in determining the MAR, the Code requires the ACCC to take into account the service standards that TNSPs are expected to maintain. Therefore, the ACCC will adopt an annual service standard adjustment in the calculation of MAR, that is:

MAR_t = (allowed revenue) + (financial incentive)

$$= \left(AR_t\right) + \left(\frac{(AR_{t-1} + AR_{t-2})}{2} \times S_{ct}\right)$$

Where:

MAR	=	maximum allowed revenue
AR	=	allowed revenue
S	=	service standards factor
t	=	regulatory period
ct	=	calendar year

1.2 Process issues

The key aspects of the review of TransGrid's Application which have occurred to date are as follows:

- On 26 September 2003, TransGrid submitted its Application for the ACCC's consideration. The Application outlines TransGrid's views on key elements of the building block and revenue cap setting processes. The Application is available on the ACCC's website.

- The closing date for submissions on TransGrid's Application was 30 January 2004. The ACCC received six submissions in response to TransGrid's Application. Copies of these submissions are available on the ACCC's website.

- The ACCC engaged GHD to review TransGrid's capital expenditure and asset base, operational expenditure and services standards application. Copies of GHD's report are available on the ACCC's website.

- During the course of the review a consultant from PB Associates Australia has been retained to assist in the development of a better informed assessment of the efficiency of TransGrid's historic and proposed future investments.

- Furthermore throughout the course of the review Mountain Associates and Dr Darryl Biggar have been engaged as internal consultants to assist the ACCC on a number of aspects of the Review. During the period of time between the release by the ACCC of the Draft Decision and the Final Decision, TransGrid and interested parties will have an opportunity to comment on Mountain Associates report to the ACCC on the MetroGrid project.

- The ACCC conducted discussions with TransGrid on matters of principle as well as for the purpose of information and fact gathering. Between the 3 February 2004 and 6 February 2004, discussions were held on historic capex. Between the 10 February 2004 and 12 February 2004 discussions were held on future capex.

- On 14 April 2004, the ACCC released GHD's final report on TransGrid's Application: The closing date for submissions was 20 April 2004. The ACCC has received submissions on GHD's Report from TransGrid, Powerlink and Energy Markets Reform Forum. The substantive arguments in these submissions have been taken into consideration by the ACCC. Some outstanding issues remain which the ACCC wishes to consider further before its Final Decision.

- The ACCC made this Draft Decision on 28 April 2004.

The timetable for TransGrid's revenue cap was placed on the ACCC's web site but has been revised to account for TransGrid's request to the ACCC of 12 March 2004 to extend the timetable in order to enable TransGrid to resubmit that part of its Application that deals with forward capex. This request is in response to the ACCC's Supplementary Discussion Paper on the *"Review of the Draft Statement of Principles for the Regulation of Transmission Revenues - Capital Expenditure Framework"*.

This Supplementary Discussion Paper proposed a new approach to capex based on a firm ex-ante cap that is further discussed in Chapter 5.

The ACCC is currently considering changes to the capex regulatory regime to place greater weight on a firm ex-ante investment cap. This would involve the ACCC setting a firm cap at the start of the regulatory period, which would enable a TNSP to decide which investments it would make within this allowance. The features of the proposed ex-ante cap are set out in more detail in Chapter 5 – Forward Capital Expenditure, and in a supplementary paper to the Discussion Paper on the DRP.[8]

The full specification of the revised regulatory arrangements is yet to be developed and the ACCC has yet to decide whether to implement these changes. However, in view of the likelihood of the changes and their likely significant implications for the control of capital expenditure, TransGrid has proposed to resubmit its capital expenditure once these changes have been finalised. The ACCC has agreed to TransGrid's proposal and will work to ensure the finalisation of changes to the regulatory regime by August 2004 so that TransGrid is able to resubmit its future capex application no later than the end of October 2004. The result of this process will be a Final Decision incorporating an assessment of TransGrid's forecast capex under the ex-ante approach as well as the ACCC's findings on the other parts of TransGrid's Application unaffected by the future capex application.

The key dates from the forecast timetable are as follows:

Early July 04	Close of submissions on Draft Decision. The ACCC will hold a public forum if requested within 14 days of the release of the Draft Decision.
End October 04	TransGrid resubmits future capex application.
Mid December 04	ACCC releases consultant's report on TransGrid's application for public consultation.
Mid February 05	ACCC releases supplementary draft decision and invites submissions.
Early March 05	Public Forum on supplementary draft decision (if requested).
Mid April 05	ACCC releases final decision.

A comprehensive indicative timetable is given in Appendix Six.

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[8] ACCC, *Review of the Draft Statement of Principles for the Regulation of Transmission Revenues, Capital Expenditure Framework*, 10 March 2004.

1.3 Structure

The remainder of this document explains the ACCC's Decision on TransGrid's Application for its MAR over the regulatory period. It is structured as follows:

- Chapter 2 outlines the opex for TransGrid;
- Chapter 3 outlines the asset roll forward principles;
- Chapter 4 sets out the ACCC's determination of prudency of TransGrid's historic spending and TransGrid's opening asset base at 1 July 2004;
- Chapter 5 sets out the ACCC's approach to assessing future capital expenditure;
- Chapter 6 deals with TransGrid's weighted average cost of capital (WACC);
- Chapter 7 sets out the ACCC's assessment of each of the elements of the building block model;
- Chapter 8 sets out the service standards to apply to TransGrid;
- Appendix 1 lists the interested parties who made submissions;
- Appendix 2 outlines the assessment of the prudency of the individual historic capex projects;
- Appendix 3 outlines the ACCC's decision on pass through rules;
- Appendix 4 sets out the financial indicators;
- Appendix 5 presents the equations for calculating the financial incentives relating to service standards; and
- Appendix 6 outlines the timetable for the future capex assessment.

Attachment A of this document is a report by Mountain Associates on the MetroGrid Project.

1.4 Overview of TransGrid's network

TransGrid operates more than 12,400 kilometres of transmission circuits as well as 81 terminal substations in NSW and the ACT. TransGrid's network spans an area that extends from the Queensland to Victorian borders and 400 kilometres inland from the east coast extending along the Murray River and up to Broken Hill. Figure 1 illustrates TransGrid's network and highlights the major load centres in NSW and figure 2 illustrates TransGrid's network in the metropolitan areas.

TransGrid's network serviced a system maximum demand of 71 GW during the 2003/04 financial year. TransGrid has forecast demand to grow at about 3.2 per cent per annum in the summer and 2.3 per cent in the winter. Further, TransGrid has forecast that approximately 1,600 MW of additional generation could be required within NSW during the next regulatory period.

NSW plays a central role in the NEM as a result of both its geographic location and its flexible generating plant. In the next regulatory period, both Queensland and Victoria are expected to rely on imports from NSW at times of high demand and export to NSW at other times.

Figure 1 Coverage of TransGrid's Network

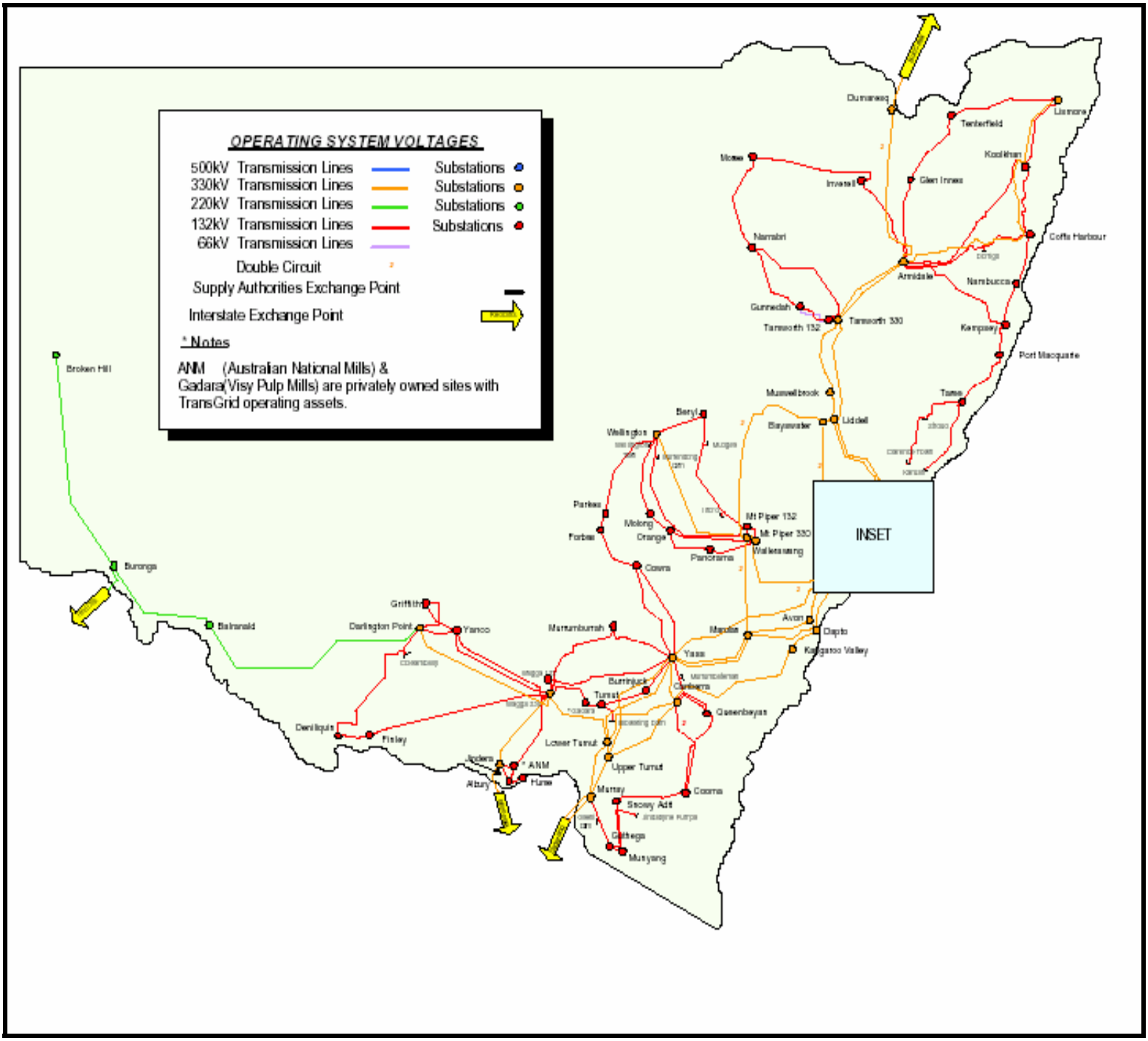
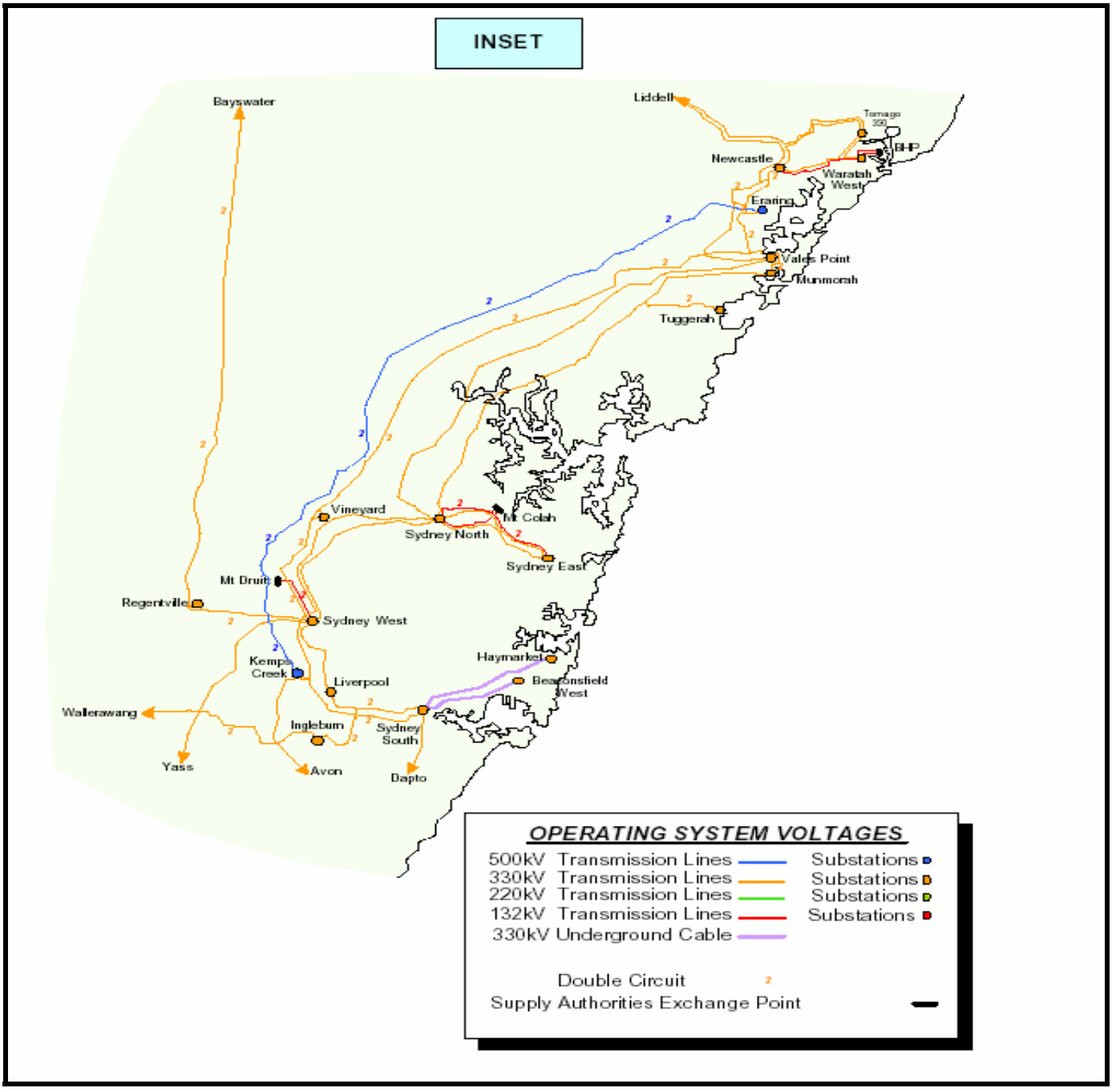


Figure 2 TransGrid's Network in the Metropolitan Areas



2 Operating and maintenance expenditure

2.1 Introduction

TransGrid has applied for a total operating and maintenance expenditure (opex) allowance from 2004 to 2009 of $658.3 million in real terms. This represents around 33 per cent of its total proposed expenditure for this period.

In the "building block" approach to regulation, the opex allowance compensates TransGrid for the cash costs of providing a transmission service to its customers. Unlike the capex allowance, the recovery of these costs through the opex allowance does not provide any return to TransGrid. TransGrid is only able to "profit" if its actual operating costs are below the allowance determined by the ACCC.

The challenge in establishing a suitable opex allowance is to ensure that it enables TransGrid to provide a reliable and high quality service, while also promoting efficiency in the delivery of the service.

This chapter sets out the ACCC's Decision on the determination of the opex allowance for the period 2004 to 2009.

The Chapter:

- considers the regulatory framework for opex and explains how the ACCC has interpreted its Code obligations (section 2.2);
- provides an analysis of TransGrid's Application (section 2.3);
- summarises submissions from interested parties (section 2.4);
- outlines the analysis of GHD's report to the ACCC on TransGrid's opex claim (section 2.5); and
- sets out the ACCC's Decision on the allowed opex (section 2.6).

2.2 Opex regulatory framework

The ACCC's approach to the regulation of opex is established in part B of Chapter 6 of the Code, the Draft Statement of Regulatory Principles (DRP) and the ACCC's 2000 Decision on TransGrid. The Code broadly defines the overall objective of regulating opex and specifically requires the ACCC to have regard to the potential for efficiency gains in expected operating and maintenance and capital costs; and to promote efficient operating and maintenance practices. However the Code does not prescribe how these objectives are to be achieved.

The current regulatory arrangements for opex were defined in the ACCC's 2000 Decision and in the DRP. The key features of this arrangement are as follows:

- The opex allowance for the coming regulatory control period is established at the start of the period;

- There is no opportunity to re-visit the allowance once established. In this respect it is quite different to the treatment of capex which is subject to ex-post prudency assessment; and

- The opex target is reset at the subsequent review but there is no requirement or obligation on the ACCC to consider the outcome from the previous period in establishing the starting point or target for the next period.

This regulatory mechanism is intended to provide a strong financial incentive to TNSPs to reveal efficiencies since if actual opex is below the forecast opex; shareholders retain the full benefit of the saving for the period of the control. On the other hand, if actual opex is above the forecast opex, shareholders face the full amount of that "overspend". In addition, in the current regime there is no explicit "efficiency carry-forward" mechanism. In other words, the ACCC is free to decide at the end of the Regulatory Period to pass on the full amount of any revealed efficiency to customers by reducing the opex target in the coming period by the full amount of those efficiency savings.

During the current regulatory period, the ACCC has consulted on changes to the regulatory regime for opex that could entail prescribing at the start of the regulatory control, how any revealed efficiencies will be taken into account in establishing future opex allowances at the time of the subsequent controls. The effect of such changes could be to strengthen opex efficiency incentives by allowing revealed efficiencies to be shared with shareholders for longer periods. However, this matter is still under consideration as part of the finalisation of the Draft Regulatory Principles and so the ACCC does not propose to include this change to the incentive mechanism in TransGrid's opex incentive from 2004 to 2009.

The ACCC has interpreted the Code obligations and prescriptions of the DRP in defining the regulatory incentive for opex from 2004 to 2009 as follows:

- The ACCC has sought to establish an opex target that reflects its estimate of the expected average opex efficiency. By implication, TransGrid will derive above average returns on equity if it achieves above average opex efficiency; and

- Where reliable benchmarks are not available, the ACCC will need to conduct a firm-specific analysis. The broad principle of such analysis is to include in the opex allowance expected costs taking account of the specific circumstances of the firm and assuming average efficiency.

The ACCC recognises that differing incentives on opex and capex may provide an incentive for inefficient substitution of operating expenditure for capital expenditure or vice versa. However, at this point, the ACCC has proposed changes to the incentive regime for capex and so the precise power of the capex efficiency incentives are somewhat unclear. Therefore the incentive to inefficiently substitute between opex and capex under the current regime is not clear. However, any evidence of inefficient substitution between capex and opex will be assessed at the time of the next regulatory review in 2009 and adjustments will be made at that time if necessary.

2.3 TransGrid's Application

TransGrid applied for a total opex allowance for the period 2004 to 2009 of $658.35 million (constant 2004 dollars). This compares to the allowance that the ACCC determined in its 2000 Decision for the period 1999 to 2004 of $563.65 million (constant 2004 dollars).

TransGrid also requested an allowance for working capital of approximately $1 million per year. This was based on an assumed total of approximately $10 million of working capital per year, the financing cost of which was approximately $1 million.

2.3.1 Starting point

TransGrid's determination of a starting point for future opex consists of two steps. First, TransGrid determined a revised estimate of efficient investment over the current regulatory period to establish an estimate of efficient opex for the final year of the current control period. Second, TransGrid converted this final year figure into a starting point for the next regulatory period. The first step is summarised in Table 2.1

Table 2.1: TransGrid's Application: determination of starting year opex ($ million nominal)

	1999/00	2000/01	2001/02	2002/03	2003/04	Total
Actual Operating Expenditure	102.92	100.39	103.44	113.80	120.68	**541.23**
Ex-ante Operating Expenditure Target	101.30	102.93	104.57	106.25	107.95	**523.00**
Adjusted for ex-post input price inflation	101.72	104.40	106.97	110.17	112.95[a]	**536.21**
Plus adjustment for SMHEA	101.72	104.40	106.97	113.17	115.95	**542.21**
Plus adjustment for self insurance costs and exogenous events	103.22	107.90	112.47	118.64	122.49	**564.72**
Plus adjusted for network size	103.22	107.90	112.47	122.28	126.93	**572.80**

(a) Forecast based on average WCI of preceding four years.

TransGrid's spending in the current regulatory period ($541 million) was 3.5 per cent higher than the ex-ante operating expenditure target ($523 million) set by the ACCC in the last Revenue Cap Decision.

TransGrid submitted that an efficient level of opex in the current period was higher than the ex-ante figure for the following reasons:

- TransGrid's acquisition of the Snowy Mountains Hydro-Electric Authority for which the ACCC provided $3.0 million in operating costs in both of 2002/03 and 2003/04;

- the Wage Cost Index was used to inflate TransGrid's costs during this period. This index was higher than the CPI used in the ex-ante figure;

- exogenous cost increases led to increases in insurance, self insurance and environmental protection costs; and

- increased network size resulting from $1 billion of new assets being installed over the current regulatory period which require monitoring and maintenance.

As a result of these revisions, TransGrid's final year estimate of "efficient" opex is $126.93 million compared to the current estimate of actual opex figure of $120.68 million.

The second step is to establish the starting point for the next regulatory period. To do this TransGrid used the mid-point of its actual opex ($120.68 million) and its own revised efficiency figure ($126.93 million). In doing this the starting point contains a form of "benefit sharing" in which fifty per cent of the claimed efficiency underspend is retained by TransGrid in the next regulatory period.

2.3.2 Evolution of opex over the period of control

TransGrid explained that the dominant factors affecting its opex were expected to include:

- real rates of wage cost increases in the electricity sector which are expected to be higher than CPI;

- substantial increases in the size of TransGrid's network;

- TransGrid's ageing workforce which requires it to provide for training and development of junior employees;

- increased network utilisation which will increase opex by reducing opportunities for planned outages and lead to an increased need for out of hours work;

- exogenous cost increases in regulatory compliance, tax and legal costs, security and fire prevention requirements will require higher opex; and

- limited capacity to realise further efficiencies beyond those already in place.

TransGrid then developed a formula based on the concept of a "maintenance unit" to link the growth in its network to its opex. The model asserts a directly proportional relationship between capex and opex. TransGrid submitted that this approach is used to benchmark the maintenance costs of Australasian transmission companies.

Following discussions on this model with ACCC staff, TransGrid submitted "line-by-line" information of the total opex application broken down into around 25 separate categories. The figures presented in the breakdown, in total reconcile with the figures derived from the maintenance unit approach. In the breakdown provided wages costs, both internal and outsourced are approximately 80 per cent of opex; and most items are forecast to rise by the CPI, with some items set to rise at above CPI rates.

2.4. Submissions from interested parties

There was limited comment from interested parties on the determination of the opex allowance.

VENCorp submitted that there needs to be an examination of the causes of the apparent increase in TransGrid's actual opex towards the end of the present regulatory period. VENCorp, the Energy Markets Reform Forum, and the Joint Customer Groups submit that the ACCC should examine the apparent increase in TransGrid's actual operating expenditure towards the end of the present regulatory period, and to consider the extent to which recent actual operating expenditure might provide a reasonable basis for developing forecasts of future efficient operating expenditure.

VENCorp and the Joint Customer Groups believe that the ACCC should present a comparison of TransGrid's actual and forecast operating costs with those of other Australian TNSPs (including the combined operating costs of VENCorp and SPI PowerNet).

The Energy Markets Reform Forum (EMRF) argues that all businesses need working capital, however, working capital balances are normally held in some form of income producing current account facility, and that this is the business norm. The EMRF submits that giving TransGrid an additional allowance on its working capital would provide a second return on top of the normal income-producing current account facility.

2.5. Analysis of GHD's report to the ACCC

GHD reviewed TransGrid's opex application to determine the efficient starting point. Their recommendation to the ACCC can be analysed in terms of their determination of the efficient opex for the first year of the control (the starting point) and then in terms of the evolution of opex over the period of the control.

2.5.1 Starting point

GHD based the calculation of the efficient starting point on the actual opex for the year ending June 2003 as this was the last year for which audited information was available. However, they made two adjustments to this:

- First GHD decreased the annual expenditure in view of what it considered to be excess overtime. During the three year period from 1999 to 2003, overtime and allowances averaged $8.0 million per annum. In 2002/03 this increased to $10.1 million largely as a result of the significant bushfires and other non-routine maintenance. GHD was unable to identify where these extraordinary costs were removed from forecast Opex. Accordingly GHD believes that TransGrid's opex should be reduced by at least $2.1 million per year.

- Second GHD made an adjustment to represent the cost of inefficient over-staffing. GHD said that after repeated discussion with TransGrid senior management, GHD came to the conclusion that TransGrid maintains approximately 50 staff surplus to core requirements. GHD estimates the cost of the non-core staff at $3.38 million per annum.

After subtracting these two adjustments from TransGrid's actual opex in 2002/3 of $113.8 million, GHD determined an efficient opex starting allowance of $108.32 million in 2003 dollars.

2.5.2 Evolution of opex over the period of the control

GHD was not convinced by TransGrid's "maintenance unit" calculation. It suggested that in the broadest terms it is an appropriate "general rule of thumb", but that it did not stand up to scrutiny over a short time period such as the 5 year regulatory control period.

GHD constructed an opex forecast model in an attempt to calculate the opex allowance. In addition GHD assumed that TransGrid could achieve opex efficiencies of 2 percent (real) per annum (not compounded). This corresponds to an internal target that TransGrid had set itself, but not achieved to-date.

In total therefore, GHD suggested that an efficient opex allowance would be $65.2 million (nominal) below TransGrid's claim.

2.6 ACCC's Draft Decision

ACCC staff reviewed TransGrid's Application in detail and a number of information requests were addressed to TransGrid to clarify and verify information provided. On the basis of the analysis of these responses and taking account of the opex regulatory framework explained in section 2.2 of this chapter, the ACCC is satisfied that the approach suggested by GHD is consistent with this framework.

The ACCC supports the idea of establishing an efficient starting point, on which the subsequent evolution of costs can be projected. This approach was also used by TransGrid in its Application. Therefore the rest of this section explains how the ACCC has arrived at the efficient starting point, and subsequently determined the evolution of opex over the period of the regulatory control.

2.6.1 Starting point

The ACCC agrees with the principle of GHD's calculation of the efficient starting point. In particular, the ACCC agrees that in the absence of better data, an appropriate starting point should be the latest year for which there is audited data. However, the ACCC notes that the actual opex for the year ending June 2003 (the last year for which audited data was available) was around 10 percent higher than for the average opex of the previous three years. Furthermore, TransGrid's forecast opex for the year ending June 2004 is a further 10 percent higher again.

The ACCC has sought to understand the reason for such sizeable annual cost increases and has not received a satisfactory explanation (even after deduction of the increase attributable to the reincorporation of Snowy Hydro's transmission assets into TransGrid). TransGrid's starting point analysis was based on the forecast 2004 opex data. The ACCC is not satisfied with the robustness of this forecast, and consequently does not believe that TransGrid's calculation of the efficient starting point, on which it rests, is appropriate.

In light of this, the ACCC agrees with GHD's Decision to take as the basis of its starting point analysis, the data for the year ending June 2003. Also, the ACCC agrees with the principle of GHD's "excess over-time" adjustment but has included TransGrid's forecast for the year following the bushfire period as an indicator of likely future overtime payments.

However, the ACCC has decided not to proceed with GHD's recommendations of a downward adjustment in respect of possible inefficient over-staffing. GHD's recommendation on this adjustment reflected its judgement on the basis of ostensibly conflicting evidence that TransGrid had presented to it.

Specifically, the issue is whether or not 50 staff that had previously been identified for redundancy was in fact surplus to requirements. This was GHD's understanding of what it had been told by TransGrid at an initial briefing. However TransGrid subsequently clarified that although 50 staff had rejected voluntary redundancy offers those staff were in fact providing necessary services and, if made redundant, their services would be outsourced. The difference between the two definitions is that with the former, the implementation of the ACCC's Code obligations would require that the full cost of employing surplus staff not be passed to consumers through regulated charges. However, if the staff are in fact gainfully employed although their services could be more economically outsourced, then the only saving to be passed on to consumers is the difference between the full cost of employment and the cost of procuring the same services from outsourced service providers.

The ACCC has reviewed the evidence presented by TransGrid and GHD and on balance have concluded that it would be inappropriate to make an adjustment in line with GHD's recommendations. This is not because the ACCC takes a different view on TransGrid's labour productivity, but rather that without evidence to disprove TransGrid's clarified position it would be inappropriate to implement GHD's recommendation. However, the ACCC does accept GHD's general view that there is scope for productivity and efficiency improvement in TransGrid and have made an adjustment for this as described later.

2.6.2 Annual opex allowance over the period of the control

The ACCC agrees with GHD that TransGrid's "maintenance unit" approach does not adequately explain the evolution of opex. In our view the most significant failings of the "maintenance unit" approach is it proposes a simple direct proportionality between opex and investment; it does not take account of the age and condition of assets; it does not consider the nature of the investment and it does not account for economies of scale. More generally, TransGrid has repeatedly asserted that significant investment in the network necessarily implies a higher opex allowance.[9] The ACCC has not analysed the relationship between opex and capex in TransGrid in detail but notes the following:

[9] See for example "TransGrid 2004 Revenue Reset Application, September 2003, page 80, and "TransGrid Response to GHD's Final Report to ACCC, April, 2004, page 8.

- A significant proportion of TransGrid's capex is to "support the business" and includes investment in IT and business systems the principal purpose of which is to improve efficiency and productivity. The business case for much of this investment relates the capital investment to the operating cost savings that result from such investment. In such cases, capex and opex ought to be inversely related;

- Much of the augmentation expenditure proposed by TransGrid is in the augmentation of existing installations, as opposed to the construction of new transmission lines. In the case of such investment, the operating and maintenance cost per unit should decrease not increase, particularly after taking account of the fact that older and higher maintenance equipment is being replaced by modern, lower maintenance equipment;

- In augmentations that increase the capacity of the network, TransGrid appears to have invested heavily in modern monitoring and automation systems. For example, TransGrid claims that the new Haymarket substation, its biggest ever substation investment "will be one of the most highly monitored and automated substations in the world"[10] These investments can be expected to considerably reduce the expected maintenance and operating cost burden, particularly in the early life of these assets; and

- TransGrid has invested a significant amount in the replacement of existing infrastructure. Again, per unit, the replacement of old equipment for new equipment can be expected to deliver decreases in operating costs.

In view of this, the ACCC considers that it is reasonable to suggest that any increase in operating and maintenance costs that may arise because TransGrid has a longer length of line or cable to maintain, will be more than offset by decreases in opex attributable to the above factors. On balance therefore, the ACCC is not convinced by TransGrid's assertion on the direct proportionality between aggregate investment and the efficient level of operating and maintenance expenditure.

Therefore the ACCC has rejected TransGrid's "maintenance unit" approach and, like GHD, the ACCC has used the "line-by-line" data on opex costs provided by TransGrid, to calculate the efficient opex allowance. In this respect, the ACCC has accepted the escalation factors that TransGrid has applied to the various disaggregated elements of opex with the exception of the Wage Cost Index (WCI) which is applied to all employment-related costs.

The actual WCI over the last five years has average 4.1 percent per year. TransGrid had assumed an average WCI of 5 percent per annum. Since average inflation was higher over the last five years than it is expected to be over the next five years, it seemed inappropriate to assume that average WCI would be higher in the future than it has been in the past. Accordingly the ACCC has assumed that the average WCI will continue to be 4.1 percent in the future and have incorporated this assumption into the model.

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[10] TransGrid 2002 Annual Report, page 27.

Like GHD, the ACCC has determined an overall efficiency adjustment to represent expected productivity improvements. The adjustment that the ACCC has chosen is 2 percent real per year. Over the five years of the control, this amounts to a compound real decrease of 12.4 percent. The choice of 2 percent is consistent with efficiency targets that TransGrid has adopted in the past (although it has not achieved them). It is also consistent with the ACCC's efficiency adjustment in its recent Decision for Transend. It should be noted that GHD had assumed a 2 percent decrease in the opex each year, but not compounded this decrease.

The ACCC believes that the 2 percent compounded adjustment should be achievable over the period, taking account of general productivity improvements in labour and in the services procured by TransGrid. The achievement of efficiency-based opex reductions by other Australian lines businesses supports this contention.[11] The ACCC notes that in other countries where incentive regulation has been applied over a long period, large real reductions in opex have been achieved.[12] Of course differences between industries and countries need to be considered when drawing comparisons.[13]

Finally, as discussed earlier, the ACCC does not believe that operating cost is necessarily proportional to investment as TransGrid has asserted. In TransGrid's case there is reason to believe that the relationship (in aggregate) for the period of the coming regulatory control period is in fact inversely proportional. Taken together, the ACCC has confidence that a 2 percent compound productivity improvement is a suitable mid-point of range of expected productivity improvements that TransGrid is able to achieve over the coming control period, and that its actual performance could be significantly higher than this.

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[11] For example, data on Victorian electricity distributor operating expenditure since 1996 is valuable in this regard. Essential Services Commission. "Electricity Distribution Business comparative performance report for the Calendar year 2002" August 2003.

[12] For example, the National Grid Company in the UK has achieved a compound real decrease in controllable operating costs of 50% (a compound real annual reduction of 3%) from 1990 to 2003. (National Audit Office 2002. "Pipes and Wires", National Audit Office, London.) Under comparable regulatory incentives, compound annual reductions in controllable operating costs of well above 2 % have been achieved in electricity distribution in the UK. (National Audit Office op. cit. p. 36.)

[13] For example, it is true that in the UK the rate of demand growth is considerably lower than in some parts of Australia. But, on closer inspection, there are in fact strong similarities. For example, in the UK, while NGC has not experienced significant diversified load growth, since 1989 it has needed to invest to accommodate the connection of 25 GW of new plant (around half the peak demand) and disconnection of 22 GW. (Woolf, F. "Global Transmission Expansion: Recipes for Success. PenWell, Tulsa, USA, page 417.) This is a considerably higher rate of generation connection and disconnection than has generally been experienced by TNSPs in the NEM over the same period.

Similar significant productivity improvements have been observed in the telecommunications, water and gas industries in the UK (National Audit Office op. cit. p. 36.) and a similar incentive regime applies to those industries as applies to TransGrid. Again, in the water industry in particular these productivity gains have been delivered when there has been an explosion of new investment.

Non-insured risks

TransGrid has claimed an allowance for non-insured risks of $1.55 million per annum for identified events based on an actuarial assessment by Trowbridge Deloitte. The non-insured risks are for "Towers and Wires" risks ($755,000) and for "Losses within insurance deductibles" ($800,000). Losses within insurance deductibles refers to the excess or deductible that TransGrid would have to pay in a claim, for example a $300,000 deductible per claim for own-property damage claims means that TransGrid would pay that first portion.

It is not clear whether an allowance of $800,000 per annum sought for "deductibles" in current insurance policies held by TransGrid is appropriate. For the purposes of this Draft Decision this allowance will not be included in the cash flows as proposed, but rather actual expenditure should be included in the pass-through mechanism as an Insurance Event. Details of the ACCC's Draft Decision on pass throughs are at Appendix 3. This is consistent with previous ACCC Decisions including the SPI PowerNet Revenue Cap Decision. With regards to the "Towers and Wires risk" self insurance allowance, this amount will only be allowed upon receipt of a TransGrid Board Resolution to self insure as per the ACCC's Guidelines on this matter. TransGrid have not yet provided this resolution to the ACCC and so no adjustment has been allowed for this.

As outlined in section 6.6.2, the ACCC will allow TransGrid debt raising costs over the regulatory period. Consistent with the Transend Revenue Cap Decision, this cost is treated as an operating expense and is calculated by applying benchmark costs and gearing ratio to the asset base. Debt raising costs averaging about $1.98 million per annum are allowed over the 2004-2009 regulatory period. In terms of equity costs, the ACCC has not allowed TransGrid's claim.

Working Capital

The ACCC considers that a TNSP should be compensated for working capital given that it is an appropriate operating cost for a TNSP.

However, the allowed revenue determined by the ACCC's Post Tax Revenue Model provides adequate compensation for any mismatch between the timing income and expenditure. This feature of the model was identified by the Allens Consulting Group (ACG) which commented that:

> *while there may be a (small) financing cost associated with operating expenditure, any shortfall from not including an allowance in respect of working capital is likely to be swamped by the favourable allowance provided in respect of capital assets under the PTRM target revenue formula*.[14]

Therefore the Commission will not provide an allowance for working capital.

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[14] Allens Consulting Report "Working Capital Relevance for the Assessment of Reference Tariffs" Report to the ACCC. March 2002. Page 24

2.6.3 Comparisons

On the basis of the adjustments described in this section, the ACCC has determined a total opex allowance for the period 2004 to 2009 of $568.22 million (in 2004 dollars). This compares to an opex allowance in the 2000 Decision of $563.65 million (in 2004 dollars). Table 2.2 below describes the ACCC's determination in constant 2004 dollars and compares it to the amount arising from GHD's recommendation and from TransGrid's Application. Some elements of TransGrid's Application which were defined as proportions of other variables (such as debt raising and working capital costs) have not been included in the figure for TransGrid's Application.

Table 2.2: Comparison of ACCC Decision to TransGrid's Application and GHD's recommendation (constant 2004 dollars)[15]

	2005 ($m)	2006 ($m)	2007 ($m)	2008 ($m)	2009 ($m)	Total ($m)
ACCC Draft Decision	115.4	114.6	113.9	113.3	111.1	**568.3**
GHD recommendation	116.5	117.0	117.5	118.0	118.6	**587.6**
TransGrid's Application	126.0	128.76	131.57	134.5	137.52	**658.3**

2.7 Benchmarking

Several factors affect the fair comparison of opex among transmission companies. These include varying load profiles, load densities, asset age profiles, network designs, local regulatory requirements, topography, climate and accounting practices.

The ACCC understands that comparisons based on partial measures are not very meaningful. Nevertheless, different measures used in combination can help to assess whether a TNSP's opex is reasonable. Hence, the ACCC undertook its own benchmarking using several different ratios to make a general assessment of its proposed opex forecast for TransGrid.

The ACCC benchmarked TransGrid against Transend, ElectraNet, Powerlink, SPI PowerNet/VenCorp and Energy Australia. The results of the ACCC's analysis are shown in Table 2.3.

15 The ACCC has assumed CPI of 2.44 per cent per annum from 2004 to 2009. However, TransGrid's total opex claim of $658.3 million assumes an inflation rate of 2.08 pecent.

Table 2.3: Ratio analysis of TransGrid compared to other TNSPs

	TNSPs	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
opex/GWh	Powerlink	1.30	1.40	1.45	1.49	1.41	1.59		
opex/substation		607.01	656.78	678.92	700.30	661.36	743.71		
opex/line length (circuit)		4.88	5.28	5.46	5.63	5.32	5.98		
opex/line length (route)		6.85	7.41	7.66	7.90	7.46	8.39		
opex/MW peak		7.89	8.53	8.82	9.10	8.59	9.66		
opex/GWh	SPI/Vencorp	1.02	1.16	1.47	1.47	1.48	1.48	1.48	
opex/substation		1193.18	1368.18	1727.27	1727.27	1736.36	1734.09	1736.36	
opex/line length (circuit)		8.01	9.19	11.60	11.60	11.66	11.65	11.66	
opex/line length (route)		13.67	15.68	19.79	19.79	19.90	19.87	19.90	
opex/MW peak		6.40	7.34	9.26	9.26	9.31	9.30	9.31	
opex/GWh	TransGrid	1.46	1.48	1.51	1.76	1.80	1.84	1.88	1.92
opex/substation		1290.99	1311.73	1332.72	1555.76	1589.89	1624.80	1661.08	1698.52
opex/line length (circuit)		8.43	8.57	8.70	10.16	10.38	10.61	10.85	11.09
opex/line length (route)		9.56	9.71	9.87	11.52	11.77	12.03	12.30	12.58
opex/MW peak		8.48	8.62	8.75	10.22	10.44	10.67	10.91	11.16
opex/GWh	ElectraNet	3.00	3.27	3.56	3.54	3.58	3.63	3.65	
opex/substation		526.47	573.53	623.28	621.46	627.16	635.59	639.28	
opex/line length (circuit)		6.42	6.99	7.60	7.57	7.64	7.75	7.79	
opex/line length (route)		7.70	8.39	9.11	9.09	9.17	9.29	9.35	
opex/MW peak		12.56	13.68	14.87	14.83	14.96	15.16	15.25	
opex/GWh	Transend	1.96	2.21	2.47	2.71	2.90	2.70	2.64	2.63
opex/substation		448.13	504.89	565.78	620.22	664.89	618.67	603.56	601.56
opex/line length (circuit)		5.78	6.51	7.30	8.00	8.58	7.98	7.79	7.76
opex/line length (route)		8.77	9.88	11.07	12.13	13.01	12.10	11.81	11.77
opex/MW peak		12.37	13.94	15.62	17.12	18.36	17.08	16.66	16.61
opex/GWh	ACCC Draft	1.46	1.48	1.51	1.61	1.60	1.59	1.58	1.55
opex/substation		1290.99	1311.73	1332.72	1424.36	1414.89	1406.57	1398.26	1371.01
opex/line length (circuit)		8.43	8.57	8.70	9.30	9.24	9.19	9.13	8.95
opex/line length (route)		9.56	9.71	9.87	10.55	10.48	10.41	10.35	10.15
opex/MW peak		8.48	8.62	8.75	9.36	9.29	9.24	9.18	9.01
opex/GWh	EnergyAustralia	1.42	1.35	1.31	1.32	1.31	1.36	1.39	1.43
opex/substation		862.87	820.17	799.26	804.07	798.52	827.41	848.52	869.63
opex/line length (circuit)		25.46	24.20	23.58	23.73	23.56	24.42	25.04	25.66
opex/line length (route)		26.60	25.28	24.63	24.78	24.61	25.50	26.15	26.80
opex/MW peak		10.90	10.36	10.10	10.16	10.09	10.45	10.72	10.99

Note: Refurbishments and grid support have been excluded from EnergyAustralia's, TransGrid's, Transend's, ElectraNet's and Powerlink's opex figures.

Source: EnergyAustralia opex figures from Application and Attachment G ($real).

Transend opex figures from 10 December 2003 *Tasmanian Transmission Network Revenue Cap 2004-2008/09* ($real).

ElectraNet opex figures from 11 December 2002 *South Australian Transmission Network Revenue Cap 2003-2007/08* ($real).

Powerlink opex figures from financial modelling ($real) used to develop final Decision.

SPI/Vencorp opex figures from 11 December 2002 *Victorian Transmission Network Revenue Caps 2003-2008* ($real).

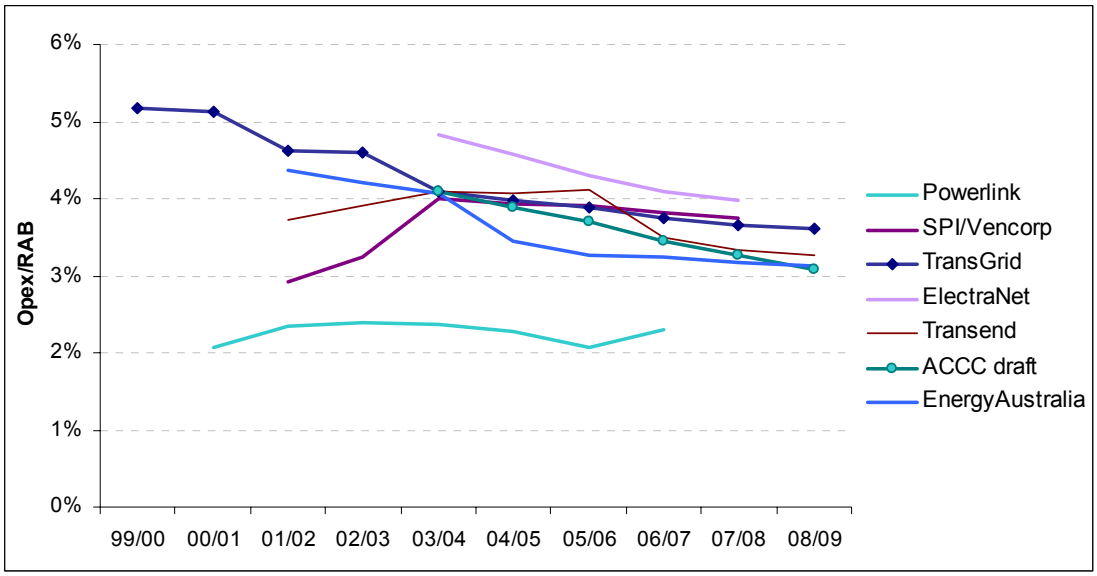
TransGrid's opex figures from TransGrid submissions ($nominal) and ACCC Draft Decision *NSW and ACT Transmission Network Revenue Caps 2004/05-2008/09* ($real).

Figures 2.4 to 2.8 compare the level of opex sought in TransGrid's Application with that of other TNSPs for the following ratios: opex per asset base; opex per line length (circuit kilometres); opex per substation; opex per Giga Watt hour (GWh); and opex per MW. They also show the corresponding ACCC's Draft Decision figures

The ACCC considers that opex as a proportion of asset base, while having some limitations, is a more useful measure than the other ratios.

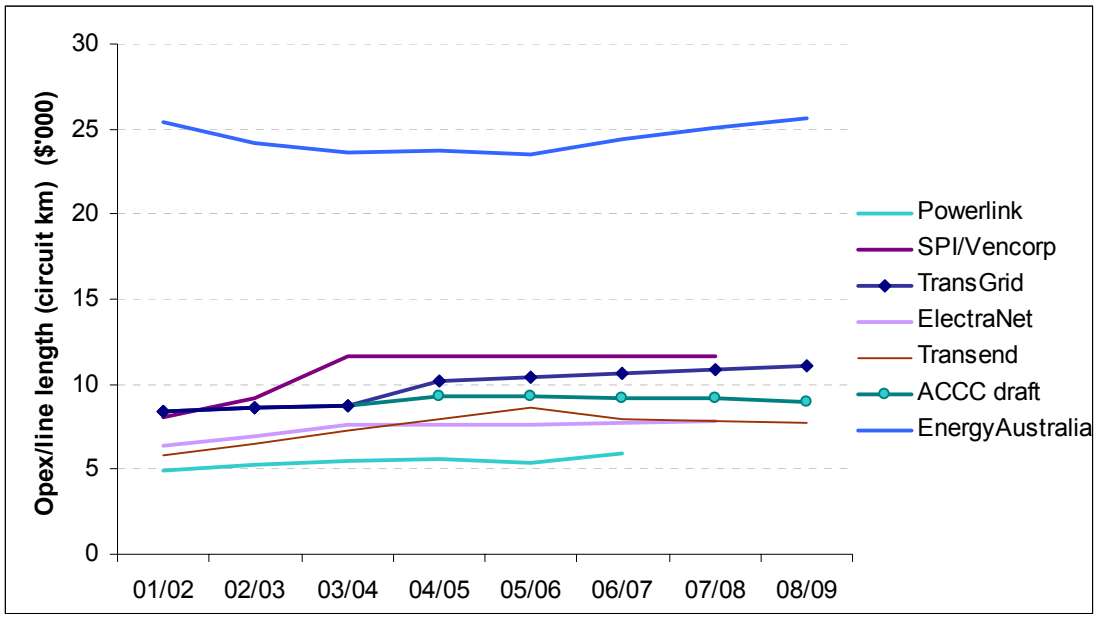
Figure 2.4 shows that ACCC's Draft Decision opex as a percentage of TransGrid's asset base over the regulatory period is reasonable compared with other TNSPs. The ACCC notes that the inclusion of additional assets into TransGrid's transmission asset base has resulted in a significantly higher asset base compared to the 1999-2004 regulatory period.

Figure 2.4 Comparison of TNSPs' opex per asset base



In previous decisions, the ACCC also considered that opex per unit of circuit length was a useful measure. Figure 2.5 shows this measure.

Figure 2.5 Comparison of TNSPs' opex per line length



Figures 2.6 to 2.8 show that TransGrid's opex (as proposed by the ACCC) is comparable to other TNSPs although higher than many others in the opex per substation category.

Figure 2.6 Comparison of TNSPs' opex per substation

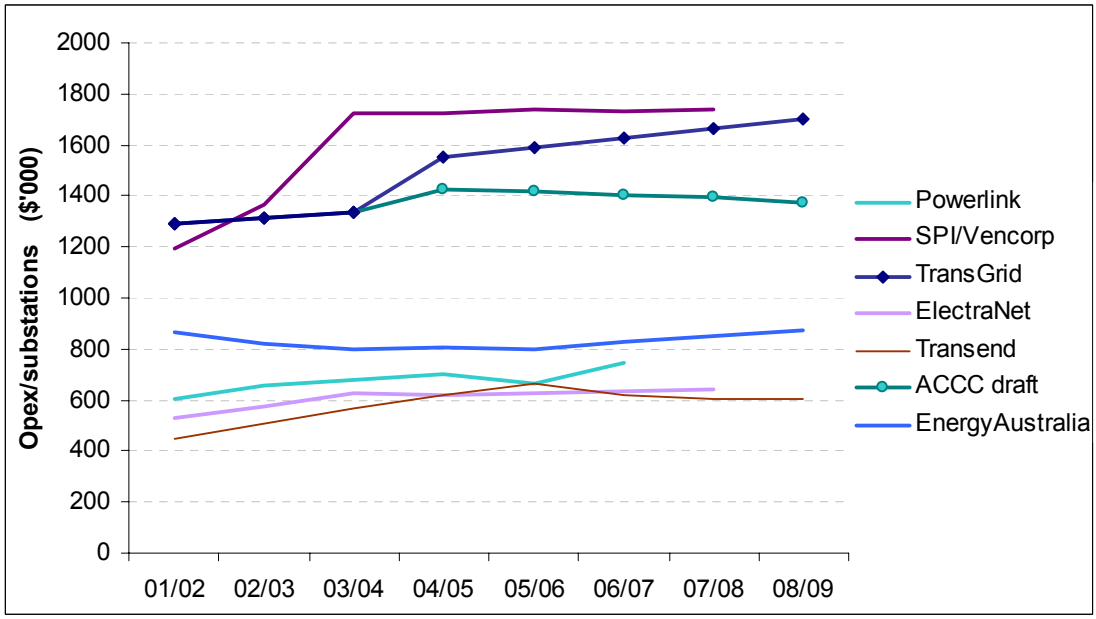


Figure 2.7 Comparison of TNSPs' opex per GWh

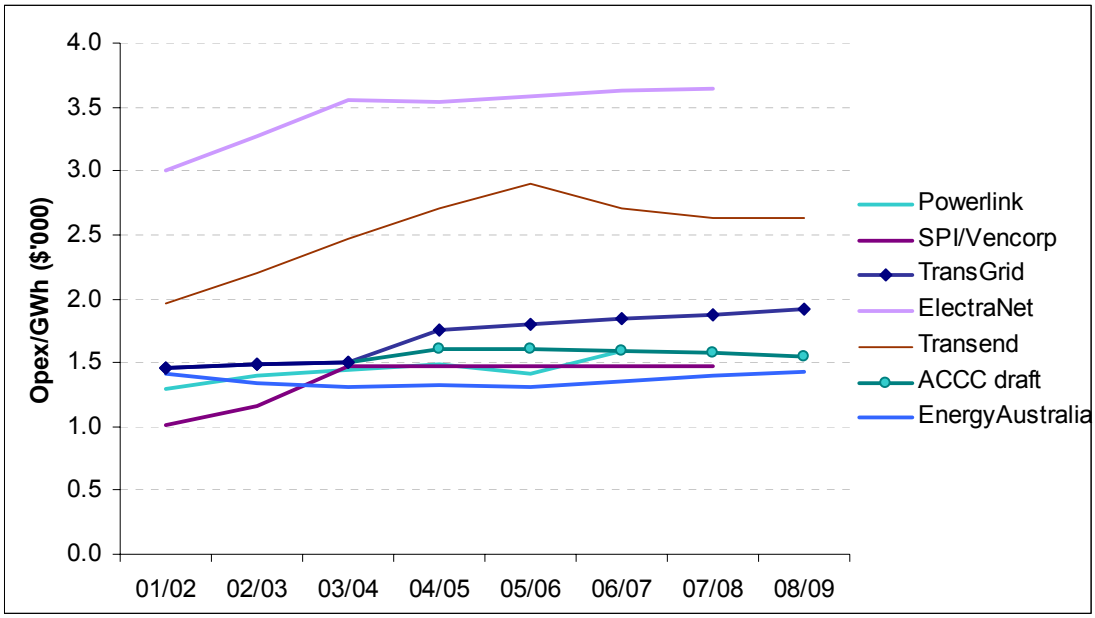
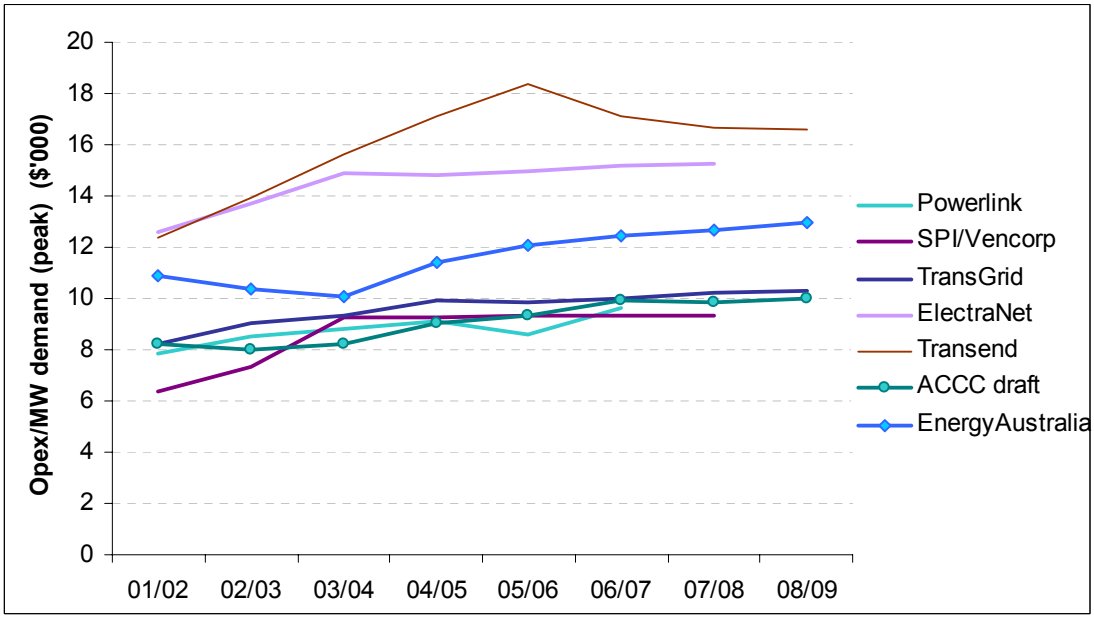


Figure 2.8 Comparison of TNSPs' opex per MW



Differences in operating conditions and scale may explain why some ratios are higher or lower. As such, these ratios can only provide a measure of reasonableness. Accordingly, the ACCC does not use benchmarking to establish opex allowances but rather as a guide to whether the allowance is within a reasonable range.

However, overall the ACCC considers that its benchmarking results show, particularly in relation to opex per asset base, opex per substation, opex per GWh and opex per MW, that the ACCC proposed opex allowance for TransGrid is broadly consistent with the other TNSPs.

2.8 Conclusion

Based on the analysis outlined above the ACCC proposes for the purposes of this Draft Decision a total nominal opex of $610.9 million including amounts for debt raising costs, as follows:

Table 2.4: TransGrid's opex: 1 July 2004 to 30 June 2009 (nominal $m)

	2005 ($m)	2006 ($m)	2007 ($m)	2008 ($m)	2009 ($m)	Total ($m)
ACCC Decision	118.19	120.27	122.48	124.72	125.28	**610.93**

3 Asset base roll forward calculation

3.1 Introduction

This chapter sets out the methodology that will be used to determine TransGrid's closing asset base at the end of the current regulatory period.

The Code requires the ACCC for the first regulatory review to value sunk assets at the value determined by the Jurisdictional Regulator or consistent with Regulated Asset Base (RAB) established in the jurisdiction, provided that this value does not exceed deprival value. The Jurisdictional Regulators determined the value of the TNSPs' sunk assets by using an ODRC approach.[16]

The Code does provide for the second regulatory review a number of options such as revaluing the existing assets on a periodic basis (for example each five-year regulatory period) using the ODRC methodology or setting the asset base by adopting the initial jurisdictional valuation and adding in new investment at cost.

The ACCC does not have unlimited discretion in determining a particular approach, as the Code requires the ACCC to satisfy a number of principles and objectives. These include the need to provide a fair and reasonable rate of return as well as the need to have regard to the COAG's preference for the use of a deprival valuation.

In its Application, TransGrid provided for the roll-forward option to determine the opening asset value for its next regulatory reset period. The ACCC considers that for existing assets a roll-forward of the jurisdictional asset base best satisfies the objectives of the Code. Most importantly, the ACCC considers that a roll-forward of the jurisdictional asset base does not deter investment as a revaluation might.[17]

This chapter sets out the principles and parameters of the roll-forward calculation for the purpose of this Decision.

The chapter considers in-turn:

- The current regulatory framework and its implications for the design of the roll-forward mechanism (section 3.2);
- TransGrid's proposal on the roll-forward calculation (section 3.3);
- The ACCC's Decision on the roll-forward calculation (section 3.4);

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[16] In the case of TransGrid a derogation from this requirement was granted which enabled the ACCC to determine the opening RAB in the absence of a valuation provided by the relevant Jurisdictional Regulator. The ACCC used an existing ODRC valuation of TransGrid.

[17] ACCC, Discussion paper 2003, *"Review of the Draft Statement of Principles for the Regulation of Transmission Revenues"*, pg. 26

- The Application of the ACCC's Decision to determine the closing RAB (section 3.5); and

- Further issues for consideration by the ACCC (section 3.6).

3.2 Regulatory framework

The basic methodology underlying the roll-forward of TransGrid's asset base is that the closing value of the asset base from year to year is constructed by taking the opening value, converting it to a nominal figure by adding in an inflation adjustment, adding in any capital expenditure and subtracting disposals and nominal depreciation for the year. The closing value for one year's asset base becomes the opening value for the following year's asset base.

In terms of the building block components:

- the operating expenditure allowance is established ex-ante (at the start of the regulatory period) and is not subject to review, even if actual operating expenditure turns out to be different to the allowance. This means that no account is taken of any difference between forecast and actual opex in the roll-forward calculation; and

- capital expenditure is forecast ex-ante but is subject to an ex-post prudency assessment. This means that the roll-forward calculation needs to take account of any difference between the ex-ante forecast and the actual outturn that is deemed to be prudent and hence allowable in the RAB.

3.3 TransGrid's proposal

TransGrid provided to the ACCC a roll-forward model that established a closing RAB at 30 June 2004 of $3,047.4 million including the Snowy transmission assets which were incorporated into TransGrid's RAB during the regulatory period.

The roll-forward model developed by TransGrid entailed a two-step calculation:

- Step 1: Calculate the closing RAB on the basis of the forecast capex using the following formula:

  Closing RAB (nominal) = Opening RAB (nominal) – Forecast Depreciation (real, scaled up for inflation) + Actual inflation multiplied by the RAB + Forecast Capex (nominal)

- Step 2: Adjust the RAB calculated in Step 1 for the difference between forecast and outturn capex as well as the accumulated return on that difference.

In developing the calculations set out in these two steps, TransGrid needed to make assumptions on a number of parameters including: the calculation of depreciation and

asset lives, the applicable WACC, and the treatment of inflation. Each of these parameters are discussed in the next section.

TransGrid also produced a closing RAB calculation on the basis of an ODRC calculation excluding easements. The "ODRC" RAB is valued at $3,062 million (as at 30 June 2004). TransGrid contends that both a roll-forward and an ODRC valuation would be consistent with the regulatory framework, but proposed that the RAB be established on the basis of a roll-forward calculation.

3.4 The ACCC's Decision on the roll-forward calculation

3.4.1 Principles

The guiding principle in the roll-forward calculation is to ensure that TransGrid earns the regulated return on prudent expenditure. The closing RAB is an input to the ACCC's Post Tax Revenue Model's (PTRM) calculation of the Maximum Allowed Revenue. The calculation of the closing RAB combined with the subsequent calculation of the Maximum Allowed Revenue in the PTRM must ensure that over the life of the regulated assets, the present value of revenue equals the present value of the sum of the allowed operating expenditure plus return on and return of capital (discounted at the allowed rate of return).

The ACCC has reviewed TransGrid's roll-forward calculation following consultation with TransGrid and after making some modifications to the model is satisfied that TransGrid's model accords with the principles outlined above.

TransGrid's model calculates a nominal closing RAB and accumulated depreciation in total and in the various asset classes (substations, lines, cables) and so provides the necessary starting point for the ACCC's calculation of allowed revenue for the following regulatory period.

The formula described in Step 1 of TransGrid's calculation is a development of the conventional "roll-forward" accounting formulation (closing assets equal opening assets plus capex less depreciation) to ensure that the closing RAB is stated in nominal (money of the day terms).[18] This is required for the nominal allowed revenue calculation performed in the ACCC's Post Tax Revenue Model (PTRM).

Several proposed changes to TransGrid's model were identified by NERA in a report[19] submitted to the ACCC on behalf of TransGrid. The adjustments to TransGrid's model that NERA recommended and which have been incorporated into the calculations for this Decision include the following:

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[18] The conversion from a "real" (constant currency) calculation to a "nominal" (money of the day) calculation requires that all parameters are adjusted for inflation (by multiplying by (1+ inflation)). However for the conversion of "real" depreciation to "nominal" depreciation it is necessary to multiply the "real" depreciation by (1+ inflation) but then subtract inflation multiplied by the RAB.

[19] NERA, March 2004. "A Review of TransGrid's roll-forward".

- The nominal "Decision depreciation" figures should reflect the actual depreciation used by the ACCC in determining TransGrid's revenues (these were higher than reported in the ACCC's 2000 Decision);

- A post-tax rather than pre-tax nominal WACC should be used in the calculation of the accumulated return on prudent capex;

- A computational error in the calculation of the rolled-forward value of additional expenditure which resulted in double-counting the ½ WACC in the first year should be rectified; and

- TransGrid should not restate Decision capital expenditure on an "as incurred" basis. This restatement is unnecessary.

3.4.2 Specification of the parameters of the roll-forward calculation

Parameters that affect the roll-forward calculation include the choice of pre-tax or post-tax WACC, the treatment of inflation, the calculation of depreciation and remaining asset lives. There are a variety of ways to specify each of these and each affects the determination of the closing RAB.

3.4.3 Weighted Average Cost of Capital

The choice of WACC affects the rolled-forward value of the prudent "unforecast" capex. This capex is that which exceeds the amount specified in the ACCC's 1999/00 Decision, that the ACCC determines, ex-post, to be efficient.

A post-tax WACC was used in the roll-forward calculations for the purpose of this Decision. TransGrid's initial model used a nominal pre-tax WACC but was later modified according to a report by NERA which recommended a post-tax WACC, subject to various conditions[20] on how the ACCC calculates TransGrid's tax depreciation and hence the post tax WACC. NERA argued that if the tax depreciation is correctly calculated then it is unnecessary to use a higher pre-tax WACC. This is because, if tax depreciation is correctly calculated, "unforecast" capex which is only rolled-in to the RAB at the end of the regulatory period will not create a tax liability because it is only recognised in TransGrid's revenues once it is rolled-in to the RAB. Because no tax liability is created it is unnecessary to use a higher pre-tax WACC.

This argument appears plausible and so, subject to further consideration, a post-tax WACC will be used for the purpose of this Decision.

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[20] NERA argued that the correct treatment of tax liabilities will require the ACCC:
- to adopt an opening 2004/05 tax value of assets in its PTRM modelling that does not include any scaling up for either inflation or unrecovered returns; and
- to alter the PTRM model such that the forecast capex within a regulatory period is not scaled up by half WACC before it enters the estimated tax value of assets.

The ACCC agrees with these recommendations and has adjusted the PTRM accordingly.

NERA has inferred that the ACCC's 1999/00 Decision real vanilla pre-tax WACC was 6.85 per cent.

In calculating the carried-forward value of the "unforecast" capex, half the WACC for the year in which the expense was incurred, and a full WACC for subsequent years have been applied. The half-WACC allowance is based on the assumption that capex can be expected to be uniformly distributed throughout the year.

3.4.4 Inflation

The PTRM necessarily uses an inflation forecast in order to calculate the nominal Maximum Allowable Revenue for each year of the regulatory period. This raises the issue of whether the roll-forward calculation should use this inflation forecast or whether it should use the actual inflation over the period of the control.

The issue reduces to deciding whether in its 1999/00 Decision, the ACCC effectively determined a fixed nominal WACC (one that does not reflect changes between forecast and actual inflation) or a fixed real WACC (one that does reflect changes in actual inflation).

The ACCC has previously claimed that its regulatory framework "incorporates the best features of the real and nominal approaches, that is, the minimisation of inflation risk of a real framework with the direct application of nominal rate of return benchmarks"[21] and that the RAB needs to be corrected "for actual inflation over the course of the regulatory period to provide the appropriate value of the regulatory asset base at the start of the next regulatory period".[22]

The clear intention of the regime developed in the 1999/00 Decision is not to create a risk that any difference between actual and forecast inflation could provide windfall gains to shareholders (if actual inflation turns out lower than forecast) or to consumers (if actual inflation turns out higher than forecast). For the purpose of this Decision nominal inputs will be rolled-forward using a nominal WACC that reflects actual inflation in each year of the regulatory period. This is equivalent to a roll-forward of real inputs on the basis of a constant real WACC.

The March Quarter CPI has been adopted as the inflation index for the purpose of this Decision as this is consistent with the CPI rate used to adjust TransGrid's MAR over the regulatory period.

3.4.5 Depreciation and asset life

The approach to the calculation of asset lives and depreciation as submitted by TransGrid and NERA will be used for the purpose of this Decision. At issue is whether the roll-forward calculation should reflect the depreciation calculated at the

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[21] ACCC, 1999. *Draft Statement of Principles for the Regulation of Transmission Revenues, May 1999,* pg. 16.

[22] Ibid pg. 36.

time of the 1999/00 Decision ("Decision depreciation") on the basis of the forecast capex, or whether it should be recalculated based on the actual (prudent) capex. In present value terms the two approaches should be equal (subject to the asset life calculation) but the choice of approach will affect the calculation of the Maximum Allowable Revenue over a specific time period.

In TransGrid's approach, prudent capex that exceeds the forecast in the ACCC's 1999/00 Decision is not depreciated during the regulatory period in which it is incurred. This approach will be adopted for the purpose of this Decision. However it is necessary to ensure that asset lives are adjusted to take account of the "unforecast" capex that results in assets that are commissioned during the regulatory period, but that are not depreciated until the beginning of the next regulatory period. This adjustment will then affect the calculation of depreciation from the beginning of the next regulatory period.

TransGrid and NERA have submitted a formula which determines the average remaining asset lives for each asset class. This formula will be used to determine the remaining asset lives for the purpose of this Decision.

$$ARAL_{t+1} = \frac{(ARAL_t - 1) * (ORAB_t - Dep_t + CPI_t) + SAL * Capex_t)}{ORAB_t - Dep_t + CPI_t + Capex_t}$$

Where:

$ARAL_{t+1}$ is the average remaining asset life at the beginning of period t+1;
$ARAL_t$ is the average remaining asset life at the beginning of period t;
$ORAB_t$ opening regulatory asset base in period t;
SAL is the standard life of an asset category;
Dep_t depreciation allowed in the 1999 ACCC Decision in period t adjusted for actual inflation outcomes;
CPIt CPI allowance in the 1999 ACCC Decision in period t adjusted for actual inflation outcomes; and
$Capex_t$ capital expenditure in period t, as used by TransGrid to calculate the opening regulatory asset base for, 1 July 2004.

3.5 Application of the ACCC's Decision to determine the closing RAB.

The principles and details of the roll-forward calculation used in this Decision are set out below with the impact of various changes to the models shown in Table 3.1 below. This table compares the roll-forward calculation used in this Decision, with TransGrid's original submission, and NERA's March 2004 calculation. For the purposes of this Draft Decision the ACCC has accepted all of NERA's recommendations.

The only remaining issue is that of accounting for under and over compensation of TransGrid as a result of using forecast capex for the last year of the current regulatory period. An adjustment will need to be made at the end of the subsequent regulatory period for differences between forecasts and actuals in the last year of the present regulatory period, where appropriate.

Table 3.1: Reconciliation of closing RABs

	Non-Snowy assets ($m)	Snowy assets ($m)	Total ($m)
TransGrid's initial submission	$2989.72	$57.68	$3047.40
NERA memo March 2004	$2963.40	$57.68	$3021.08
ACCC roll-forward calculation (forecast)	$2865.57	$57.68	$2923.25

Note: For the purpose of this model all historic capex is assumed to be prudent.

3.6 Further issues for consideration

Some issues regarding the optimal means of carrying-out the roll-forward are outstanding. These issues relate to the question of how to take into account out-turn figures (such as revenues and taxes) as opposed to forecast figures where appropriate.

These matters could involve amendments to the roll forward model. The ACCC will only make such modifications if they accord with the principle of financial capital maintenance such that neither TransGrid nor consumers are subject to windfall gains or losses.

4 Historic Capital Expenditure

4.1 Introduction

This Chapter sets out the ACCC's decision on the prudency of TransGrid's capital expenditure over the period from 1999 to 2004. This is the first time that the ACCC has applied the ex-post prudency arrangements established in the current regulatory regime. This Chapter:

- considers the existing regulatory framework and the approach to the assessment of historic capex (section 4.2);
- provides a quantitative comparison of TransGrid's actual spend from 1999 to 2004 and the expenditure allowed at the time of the previous Decision (section 4.3);
- summarises GHD's findings and submissions from interested parties (sections 4.4 and 4.5);
- provides the ACCC's decision of the prudency of TransGrid's expenditure (section 4.6); and
- presents a quantitative summary of the ACCC's prudency decisions and the resulting impact on the regulatory asset base (section 4.7).

4.2 Overview of the regulatory framework for transmission investment

This section describes the relevant features of the regulatory regime as it applies to the regulation of capital investment over the period from 1999 to July 2004. This regime defines how the ACCC is required to assess the efficiency of capital expenditure by TransGrid and thereby determine the amount of such expenditure to be included in the RAB.

4.2.1 The ACCC's Code obligations

The core obligation of the ACCC in relation to the regulation of capital investment by TNSPs is set out in Clause 6.2.3(d) of the Code. This provides that the regulatory regime to be administered by the ACCC must have regard to the need to (inter alia) "provide a fair and reasonable risk-adjusted cash flow rate of return to … Transmission Network Service Providers on efficient investment given efficient operating and maintenance practices on the part of the Transmission Network Service Providers."

4.2.2 The provisions of the Draft Regulatory Principles

The DRP elaborated on how the ACCC interprets its Code obligations to regulate capital investment. The basic design of this arrangement is that:

- the ACCC would determine an allowance for capital expenditure based on a forecast at the start of the regulatory period; and

- at the end of the period (after the investment had been made) the ACCC would assess the prudency of actual capital expenditure.

The test of prudent investment was "…the amount that would be invested by a prudent TNSP acting efficiently in accordance with good industry practice …"[23] The ACCC's approach to the determination of prudency is set out in the next section.

A defining characteristic of the regime outlined in the DRP is that it requires the assessment of prudency ex-post, that is, the assessment of prudent investment and the determination of the amount of expenditure to be included in the Regulatory Asset Base is to be determined after the investment has been made. The determination of the capital expenditure forecast at the start of the period provides TNSPs with sufficient cash-flow to finance their expected investment programs. This forecast is based on an assessment of likely investment over the period of the revenue control and is not intended to represent a final assessment of efficient investment.

By implication, any difference between the actual expenditure and the forecast expenditure can not simply be attributed to efficiency higher than expected (if actual capital expenditure is below forecast capital expenditure) or lower than expected (if actual expenditure is above forecast expenditure).

TransGrid developed at least 40 individual transmission reliability or augmentation projects, and several hundred further maintenance, replacement and "support-the-business" investments were made. The practical challenge of assessing the prudency of several hundred investment projects has required the use of discretion in developing an ex-post assessment approach that maximises the effective performance of the ACCC's Code obligations within its resource constraints and in view of the time available to complete the review. This discretion has been applied in the following ways:

- if a project was included in the capital expenditure forecast in the ACCC's 2000 Decision, and if the actual expenditure on that project turned out to be equal to or less than the forecast, then a lower standard of ex-post prudency assessment has been applied to that investment on the basis that the prudency of that investment was in effect approved through its inclusion in the 2000 Decision;

- there has been no specific re-examination of the prudency of projects that were included in the capex forecast in the ACCC's 2000 Decision, but which TransGrid

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[23] This is taken from proposed statement 5.1 on page 63 of the Statement of Principles for the Regulation of Transmission Revenues", May 1999. The full text of this statement also required that one of three other conditions be satisfied for investment to be deemed prudent. The first condition was that incremental revenue generated by the capital expenditure exceeds the investment cost". This condition is obviously circular, as long as the ACCC determines that the investment is prudent the present value of revenues will be greater than the investment cost.

did not develop. Consistent with proposed statement 5.3 of the DRP, the cost of such projects has been removed from the RAB;

- a "process-based" evaluation (an evaluation of the prudency of the investment selection and delivery processes used by the TNSP during the regulatory control period) has dominated the assessment of the prudency of maintenance and replacement capital expenditure and of TransGrid's "support-the-business" capital expenditure;

- best endeavours have been made to minimise the amount of network capital expenditure characterised as "miscellaneous" (for example "miscellaneous transmission lines and substations" or "miscellaneous current transformers"). However, some amount of investment has remained under these categories and the ACCC has sought to evaluate this investment primarily through process-based assessments; and

- a much higher standard of prudency assessment has been applied to large projects the cost of which turned-out to be materially higher than forecast.

4.2.3 The role of the Regulatory Test in assessing network augmentation

The Regulatory Test was promulgated in December 1999 under clause 5.6.5(q) of the Code (as it then was). The relevant provisions dealing with the Regulatory Test are now established in clause 5.6.5A of the Code.

The role of the Regulatory Test and the ACCC's determination of prudent investment has changed over time. Before the "Network and Distributed Resources" (NDR) Code changes in March 2002, the ACCC was required to automatically roll-in to the TNSP's RAB any investment that had passed the Regulatory Test as applied by NEMMCO in a network augmentation determination under clause 5.6.5. Since the NDR Code changes, NEMMCO's power to make such a determination has been removed. Therefore there is no explicit link between the outcome of the Regulatory Test and amount of the investment to be "rolled-in" to the RAB. The ACCC is not expressly bound to accept the outcome of the Regulatory Test as the definitive statement on the amount to be rolled-in to the RAB. Nevertheless, the ACCC has adopted the Regulatory Test as the starting point in assessing the prudency of TransGrid's capex as foreshadowed in the 2000 Decision.

The following sections outline the approach to the assessment of the prudency of expenditure over the period 1 July 1999 to 30 June 2004.

4.2.4 General principles for the assessment of prudency

The TransGrid and EnergyAustralia Revenue Decisions set out in this report are the first of the "second-round" revenue resets. For the first time the ACCC has been required to examine how it will assess the prudency of money already spent.

The DRP defines prudency in terms of "good industry practice" which is not given a precise definition. The key issue in the assessment of the efficiency of investment is how this term is defined. An assessment of whether TransGrid developed a project in

accordance with "good industry practice" necessarily requires the exercise of judgement, taking account of the specific facts and circumstances of the investment.

In addition to an assessment of the engineering and economic facts of an investment, the ACCC needs to weigh the political, organisational, environmental, strategic and administrative constraints facing TransGrid in deciding whether a project should be developed, and then in subsequently delivering that project. In the ACCC's view, a simplistic and doctrinaire interpretation of "good industry practice" that fails to take account of the real world constraints faced by TransGrid is contrary to the spirit and letter of the ACCC's Code obligations.

The ACCC is also mindful of ensuring that the assessment of "good industry practice" takes account of the information and analysis available to TransGrid (or that could reasonably be expected to be available to TransGrid) at the time it made the decision to invest. For example, if the investment was justified on the basis of demand increases that did not subsequently eventuate, TransGrid should not be penalised for making the investment if its demand forecast at the time the investment was made reflected the available information (and a reasonable analysis of that information) consistent with what would be expected if TransGrid applied "good industry practice". In general the ACCC would like to encourage TransGrid to take account of the most accurate information available to ensure that the design and development of a project reflects this information, even if the project eventually delivered is different to the project first envisaged.

However it is much less clear what should be done if TransGrid conducts an inadequate analysis and chooses to invest in a project that does not reflect an economically sensible investment on the basis of the information available at the time, but which proves to economically justifiable. In this case, should the ACCC penalise TransGrid for poor decision-making (by disallowing the inclusion of all or part of investment in the RAB) even if the investment turns out to be efficient? The approach in such circumstances is not to disallow such investment, as this could be inconsistent with the ACCC's Code obligations. However, this is obviously not to condone inadequate investment appraisal by TNSPs.

In undertaking the ex-post assessment of investment, the essence of the ACCC's task is to step into the TNSP's shoes at the time the investment decisions were taken and assess whether, according to the benchmark of "good industry practice", a prudent TNSP would have made the same decisions.

If the ACCC determines that different decisions would have been made by a prudent operator than were actually made by the TNSP, then the task is to quantify the difference in investment under each set of decisions. By implication, this difference represents the cost of "inefficiency" to be excluded from the RAB. In this way, the ACCC is able to maintain consistency with its Code obligation to ensure a "fair and reasonable risk-adjusted rate of return on efficient investment given efficient operation and maintenance practices".

It should be noted that this approach to the prudency test is designed to ensure that the test is properly applied having regard to assessing the efficiency of investment for the

purposes of asset valuation under clause 6.2 of the Code. Different approaches may be appropriate if a prudency test is being applied in other contexts or other purposes.

4.2.5 The application of the prudency test to augmentation investment

There may be a number of ways to implement such prudency assessments. The methodology adopted in this instance is based on a systematic chronological examination of the critical decisions in selecting and delivering investment. The purpose of the examination is to establish whether the TNSP made decisions at each stage consistent with good industry practice. The examination consists of three sequential stages, which have been applied to projects that have been assessed under the Regulatory Test, and to projects that have not been subject to the Regulatory Test. This approach is applied whether or not the Regulatory Test has been conducted. The approach is as follows:

- First, assess whether there is a justifiable need for the investment. This stage examines whether TransGrid correctly assessed the need for investment against its statutory and Code obligations. At this stage, the assessment focuses on the need for investment, without specifically focussing on what the "correct" investment to meet that need should be. An affirmation of the need for an investment does not imply acceptance of the specific project that was developed.

- Second, assuming the need for an investment is recognised, assess whether TransGrid proposed the most efficient investment to meet that need. The content of the assessment here is whether TransGrid objectively and competently analysed the investment to a standard that is consistent with "good industry practice."

- Third, assess whether the project that was analysed to be the most efficient was indeed developed, and if not, whether the difference reflects decisions that are consistent with "good industry practice". The analysis in this third step examines in detail the factors that caused changes in the project design and/or delivery and assesses how TransGrid responded to those factors in comparison to what could be expected of a prudent operator.

A structured examination of the project through each of these stages provides the content and rationale for the prudency assessment and any possible reduction in the total cost of the project to be rolled-in to the RAB.

Finally, it bears specific mention that the discussion in this section on the application of the ex-post prudency assessment of investment by TransGrid is germane to the regulatory framework that applies to TransGrid (and other TNSPs) over the current regulatory control period. The ACCC has recently issued a discussion paper on changes to the regulatory framework which discusses placing far greater reliance on a firm ex-ante assessment, thereby minimising the scope for ex-post prudency assessments. If these changes are accepted they will apply to the regulation of investment in the coming regulatory period. However the ACCC is required to abide by the existing regulatory framework in its assessment of investment by TransGrid over the period 1999 to 2004.

4.2.6 The application of the prudency test to non-augmentation investment

A significant proportion of TransGrid's total investment, $369.1 million out of a total investment of $1,107.4 million, relates to capital expenditure to support the business such as investment in business systems and IT, and in investment to maintain and replace old assets.

As mentioned earlier, the assessment of the prudency of such investment has principally consisted of a review of the processes TransGrid has used to assess the need for investment, to select the appropriate project and then to deliver that project. This is the "prudency test" that the ACCC has applied to such investment.

4.3 Comparison of actual expenditure to 2000 Revenue Cap Decision

The ACCC's 2000 Decision provided an allowance of $885.6 million[24] over the previous regulatory period. This amount represents the carried value of the expenditure, includes interest during construction (IDC), and is in 1999 dollars. TransGrid's Application stated that it expected to have spent $1,066.9 million[25] over the period 1 July 1999 to 30 June 2004. This amount is in 2004 dollars and excludes the return on investment during construction.

To enable a fair comparison of the ACCC's 2000 Decision and the actual spend by TransGrid, a number of adjustments need to be made:

- the ACCC's 2000 Decision and TransGrid's actual expenditure need to be brought to a common currency (2004 dollars); and

- the return on investment needs to be included in TransGrid's estimate of actual capital expenditure.

After adjusting for these factors, the ACCC's 2000 Decision is $906.17 million and TransGrid's actual spend is $1,194.9 million. The difference is $288.7 million.[26] This represents the carried-forward value of the expenditure TransGrid made, above the ACCC's Decision.

However, an explanation of the aggregate difference does not adequately convey the full scope of the difference between the capital program envisaged in the ACCC's 2000 Decision, and the capital program that TransGrid actually undertook.

Table 4.1 below compares TransGrid's actual capex program with the capex provided in the ACCC's 2000 Decision. From this table it is clear that the capital program envisaged at the time of the 2000 Decision does not correlate closely with the actual

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[24] Including the Snowy assets.

[25] Since submitting its Application, TransGrid has revised up by $40.1 million the estimate for the MetroGrid project, and SNI by an additional $500,000.

[26] These figures are based on numbers in Attachment 8 of TransGrid's Application.

investment program. In particular for only 9 of the 63 identified projects has the actual expenditure been below the forecast expenditure. For the remaining 15 projects identified at the time of the 2000 Decision, the actual expenditure has been significantly higher than forecast, exceeding the budget in aggregate by more than $250.61 million.

Table 4.1: Breakdown of TransGrid's actual spend compared to allowance

Project Type	**Projects where actual expenditure is less than expenditure provided in 2000 Decision**			**Projects where actual expenditure is greater than expenditure provided in 2000 Decision**		
	No. of Projects	Actual spend ($m)	Allowance ($m)	No. of Projects	Actual spend ($m)	Allowance ($m)
Augmentation	5	22.8	52.57	10	647.6	488.22
Non-augmentation	3	8.4	70.35	4	158.1	73.47
Support the business	1	15.4	16.75	1	37.4	30.8
Total	**9**	**46.6**	**139.67**	**15**	**843.1**	**592.49**

Many of the projects the actual expenditure on which is less than the allowance provided in the ACCC's 2000 Decision have not been completed yet.

Table 4.2 below presents the remaining 40 projects which account for $218.4 million of the total expenditure that were not forecast at the time of the 2000 Decision.

Table 4.2: Breakdown of TransGrid's actual spend that was not forecast

Project Type	**Projects not identified in 2000 Decision**	
	No. of Projects	Actual spend ($ million)
Augmentation	25	68.5
Non-augmentation	11	109.7
Support the business	4	40.1
Easements	n/a	n/a
Total	**40**	**218.3**

4.4 Consultant Review

GHD Pty Ltd (GHD) was engaged by the ACCC to undertake a review of the prudency and efficiency of TransGrid's historic capital expenditure.

The main conclusions and recommendations of GHD's review of TransGrid's historic capex are:

- Based on sampling a range of projects totalling $463 million in each category of historic capex, no conclusion could be drawn on $301 million due to insufficient information or a limited level of review by GHD, within the scope and resource constraints of the assignment;

- Some $115 million was considered prudent and efficient;

- $0.9 million capex on private use vehicles was considered to be expenditure on unregulated assets and GHD recommends its removal from the asset base;

- $31.5 million was deducted for vehicle resale revenue ($25 million) and unsubstantiated Other Projects ($6.5 million);

- One augmentation project (Molong substation and line: $14.7 million) was not considered prudent, but other investment would have been required in its place, possibly at a lower cost; and

- Given the limited sample from which conclusions could be drawn and the complexities of the conclusion in each project reviewed, drawing wider conclusions on the overall historic capex was not appropriate. However, it was clear from the assessment that TransGrid has some difficulty in tracking project costs from project inception to completion, undertaking and providing adequate economic project justifications, and reviewing project costs after approval.

4.4.1 Historic capital expenditure augmentation

A detailed review was not undertaken by GHD with respect to TransGrid's entire historic capex augmentation project. However, GHD sampled five projects, and its review indicated the following for the four augmentation projects assessed:

- Kempsey-Nambucca-Coffs Harbour 132kV line. GHD notes that the final cost is well in excess of the original project estimate of $21.4 million (excluding the SVC, not built) and significantly above costs in the economic evaluation. Following provision of further information by TransGrid, GHD considers that this project appears to be prudent, but notes that this should be subject to a more detailed review by the ACCC.

- Tuggerah-Sterland 330kV transmission line duplication. GHD highlights that this was not in the original 1999 ACCC allowance, but was considered prudent and consistent with the Regulatory Test.

- Reinforce Wagga area supply. GHD highlights that the ACCC provided an allowance of $92.9 million. However, the project has been deferred by minor works and this is considered prudent by GHD.

GHD notes that from the projects sampled, a step appears to be missing in the TransGrid process, in that once a selected option is subject to detailed engineering costing it is not reassessed to ensure that it is still the most economic. Furthermore, based on the projects sampled, once projects are undertaken, TransGrid can incur significant cost overruns. However GHD notes that a more detailed review would be required to confirm this. GHD considers it reasonable that the detailed engineering costs should at least be compared to the sensitivity test undertaken in the Regulatory Test to see if a review should occur. There does not appear to be any evidence of this occurring.

Furthermore, GHD notes that projects can incur significant cost and scope changes because of various factors during their development and implementation. Sampling indicates this has occurred on a number of projects and it has not been possible to determine within GHD's review whether the expenditure is efficient. GHD states that a more detailed review of the project would be required to confirm this.

GHD raises the issue of TransGrid building transmission works that are used by DNSPs even though the DNSPs have made no capital contribution, as in the Molong and Kempsey-Nambucca-Coffs Harbour projects. GHD notes that while the augmentation works are considered least cost to the community, it would appear that TransGrid customers are paying some of the costs that should be paid by the DNSP customers.

4.4.2 Historic capital expenditure refurbishment

GHD notes with respect to TransGrid's substation projects that the actual costs of $214.4 million overall indicate over-expenditure of $140 million compared to the 1999 allowance and between $45 million and $130 million compared with TransGrid's long term plans and simple age-based replacement estimates. However, GHD also notes that due to its inability to adequately categorise expenditure, and establish the actual total spend for each Asset Management Strategy, GHD was unable to arrive at a conclusion on the level of prudent and efficient expenditure in this category. GHD notes that further information was provided by TransGrid in response to its Draft Report, which more clearly showed the categorisation of expenditure and the relationship between strategies and budget. However, this information was not reviewed and explored to incorporate findings in GHD's report.

For the Communication Upgrades and Replacement category with a spend of $46.6 million, GHD notes that the project need was established, and TransGrid provided information proposing a reduction of $2.0 million in the value of the investment for asset elements of the project scope provided for commercial gain. GHD states that in the absence of understanding the potential commercial benefit of these assets, GHD is unable to conclude on the prudent value of the regulated asset.

4.4.3 Historic capital expenditure: support the business

In assessing TransGrid's historic "support the business investment", GHD comments on three aspects including Information Technology Projects, Motor Vehicles, and Miscellaneous Plant and Equipment.

With respect to IT projects, GHD concludes that IT capex for the period was justified in terms of need. Overall project costs were provided by TransGrid for selected projects, but were not sufficient to enable GHD to establish that spending was efficient.

GHD highlights that the actual cost for the motor vehicles line item is $37.4 million compared to the ACCC's allowance of $30.9 million. GHD concludes with respect to this project that the net allowance for vehicles should be $11.58 million after deducting vehicle sales revenues and private use vehicles considered as unregulated assets.

4.5 Submissions by interested parties

4.5.1 General process

When assessing the prudency of TransGrid's historic spend, information and comments provided by interested parties to the ACCC have been reviewed and considered where applicable as part of the review process. These include:

- TransGrid's Application;
- submissions from interested parties;
- TransGrid's response to ACCC information requests;
- findings presented in GHD's report; and
- discussions held between TransGrid and ACCC staff.

The following section provides a summary of submissions received from interested parties and TransGrid's responses to submissions by interested parties.

4.5.2 Summary of submissions from interested parties

Planning and Investment Criteria

VENCorp notes that TransGrid's network investment criteria appear to be based on an interpretation of Schedule 5.1 of the Code that differs from VENCorp's interpretation. These different interpretations have the potential to lead to the application of different investment criteria. This in turn may lead to different levels of transmission investment (and possible network reliability) in different regions of the NEM.

The Joint Customer Groups Submissions (Customer Groups) noted that TransGrid and Energy Australia implemented a Demand Management Strategy to defer or avoid network expansion in the inner metropolitan Sydney area. However, despite these initiatives, TransGrid's Application does not provide any detail on how cogeneration, embedded generation and demand management have been considered to reduce the need for increased network augmentation. The lack of emphasis on these important options highlights that little has been accomplished.

Beneficiaries Pay

The Customer Groups noted that in cases such as the capex allocated to support the operations of QNI the principle of beneficiaries pay should apply. The Customer Groups argued that the augmenting of the NSW transmission system to enable the flow of energy from Queensland to Victoria and South Australia and visa-visa does not benefit NSW customers and accordingly NSW customers should not be required to bear this cost.

Ex-post prudency review

Origin considers it reasonable that regulated network service providers be subject to the same sorts of ex-post demand and cost-related risks as market participants, considering they effectively operate within and have a significant impact upon the same commercial environment.

VENCorp agrees in principle with TransGrid's proposal that TNSPs should be permitted to roll-in to the regulated asset base the efficient cost of all investments that satisfy the Regulatory Test. Further, VENCorp suggests that arrangements relating to the full recovery of capital expenditure in excess of that provided for in the revenue cap should distinguish between:

- capital expenditure within the control of the network owner (such as asset renewals); and

- capital expenditure driven by factors beyond the control of the network owner (such as demand and generation-development related expenditure).

VENCorp considers that the allocation of growth forecast risk to a TNSP operating under a fixed revenue cap serves no economic purpose. In principle, therefore, there appears to be good reason to allow TNSPs to fully recover the efficient costs associated with unforseen demand growth and generation development.

However, in the second case, given that the TNSP is best placed to manage risks such as asset maintenance, performance and availability over the life cycle, there is a case for not automatically rolling in the unforseen amount.

The Energy Market Reform Forum (the EMRF) noted its concern with the size of the differences between the forecasts and actual capital expenditure and the front loading of capex over-runs in the earlier years of the regulatory period, thereby raising questions as to why TransGrid's asset management systems did not account for these at the commencement of the current regulatory period.

In addition, the EMRF noted that if the prudent and efficient capital expenditure is higher than projected for the current period, TransGrid should also not be compensated for interest and depreciated costs. To allow TransGrid to fully recover the cost of unexpected capital expenditure would simply mean a de facto shift of its business risks onto its customers.

The Customer Groups note that the amount of overspend between TransGrid's forecast and its allowance is 21 per cent. The Customer Groups state that it is difficult to see how a 45 per cent increase in real capex can be justified when the increase in load growth amounts to only 4 to 5 per cent over the two regulatory periods. Further, the Customer Groups fail to understand why actual capex during the first couple of years after a review should be so much higher than forecast as planning, costing and commitment to the level of capex must have been made before the previous regulatory review.

The Customer Groups consider that allowing TransGrid to simply roll into its asset base any cost increases would undermine and negate the whole concept of incentive regulation. As claw back is considered to diminish the incentives for the TNSP to be innovative and efficient, so too would rolling in the foregone return on the overspending.

4.5.3 TransGrid's response to submissions from interested parties

TransGrid disagrees with the EMRF that neither additional prudent capex nor associated unrecovered returns should be recognised. TransGrid however agrees with VENCorp that efficient costs of all investment that has satisfied the Regulatory Test should be rolled into the regulatory asset base.

4.6 ACCC's consideration of the prudency of TransGrid's capital expenditure from 1999 to 2004

This section sets out the ACCC's determination of the prudency of TransGrid's investment in network augmentation, investment needed to replace and refurbish existing assets and investment needed to support the delivery of its services. These prudency assessments underlie the ACCC's determination of the amount of capital expenditure to be included in the RAB

The ACCC has not yet come to a final view on the prudency of TransGrid's investment in a number of significant projects. In these cases, for the purposes of this Draft Decision the approach has been to roll the full amount of the expenditure into the RAB. Further analysis will be conducted on these projects in time for the Final Decision. The rest of this section outlines the prudency assessment of the MetroGrid project and the Bayswater – Marulan 500 kV line. All other projects specifically reviewed are set out in Appendix 2. In this section, the ACCC has included a summary of the project for which the final cost was not rolled into the asset base.

4.6.1 Prudency assessment of the MetroGrid project

The MetroGrid project, an investment in a 330 kV cable to the CBD of Sydney, and the construction of 330 kV substation at Haymarket, has been one of TransGrid's largest single investments over the past regulatory period. This project alone accounts for around one third of the total capital expenditure by TransGrid from 1999 to 2004. The total cost of the project is now estimated to be $276 million but TransGrid is facing additional claims from various contractors and suppliers that total around $40 million. The project has not yet been commissioned, but it is scheduled to be operational by July 2004. By comparison, in the Regulatory Test application completed in February 2000, TransGrid estimated the capital cost of this project to be $142 million and that the project would be operational by October 2003.

A detailed review has been undertaken with assistance from PB Associates and Mountain Associates. A report on the prudency of TransGrid's investment in the MetroGrid project by Mountain Associates is in Attachment A.

The consideration of the need for this investment, the robustness and rigour of TransGrid's assessment of the most appropriate investment to meet that need, and the efficiency of the actual project that has been developed are set out below.

Need for investment

The ACCC is not responsible for regulating TNSP's planning standards. Rather, these standards are regulated by jurisdictional governments and it is therefore for the jurisdictions to decide the planning standards to be adopted by TNSPs. The ACCC accepts TransGrid's analysis that a significant investment of around 200 MW or more was needed to bring the networks in the CBD and Inner City to the proposed modified n-2 standard. The ACCC also considers that the principle underlying TransGrid's justification for the timing of the implementation of the revised standard, that is, when the network no longer satisfied the existing standard, is reasonable.

Assessment of the preferred investment

The assessment of the scope for demand side management by NERA appears robust, although NERA's estimate of the potential for demand side reduction may be considered to be a plausible minimum. The evaluation of generation alternatives, also conducted by NERA, appears to be objective and robust. However the ACCC understands from TransGrid that there is now significant doubt about the potential for large scale generation within the CBD. TransGrid should have investigated in greater detail the option of locating a generator in the CBD in order to obtain much greater certainty on this option at the time of the Regulatory Test assessment. The ACCC also considers that the cost-effectiveness analysis conducted by NERA was objective.

However, the ACCC has concerns about the quality of the design and costing of possible network options included in the Regulatory Test assessment. In particular the ACCC is concerned that the quality of the analysis of possible network options by TransGrid was inadequate. The evidence for this is that the project that was actually developed bears little resemblance to the conceptual design of the project at the time of the regulatory test. TransGrid developed possible network options based only on a high level desk-top analysis. TransGrid asserted that it would not be practical to have done a more detailed design of the network options because this would mean that significant additional work would need to be done not just for the chosen network project, but also for all other possible projects.

TransGrid knew that the MetroGrid project would be one of the largest and most complex projects ever developed in New South Wales. In developing the detailed conceptual design of the chosen project after the Regulatory Test, a very significant number of alterations were made to the project, including the route and specification of the cable trench and tunnel; the design of the Haymarket substation; and the insulation of transformers. TransGrid explained that the need for these changes was self-evident particularly in terms of finding a cable route and accommodating a major substation in one of the busiest and most heavily utilised precincts in Sydney.

It would have been obvious to TransGrid from the outset that the project would involve a challenging combination of local planning, engineering and environmental constraints. The application of "good industry practice" would have led to more

circumspect and thorough analysis than TransGrid conducted, even though this would have been more time consuming and expensive to do. Had a more refined analysis been undertaken at the time of the Regulatory Test, it may well have led to the selection of a different project or possible deferral of the proposed project.

Efficiency of project actually developed

A detailed review of the documentation on the progress of this project was undertaken. From this it is clear that TransGrid knew with a high degree of certainty that the project would cost much more than envisaged (around $227 million compared to $142 million) around a year to 18 months after the Regulatory Test was complete.

Part of the difference in costs at this stage is attributed to better estimates of the work actually required, and the cost of the equipment needed. However, part of the difference is explained by TransGrid's decision to significantly expand the size of the project through a 25 per cent larger cable and larger and more transformers. In an early report to the ACCC, TransGrid explained that this decision was based on information at the time of the decision that demand was much higher than forecast. This information was reviewed and it appears that demand was no higher than had been forecast at the time of the Regulatory Test and so it was difficult to see why this would have justified building a larger project.

TransGrid subsequently produced a report for the ACCC apparently based on an analysis undertaken in 2001 that purported to show that not only would the expansion of the project increase its useful life, but that it was essential in order to ensure that the project met the modified n-2 standard. This report has been reviewed. In fact the results set out in this report seem to go even further than TransGrid claims. In particular, it suggests that even after the MetroGrid project is commissioned the metropolitan transmission network would still fail to meet the adopted modified n-2 standard.

This is a very significant conclusion. In effect, if this analysis is correct, TransGrid appear to have spent more than $276 million on a project that ultimately fails to deliver the outcome that justified the expenditure in the first place. This is a complex issue and the ACCC has yet to complete its analysis in this area. However, at this stage the ACCC does not propose to make an adjustment for the prudency of the expenditure related to TransGrid's decision to re-size this project.

In considering other aspects of the efficiency of the project actually developed, the ACCC has not attempted to assess the efficiency with which TransGrid managed the development of this project, hired contractors, developed the detail design, purchased equipment and so on. Instead the focus has been on how TransGrid reacted to information on the actual cost of the project when this became known, and whether its response could be considered to be in line with "good industry practice". The report by Mountain Associates examined this issue in detail. It concluded that:

> "TransGrid and EnergyAustralia could have deferred the implementation of the modified n-2 criterion from the October 2003 implementation date specified at the time of the Regulatory Test, while still ensuring compliance with their existing planning standard. In particular, by bringing forward investment in the DSM program specified in the Regulatory Test assessment of the chosen option, TransGrid would have been able to defer investment in the MetroGrid

> project to ensure the continued compliance of the network with the existing n-1 standard until 2006 and potentially much later than this. This action would have been consistent with TransGrid's own logic for assessing the timing of the implementation of the MetroGrid project."

The ability to extend the period of time in which the network complied with the existing planning standard would have provided a "window of opportunity" to revisit the Regulatory Test analysis to develop a more accurate specification of the network options (and cost). When it became known to TransGrid that the Regulatory Test Decision was based on fundamentally flawed analysis (between a year and 18 months after the completion of the test), TransGrid could be expected to take advantage of the window of opportunity to re-evaluate the project. This conclusion necessarily relies on the assumption that doing this would not impinge on its ability to deliver its existing statutory obligations.

However, the ACCC recognises that it could be argued that there is an inconsistency between a judgement that TransGrid should have taken advantage of an opportunity to defer the investment needed to achieve the new planning standard, and the ACCC's recognition that planning standards are a matter for jurisdictional regulation. Specifically it could be argued that if the ACCC does not judge the appropriate planning standard to be adopted, so it should also not judge the timing for the adoption of any change to the standard. On the other hand, the ACCC notes that the argument that TransGrid should have exploited the window of opportunity to defer the change to the new standard is consistent with the logic on the timing of the MetroGrid project that TransGrid had produced to justify the development of this project by October 2003.

ACCC's Decision

The ACCC's view is that TransGrid conducted inadequate analysis of the investment choices available to best meet the investment need. Furthermore it seems reasonable to argue that TransGrid failed to respond adequately to information that the actual project would cost considerably more than envisaged at the time of the Regulatory Test. This leads the Commission to believe that at least part of the investment in the MetroGrid project was not prudent. The issue is therefore determining what proportion of the total cost is inefficient, and hence should not be charged to consumers.

An objective way to calculate a prudency adjustment would be to re-run the Regulatory Test evaluation. This would mean reconstructing the entire analysis; altering the existing investment options and adding new ones; redesigning and costing all network and non-network options; re-running load flow analyses to model the revised investment options and finally performing the cost effectiveness assessment. Having done this, it would be necessary to consider whether the revised Regulatory Test estimate of the most efficient investment, is an accurate estimate of the actual cost, or whether further adjustments would be needed to take account of contingencies and unforeseen events. This analysis would be a very significant undertaking and could not be completed by the ACCC alone. It would require extensive information and analysis by TransGrid and EnergyAustralia and possibly other interested parties. It would clearly not be possible to complete this analysis within the time allowed for this Revenue Cap Decision.

The Mountain Associates report calculated a prudency adjustment based on the arguments described earlier in this section. Another way to calculate a prudency adjustment would be to disallow any return on TransGrid's investment in the MetroGrid project during the period of its construction. Our calculation of the return on TransGrid's investment in the MetroGrid project during the period of its construction would be $51 million (nominal).[27]

The ACCC notes that there is nothing sacrosanct about disallowing the full return on investment, it could just as well be half the return on investment or even twice the return on investment. A narrow reading of the ACCC's Code obligations and Draft Regulatory Principles undertakings is that the ACCC should only allow what it determines to be efficient investment into the RAB, and the difference between the "efficient investment" and the actual expenditure should be excluded from the RAB. The ACCC believes that the execution of this obligation demands the consideration of a number of other issues:

- Firstly, while "re-running" the full Regulatory Test ex-post may deliver a more objective assessment of what the level of efficient investment should be, it is subject to a large number of judgements. The level of "efficient" investment is not knowable with absolute certainty, it will always be subject to a number of judgements no matter how precisely costs are examined and alternative projects are designed.

- Second, the ACCC also has a Code obligation to develop and apply efficiency incentives. This means considering the likely impact of an ex-post prudency adjustment on a TNSP's future investment behaviour. As described elsewhere in this report, the ACCC is currently considering a new regulatory regime to be applied to investment. However, the decision to move to this regime has not yet been made, and the full details of the new regime have not yet been worked out. The ACCC therefore needs to consider the impact of any ex-post prudency assessment under the current regime on investment incentives under this regime. It could be argued that an excessively punitive ex-post adjustment could lead to higher risk aversion and possibly deferring or avoiding investments that could prove to be efficient. At the extreme that this could even jeopardise TNSPs' delivery of secure and reliable networks. On the other hand, an excessively lenient ex-post adjustment could weaken incentives for efficient investment in the future. This would mean higher costs for consumers, not necessarily matched by better service.

On balance, the ACCC believes that a prudency adjustment based on disallowing the return on investment during construction which is equal to $51 million in 2004 dollars

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[27] This is based on a calculation that assumes that the profile of actual expenditure is consistent with the profile determined at the time of the Regulatory Test, but the expenditure has been scaled-up so that in total it is equal to the current estimated total cost of the project of $276m (nominal).

is appropriate. In effect this means that the ACCC is allowing TransGrid to recover its full cash expenditure on this project to-date.[28]

Finally, the ACCC notes that this Decision provides no economic incentive for TransGrid to minimise any remaining expenditure on the project, or to seek to minimise the claims made against it. Of course this is not to say that TransGrid will not make every effort to efficiently manage such costs, only that there is no economic incentive for it to do so. Accordingly, the ACCC has decided to apply an incentive on TransGrid to manage the remaining costs on this project.

The principle of this incentive is to extend the impact of the ACCC's determination to the remaining expenditure on this project. A simple way to do this is to determine an incentive on the remaining expenditure that is consistent with the prudency adjustment on expenditure on the project to-date.

Accordingly, TransGrid may include in the RAB only 84 per cent of the remaining capital expenditure.[29] This clearly provides an incentive on TransGrid to minimise such costs since for every additional dollar spent, in present value terms, TransGrid only recovers 84 cents. It should be noted that this incentive applies only to capital expenditure on this project, as operating expenditure is already subject to a fixed ex-ante incentive. The ACCC does not envisage that a specific mechanism will be needed to implement this incentive. Rather, the impact of the incentive on the determination of the closing RAB in 2009 will be calculated at the time of the next regulatory reset.

4.6.2 Bayswater-Mt Piper-Marulan 500kV re-optimisation

This section sets out the ACCC's decision on whether to exclude (re-optimise) an amount of $70 million linked to the Bayswater-Mt Piper-Marulan 500kV (Bayswater) transmission line from TransGrid's RAB. This amount was first written-down (optimised) from TransGrid's RAB by IPART in 1996, but the ACCC decided (in its 2000 Revenue cap Decision) to include it in the RAB in 2001 on condition that the line would be utilised at its higher (design) capacity.

Statement of the issue

The issue for consideration is whether the ACCC should allow TransGrid to retain $70 million in its RAB for the Bayswater line, or whether this amount should be

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[28] Adopting this approach would mean a write-down of $44 million of the cash expenditure on the project based on the profile of annual expenditure as set out in TransGrid's regulatory test application but scaled up to the total expected cost of the project of $276 million. In other words, reducing the cash expenditure by $44m based on the regulatory test profile of spending, reduces the rolled-forward value (the amount that is to be included in the RAB by $51 million.

[29] This percentage has been calculated by translating the $51 million adjustment on the carried-forward value of the project to an equivalent adjustment to the underlying capital cost of the project, based on the profile of historic spending on the project. This adjustment, stated as a percentage of the capital cost of the project, is 16 per cent which means that 84 per cent of the historic expenditure is recoverable.

excluded from the RAB. The optimisation of the investment in the Bayswater line was undertaken by IPART in the context of the ODRC asset valuation undertaken at the time TransGrid was formed as a distinct corporate entity. The ACCC understands that the basis of IPART's optimisation was that the Bayswater line was constructed to operate at 500kV but was commissioned at 330 kV and has continued to operate at this voltage. IPART's optimisation was intended to ensure that consumers were not paying for the cost of an investment that was not needed. It is important to note that this expenditure was made in the 1980s and therefore does not relate to a cash investment by TransGrid during the current regulatory period.

As part of the 2000 Revenue Cap Decision, the ACCC's consultants noted that with the commissioning of QNI, there should be an increase in the value of the Bayswater line. Having regard to this recommendation, the ACCC reinstated the value of the 500kV lines in TransGrid's RAB from 2001. However, in its Final Decision, the ACCC noted the following:

> *"Although some interested parties argued that the future development of generation options in Queensland should preclude the need for re-optimisation, the Commission believes that the future pattern of generation investment in Queensland remain highly uncertain. On this basis, the Commission is not in a position to conclude that the reoptimisation suggested by its technical consultant is inappropriate at this time. Nevertheless, this situation could change by the time of the next regulatory review. For instance, if at that time there is evidence that new generation investment has meant that TransGrid's 500kV assets have functioned, and are likely to continue to function, at a lower service level, then the Commission will have no hesitation in optimising the value of those assets accordingly*."[30]

ACCC's position

TransGrid argued that the ACCC's right to review the value of the Bayswater line is limited to re-optimising the value of specific assets pursuant to S4.3 of the DRP, which can only be done where the ACCC has notified the TNSP, prior to the commencement of the regulatory review, that it intends to revalue the entire asset base pursuant to S4.2 of the DRP.

While in its 2000 Decision the ACCC re-included in the RAB in 2001 the amount optimised by IPART ($70 million) it foreshadowed that this issue would be re-visited at the next revenue reset. The ACCC made it clear in its 2000 Decision that it would "not hesitate" to exclude the optimised amount again, if the Bayswater line continued to operate at a level below 500 kV. As such the ACCC does not consider that the re-optimised $70 million should be automatically included in the regulated asset base but rather as flagged in the 2000 Decision should be subject to review[31].

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[30] ACCC Decision, *NSW and ACT Transmission Network Revenue Caps 1999/00 – 2003/04*, 25 January 2000, p.g. 63

[31] In any case the ACCC does not believe that its authority to re-optimise the Bayswater line, which is derived from clause 6.2.3(d)(4)(iv) of the Code, is limited in the manner suggested by TransGrid. Statement S4.2 sets out a process to apply where the ACCC proposes to conduct an ODRC re-valuation of the entire RAB. The ACCC is not proposing to do this in the current process. The ACCC is considering only whether to partially re-optimise a specific asset as foreshadowed in its 2000 Decision and raised in subsequent communications with TransGrid in the course of assessing TransGrid's application.

Capacity of the Bayswater line

TransGrid has argued that the facts of the situation do not justify the exclusion of the $70 million from the RAB. TransGrid has noted that the ACCC's 2000 Decision stated that it would reconsider the inclusion of the optimised investment in the Bayswater line, if this line had operated at a *lower* service level over the regulatory period. TransGrid argued that since the Bayswater line has not functioned at a *lower* service level[32] there is no basis for the ACCC to reconsider the "re-optimisation" of the investment.

It is clear from the 2000 Decision that, while the ACCC included the value of a 500kV line in the RAB, it was concerned about whether this line would operate at that service level (500kV). The ACCC foreshadowed the possibility that it would consider re-optimising the asset if it operated at a lower service level than the 500kV assumed for the purposes of the 2000 Decision.

ACCC's consideration and Decision

Clause 6.2.3(d)(4) of the Code requires the ACCC to have regard to the need to provide a fair and reasonable risk adjusted return on efficient investment. The Code also gives the ACCC the discretion to determine the basis on which the re-valuation of assets in existence and generally in service on 1 July 1999 is to be undertaken (clause 6.2.3(d)(4)(iv)). In making this determination, the ACCC must have regard to, among other things, COAG's Decision that deprival value (the lesser of economic value and ODRC) is the preferred approach to valuing network assets. This preference has been reflected in the DRP (eg. statement S4.1).

In deciding whether to allow the full cost of the 500kV line to be recovered from customers when the line has only been operating at 330 kV, the ACCC needs to decide whether the construction of the line to 500kV, and operation at 330 kV was an efficient investment for the purposes of clause 6.2.3. In some circumstances it may well be the case that the most efficient investment would have been to develop a 500kV line even if it were only operated at a lower voltage initially. This could be expected to be the case, for example, if demand was growing rapidly: in the long run it may be more economical to build an asset that may be oversized initially as it is likely to defer the need for subsequent augmentation.

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[32] TransGrid advised the ACCC that the utilization of the Bayswater line has increased and is continuing to increase due to:

- increased north to south flows from Queensland to NSW;
- the commissioning of Redbank Power Station in the Muswellbrook area (near Bayswater and Liddell Power stations);
- increased availability of Macquarie Generation generating units at Bayswater and Liddell power stations; and
- increases in the individual generator capacity at Bayswater of 80 MW now (and an additional 80 MW in the near future).

However, IPART concluded that the construction of the Bayswater line to 500kV was not an example of such efficient overbuilding. Accordingly, IPART wrote-down the value of the Bayswater line to the equivalent cost of a 330kV line so that consumers were not burdened with the recovery of inefficient investment. Since the IPART Decision in 1996, the specification of the Bayswater line has remained unchanged. It has continued to operate at 330kV despite the fact that the QNI interconnector has been commissioned and additional generation in the Hunter valley has come on stream. In 2000 the ACCC was prepared to include this line in the RAB at an increased value in anticipation of the line operating at500kV. However, it is not clear to the ACCC when this is likely to occur during the next regulatory control period. While TransGrid has argued that utilisation of the line has increase and is continuing to increase it has not been uprated to its design voltage. The ACCC therefore sees no reason to maintain the value of these assets to require consumers to continue to pay for what still remains to be excess, unneeded capacity.

It is open to TransGrid to argue that the depreciated value of the optimised investment should be re-instated into the RAB if TransGrid re-rates the Bayswater line to 500kV. The ACCC understands that TransGrid plans to re-rate the Bayswater line to 500kV in the coming regulatory period through the upgrade of the Western substations. As discussed in the chapter on TransGrid's future capex proposal, the ACCC has accepted TransGrid's estimate of capital expenditure during the coming period without alteration in light of the review of this expenditure later this year. The ACCC envisages that the prudency of such a measure, and the reinstatement of the depreciated value of the optimised Bayswater investment, should be reconsidered at this time.

4.6.3 Other Projects

In this section, the ACCC has included a summary of the projects for which the final cost has not been rolled into the asset base. The ACCC's assessment of these projects is presented in Appendix 2.

Kempsey – Nambucca- Coffs Harbour 132kV

The Kempsey line is a dual circuit 132kV transmission line using the route of a 66kV line operated by, North Power (which became part of Country Energy), between Kempsey and Coffs Harbour. The Kempsey project also involved the construction of a 132/66kV substation at Nambucca Heads (which lies between Coffs Harbour and Kempsey).

The ACCC in its 2000 Revenue Cap Decision provided an allowance of $31.62 million for the Kempsey project. The estimated capital cost of this project under the economic assessment was $31.4 million. However, the actual cost of this project is $56.3 million. The difference between the economic assessment and the actual cost is attributable to higher construction and easement cost.[33] At this stage the ACCC is

[33] The construction costs were $13.1 million higher than the economic assessment. Actual easement costs were $21.8 million.

satisfied that this project is justified. But the actual cost of the project has turned out to be much higher than forecast and the Commission is not yet convinced that the higher expenditure was prudently incurred. This is an issue the ACCC has yet to finalise but for the purpose of this Draft Decision, the ACCC has not reduced the cost to be included in the RAB.

A second issue relates to the allocation of costs. The ACCC understands that the conductors on one of the circuits remain in Country Energy's asset base, and are owned and operated by Country Energy. It may therefore be the case that costs are being double-counted: both by Country Energy and TransGrid. TransGrid has advised that the cost of the conductors used by Country Energy is $2.15 million. Therefore, at this stage, the ACCC proposes to exclude this amount from the total cost of the Kempsey line to be rolled into the asset base.

For the purposes of this Draft Decision, the ACCC proposes to roll in the value of the Kempsey project as $54.15 million instead of $56.3 million.

Telecommunication Assets

In its 25 January 2000 Revenue Cap Decision the ACCC provided an allowance for telecommunication expenditure of $54.85 million. TransGrid has claimed an expenditure of $41.7 million.

The majority of this amount relates to the replacement of TransGrid's microwave radio systems with a fibre optic (OPGW) network. The ACCC has not been provided with any evidence to indicate that cost/benefit analysis has been undertaken before deciding on this investment.

TransGrid has installed OPGW with 24 fibres and its requirement at this point in time is 12 fibres for the provision of regulated services. TransGrid has advised that the remaining fibres could be leased on a commercial basis. The cost of these fibres is $3.2 million. At this stage, the ACCC considers it appropriate to optimise $3.2 million of the investment. This represents that amount of the total investment which could be leased on a commercial basis and so excluded from the Regulatory Asset Base.

Other Sydney City projects

The ACCC understands that the Other Sydney Projects involve works such as the instalment of security equipment such as closed television cameras and motion detectors at substation sites.[34] In its Application, TransGrid proposed to spend $11.1

[34] The ACCC understands that TNSPs have formed a working group under the auspices of the Electricity Supply Association of Australia (ESAA) to develop a guide on security arrangements for substations. This has been a reaction to events such as September 11 and the heightened awareness of terrorism by governments in Australia re-appraising the security arrangements for critical infrastructure. In order to abide by these guidelines TransGrid has commenced installing security equipment such as closed television cameras and motion detectors at its substations.

million on this project in 2003/04. The Other Sydney Projects is part of a much wider security program estimated by TransGrid to cost $54.6 million over six years commencing from 2003/04.

TransGrid provided information on the wider security program which claims that $4.6 million rather than $11.1 million will be spent in 2003/04. The ACCC therefore concludes that the amount to be rolled into the asset base at this time is $4.6 million.

Motor Vehicles

In its 25 January 2000 Revenue Cap Decision, the ACCC provided an allowance for Motor Vehicles expenditure of $30.9 million. TransGrid has claimed an expenditure of $37.4 million.

TransGrid has only capitalised the net cost of the motor vehicles that is the purchase cost, which is $37.4 million less the trade-in-value. This calculation is evident in Attachment 8 of TransGrid's Application. The net cost of the motor vehicles is the actual "cost of service" for the motor vehicles which consumers should be paying, for not the purchase cost.

The ACCC found that vehicles for private use which are funded through salary sacrifice arrangements are also included in the expenditure on vehicles. The ACCC considers that the use of private vehicles should be considered unregulated assets and the value excluded from the approved amount. The net value of the private use vehicles (purchase cost less trade-in value) for the current regulatory period is in the order of $0.9 million. The ACCC therefore considers it appropriate to not include $0.9 million into the regulated asset base.

South Australia – NSW Interconnector

In its 25 January 2000 Revenue Cap Decision, the ACCC did not provide an allowance for the South Australia – NSW Interconnector (SNI). TransGrid has claimed an expenditure of $11.2 million.

Given that TransGrid requested that the capital expenditure proposed for SNI should be excluded from the forecast capex program, the ACCC is currently considering the treatment of costs incurred during the current regulatory period ($11.2 million) to determine whether they are capitalised or expensed for the purpose of the Draft Decision, the ACCC has assumed these costs are to be capitalised.

4.7 Impact of the prudency assessment on the opening RAB on 1 July 2004

Table 4.3 below summarises the ACCC's Decision on the amount of expenditure to be rolled-in to the RAB, and compares this to TransGrid's actual expenditure.

Table 4.3 Comparison of ACCC Decision and TransGrid's actual expenditure

	Actual spend over 1999/2004 ($m nominal)	ACCC 2004 Decision allowance for 1999/2004 ($m nominal)	Prudency adjustment ($m nominal)
Augmentation			
Kempsey-Nambucca-Coffs Harbour 132kV	56.3	54.15	2.15
Bayswater 500kV	70	0	70
Sydney City CBD	276.5	232.5	44
Non-augmentation: replace/refurb			
Telecommunication assets	41.7	38.5	3.2
Other Sydney Projects	11.1	4.6	6.5
Support the business			
Motor vehicles	37.4	36.5	0.9
Other projects	614.4	614.4	n/a
Total	**1,107.4**	**980.65**	**126.75**

The amounts shown in Table 4.3 represent the ACCC's Draft Decision on the deduction to be made from the total expenditure by TransGrid in each project. Exactly which year that deduction is taken from will affect the calculation of the closing RAB. The ACCC has simply decreased the total reported capital expenditure for each year based on the prudency adjustment as a percentage of the reported expenditure. For the MetroGrid project the adjustment has been made as described earlier. Using this approach the resulting asset-base roll-forward calculation is shown in Table 4.4 below.

Table 4.4 TransGrid's 30 June 2004 Closing RAB

	1999/00 ($m)	2000/01 (m)	2001/02 ($m)	2002/03 ($m)	2003/04 ($m)	Roll in un-forecast capex
Opening asset base	1,996.99	2,014	2,120.24	2,369.43	2,425.61	
Decision capex at actual CPI	54.43	85.33	294.13	95.1	37.22	**190.82**
CPI adjustment	55.75	120.65	62.31	81.52	54.93	
Economic depreciation	91.16	99.73	107.25	120.44	126.33	
Closing asset base	2,014	2,120.24	2,369.43	2,425.61	2,732.43	**2,923.25**

5. Forward Capital expenditure

5.1 Overview of the current approach to assessing capital expenditure

Since 1 July 1999 the ACCC has assumed responsibility for the regulation of transmission revenues on a progressive basis. It has undertaken first round revenue assessments of each of the TNSPs in the NEM. In assessing the revenue requirements for TransGrid and EnergyAustralia, the ACCC is conducting its first "second round" revenue reset.

The ACCC's 1999 Draft Statement of Regulatory Principles (DRP) outlined the ACCC's approach to determining a TNSP's allowed revenue. The DRP explained that an ex-ante forecast of capital expenditure would be used to determine a path of revenues and prices over the regulatory period.

The DRP also explained that prudent and efficient capex that took place in the previous regulatory period, but which had not been previously forecast, would also be rolled into the RAB if the ACCC assessed it to be prudent. This assessment would be done at the end of the regulatory period (an ex-post review).

Hence, the provisions in the DRP indicate that the ACCC would make a distinction between those forecast capital projects that were included in the ACCC's determination of the allowed capital expenditure for a TNSP at the start of a regulatory control period; and investments that were either not forecast, or the actual cost of which was more than provided for in the revenue allowance. In particular, capital projects that were forecast that were undertaken would not be subject to as rigorous an ex-post review as unforecast capex; and capital projects that were not forecast (or projects that were forecast but that cost more than expected) would be subject to a rigorous prudency test. Expenditure deemed to be prudent would be included in the regulated asset base.

In practice, the ex-post approach has been found to have significant limitations. One shortcoming is the potential for ex-post optimisation of investments, which creates considerable uncertainty for the TNSP. The current regulatory framework attempts to deal with this uncertainty through the Regulatory Test. The Regulatory Test is designed to give some certainty to TNSPs that their capex programs will not be subject to ex-post optimisation. However, to generate this certainty it would appear that the Regulatory Test and its application must be unambiguous, transparent, and objective. Given the sensitivity of Regulatory Test modelling to input assumptions, it is debatable whether this could ever be the case.

Further, the Regulatory Test framework requires interested parties to effectively evaluate a TNSP's application of the test. Questions have been raised as to whether interested parties have sufficient resources or expertise to make a sufficiently informed assessment of whether a TNSP has applied the test thoroughly and impartially.

Finally, the ex-post review can be an intrusive form of regulation, and is resource intensive. It requires detailed analysis of the costs and benefits of each project. In the

context of the current TransGrid and EnergyAustralia revenue resets, the adequacy of the Regulatory Test processes undertaken by the TNSPs across a range of projects must be assessed. This has been found to be a demanding form of regulation.

5.2 Options for the reform of transmission investment regulation

The ACCC is presently considering an alternative approach to transmission investment regulation through the potential introduction of a firm ex-ante investment cap. This approach would involve a TNSP proposing a five-year capex allowance, which would be assessed by the ACCC. The ACCC would establish a firm cap at the start of each regulatory control period. This would be expressed as a profile of spending for each year of the control period, rather than as a specified list of investments and their expected costs.

TNSPs would be free to decide which projects to build and when to build them with the knowledge that as long as the aggregate costs of those projects were less than the cap, then they would be authorised to recover the cost of these investments through regulated charges. In the event that a TNSP invested at a level higher than the cap, the additional investment would not be included in its regulated asset base. There would be no ex-post optimisation of TNSPs' investments under the cap. Provided that the aggregate cost of a TNSP's investments was less than the cap, there would be no risk that the regulator would re-assess the efficiency of the TNSP's investments at the end of the regulatory period.

There are several implementation issues associated with this proposal, including the question of how the ex-ante cap would be set, and the scope of investments that the cap would include. The ACCC recently released a discussion paper on the issues surrounding the ex-ante framework. The discussion paper is available on the ACCC's website and the ACCC has invited submissions from interested parties.[35]

5.3 Implications for TransGrid's revenue reset

The ACCC has discussed the ex-ante proposal for the reform of transmission investment regulation with TransGrid.

On 12 March 2004 TransGrid informed the ACCC that it is willing to have its future capex assessed under the ACCC's proposed capex framework. TransGrid requested additional time to reformulate its future capex application in accordance with the requirements of the newly developed assessment process.

TransGrid explained that its initial submission on forward capex was made on the assumption that the information would be used to determine a path of prices over the next regulatory period that would approximate actual capital expenditure. The submission had not been designed to provide a definitive list of actual projects which would proceed and a firm cost of capex in the next regulatory period.

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[35] Australian Competition and Consumer Commission, *Review of the Draft Statement of Principles for the Regulation of Transmission Revenues, Supplementary Discussion Paper: Capital Expenditure Framework,* 10 March 2003. A copy is available at www.accc.gov.au.

TransGrid indicated that it would expect to be in a position to resubmit its revised capex application following receipt of the ACCC's revised requirements.

The ACCC acknowledges that TransGrid's initial Application was not prepared with the objective of setting a fixed cap for capital expenditure, but rather to determine a path of prices and cash flows. The ACCC therefore considers that TransGrid's request to reformulate its future capex application is reasonable.

One issue presented by the extension of time for the submission and assessment of TransGrid's future capex application is that the Code requires TransGrid to set its transmission prices for the following financial year by 15 May 2004. Therefore, for the period during which the revised future capex application is being reformulated and then assessed, the ACCC will issue a Draft Decision which will provide TransGrid with an indicative revenue stream which it can use to set prices. The ACCC is prepared to allow the value of future capex as proposed in TransGrid's initial Application to enable it to prepare its transmission prices. However, in accordance with advice provided by TransGrid, the future capex program will not include the SNI proposal which TransGrid has estimated at a cost of $94.47 million. Therefore the future capex used in the calculation of prices is $1,308 million over the period 2004 to 2009.

5.3.1 Submissions by interested parties

The ACCC received submissions in relation to TransGrid's initial future capex application from VENCorp, the Total Environment Centre, the Energy Markets Reform Forum, and a joint Customer Groups submission from Australian Business Ltd, the Australian Consumers Association, the Energy Action Group, the Energy Users Association of Australia, and the National Farmers Federation.

The ACCC will take these submissions into account, as well as any other submissions received in relation to TransGrid's revised future capex application, when it releases a supplementary Draft Decision on the Application.

5.4 A timetable for assessment of TransGrid's future capex application

The ACCC envisages that TransGrid will resubmit its Application in accordance with the envisaged ex-ante approach according to the indicative timetable below. The result of this process will be a Final Decision incorporating an assessment of TransGrid's forecast capex under the ex ante approach as well as the ACCC's findings on the other parts of TransGrid's Application unaffected by the future capex application (such as historic capex and opex). All usual consultation and assessment processes will be conducted in the assessment of TransGrid's revised future capex application.

An indicative timetable for the future capex assessment is as follows:

Early May 04	ACCC releases Draft Decision on TransGrid's initial Application and invites submissions. The ACCC will hold a public forum if requested within 14 days of the release of the Draft Decision.
Early July 04	Close of submissions on Draft Decision.
End October 04	TransGrid resubmits future capex application. ACCC releases TransGrid's revised application for public consultation.
Mid December 04	ACCC releases consultant's report on TransGrid's application for public consultation.
Mid January 05	Close of submissions on TransGrid's application and consultant's report.
Mid February 05	ACCC releases supplementary draft decision and invites submissions.
Early March 05	Public forum on supplementary draft decision.
End March 05	Close of submissions on supplementary draft decision.
Mid April 05	ACCC releases final decision.

5.5 Conclusion

TransGrid has agreed to proceed with an assessment of its forward capex under an ex-ante regime. The form of this proposed regime will be finalised this year and is currently subject to a consultation process.

The ACCC considers that TransGrid's request to reformulate its forward capex application to suit this new process is reasonable.

For the purposes of this Draft Decision, the ACCC will use the forecast capex value in TransGrid's initial Application to determine a MAR, and hence enable TransGrid to publish its prices for 2004-05 before the 15 May 2004 deadline.

Once the ACCC has received TransGrid's revised forward capex application, a final decision will be issued which will enable TransGrid to set prices for subsequent years. In this final decision, the revenue path will be adjusted appropriately to ensure that the total revenue received by TransGrid over the regulatory period is appropriate.

The ACCC anticipates that TransGrid will submit its revised Application later this year and that the assessment process will be completed in time to meet TransGrid's price-setting obligations for the year 2005-06 and subsequent years.

6. Cost of Capital

6.1 Introduction

One of the objectives of economic regulation is to provide a fair and reasonable rate of return on efficient investment (clause 6.2.2(b)(2) of the Code). Clause 6.2.4(c)(4) of the Code provides guidance by stating that the ACCC must have regard to the Weighted Average Cost of Capital (WACC) of the transmission network.

The ACCC uses the risk adjusted rate of return required by investors in commercial enterprises facing similar business risks to establish the WACC for TransGrid. Electricity transmission is a highly capital intensive industry where return on capital generally accounts for about half of the revenue allowed. Relatively small changes to the cost of capital could have a substantial impact on the allowed revenue (AR).

Therefore, correctly assessing the WACC is important because:

- if the return on equity is too low, the regulated network may be unable to earn sufficient returns for the owner. This could reduce the incentive to reinvest in the business.

- conversely, if the return on equity is too high, networks may have a strong incentive to overcapitalise, thus creating inefficient investment; and

- AR translates into prices for users. Hence, a higher AR would mean higher prices.

In the DRP,[36] the ACCC outlines its views on the appropriate expression of the return on equity to be achieved, and how it is to be used for deriving the AR. This is summarised in statement S6.3:

> *The ACCC will apply the nominal post-tax return on equity as a benchmark. The revenues will be calculated on the basis of the cash-flows associated with the regulatory accounts necessary to deliver this return after taking into account liabilities and the assessed value of franking credits based on existing tax provisions and foreshadowed tax changes due to occur during the regulatory period.*

For this decision, the ACCC has chosen to use the 'vanilla WACC' in which the parameters relating to business income tax are removed from the WACC formula:

$$WACC = r_e (E/V) + r_d (D/V)$$

where:

r_e = required rate of return on equity

r_d = cost of debt

E = market value of equity

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[36] ACCC, *Draft Statement of Principles for the Regulation of Transmission Revenues*, 27 May 1999, p. 84.

D = market value of debt

V = market value of equity plus debt.

In doing so, the ACCC explicitly models the tax liabilities (i.e. interest expense and franking credits) of the TNSP in the cash flow model.

TransGrid has adopted the ACCC's post-tax approach to setting the WACC, expressed in nominal terms, in its application.

The remainder of this chapter sets out the parameters in the WACC framework and assesses the issues identified in TransGrid's application and submissions from interested parties. The ACCC's draft decision on each parameter and the appropriate WACC for TransGrid is summarised in section 6.13.

6.2 The capital asset pricing model

The regulatory regime administered by the ACCC must provide for:

> *a sustainable commercial revenue stream, which includes a fair and reasonable rate of return to Transmission Network Owners and/or Transmission Network Service Providers on efficient investment, given efficient operating and maintenance practices. (clause 6.2.2 of the Code.)*

Various methods can be applied to estimate the return on equity (r_e) as outlined under schedule 6.2.2. of the Code, for example the price to earnings ratio, the dividend growth model and arbitrage pricing theory. However, the Code indicates that the capital asset pricing model (CAPM) remains the most widely accepted practical tool to estimate the cost of equity.

The CAPM calculates the required return given:

- The opportunity-cost of investing in the market;
- The market's own volatility; and
- The systematic risk of holding equity in the particular company.

The CAPM formula is:

$$r_e = r_f + \beta_e(r_m - r_f)$$

where: r_f = the risk free rate of return (usually based on government bond rates of an appropriate tenure)

$(r_m - r_f)$ = the market risk premium (MRP) which measures the return of the market as a whole less the risk free rate

β_e = the relative systematic risk of the individual company's equity (equity beta)

The CAPM expresses the rate of return as the post-tax nominal return on equity.

However businesses are funded by equity and debt. Therefore by including the cost of debt we can derive the corresponding return on capital employed.

6.2.1 TransGrid's proposal

TransGrid proposes the use of the international CAPM with parameters derived from domestic Australian observations. TransGrid states that there is not an 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 global equity markets are integrated.

6.2.2 ACCC's considerations

The ACCC has historically used a domestic version of CAPM, which assumes private Australian ownership of capital.

Whilst it is acknowledged that there is some degree of integration of global equity markets, in the study by Associate Professor Lally a comparison of the cost of capital calculated under international and domestic models is given.[37] The result is a slightly higher cost of capital associated with using the domestic model. Nonetheless, there is little difference in the outcome, due to offsetting of bias in the parameters.

It was also noted by Professor Lally, that when using an international value of gamma within the domestic CAPM, the cost of capital was inflated above the results obtained by using the full international or full domestic models.

The ACCC notes TransGrid's claims that global equity markets have been integrated long enough for the impact to be reflected in domestic historical data. This does not appear to be the case, given the differences in the MRP between countries (see section 6.7).

Regulatory decisions in the United Kingdom have used an MRP of 3.5 per cent.[38] This appears to be based on an ex-ante estimation method (using a dividend growth model). Australian decisions have commonly used an ex-post approach to estimating the MRP. However, similar applications of the ex-ante approach have arrived at an estimate of around 5.7 per cent. The main reason for the differential is the Australian assumption of significantly higher long run growth in gross domestic product. This gives rise to the incidence of some degree of market separation.[39] Hence, the adoption of domestic parameters in an international model would be likely to result in a biased estimate of the cost of equity.

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37 Lally, *The Cost of Capital under Dividend Imputation*, June 2002, p.15-16

38 OFGEM, *Review of Tranco's price control from 2002*, Feb 2001.

39 Another rationale is that home asset bias (where investors exhibit a strong bias favouring their own domestic market portfolio rather than choosing to be fully diversified internationally) is an indication of a segmented financial market.

The alternative approach of assuming foreign ownership and using an international CAPM may be methodologically sound, but in practice it would be less feasible given the difficulty of assessing corresponding WACC parameters.

According to finance theory, in a fully integrated financial market, there would be no barriers to financial flows and purchasing power parity would hold across equivalent assets wherever they are traded. Because markets are integrated, the use of an international CAPM would assume that all investors are fully diversified across asset classes. The risky assets are placed in the world market portfolio and this optimal world market portfolio is shared by investors in every country.

The world market portfolio is a diversified set of international assets (such as shares, bonds, bills, derivatives, and real estate). The systematic risk of an asset in an integrated financial market reflects the asset's sensitivity to changes in the value of the world market portfolio.

On this basis, the ACCC considers that when comparing the use of a domestic CAPM with an international CAPM, there would be some source of difference in the parameters. That is, when using the international CAPM, the MRP and beta risk should reflect the global rather than a national market portfolio.

This implies that the domestic MRP currently used would require adjustment to reflect the global MRP. The process of estimating a global MRP also raises questions of the use of historical estimates and what time period data should be considered to reliably estimate the global MRP.[40]

In this context, the use of an international CAPM tends to be more complex and consequently more difficult to implement. This may explain why they are not generally used in practice, despite the accumulating evidence of greater market integration.

The ACCC considers that the reality of present day financial markets lies somewhere between the two extremes of segmented and integrated markets. The ACCC further considers that the use of an international CAPM could be expected to lead to significantly more debate about the methodology and interpretation of the model without substantial improvement in the outcomes of applying the domestic CAPM.

With this in mind and for simplicity in calculating the WACC, the ACCC has decided to continue using the domestic CAPM.

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[40] Lally has suggested that estimates of the international MRP should follow the Stulz-Merton methodology. In this instance, a world MRP of 3.9 per cent has been estimated. This is consistent with expanded international investment opportunities where a lower MRP is due to the increased diversification implicit in a world market portfolio.

6.3 Estimate of the risk-free interest rate

The risk-free rate measures the return an investor would expect from an asset with zero volatility and zero default risk. The yield on long-term Commonwealth government bonds is considered to be a proxy for the risk-free rate. The two issues for consideration are the sampling period used to determine the risk free rate, and the term of the risk free rate.

Sampling period

In the CAPM framework all information used to derive the rate of return should, in principle, be as recent as possible at the time the decision comes into effect. In the case of interest rates and inflationary expectations, financial markets determine these on a continuous basis.

On this issue Statement S6.7 of the DRP states:

> *The risk free rate will be normally based on a 40 day moving average covering the eight weeks prior to the reset date unless there is evidence to suggest that the current rate of the day represents a transition to a new level which is expected to be maintained.*

6.3.1 TransGrid's proposal

TransGrid proposes that a 10-day averaging period be used to estimate the risk-free rate.

6.3.2 ACCC's considerations

The ACCC is aware of the inherent limitations associated with using either an 'on the day' rate or an "historical average" in calculating the risk-free rate.

The financial theory underlying the CAPM explicitly specifies the use of ex-ante returns. Using on the day rates gives the best estimate of ex-ante returns. Therefore theoretically on the day rates are more appropriate.

However, on the day rates reflect short-term fluctuations which may differ from long-term trends. Such market volatility can be minimised by averaging rates over some time before the start of the regulatory period. Several regulators have traditionally used an average rate as the risk-free rate.

In the DRP the ACCC suggested a 40-day moving average and has used it in several of its regulatory decisions. More recently, the ACCC has adopted a 10-day averaging period in its Tasmanian[41], Victorian[42] and South Australian[43] Revenue Cap Decisions.

The ACCC, therefore, accepts TransGrid's proposal to use a 10-day moving average.

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41 ACCC, *Tasmanian Transmission Network Revenue Cap 2004-2008/09*, December 2003

42 ACCC, *Victorian Transmission Network Revenue Caps 2003-2008*, December 2002.

43 ACCC, *South Australian Transmission Network Revenue Cap 2003-2007/08*, December 2002.

Term of the risk-free bond rate

6.3.3 TransGrid's proposal and submissions by interested parties

The ACCC received submissions relating to the selection of the risk-free bond rate from TransGrid, the Energy Markets Reform Forum (EMRF) and a joint submission from customer groups. The customer groups include Australian Business Ltd, Australian Consumers Association, Energy Action Group, Energy Users Association of Australia, and National Farmers' Federation.

Their comments focussed on:

- whether the risk-free rate should align with the life of the asset or regulatory period; and

- the recent GasNet Tribunal Decision.

Alignment of the risk-free rate with the life of the asset or regulatory period

TransGrid argues that the 10-year bond rate should be used in its revenue cap reset. It contends that the term of the risk free rate should be set equal to a period that is consistent with investors' time horizons. TransGrid further contends that if the ACCC continues to use the 5-year rate as the risk-free rate, then adjustments will need to be made to other parameters in the WACC to adjust for duration. For this reason, TransGrid and the EMRF believe that the term of the MRP and bond rate maturity should coincide. They believe that if a 5-year bond rate is used as the risk-free rate then the MRP associated with the shorter term bond rate should be used.

The joint customer groups state that, given the five year regulatory cycle, it is more appropriate for five year bond rates to be used, as refinancing can occur to coincide with the regulatory cycle. They believe that the risk-free rate being set with reference to the bond rate yield consistent with the investment horizon is spurious as it ignores the fact that refinancing of debt can be readily undertaken in a financially mature market like Australia.

Consistency with the recent GasNet Tribunal Decision

The EMRF has referred to the recent GasNet Decision in which the Australian Competition Tribunal (Tribunal) supported the view that the risk-free rate should be the 10-year bond rate. However the EMRF notes that the Tribunal did not comment on what adjustments should be made to other factors which modify this basic risk free input, such as the debt margin, the MRP, the debt beta and the equity beta. In accepting the Tribunal's decision, the EMRF suggests that the ACCC adjust other input parameters to the CAPM formula in order to not reward returns which are not in keeping with benchmarking.

6.3.4 ACCC's considerations

The WACC is calculated at each revenue reset and is maintained throughout the regulatory period. Hence, the term for the risk-free interest rate, which is a component of the WACC, should match the length of the regulatory period. In the case of TransGrid's revenue reset, the regulatory period is five years.

In previous revenue cap decisions, the ACCC has used government bond yields with terms matching the regulatory period as the proxy risk-free rate for the following two reasons:

- the regulatory framework seeks to provide an efficient return on the capital; and
- the regulatory asset value is supported by the expected cash flows during the regulatory period.

Some interested parties support using the risk-free interest rate which matches the length of the regulatory period. Alternatively, other interested parties believe that bond rates with terms matching the life of the assets should be used. Transmission assets have long effective lives, far exceeding the term of the most traded Australian bond with the longest maturity period (10 years). These parties suggest that 10-year bond yields should be used in the CAPM formula. Other Australian state regulators also use a 10-year bond rate.

In December 2003, the Tribunal handed down its decision on its review of the ACCC's tariff determination for transportation services on GasNet's Victorian natural gas transmission network.

Although the ACCC used a 5-year rate, the Tribunal accepted GasNet's approach to calculating the risk-free rate on the basis of a 10-year government bond rate. Following this decision, the ACCC stated that it would be guided by this finding in its future regulatory decisions.

Accordingly, the ACCC proposes to accept TransGrid's request to use the 10-year bond rate as a proxy for the risk-free rate.

Maturity dates on nominal and indexed bonds rarely correspond and require realignment using either interpolation or extrapolation, that is, by estimating the rate at a given moment from a 'line of best fit'. The ACCC has used this approach in all of its revenue cap decisions, which is also consistent with jurisdictional regulatory decisions.

At the time of this Draft Decision, the nominal 10-year bond rate, ten-day moving average for Commonwealth government bond rates results in a risk free rate of 5.89 per cent.

6.4 Expected inflation rate

The expected inflation rate is not an explicit parameter in the return on equity calculation. It is a component of the risk-free rate (which has implications for the cost of both debt and equity), that can be estimated by the:

- difference between the nominal and indexed bond yields; or
- the Commonwealth Treasury's inflation forecasts (based on its modelling).

Statement S6.11 of the DRP states:

> *The forecast inflation rate will be deduced from the difference in the nominal bond rate and inflation indexed bond rates, and will be deduced for the term corresponding to the duration of the regulatory period. Alternatively, official inflation forecasts may be used.*

For this Draft Decision, the ACCC forecasts inflation of 2.44 per cent per annum based on the Fisher equation (difference between nominal and indexed bond yields).

6.5 Cost of debt

The cost of debt on commercial loans is the debt margin added to the risk-free rate as illustrated by the formula:

$$r_d = r_f + d_m$$

where:

r_d = the cost of debt

r_f = the risk free rate of return

d_m = the debt margin.

The debt margin varies depending on the entity's gearing, credit rating and the term of the debt. Applying the cost of debt to the asset base, using the assumed gearing, will generate the interest costs for regulatory purposes.

Statement S6.10 of the DRP states:

> *The ACCC will estimate the cost of debt for a firm conforming to the financial structures implied by the regulatory accounts in consultation with relevant finance agencies.*

6.5.1 TransGrid's proposal

TransGrid proposes that a debt margin, excluding transaction costs, of between 125 and 150 basis points would be appropriate for a benchmarked network business with a gearing ratio of 60 per cent. It argues that 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.

TransGrid notes the ACCC's previous sampling of credit ratings for electricity firms. It believes that an appropriate credit rating is a credit rating based on the privately owned businesses in the ACCC's benchmarking sample. The average credit rating for these businesses is between BBB+ and A-. Therefore, TransGrid considers that a conservative approach is to adopt a credit rating of A-.

6.5.2 Submissions by interested parties

The customer groups note that TransGrid is proposing a debt margin of 1.485 per cent and is concerned that there is no consistency in these values compared with other Revenue Cap Decisions.

6.5.3 ACCC's considerations

In considering an appropriate debt margin for an entity, the ACCC adopts industry-wide benchmarking, thus offering an incentive to minimise inefficient debt financing. This is consistent with the DRP.

Asset backing influences the credit rating of an entity. That is, the greater the debt to asset/equity ratio, the greater the risk and, therefore, the debt margin (other things being equal).

When calculating the debt margin, the ACCC considers the appropriate benchmark credit rating of the TNSP and the (market) debt margin associated with that rating. The ACCC prefers to use a benchmark rather than an actual credit rating, as the credit-worthiness of the entity is partly under managerial control.

The ACCC considers that relevant Australian electricity transmission and distribution companies should be used as the basis for a benchmark. Table 6.1 sets out the long term credit rating for nine Australian electricity network companies that have been assigned a credit rating by Standard and Poor's.

Table 6.1: Credit ratings of electricity companies

Company	Long-term rating	Actual Gearing (%)
Ergon Energy	AA+	49.3
Country Energy	AA	68.3
EnergyAustralia	AA	51.4
Integral Energy	AA	51.3
SPI PowerNet	A+	79.8
Citipower Trust	A-	20.6
ETSA Utilities	A-	63.5
Powercor Australia	A-	39.7
ElectraNet	BBB+	72.6

Source: Standard and Poor's, *Australian Report Card Utilities*, March 2004

The table also shows that the average credit rating of these entities is about A and their average gearing is about 55 per cent which is close to the benchmark of 60 per cent.

In its sampling of the average credit rating for electricity network businesses the ACCC has included both private and government owned entities. The ACCC considers that choosing stand-alone private companies would provide too small a sample to obtain an appropriate average credit rating.

The ACCC notes the concern that including government-owned companies in the sample may bias the credit rating upwards. However, the ACCC considers that government/parent ownership is only one factor which may affect a credit rating and would not create a significant bias to the sample. The ACCC also notes that TransGrid, being a fully government-owned entity, is not in the sample because it does not have a publicly available credit rating from Standard and Poor's.

Standard and Poor's has stated that the A rated entities are generally stable network or transmission businesses.[44] FitchRatings has also stated that:

> *...the transmission company should enjoy stronger credit ratings than other players in the electricity chain, because of the strong regulatory environment and low operating risks currently evident in Australia.*[45]

Accordingly, the ACCC considers that an A credit rating represents an appropriate proxy for the benchmark electricity company. This is consistent with the ACCC's previous revenue cap decisions.

Having established a credit rating, a debt margin can be determined. The debt margin should reflect the prevailing market rates for debt issues at the benchmark maturity and credit rating for the regulated entity. This explains the differences in the debt margins applied by the ACCC in previous revenue cap decisions (as queried by customer groups).

The ACCC acknowledges that the 10-year bond rate can be used as a proxy for the risk-free rate. Therefore the ACCC considers that the term of the relevant corporate bond rate should also match the term of the risk-free rate used. For this Draft Decision, the current 10-day moving average benchmark spread over the government bond yields, for A rated corporate bonds with a maturity of ten years, is 87 basis points[46]. Combined with the nominal risk-free rate of 5.89 per cent, it suggests a nominal cost of debt figure of 6.76 percent for use in the WACC estimate.

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44 Standard and Poor's, *Australian and New Zealand Electric and Gas Utilities Ripe for Rationalization*, May 2002.

45 FitchRatings, *Australian Electricity Sector - At That Awkward Adolescence Stage*, March 2004, p.40.

46 CBASpectrum website: www.cbaspectrum.com

6.6 Debt and equity raising costs

Debt raising costs

To raise debt, a company has to pay debt financing costs over and above the debt margin. Such costs are likely to vary between each debt issue, depending on the borrower, lender or market conditions.

According to a consultancy undertaken by Macquarie Bank for the ACCC, TNSPs often incur advisory fees, agency fees, arrangement fees, credit rating costs and syndication expenses when raising debt.[47] In addition, TNSPs may also face other costs, such as dealer swap margins to transfer from floating to a fixed rate facility.

Equity raising costs

Entities incur costs when raising equity. These include payments for services such as financial structuring, marketing, preparing and distributing information, and undertaking presentations to prospective investors and underwriting.[48]

6.6.1 TransGrid's proposal

TransGrid notes that the ACCC has allowed between 10.5-12.5 basis points per year for debt raising costs in previous regulatory decisions. TransGrid believes a value in the middle of this range (11.5 basis points) to be appropriate.

TransGrid's Application states that equity raising costs (being 0.23 per cent per annum of the equity portion of the RAB) should be allowed in the opex forecasts. It argues that this is in line with the previous practice of the ACCC.

6.6.2 ACCC's considerations

Debt raising costs

The ACCC considers that TNSPs should be provided an allowance for debt raising costs. A benchmark, reflecting current market costs, needs to be established to determine a reasonable allowance.

Information provided by a number of commercial banks indicated that debt raised on capital markets is likely to incur fees in the range of 8-12.5 basis points per year in addition to the debt margin.

Consistent with its recent Tasmanian Revenue Cap Decision, the ACCC considers an allowance of 10.5 basis points per year for debt raising costs as a reasonable benchmark for a TNSP. This is included as part of opex (see Chapter 2) because it is an identified cost category.

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47 Macquarie Bank, *Issues for debt and equity providers in assessing greenfields gas pipelines,* report for the ACCC, May 2002, pp. 16, 21.

48 Ibid, pg. 10.

The allowance for debt raising cost is about $1.98 million per year on average over the regulatory period. This is based on an opening RAB of $2,923.25 million and the assumed benchmark gearing ratio of 60:40.

The ACCC notes that the practice of allowing debt raising costs is relatively new. Therefore the ACCC will examine this approach in the light of new information in its future revenue cap decisions.

Equity raising costs

The ACCC considers that equity raising costs should not be allowed for TransGrid because:

- it is unlikely that TransGrid would incur equity raising costs during the regulatory period, therefore any provision will have to be notional; and
- return on equity is a benchmark return calculated by using the CAPM.

This is consistent with the ACCC's Decision on equity raising costs in the Transend Decision.

6.7 Market risk premium

The MRP is the margin above the risk free rate of return that investors expect to earn if they held the market portfolio. That is, the return of the market as a whole less the risk-free rate:

$$MRP = r_m - r_f$$

Statement S6.8 of the DRP states:

> *The ACCC will adopt what it perceives to be the accepted value of the market risk premium available at the time of the regulatory decision.*

Under a classical taxation system, conventional thinking suggests a value for the MRP of around 6 percent.

Determination of the return on capital for a regulated business (by multiplying the WACC to the RAB) is a forward-looking process. However estimates of the future cost of equity are not readily available. Practical applications of the CAPM therefore rely on the analysis of historic returns to equity when estimating the MRP.

6.7.1 TransGrid's proposal

TransGrid proposes an MRP of 6 per cent in its application if the ACCC accepts the use of the 10-year bond rate. TransGrid contends that if the 5-year rate is used as a proxy for the risk free rate then a corresponding rate of 6.2 per cent should be used as the MRP.

6.7.2 Submissions by interested parties

The EMRF argues that the historical MRP has declined over recent times due to fundamental changes occurring in the competitive environment now operating in Australia. The EMRF further contends that as the CAPM is intended to be a forward looking model for setting regulated returns, the use of average figures using data extending over 100 years does not adequately reflect current and expected future conditions.

The EMRF's analysis shows that over recent years the MRP has averaged 3.0-3.3 per cent, which is consistent with the recent surveys of Mercer Consulting.

The customer groups believe that recent regulatory decisions using an MRP of 6 per cent grossly inflate the returns on equity above the level required by the market.

They believe that Australian regulators persist with decisions that suggest Australian utilities are less efficient and more costly to finance than their UK and US counterparts. They argue that these outcomes may well be the result of overly-cautious regulation, or regulatory error, and that there is a real possibility that regulators are contributing to a reduction in the competitiveness of the Australian economy.

6.7.3 ACCC's considerations

The ACCC's assessment of the MRP, though based on more traditional views using a historical MRP (ex-post measure), still remains at around 6 per cent.[49]

This is consistent with the study by Associate Professor Lally for the ACCC, which recommended an MRP of 6 per cent.[50]

The Allen Consulting Group (ACG) recently completed a study on behalf of the ACCC, which also analysed the factors that impact on the magnitude of the MRP to provide insight into the level of Australia's MRP relative to markets in other advanced economies.[51] Based on the evidence presented which includes an analysis of international trends in MRP, the ACG concluded that:

> *...there is no justification for applying an MRP different from 6%, as is the practice of Australian regulators.*

Some overseas regulators have used an MRP of about 3.5 per cent. However, there is reason to believe that the MRP in Australia might be different as:

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49 There appears to be consensus that the MRP cannot easily be predicted over shorter periods and is likely to have poor statistical properties.

50 Lally, *The Cost of Capital under Dividend Imputation*, June 2002, p.34.

51 Allen Consulting Group, *Review of studies comparing international regulatory determinations,* 2004.

- despite the existence of global markets, a perception of segmented stock markets still exists and investors may require a higher premium to invest in the Australian market; and

- a domestic CAPM is used in estimating the required cost of equity.

Further, in the absence of any adjustment for differences in financial market conditions and institutional arrangements between countries, the ACCC considers that such a direct comparison between Australian and UK MRP figures (in regulatory decisions) is subject to some uncertainty.

A number of surveys have supported the ACCC's MRP estimate. For example, the Jardine Fleming capital markets survey on professional market practitioners' MRP expectations found that it was 5.87 per cent on average.[52] Other surveys have also found the expected future MRP to be about 1-2 per cent below this figure. However, the ACCC considers that the evidence that the MRP is less than 6 per cent is not sufficiently conclusive at this time to warrant its adoption. However, the ACCC will continue to monitor the evidence.

6.8 Value of franking credits

Australia has a full imputation tax system in which a proportion of the tax paid by a company is, in effect, personal tax withheld at the company level.

The analysis of imputation credits and their impact on cost of capital in Australia is a developing field. The rate of use of tax credits or gamma (γ) may have an effect on the WACC (where a TNSP actually pays tax) and there is little doubt that franking credits have value (schedule 6.1(5.2) of the Code):

> *As the ultimate owners of government business enterprises, tax payers would value their equity on exactly the same basis as they would value an investment in any other corporate tax paying entity. On this basis, it would be reasonable to assume the average franking credit value (of 50 per cent) in the calculation of the network owner's pre tax WACC.*

6.8.1 TransGrid's proposal

TransGrid proposes a value for γ of 0 in its Application. It states that global equity markets are highly integrated. Australian equity markets rely heavily on foreign investment in order for businesses capital requirements to be met. TransGrid argues that in effect, 30 per cent of Australian equities are held by foreign investors, whilst Australian equities constitute 1 percent of world equities suggesting an elastic demand for Australian equities by foreign investors. Hence, foreign investors would have a greater affect on Australian equity prices than Australian investors.

According to TransGrid, since foreign investors do not gain any value from franking credits, they would not accept a perceived reduction in their rate of return given the

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[52] Jardine Fleming Capital Partners Limited, *The Equity Risk Premium-An Australian Perspective*, September 2001.

level of risk observed and would reduce their holdings of Australian equities and re-optimise their portfolios accordingly, decreasing the price of Australian equities.

As such, TransGrid claims that Australian companies must offer a rate of return equal to that required by foreign investors. This implies a 0 value of franking credits.

6.8.2 Submissions by interested parties

In considering TransGrid's argument that a significant amount of the capital of enterprises is held off shore (and therefore not a beneficiary of dividend franking), the EMRF states that this is inapplicable as all other inputs into the WACC calculation are based on the results of analysing Australian businesses.

The customer groups state that TransGrid's proposal to set γ at 0 is an ambit claim. They note that this claim assumes TransGrid is totally dependent on foreign sources for equity investment. They further note that setting γ at 0 is as inappropriate as setting γ at 1.0 to reflect the fact that TransGrid is in fact wholly owned by the NSW government.

The customer groups state that given that it is acknowledged that around 30 per cent of the Australian market is foreign owned then a gamma of 0.7 should be set to reflect this ownership level.

6.8.3 ACCC's considerations

The γ parameter incorporates both dividend payouts issued that carry franking credits and the proportion of those credits that could be used by investors to offset tax payable on other income.

In previous Decisions, the ACCC has assumed a domestic CAPM, which values equity in the presence of franking credits. Given that the value of these credits is somewhere between 0 and 1.0 (no value and full value), the ACCC has consistently applied an average value for γ of 0.5.

In considering the ratios of franking credits assigned to company tax paid for the eight largest listed companies in Australia, as done by Associate Professor Lally, the result is a ratio of 1.0.[53] Given that these companies constitute 50 per cent of total equity listed in Australia, he suggests that this ratio is close to 1.0 for most industries.

It is therefore apparent that franking credits do have some value. However, the proportion that can be used by investors to offset tax payable on other income is ambiguous. In the past, the estimate of the average value once distributed has ranged from 50-90 per cent.[54]

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[53] Lally, *The Cost of Capital under Dividend Imputation*, June 2002, p.19

[54] According to IPART Australian industrial stocks currently show an average dividend payout ratio of approximately 70 per cent. IPART, *The Rate of Return for Electricity Distribution Networks, Discussion Paper*, November 1998, p. 22.

The ACCC notes that 30 per cent of Australian equities are held by foreign investors and that Australian equities constitute a relatively small proportion of total global equities. However, it cannot be determined from this alone that a relatively elastic demand for Australian equities by foreign investors exists and that foreign investors are not willing to accept a perceived reduced rate of return. The foreign investor may not be able to take advantage of franking credits, but there may be other foreign tax or other benefits that could increase their perceived rate of return.

The ACCC also notes that it is not sufficient to support a conclusion that, for even a partly owned foreign company, foreign capital is required to finance a firm's projects. Even assuming that a significant proportion of foreign ownership is required, the ACCC considers that it does not prove the γ should be set at 0 as it does not rule out overseas investors obtaining foreign tax advantages not available to local investors. The likelihood that such foreign tax benefits exist suggests that γ should lie above zero.

The ACCC considers that there is no well founded basis for discriminating the selection of γ in favour of one type of investor over another. Such an approach may distort pricing outcomes on the basis of share ownership.

Given the inconclusive nature of the empirical evidence on this issue, the ACCC considers that the selection of γ is ultimately a matter of judgement, having regard to the empirical evidence. Furthermore there does not seem to be consensus among Australian academics and practitioners to date on adjusting the rate of use of franking credits. Accordingly, the ACCC has decided to retain the value of 0.5 for γ.

6.9 Gearing

The ACCC uses benchmark gearing rather than actual gearing to calculate the WACC. Schedule 6.1(5.5.1) of the Code states that:

> *Gearing should not affect a government trading enterprise's target rate of return ... For practical ranges of capital structure (say less than 80 per cent debt), the required rate of return on total assets for a government trading enterprise should not be affected by changing debt to equity ratios.*

6.9.1 TransGrid's proposal

TransGrid adopts the ACCC's benchmark gearing of 60 per cent in its Application.

6.9.2 Submissions by interested parties

The EMRF provides an analysis which highlights that implied gearing for a company is much higher than 60 per cent and that this comprises a mix of interest bearing debt (60 per cent of total capital) and non-interest bearing debt such as retained cash (15 per cent of total capital), with an equity element of 25 per cent of total capital. It argues that using a higher level of equity and not providing for non-interest bearing debt in the CAPM framework (incorrectly) inflates the WACC calculation.

6.9.3 ACCC's considerations

A firm's capital structure (expressed as gearing) is unlikely to affect its WACC according to the theory predicated by Modigliani and Miller. This theory however is based on specific assumptions. In reality this is only true within reasonable boundaries, as at extremes the capital structure of a company could affect its WACC because higher gearing could result in increased risks for both debt and equity holders.

Typically regulators have assumed gearing of 60 per cent (Table 6.2) in calculating the WACC. This WACC should be applicable within reasonable range of actual gearing, say of 40-70 per cent (see above paragraph).

Table 6.2: Gearing levels adopted in regulatory decisions

Entity	Industry	Debt/Debt+Equity
ACCC (2003)	Electricity transmission	60%
QCA(2001)	Electricity distribution	60%
ESC (2000)	Electricity distribution	60%
IPART (1999)	Electricity distribution	60%
OTTER (1999)	Electricity distribution	50-70%
OFGEM (1999)	Electricity distribution (UK)	50%
IPART (1999)	Gas distribution	60%
ACCC/ESC (1998)	Gas transmission	60%

The ACCC's regulatory regime is both light-handed and incentive based. It sets the benchmarks allowing regulated entities to operate freely. The entities gain by performing better than the benchmarks and vice versa. Accordingly, in the DRP the ACCC stated that it would not use the actual gearing of a TNSP, but an appropriate benchmark instead.

A survey conducted by Standard and Poor's suggests that gearing ratios for transmission and distribution businesses should between 65 per cent and 55 per cent.[55]

The ACCC notes the EMRF's comments but considers that it departs from the accepted practice of calculating the WACC based on a capital structure of equity and debt financing. The ACCC also notes that even retained cash would have some form of opportunity cost attached.

On balance the ACCC has decided to adopt a benchmark gearing of 60 per cent.

6.9.4 Betas and risk

The equity beta is a measure of the expected volatility of a particular stock relative to the market portfolio. It measures the systematic risk of the stock, that is, the risk that cannot be eliminated in a balanced and diversified portfolio.

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[55] Standard and Poor's '*Rating Methodology for Global Power Companies*', 1999.

Generally, the Australian stock index is used as a proxy for the market portfolio. An equity beta of less than one indicates that the stock has a low systematic risk relative to the market (the market portfolio beta being equal to one). Conversely an equity beta of more than one indicates the stock has a higher risk relative to the market.

Calculating equity betas for publicly listed companies is straightforward. A company's return is calculated by adding the dividend income to changes in the value of the stock. Then the company's return is compared to the market return. Market return is calculated in the same way, by adding the dividends and changes in values of all the companies listed on the stock exchange.

Calculating equity betas for unlisted firms is more complicated, as their returns cannot be calculated directly. Hence, conventional practice is to find the beta of a similar listed company or the average beta for the sector, and then adjust it. For Australian regulated electricity networks even this approach is problematic, as very few similar stocks are listed.

The equity beta of a firm may also be dependent on its capital structure. Hence, to estimate the beta of a regulated firm, the beta of the comparable (listed) firm has to be adjusted for differences in capital structure.

Usually, practitioners start with the equity beta of a firm. Then by 'de-levering' it, to approximate a firm without debt (100 per cent equity), they arrive at the 'asset' or 'unlevered' beta.

The asset beta is common for all firms in a similar business. Equity beta for a particular level of gearing is obtained by 're-levering' the asset beta. While there are a number of levering formulae, the ACCC has consistently applied the formula developed by Monkhouse:[56]

$$\beta e = \beta a + (\beta a - \beta d)\left[1 - \left(\frac{rd}{1+rd}\right)(1-\gamma)Te\right]\frac{D}{E}$$

where:

β_e	=	equity beta
β_a	=	asset beta
β_d	=	debt beta
r_d	=	cost of debt
γ	=	gamma
T_e	=	effective tax rate
E	=	market value of equity
D	=	market value of debt.

[56] ACCC, *DRP*, pp. 79-81.

The debt beta captures the systematic risk of debt, just as the equity beta captures the systematic risk of equity. The debt beta is used to de/re-lever equity beta. When converting asset betas to equity betas, one includes the systematic risk for debt in the capital structure. The debt beta shows the sharing of a firm's systematic risk between the systematic risk of equity and the systematic risk of debt.

6.9.5 TransGrid's proposal

TransGrid adopts a debt beta of zero combined with an asset beta of 0.45 which, in accordance with the Monkhouse formula, provides a re-levered equity beta of 1.12.

6.9.6 Submissions by interested parties

The EMRF suggests that the equity betas used by regulators assume that regulated businesses are "average". It notes that the market accepts that regulated businesses exhibit a "conservative" rating, recognising that while providing a lower return, there is enhanced certainty of return. The EMRF argues that the market assess regulated firms as exhibiting a lower equity beta than 1.0. It states that equity betas for regulated electricity transport businesses should be in the range of 0.5-0.7.

The customer groups also take this point of view, suggesting that an equity beta of less than 1.0 is required for a business with TransGrid's risk profile. Given that 99 per cent of TransGrid's revenue is guaranteed, the customer groups state that it is preposterous of TransGrid to propose an equity beta of 1.12 which would indicate TransGrid being more risky than the market as a whole.

6.9.7 ACCC's considerations

Equity Beta

The ACCC notes that in previous revenue cap decisions, an equity beta estimate of 1.0 was adopted. This suggests that TNSPs experience the same volatility as the market portfolio in general. However, this is not consistent with the frequently held view that gas and electricity transmission businesses are less risky relative to the market, irrespective of their gearing. This view is predicated on the observation that the earnings of gas and electricity business are more stable than most other businesses in the market. Greater stability of cash flows suggests that the equity beta should be less than 1.0.

Asset Beta

The asset beta is only relevant within the de/re-levering process. The asset beta is simply the equity beta of a firm that is 100 per cent equity financed and has no debt in its capital structure. It is not observable and must be de-levered from the observable equity beta.

The ACCC has taken a consistent approach of using past regulatory decisions to determine an estimate of the asset beta. Table 6.3 lists the asset betas for recent regulatory decisions. The asset betas for electricity networks have been set between 0.35-0.5.

Table 6.3: Recent regulatory decisions on asset betas for electricity industry

Decision	Network Type	Asset Beta
ESC, price determination	Distribution	0.40
ACCC, Tasmania	Transmission	0.40
ACCC, NSW and ACT	Transmission	0.35-0.50
ACCC, Queensland	Transmission	0.40
IPART, NSW	Distribution	0.35-0.50
QCA, price determination	Distribution	0.45

Debt Beta

The ACCC notes that a debt beta estimate of zero has been applied in its previous electricity revenue cap decisions. The ACCC, in the past, considered that as the systematic risk of debt is low (given that the risk of debt is primarily related to default risk) then a relatively low debt beta is appropriate and as such treated the debt beta as a residual parameter.

A report prepared by Allen Consulting Group (AGC) for the ACCC also considered this information and suggested that an appropriate range for the debt beta would be between 0 and 0.15.[57]

Nonetheless, as long as there is consistency in the value of the debt beta between the de-levering and re-levering processes, its effect on the equity beta is generally negligible.

Consistent with previous practice and TransGrid's application, the ACCC considers that an appropriate value for the debt beta to be zero in the de/re-levering process.

Estimating equity beta from market data

The ACG report suggested an equity beta for Australian gas transmission companies of just below 0.7, based exclusively on market evidence.[58] ACG also considered data for comparable businesses in the USA, Canada and UK. This data produced lower beta estimates and ACG concluded that this secondary information supports the view that Australian estimates are not understated. However, due to several qualifications to their analysis, ACG did not recommend relying only upon domestic empirical information.

ACG recommended that a conservative approach to beta estimation be retained by Australian regulators with an equity beta estimate of one. ACG however, noted that:

> *In the future, however, it should be possible for greater reliance to be placed upon market evidence when deriving a proxy beta for regulated Australian gas transmission activities.*[59]

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57 Allen Consulting Group, *Empirical evidence on proxy beta values for regulated gas transmission activities*, Final Report for the ACCC, July 2002, pp. 28-29.

58 Ibid. pg. 46.

59 Ibid, pg. 43.

As shown in Table 6.4, the ACCC has derived betas from comparable Australian firms based on September 2003 and December 2003 data from the Australian Graduate School of Management (AGSM). For calculation purposes, the ACCC has had regard to raw (unadjusted) beta estimates, the debt beta was set at zero, and the corresponding gearing levels were from Standard and Poor's.[60] The sample market beta estimates (average relevered beta of 0.16 in September 2003 and average relevered beta of 0.18 in December 2003) suggest that the ACCC has been generous, in terms of the equity beta, in its previous decisions.

Table 6.4: Sample betas

		September 2003 AGSM data			**December 2003 AGSM data**		
Company	**Gearing level**	**Unadjusted β_e**	**Delevered β_a**	**Relevered β_e**	**Unadjusted β_e**	**Delevered β_a**	**Relevered β_e**
Australian Pipeline Trust	66.60	0.35	0.12	0.29	0.36	0.12	0.30
Envestra	79.90	0.28	0.06	0.14	0.30	0.06	0.15
AlintaGas	49.20	0.33	0.17	0.42	0.37	0.19	0.47
Australian Gas Light	52.20	-0.07	-0.03	-0.08	-0.06	-0.03	-0.07
Gasnet	67.20	0.05	0.02	0.04	0.05	0.02	0.04
Average	**59.50**	**0.19**	**0.07**	**0.16**	**0.20**	**0.08**	**0.18**

At the same time, the ACCC would like to be confident that market derived betas would not systematically under compensate TNSPs. The ACCC considers that it may be premature to rely on market data exclusively when determining the equity beta.[61]

The ACCC is considering the merits of relying more on market data, in determining an estimate of the proxy equity beta for TNSPs, as part of the DRP review process. Thus future decisions may incorporate equity betas which reflect market information more accurately. Accordingly, for this Decision the ACCC has maintained the beta values previously adopted. On balance, the ACCC considers that an equity beta of 1.0, while biased in favour of the service provider, is appropriate for TransGrid. It should be noted however, that future decisions may place greater weight on contemporary market information in determining appropriate beta values.

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60 Standard & Poor's, *Australia & New Zealand CreditStats,* June 2003.

61 The data on betas of listed firms in the Australian Stock Exchange considered to be comparable for benchmarking a TNSP's proxy equity beta is limited. However in the future, expanded data on beta estimates for comparable firms may mean more weight should be placed on market estimates.

Conclusion

TransGrid's proposed equity beta of 1.12 suggests that it has a higher risk relative to the market portfolio. In past electricity decisions, the ACCC has consistently applied an equity beta of 1.0.

For the purposes of this Decision, the ACCC has decided to adopt an asset beta of 0.4 and a debt beta of zero, which equates to an equity beta of approximately 1.0. However, in future, greater reliance on market data may be more appropriate in determining a proxy equity beta for TNSPs. This will be considered further in the process of finalising the DRP.

6.10 Other issues

Championing of new investment

6.10.1 TransGrid's proposal

In its Application, TransGrid contends that the Code requires transmission companies to be a proponent of investment proposals. Furthermore, this institutional setting does not provide for a 'true cost of capital' as there are costs associated with the approval process which are not included in the regulated capital base of the investment. Setting the regulated cost of capital equal to the actual cost of capital will create a disincentive for a transmission company to champion new investment.

TransGrid believes that the asymmetrically higher costs of under investment as opposed to over investment and the nature of the investment approval process, suggest that it would be appropriate for the ACCC to place a modest positive margin of around 50 basis points on the WACC when determining the regulated cost of capital.

6.10.2 Submissions by interested parties

VENCorp questions the rationale for any such margin given that provisions for all of the costs referred to by TransGrid are already included in a TNSP's regulated revenue stream. The market cost of capital represents the return that investors expect to receive on a risky investment and it also represents the price at which that risk is freely traded in the capital market.

6.10.3 ACCC's considerations

The ACCC considers that the costs associated with championing new investment projects are not a reflection of the risk adjusted rate of return which the WACC is meant to represent. TransGrid has neither justified the 50 basis points increment to the WACC nor described a process by which this cost can be determined.

The ACCC agrees with VENCorp's view on this issue. It is likely that such costs would be reflected in operating expenditure or in the capital costs of the projects themselves in any case and there does not seem to be a justification for opening up

this new revenue stream. Therefore, the ACCC is of the view that this increment to the WACC is inappropriate.

6.11 Treatment of taxation

The effective tax rate is defined as the difference between pre-tax and post-tax rates of return. It is sensitive to several factors, including the corporate tax rate and the range of available tax concessions that lessen or defer tax liabilities. Although the tax rate on accounting income is always at the corporate rate, in any year the income assessable for tax purposes can be quite different from the net revenues available to the business.

The timing aspect and the fact that taxes are assessed on the basis of nominal income means that the prevailing inflation rate also has a significant impact on the effective tax rate.

In its early decisions, the ACCC applied the statutory company tax rate of 30 per cent. This was in the context of difficulties in determining a satisfactorily accurate long-term tax rate as part of the pre-tax real framework being used at the time. However, the capital-intensive nature of electricity utilities has historically meant that the effective tax rate for such networks has been less than the statutory tax rate.[62]

The ACCC considers that adopting the post-tax nominal framework which uses the effective tax rate can potentially generate more appropriate cost reflective revenue caps. Furthermore, the ACCC's WACC calculations require the derivation value of the effective tax rate.

6.11.1 ACCC's considerations

Based on the ACCC's approach to modelling the effective tax rate, the ACCC has derived an effective tax rate of 20.81 per cent.

6.12 Conclusion

The ACCC has carefully considered the values that should be assigned to TransGrid's cost of capital, given the nature of its business and current financial circumstances. The parameter values adopted for the Draft Decision are shown in Table 6.5.

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[62] According to IPART's calculations, the average effective tax rate paid by the NSW distributors amounted to 25 per cent in 1996/97 (see IPART, The Rate of Return of Electricity Distribution Networks, Discussion Paper, November 1998, pg. 9).

Table 6.5: Comparison of cost of capital parameters

Parameter	Draft Decision	TransGrid's Proposal
Nominal risk-free interest rate (r_f)	5.89 %	5.01%
Expected inflation rate (f)	2.44 %	2.08%
Debt margin (over r_f)	0.87 %	1.485 %
Cost of debt $r_d = r_f$ + debt margin	6.76 %	6.495%
Market risk premium (r_m-r_f)	6.00 %	6.00 %
Gearing (D/V)	60 %	60 %
Value of imputation credits γ	50 %	50 %
Asset beta β_a	0.40	0.45
Debt beta β_d	0.00	0.00
Equity beta βe	1.00	1.12
Nominal post-tax return on equity	11.87 %	11.73 %
Post-tax nominal WACC	7.03 %	7.42 %
Pre-tax real WACC	6.75 %	8.35 %
Nominal vanilla WACC	**8.80 %**	**8.59 %**

7. Total Revenue

7.1 Introduction

The main components of TransGrid's revenue cap were discussed in detail in the preceding chapters. This chapter explains the ACCC's calculation of TransGrid's allowable revenue (AR) from 1 July 2004 to 30 June 2009.

The ACCC's role as regulator of transmission revenues is limited to determining a TNSP's maximum allowable revenue (MAR). As shown below, the MAR is calculated by adding (or deducting) a financial incentive related to service standard performance and pass-through amounts to (or from) the AR. Details on how the financial incentive component is calculated are provided in Appendix 4.

TNSPs are responsible for calculating the transmission charges payable by their customers in accordance with the principles contained in part C of chapter 6 of the Code. The annual revenue that a TNSP recovers through these charges must not exceed the MAR set by the ACCC. Any over or under recoveries must be offset against a TNSP's revenues in the following year.

7.2 The accrual building block approach

The building block formula, below, is used to calculate the AR in the first year (in TransGrid's case the first half year). The MAR is equivalent to the AR for the first year:

MAR = return on capital + return of capital + opex + taxes
± service standards

= (WACC * WDV) + D + opex + taxes ± service standards

where:	WACC	=	post-tax nominal weighted average cost of capital;
	WDV	=	written down (depreciated) value of the asset base;
	D	=	depreciation allowance;
	opex	=	operating and maintenance expenditure
	taxes	=	income tax liability allowance and
	service standards	=	ACCC performance incentive scheme.

However, in determining the MAR, the code requires the Commission to take into account the service standards that TNSPs are expected to maintain. Therefore, the Commission will adopt an annual service standard adjustment in the calculation of MAR, that is:

MAR_t = (allowed revenue) + (financial incentive)

$$= \left(AR_t\right) + \left(\frac{(AR_{t-1} + AR_{t-2})}{2} \times S_{ct}\right)$$

Where:

MAR = maximum allowed revenue

AR = allowed revenue

S = service standards factor

t = regulatory period

ct = calendar year

7.3 TransGrid's proposal

In its Application TransGrid applied for revenue in nominal terms of $474.76 million in the year 2004/05 to $506.76 million, $544.05 million, $582.61 million, and $627.01 million in the subsequent full financial years of the regulatory period.

TransGrid claims that a substantial revenue increase is required due to:

- Additional opex requirements resulting from increases in network growth, wages and network utilisation.
- An increase in forecast capex from the previous regulatory period relating to demand and generation development.
- The rolling in of un-forecast capital expenditure and the additional return on capital on the un-forecast capital expenditure into the regulatory asset base.

7.4 ACCC assessment of building blocks

7.4.1 Operating and maintenance expenses

The ACCC has included a total opex allowance in nominal terms of $610.93million over the regulatory period. This amount is inclusive of debt raising costs.

The ACCC proposes a reduction of $81.77 million (11.8 percent) from TransGrid's Application, based on an adjustment to the initial starting opex figure which has been reduced to reflect an efficient starting point. The growth rates of key cost drivers been adjusted to reflect the ACCC's and GHD's assessments. More detail regarding the ACCC's assessment of TransGrid's operational expenditure claim is provided in Chapter 2.

7.4.2 Opening asset base

To establish the appropriate return on capital, the ACCC modelled TransGrid's asset base over the life of the regulatory period, and the WACC (estimated on the basis of the most recent market financial information). As explained in Chapters 3 and 4, the ACCC has determined the value of TransGrid's asset base as at 30 June 2004 to be $2,923.25 million. Table 7.1 presents TransGrid's asset base over the upcoming regulatory period (2004/05 – 2008/09).

Table 7.1: TransGrid's return on capital, 1 July 2004 to 30 June 2009 ($ million, nominal)

	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
opening asset base	2923.25	3048.27	3254.03	3555.02	3824.23
capital expenditure	175.56	264.05	367.21	337.57	332.52
Economic depreciation	50.54	58.29	66.21	68.36	75.33
closing asset base	3048.27	3254.03	3555.02	3824.23	4081.42
return on capital	257.32	268.32	286.44	312.93	336.63

7.4.3 Capital expenditure

TransGrid and the ACCC has agreed that TransGrid can resubmit its forecast capital expenditure as a result of the recent proposal by the ACCC to reform its assessment of TNSP's capex requirements. The change in the assessment process is explained in more detail in Chapter 5. For the purposes of the Draft Decision and for TransGrid to set prices at the start of the next regulatory period the ACCC accepts TransGrid's forecast capex claim of $1,308.40[63] million excluding SNI, the cost of which is estimated at $94.47million (in real terms). However, this will be subject to review after the ACCC receives TransGrid's revised forecast capital expenditure proposal.

7.4.4 Depreciation (return of capital)

The ACCC used a straight-line depreciation method (based on the remaining life per asset class of existing assets and the standard life for new assets) to model economic depreciation. The resulting figures (referred to as return of capital) are shown in table 7.2.

7.4.5 Weighted average cost of capital

The ACCC's estimate of TransGrid's WACC is explained in Chapter 6. The ACCC has considered the nature of TransGrid's business and its current financial circumstances in establishing the WACC. It notes that, although there is a well

[63] In its initial application TransGrid proposed a forecast capital program totalling $1.388 billion; this was later revised to $1.403 billion.

recognised theoretical model for establishing WACC, there is not full agreement on the precise magnitude of the various financial parameters used.

The ACCC has applied a post-tax nominal return on equity of 11.87 per cent, which equates to a nominal vanilla WACC of 8.80 per cent.

7.4.6 Estimated taxes payable

Tax estimates relate to the network's regulated activities only. The ACCC anticipates that TransGrid will be paying income tax during the regulatory period, based on TransGrid's tax depreciation profile. The ACCC's assessment of taxes payable are based on the 60 per cent gearing assumed in the WACC parameters as opposed to TransGrid's actual gearing. The ACCC's estimates of TransGrid's tax payments are as shown in table 7.2.

7.4.7 Total revenue and CPI-X smoothing in nominal terms

Based on the various elements of the building block approach, the ACCC propose a smoothed revenue allowance that increases from $432.8 million for 1 July 2004 to 30 June 2005 to $458.7 million, $486.2 million, $515.4 million, and $546.3 million in the subsequent financial years (table 7.2). These figures incorporate revenue smoothing based on the X smoothing factor 3.5 per cent. That is, the MAR will increase by CPI plus 3.5 per cent in each year of the regulatory period.

Table 7.2: TransGrid's MAR from 1 July 2004 to 30 June 2009 ($ million, nominal)

	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009
return on capital	257.32	268.32	286.44	312.93	336.63
return of capital	50.54	58.29	66.21	68.36	75.33
operating expenses	118.19	120.26	122.47	124.71	125.26
estimated taxes payable	13.42	15.60	18.56	22.16	28.98
less value of franking credits	6.71	7.80	9.28	11.08	14.49
raw revenue	432.75	454.68	484.40	517.09	551.71
smoothed revenue	**432.75**	**458.70**	**486.21**	**515.36**	**546.27**

Comparison of TransGrid's Initial Application and the ACCC's Draft Decision

Revenue comparison in constant 2004 dollars

TransGrid initially applied for revenue in real terms of $463.46 million in the year 2004/05 to $482.92 million, $506.13 million, $529.09 million, and $555.87 million in the subsequent full financial years of the regulatory period. Based on the various elements of the building block approach, the ACCC proposes a smoothed revenue allowance in real terms of $422.45 million in the year 2004/05 to $437.13 million, $452.32 million, $468.03 million, and $484.29 million in the subsequent full financial

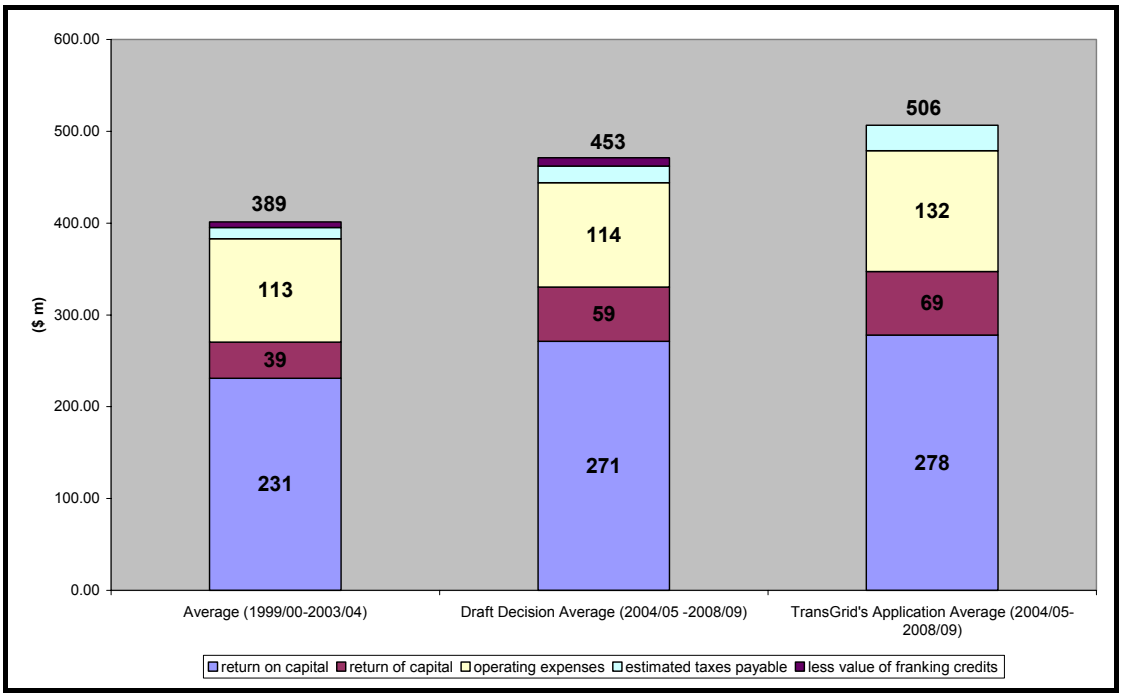
years of the regulatory period. Table 7.3 compares the ACCC's MAR and TransGrid's MAR over the regulatory period.

Table 7.3: Comparison of MAR 2005/05 – 2008/09 ($ million, constant 2004 dollars)

	2003/04(f)	2004/05	2005/06	2006/07	2007/08	2008/09
ACCC's 2000 Decision	399.41					
TransGrid's Initial Application		463.46	482.92	506.13	529.09	555.87
Draft Decision		422.45	437.13	452.32	468.03	484.29

The revenue set by the ACCC for this Draft Decision is on average 14.02 per cent below that sought by TransGrid. Figure 7.1, outlined below, is a comparison of the building block revenues of the ACCC's 2000 Revenue Cap Decision, TransGrid's proposed revenue, and the ACCC's Draft Decision for the regulatory period 2004/05 to 2008/09.[64]

Figure 7.1 Building Block comparison of revenues ($m, constant 2004 dollars)



Impact on transmission charges in constant 2004 dollars

Table 7.4 below, illustrates how, based on forecast energy demand in New South Wales over the regulatory period, TransGrid's initial Application translate into real price changes. The overall effect is that the Draft Decision results in a 2.67 percent

[64] This comparison is based on TransGrid's initial application and unsmoothed revenues.

increase in prices in the first year of the regulatory period and on average increases by around 1 percent in the subsequent years of the regulatory period. The modest price increases arising from the Draft Decision compare to TransGrid's proposed price increase in the first year of 12.64 percent and an increase of around 2 percent in subsequent years.[65]

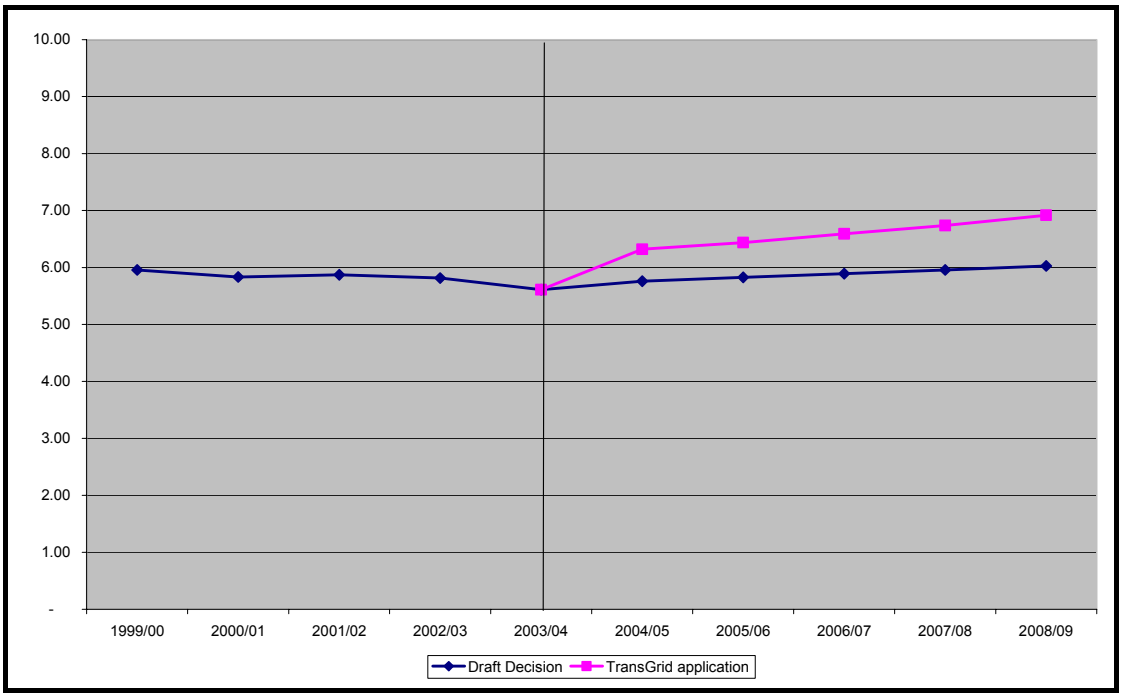
Table 7.4 Impact on Transmission prices (constant 2004 dollars/MWh)

	2004/05	2005/06	2006/07	2007/08	2008/09
TransGrid's Initial Application	12.64	1.85	2.40	2.20	2.69
Draft Decision	2.67	1.14	1.10	1.16	1.14

The increase in prices has been a result of growing demand and the need to accommodate efficient investment needed to ensure a reliable supply of electricity to NSW.

Figure 7.2 shows the resulting price path of this Decision over the regulatory period compared to TransGrid's initial Application, and the ACCC's 2000 Decision.

Figure 7.2 Illustrative price path 2002-03 to 2008-09 (constant 2004 dollars /MWh)



[65] The transmission prices have been calculated by dividing the real smoothed revenue by the Energy demand (MWh) for that respective year. The ACCC has used the MWh forecast from the NEMMCo Statement of Opportunities 2003.

7.5 Conclusion

On the basis of the ACCC's forecast inflation, the ACCC has determined for the purposes of this Draft Decision a revenue cap in nominal terms for TransGrid that increases from approximately $432.75 million for 1 July 2004 to 30 June 2005, to $546.26 million from 1 July 2008 to 30 June 2009.

8. Service standards

8.1 Introduction

Clause 6.2.4 (c) (2) of the Code recognises that the ACCC determines a revenue cap on the services that a TNSP provides and the level of service provided. Clause 6.2.4 states:

> *'In setting a separate revenue cap to be applied to each Transmission Network Owner and/or Transmission Network Service Provider (as appropriate) in accordance with clause 6.2.4(b), the ACCC must take into account the revenue requirements of each Transmission Network Owner and/or Transmission Network Service Provider (as appropriate) during the regulatory control period, having regard for:*
>
> *(1) ...*
>
> *(2) the service standards referred to in the Code applicable to the Transmission Network Owner and/or Transmission Network Service Provider (as appropriate) and any other standards imposed on the Transmission Network Owner and/or Transmission Network Service Provider (as appropriate) by any regulatory regime administered by the ACCC or by agreement with the relevant Network Users;*
>
> *(3) ...*

On 12 November 2003, the ACCC released its Service Standards Guidelines. The Guidelines explain the ACCC's approach to setting performance incentives within the transmission revenue cap process; and outline the ACCC's information requirements to implement the service standards performance incentive scheme.

The service standard target, or performance incentive (PI) scheme, is designed to provide an incentive for TNSPs to reduce their costs below the forecast level set by the ACCC's revenue cap, as well as provide an incentive to improve service quality.

The PI scheme is based on five performance indicators:

- Transmission circuit availability;
- Average outage duration;
- Frequency of "off-supply" events;
- Inter-regional constraints; and
- Intra-regional constraints.

The definitions of these performance measures are provided in the ACCC's Service Standards Guidelines.

The ACCC aims to create a service standard incentive by linking each TNSP's revenue cap to its performance, or service standards. TNSPs are rewarded for improvements over performance targets and penalised for deteriorations. The

maximum reward is 1 per cent of the annual revenue. Overall the scheme is designed to have an expected value of zero.

The TNSP's average performance during the previous three to five years is generally set as the performance target. However, some adjustments to targets may be made taking into account factors affecting future performance.

Previous findings on service standards

In the ACCC's 1999 Revenue Cap Decision for TransGrid, the service standards regime was still being developed. The ACCC stated:

> *Due to the incomplete nature of the ACCC's work in relation to service standards and the changes currently taking place in NSW, the ACCC notes that it will, at the next regulatory reset, consider adjusting TransGrid's revenue cap to reflect any non-performance during the current period against the level of service standards presently contained in the NEC as well as the service standards proposed by the network during this inquiry at the performance levels assessed by SKM. TransGrid will be required to provide the ACCC with information suitable to make such an assessment as part of its annual regulatory reporting requirements.*
>
> *Beyond the next reset, the ACCC intends to benchmark TransGrid's performance against the suite of indicators being developed at present. The ACCC also intends to further consider the need for, and scope of, any penalty (and/or bonus) regime that should apply to non-performance against those standards. In this respect, the ACCC also plans to examine the experiences associated with the performance regime included in the recent South Australian Electricity Pricing Order.*[66]

The ACCC's Service Standards Guidelines were finalised and released on 12 November 2003, and are based on a consultancy report produced by Sinclair Knight Merz (SKM)[67]. The ACCC's Decisions outlining the revenue caps for ElectraNet, SPI PowerNet and VENCorp were finalised before the ACCC released the Draft Guidelines, and were based on SKM's recommendations. However, since the Guidelines were finalised in November 2003, the ACCC engaged GHD to provide a review of TransGrid's historic service standards performance and recommend performance targets for the upcoming regulatory period.

The remainder of this chapter sets out:

- TransGrid's Application and proposed service standards for the upcoming regulatory period (section 8.2);
- The views of interested parties (section 8.3);
- A summary of the consultant's report and recommendations on TransGrid's service standards (section 8.4);
- The ACCC's considerations (section 8.5); and

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66 ACCC, *NSW and ACT Transmission Network Revenue Caps: Decision.* 25 January 2000, p131.

67 SKM, *Transmission Network Service Providers – Service Standards*, March 2003.

- The ACCC's conclusions on TransGrid's performance incentives for the upcoming regulatory period (section 8.6).

8.2 TransGrid's Application

TransGrid proposed service measures that focus on the following areas:

- Circuit Availability, which encompasses three specific measures:
  - Transmission line availability (%);
  - Transformer availability (%); and
  - Reactive plant availability (%).

- Reliability. In the form of loss of supply event frequency, this category is split into two measures reflecting different magnitudes of the event, as follows:
  - Number of events greater than 0.05 system minutes; and
  - Number of events greater than 0.4 system minutes.

- Average Outage Restoration Time. This is measured in minutes, with a seven-day cap per event.

Table 8.1 Service Standards proposed by TransGrid

Performance measure	Unit of measure	Revenue at risk (%)	Collar	Dead Band Knee 1	Target	Dead Band Knee 2	Cap
Transmission Line availability	%	0.2	98.9	-	99.4	-	99.7
Transformer availability	%	0.15	98.0	-	99.0	-	99.5
Reactive Plant Availability	%	0.1	97.0	-	98.5	-	99.3
Reliability (Events >0.05 system minutes)	Number	0.25	4	-	6	-	9
Reliability (Events>0.4 system minutes)	Number	0.2	0	-	1	-	3
Average Outage Restoration Time (7 day cap per event)	Minutes	0.1	2400	1800	1500	1200	800

TransGrid states that the service measures and targets set out in Table 8.1 provide a sound basis for implementing service performance incentives linked to TransGrid's MAR. TransGrid also notes that the implementation of the proposed service standards would be subject to three factors:

- the ACCC incorporating TransGrid's required capital and operating expenditure in the ACCC's MAR Decision;

- achieving an appropriate definition of 'force majeure' events; and

- satisfactorily clarifying the definition of the performance measures involved.

In relation to incentives for TransGrid to be more responsive to market conditions, TransGrid proposes that:

- additional costs associated with rescheduling of outages to improve wholesale market efficiency be treated as a 'pass through' for TransGrid's next reset period pending agreement on an improved incentive framework; and

- work continues jointly with the ACCC and Market Participant representatives to develop improved TNSP incentive arrangements.

Finally, TransGrid submits that before adopting the proposed service standards targets set out in its Application, it would be necessary for it to understand the ACCC's position in advance, as to what actions or remedies are to be implemented in "reassessing" performance targets when reviewing a TNSP's actual performance data.

8.3 Submissions from interested parties

VENCorp proposes solutions to address the issue of linking the performance incentive regime to the market impacts of transmission outages. It says that the performance incentive scheme that presently applies to SPI PowerNet is an example of arrangements that provide stronger incentives to the network asset owner to optimise the availability of network infrastructure, having regard to:

- the potential market impacts of the infrastructure being unavailable; and

- the need to ensure that the transmission asset owner is not unduly exposed to risks that are beyond its control.

VENCorp suggests there is merit in the ACCC considering the applicability of a similar scheme to TransGrid.

The Energy Retailers Association of Australia (ERAA) and the Joint Customer Groups both submit that the service standards should be consistent with best industry practice, directed at wholesale market outcomes that benefit electricity users, and universally applied to all TNSPs. The ERAA also submits that TNSPs should be required to adopt developments in service standards immediately, instead of having them adopt the changes to the service standards after the subsequent revenue cap determination.

The Joint Customer Groups also submit that the financial incentive of 1 per cent is inadequate, and that the ACCC should apply incentives that ensure that consumers do not pay for an incentive bonus for the better performance that the increased investments would bring in any event.

8.4 GHD's Review

The ACCC engaged GHD to recommend an appropriate set of service standards and performance targets for TransGrid for the upcoming regulatory period.

GHD evaluated TransGrid's proposed service standards against its actual performance in the previous regulatory period, to evaluate the reasonableness of the proposed measures. To recommend a set of service standards, GHD took into account the items that are expected to impact upon the performance of TransGrid against the proposed measures in the upcoming regulatory period.

8.4.1 Selection of performance measures

GHD notes that the cap proposed by TransGrid aligns closely with the Service Standards, exposing ± 1 per cent of its maximum allowable revenue (MAR) at risk. However, TransGrid proposed a cap of 7 days for any single event impacting upon the average outage duration. This differs from the Service Standards Guidelines, which nominated that single events be capped at 14 days. However, GHD considers that using a 7-day cap for single outage events provides sufficient flexibility to set a reasonable target, cap, collar and deadband, and thus enables it to set a sound incentive scheme for this outage measure.

GHD acknowledged that the ACCC recognises that TNSPs may be operating at high-levels of performance, and as such an asymmetric performance incentive can help balance the risk associated with achieving performance targets in some cases. GHD noted that TransGrid has proposed asymmetric incentive schemes.

Finally, GHD observed that the ACCC and SKM documents propose measures and targets only, but don't propose details on specific caps, collars or deadbands, which TransGrid has included in its proposal.

8.4.2 Historic Performance Comparison

Table 8-2 and Table 8-3 show the performance of TransGrid based upon the measures proposed by TransGrid against the actual performance over the past eight years. The results show that TransGrid would receive a net bonus for the previous regulatory period.

Table 8.2 Historic Service Standards Performance

Performance measure	Unit of measure	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Transmission line availability	%	99.49	99.45	99.26	99.31	99.55	99.63	N/A	N/A
Transformer availability	%	98.26	99.18	98.74	99.16	99.10	99.47	N/A	N/A
Reactive plant availability	%	98.30	99.09	98.44	96.97	98.72	98.97	N/A	N/A
Reliability (Events >0.05 system minutes)	Number	4	6	5	6	5	3	7	N/A
Reliability (Events >0.4 system minutes)	Number	0	0	0	2	0	0	2	N/A
Average Outage Restoration Time (7 day cap per event)	Minutes	2143	1540	1241	1769	793	N/A	N/A	N/A

Table 8.3 Summary of Associated Bonuses/Penalties

Performance measure	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	Sum of bonus/penalties
Transmission line availability	0.060	0.033	-0.056	-0.036	0.100	0.153	N/A	N/A	0.255
Transformer availability	-0.111	0.054	-0.039	0.048	0.030	0.141	N/A	N/A	0.123
Reactive plant availability	-0.013	0.074	-0.004	-0.100	-0.052	0.059	N/A	N/A	-0.037
Reliability (Events >0.05 system minutes)	0.250	0.000	0.125	0.000	0.125	0.250	-0.083	N/A	0.667
Reliability (Events >0.4 system minutes)	0.200	0.200	0.200	-0.100	0.200	0.200	-0.100	N/A	0.800
Average Outage Restoration Time (7 day cap per event)	-0.057	0.000	0.000	0.000	0.100	0.082	N/A	N/A	0.125
Annual totals (max +/- 1%)	**0.328**	**0.361**	**0.226**	**-0.188**	**0.503**	**0.885**	**-0.183**		**1.932**

GHD states that two measures stood out during the historic review of the performance incentive scheme proposed by TransGrid, Average Outage Restoration Time and Reliability Measures. These are discussed below.

8.4.3 Average Outage Restoration Time

TransGrid proposed a 7-day cap instead of the 14-day cap outlined by SKM and the ACCC's Service Standards Guidelines, stating that its annual target of 1500 minutes is firmly linked to the 7-day cap. GHD states that the implications of this proposed variation are that all events that cause outages within the 7 and 14-day range would be incorporated into the measure as 7 day events, thus the target that it has set should allow for this.

GHD's analysis of TransGrid's historic performance with regards to the Average Outage Restoration Time with a 7-day cap per event found that half of the results lie within the deadband set for this measure. If the proposed service standard for this measure were applied over the six years of available data, TransGrid would have returned a total bonus of 0.125 per cent of MAR.

8.4.4 Reliability Measures

The reliability performance measures are divided into two segments:

- Events greater than 0.05 system minutes, and
- Events greater than 0.4 system minutes.

These reliability measures are allocated 45 per cent of the revenue that is put at risk by the PI scheme. GHD states that based upon the historic comparison in the previous

tables, TransGrid would have received 72.6 per cent of its bonus for the period through these reliability measures on the basis of the PI scheme proposed by TransGrid. GHD states that it is noteworthy that both of these measures would have recorded losses in 2002/03, which was probably the result of the impact of the NSW bushfires.

GHD states that there is a potential impact of future investment on reliability and outage measure performance. GHD considers that given the increased capital investment planned, TransGrid will have to manage the planned outages better in order to deliver the same levels of performance.

8.4.5 Financial Impact for TransGrid

GHD calculated the financial impact of TransGrid's service standards according to the formula set out in the ACCC's Service Standards Guidelines. The results of applying this equation against the one available data point for TransGrid are summarised in the following table. Only those periods with a full set of reference data have been included in Table 8.4.

Table 8.4 Historic Performance against TransGrid's proposed service standards

Six months beginning	1 % of Averaged Annual Revenue AR' $M	Performance 'S'	Financial Incentive 'FI' for TransGrid $M
01 July 1997	3.7		
01 January 1998		-0.328	1.215
01 July 1998	3.7		
01 January 1999		0.361	1.3357
01 July 1999	3.7		
01 January 2000		0.228	0.8436
01 July 2000	3.7		
01 January 2001		-0.188	-0.6956
01 July 2001	3.7		
01 January 2002		0.503	1.8611
01 July 2002	3.7		
01 January 2003		0.885	3.2745
01 July 2003	3.7		
01 January 2004			

8.4.6 Suggested Performance Incentive Scheme

GHD found that TransGrid in general has high levels of performance in the measured areas. As such, asymmetric performance incentives are reasonable in many cases. It is also noticeable that TransGrid often has higher targets than some other TNSPs.

In terms of the incentive properties contained in the ACCC's service standards system, GHD notes that the performance levels should be set so that they are revenue neutral against current levels of performance, providing an incentive for performance improvement.

With this in mind GHD recommends the following modifications to TransGrid's proposed incentive scheme:

Transmission line availability (%)

- Collar: Increased from 98.9 to 99
- Target: Increased from 99.4 to 99.5
- Cap: No change

Transformer availability (%)

- Collar: Increased from 98 to 98.2
- Target: Increased from 99 to 99.1
- Cap: No change

Reactive plant availability (%)

- Collar: No change
- Target: Increased from 98.5 to 98.6
- Cap: No change

Number of events greater than 0.05 system minutes

- Collar: Decreased from 4 to 3
- Target: Decreased from 6 to 5
- Cap: Decreased from 9 to 8

Number of events greater than 0.4 system minutes

- Collar: Decreased from 0 to –1.5 (negative number utilised to obtain revenue
- neutral outcome)
- Target: No Change
- Cap: Decreased from 3 to 2

Average Outage Restoration Time

- Collar: Decreased from 2400 to 1800
- Dead Band Knee 1: Decreased from 1800 to 1600
- Target: No Change
- Dead Band Knee 2: Increased from 1200 to 1400
- Cap: No Change

GHD's recommendations for the upcoming regulatory period are summarised below.

Table 8.5 Summary of Service Standards suggested by GHD

Performance measure	Unit of measure	Revenue at risk (%)	Collar	Dead Band Knee 1	Target	Dead Band Knee 2	Cap
Transmission line availability	%	0.2	99.0	-	99.5	-	99.7
Transformer availability	%	0.15	98.2	-	99.0	-	99.7
Reactive plant availability	%	0.1	97.0	-	98.6	-	99.3
Reliability (Events >0.05 system minutes)	Number	0.25	8	-	5	-	3
Reliability (Events >0.4 system minutes)	Number	0.2	2	-	1	-	0
Average Outage Restoration Time (7 day cap per event)	Minutes	0.1	1800	1600	1500	1400	800

This incentive scheme would return a total bonus over the 1996/97 – 2003/04 period of 0.602 per cent based on the available data, as opposed to the total bonus from TransGrid's proposed incentive scheme of 1.932 per cent for the same period.

GHD indicates that of the 0.602 per cent performance achieved by TransGrid within the GHD scheme, 0.600 of this measure results from the reliability measure for events greater than 0.4 system minutes. GHD states that, using this particular measure, it was unable to develop a reasonable cap, target and collar arrangement that would derive a near-neutral revenue result. GHD submits that performance levels should be set close to revenue neutral against current performance levels in order to provide a clear incentive for the TNSP to improve its performance beyond historical levels.

In dollar terms, this would return a total bonus of $3.584 million, compared to the total bonus from the incentive scheme proposed by TransGrid, which would have provided a bonus of $7.827 million for the same period.

In its annual notification to the ACCC of its MAR, TransGrid will include its calculation of the 'S' factor. TransGrid will use the following tables to calculate 'S' at the end of each year. The ACCC will audit TransGrid's calculation and approve 'S', making adjustments if necessary. The total 'S' factor is equal to the sum of the individual 'S' factors for each performance target. The equations are demonstrated in detail in Appendix Five.

8.5 ACCC's considerations

8.5.1 Relationship between TransGrid's capex and opex requirements and the proposed service standards

TransGrid submitted that the service standards arrangements and associated incentive arrangements would need to be adjusted according to any reductions in its capex and opex requirements. TransGrid suggested that the ACCC determine the proposed service standards for TransGrid after it has finalised these matters.

The service standards regime is intended to provide TNSPs with an incentive to reduce costs and achieve profits without sacrificing service quality by linking the TNSP's service standards performance with a reward element that is built into the revenue cap. The revenue cap set by the ACCC aims to enable the TNSP to achieve a return on the efficient costs of maintaining and improving the network. In determining the revenue cap, the ACCC considers the level of investment that is necessary to enable the TNSP to deliver a reliable and efficient transmission supply and which enables the TNSP to meet its statutory obligations. Therefore, the ACCC considers that the process that it follows to decide a service standards target is appropriate for enabling TNSPs to fulfil their obligations.

8.5.2 Definition of 'force majeure' events

The ACCC will apply the force majeure definition from its Service Standards Guidelines to TransGrid's Revenue Cap. The ACCC will consider excluding any event that TransGrid believes to be a force majeure event on a case by case basis. The factors that the ACCC would take into account are set out in the Service Standards Guidelines.

8.5.3 Definition of performance measures

The ACCC notes TransGrid's recommendation that the definition of the Loss of Supply Event Frequency Index be amended to reflect "System minutes" instead of "Minutes". This was amended in the ACCC's Final Decision on the Service Standards Guidelines.

8.5.4 Average outage restoration time

TransGrid has proposed a 7 Day cap instead of the 14 day cap on outage restoration time, with an annual target of 1500 system minutes. The ACCC understands that by not using the 14-day measure that was outlined by SKM and incorporated into the Service Standards Guidelines, the outage events that could occur between 7 and 14 days would not be caught by TransGrid's proposed target. If 1500 system minutes is the annual average outage restoration time associated with a 14 day cap, then a lower annual average target is appropriate for a 7 day cap. The ACCC believes that the outage restoration targets recommended by GHD are appropriate.

8.5.5 Best practice performance

The ACCC acknowledges the ERAA's submission that the service standards should be focused on industry best practice. As outlined in the Service Standards guidelines, the ACCC considers that best practice would represent the frontier of transmission service performance. However, the ACCC believes that there would be considerable difficulties in determining the position of the frontier, and which TNSPs, if any, were operating at such a level. Consequently, the ACCC has chosen not to refer to 'best practice' performance in setting performance targets. Instead, the ACCC will use a TNSP's own recent performance as a benchmark.

8.5.6 Market impact incentives

An initial objective of the performance incentive scheme was to include performance measures linking market impacts to TNSP behaviour. In this context, the ACCC acknowledges the respective solutions proposed by VENCorp and TransGrid regarding the market impacts of transmission outages. The ACCC also notes that the Terms of Reference for the Service Standards Working Group envisages that, in considering how the guidelines might be improved, the group will specifically focus on how market-based performance measures could be incorporated into the performance incentive scheme. The ACCC considers that the Working Group is the appropriate forum for discussing proposed changes to the scheme.

8.5.7 Other matters

The ACCC notes TransGrid's submission that it requires advance notice of the actions or remedies that the ACCC would implement after "reassessing" a TNSP's actual performance data against the targets. However, the ACCC considers that in arriving at a position, it would be appropriate for it to consider the information that is available and relevant at the time of making the Decision.

8.6 Conclusion

GHD recommended performance targets based on TransGrid's service standards performance over the current regulatory period. GHD also took into account any factors that might be expected to impact on TransGrid's ability to meet the service standards targets in the future. In order to set financial incentives, the ACCC intends to implement GHD's proposed performance measures and targets for TransGrid. For the 2004-2009 regulatory period, the ACCC's draft decision is to adopt the weightings and targets recommended by GHD in Table 8.5.

Therefore, for the 2004-2009 regulatory period, TransGrid has a financial incentive applying to its performance as measured by the six performance indicators outlined in Table 8.5.

In addition to this, the ACCC requires TransGrid to report on the performance measures contained in its service standards guidelines as part of the annual compliance reporting requirements set out in section 6.2.5 of the Code.

Appendix 1 Submissions in response to TransGrid's Application

Ergon Energy

Energy Markets Reform Forum

Energy Retailers Association of Australia Incorporated

Joint Customer Groups Submission by:

- Australian Business Ltd
- Australian Consumers Association
- Energy Action Group
- Energy Users Association of Australia
- National Farmers' Federation

National Generators Forum

Origin Energy

Total Environment Centre

VENCorp

Appendix 2 Prudency assessment of TransGrid's historic capex

This Appendix sets out the assessment of specific capex items making up TransGrid's historic spend from 1 July 1999 to 30 June 2004. The projects assessed contribute to the difference between TransGrid's actual spend and the ACCC's 2000 allowance.

The projects assessed make up $973.9 million of TransGrid's actual outturn capex of $1,107.9 million. The ACCC sampled 17 projects. The ACCC's considerations with respect to the MetroGrid and Bayswater to Marulan 500 kV line are outlined in the historic capex chapter. The prudency assessment of the remaining projects is outlined below. These projects include:

- Queensland – New South Wales Interconnector
- Kempsey – Nambucca – Coffs Harbour 132 kV line
- Tuggerah to Sterland 330 kV line duplication
- Molong 132/66 kV substation and 132 kV line from Molong to Manildra
- Substation projects (miscellaneous substations)
- Transmission line projects (miscellaneous transmission lines)
- Transformer additions and replacements
- Circuit breakers and current transformers
- Telecommunications
- Yass 330/132kV substation
- Sydney West SVC
- Other Sydney City Projects
- Information technology
- Motor vehicles
- South Australia-New South Wales Interconnector (SNI)

2.1 Queensland – New South Wales Interconnector

The section that follows outlines the prudency assessment of the Queensland- New South Wales Interconnector (QNI).

QNI is an electricity transmission line linking the Queensland and New South Wales (NSW) region of the NEM between Dumaresq in Northern NSW and Bulli Creek in Southern Queensland. QNI commenced commercial operation in February 2001. In its 25 January 2000 Revenue Cap Decision the ACCC provided an allowance for QNI of $131.86 million.[68] TransGrid has claimed expenditure of $148.2 million. This does not include QNI costs allocated to the Miscellaneous Accounts of $3.144 million. Therefore, the total spend on the interconnector itself is $151.24 million. This results in an overspend of $19.38 million for this investment.

The ACCC at this stage has no evidence to suggest that the additional expenditure on the interconnector was not prudent. There are a number of possible reasons for the cost over-runs including environmental issues which delayed access and the need for additional reactive plant. Further, the ACCC understands that the additional construction costs were incurred in complying with the 69 conditions of approval resulting from the Environmental Impact Statement, including painting transmission towers, line relocations requiring additional strain towers, environmental remedial work, and heritage protection works.

2.2 Kempsey-Nambucca-Coffs Harbour 132 kV

This section sets out the assessment of the prudency of TransGrid's investment in the Kempsey – Nambucca – Coffs Harbour 132 kV line (Kempsey line) and explains the ACCC's Decision on the amount to be included in the regulatory asset base.

The Kempsey line is a dual circuit 132 kV transmission line using the route of a 66 kV transmission line operated by one of Country Energy's predecessors, NorthPower, between Kempsey and Coffs Harbour. The Kempsey project also involved the construction of a 132/66 kV substation at Nambucca Heads (which lies between Coffs Harbour and Kempsey). The dual circuit and substation constructed has cost $56.3 million.

In November 1998, TransGrid conducted an economic assessment. The estimated capital cost of the preferred option was $31.4 million. The ACCC's 2000 Revenue Cap Decision provided an allowance of $31.62 million for the Kempsey project.

The assessment of the Kempsey project is set out as follows:

- sub-section one reviews TransGrid's assessment of the need for the project;
- sub-section two reviews whether TransGrid proposed the most efficient project to meet the need; and
- the final sub-section sets out the ACCC's considerations and Decision.

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[68] The ACCC stated in the 2000 Decision that on the commissioning of QNI, TransGrid could reoptimise $70 million for the Bayswater 500kV line. Hence, the total amount for both QNI and the Bayswater line (which was capitalised against QNI) totalled $201.86 million

2.2.1 TransGrid's assessment of the need for this project

The 66 kV network between Coffs Harbour and Kempsey is part of the Mid North area of NSW. Prior to this investment, Country Energy's 66 kV distribution system between Coffs Harbour and Kempsey supplied the growing areas between Sawtell and Macksville with four zone substations at Sawtell, Raleigh, Nambucca Heads and Newee Creek.

TransGrid states that due to increasing load forecasts at the time of the investment, the 66 kV system between Coffs Harbour and Kempsey required augmentation.[69] If the line was not augmented there could be substantial risk of supply interruptions under outage conditions.[70] It was determined based on load forecast and planning standards, that Kempsey to Nambucca would be required by early 2001 and Nambucca to Coffs Harbour by late 2001.

The ACCC considers that there appears to be a need for the investment to overcome inadequacies in the 66kV system's stability under certain outage conditions. The ACCC also concurs with its consultant GHD that the timing for the development of this project appears appropriate. Therefore based on the load growth in the area and the planning standard adopted, there appears to be a need to augment supply in the area.

2.2.2 TransGrid's cost effectiveness assessment

This project was planned and developed prior to the development of the NEM. This means that there was no Code requirement imposed on a TNSP that it consult with interested parties on augmentation developments, nor apply a Regulatory Test assessment.

TransGrid's economic assessment of this project considered six network options. The option which maximised the market benefits was option 5[71] under the full range of

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69 This project was driven primarily by high load growth in the area. TransGrid advised that the area's maximum demand is expected to grow at around 3 per cent per annum up to 2015. The main reason identified for the increases in electricity demand was population growth which it expected to increase by 2-3 per cent for the next ten years.

70 TransGrid applied a N-1 planning criteria when assessing the capability of the network surrounding Kempsey and Coffs Harbour to supply the forecast loads with one network element out of service. TransGrid has advised that due to the load growth over recent years in the Mid-North Coast area the existing 66kV transmission line would not be able to support the full load in the area under line outage conditions. The outage conditions noted were:

- outages in NorthPower's existing 66kV system between Coffs Harbour and Kempsey would result in the thermal rating of 66kV lines being exceeded.
- outages of 132kV lines in the area would result in uncontrollable low voltages at connection points.

71 Option 5 involved the construction of a new single circuit 132kV line from Coffs Harbour to Kempsey and a new SVC at Port Macquarie in 2008/09. The estimated capital costs for option 5 was $24.4 million plus design and EIS costs[71] of $3.8 million and easements of $9.6 million, hence the total cost was $37.8 million.

sensitivities with a total cost of $37.8 million. However option 5A, which was the only option that proposed the use of the existing line route of Country Energy's 66 kV line for a 132 kV double circuit, was selected as the preferred option. The estimated cost for option 5A was $41 million.

TransGrid states that option 5A was considered the preferred option due to:

- extensive community consultation which indicated that there was a strong preference to develop new transmission projects in existing corridors rather than develop new routes in the Mid North Coast area; and

- option 5A catered for the long term supply strategy by having a second circuit of 132 kV construction available when required.[72]

The ACCC notes that there is difficulty in obtaining new line routes in the area and that extensive community consultation indicated a preference to develop transmission networks in an existing corridor rather than new routes. Based on the information before it, the ACCC considers that the selection of the preferred option was reasonable.

2.2.3 ACCC's considerations and conclusion

As discussed the ACCC has no reason to doubt the need for investment and the conclusion of TransGrid's investment analysis conducted in 1998 before TransGrid was regulated by the ACCC. However, the construction costs for the chosen project was approximately $13.1 million[73] above the original estimate of $21.4 million. In response to the ACCC's request to justify this expenditure, TransGrid suggested that the increased expenditure over the original estimate can be attributed to "market forces" and increased "community and environmental requirements over the life of the job".[74]

In addition to very significant construction cost overruns, the cost of easements for this project ($21.8 million) was also very much greater than the original estimate of the cost of easements $10.77 million.[75] The ACCC requested that TransGrid compare

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72 TransGrid advised that as an intermediate step it would continue to supply the region with one circuit operating at 66 kV and the other operating at 132 kV. Further, TransGrid stated that it always envisaged that eventually both circuits of the line would be required to operate at 132kV in order to maintain supply reliability standards.

73 The $13.1 million is the differences between the actual construction cost costs for the project at $34.5 million and the costs as identified in TransGrid's economic assessment of $21.4 million.

74 This expenditure includes: extensive redesign of the concrete pole footings on the Macleay river flood plain, structure redesign, increased live line crossing, wet weather impact after the flooding of March 2001, and minor variations during contract period.

75 The economic evaluation report did not identify a specific cost of easements in regard to the preferred option, however, in the section titled, "TransGrid Economic Evaluation Spreadsheet", for the preferred option, the undiscounted easement and EIS costs total to $14.57 million of which

its easements costs for the Kempsey line to the Mullumbimby-Lismore project (built by TransGrid in 1995), which runs through similar terrain. The information provided by TransGrid indicated that costs per kilometre and cost per individual holding were similar when adjusted to a common currency.[76] Given the experience of the Mullumbimby-Lismore, it is difficult to see why TransGrid was not unable to have developed a more accurate estimate of the easement cost at the time that the investments were analysed and selected.

The ACCC notes that had TransGrid known that construction costs and easement costs would have turned out as they did, they may have chosen another project, assuming that the same mis-estimation of costs would not have applied also to the other possible projects. The ACCC has not completed its analysis of this project and is not yet satisfied that the cost overruns represent the outcome of exogenous events that TransGrid managed as efficiently as could be expected of a prudent operator. The ACCC has also not yet reached a conclusion on whether the mis-calculation of the construction costs could have been foreseen at the time the investment Decision was made.

For the purpose of this Draft Decision, and in view of the incomplete analysis to date, the ACCC has not reduced the amount of the cost of this project to be included in the RAB. However, the ACCC intends to conclude on the prudency of this project in its Final Decision.

A final issue to be considered relates to the allocation of costs. As noted earlier, the Kempsey project involved building a double circuit 132 kV line along Country Energy's 66kV line route. One circuit however is derated to 66 kV and operated by Country Energy, although TransGrid paid for the (derated) lines and the relocation costs of Country Energy assets affected by the construction of the new line.

The ACCC understands that the conductors on one of the circuits remain in Country Energy's asset base, and are owned and operated by Country Energy. It may therefore be the case that costs are being double-counted with both TransGrid and Country Energy depreciating and charging a return on the same asset. TransGrid has advised that the cost of the conductors used by Country Energy is $2.15 million. Therefore at this stage, the ACCC proposes to exclude this amount from the amount of the total cost of the Kempsey line to be rolled-in to TransGrid's asset base. However, the ACCC is yet to confirm the precise cost and whether there are any related TransGrid – Country Energy commercial transactions to be taken into account.

$3.8 million is identified as EIS costs. Therefore, the spreadsheet indicates the easement component for the preferred option amounts to $10.77 million.

76 The Mullumbimby line is 38 km and affected 114 individual property holdings. The easements costs per km are $123,700 for the Coffs Harbour-Kempsey line, and $98,680 for the Lismore-Mullumbimby line. The easement costs per individual holding were $35,400 for the Coffs Harbour-Kempsey, and $32,900 for the Lismore-Mullumbimby line.

2.3 Central Coast development: Tuggerah – Sterland 330kV line duplication

This section sets out the assessment of the prudency of TransGrid's investment in the Tuggerah-Sterland 330 kV line duplication, and sets out the amount to be included in the regulatory asset base.

This project involves the construction of a double circuit 330 kV transmission line from Tuggerah - Sterland and the installation of a second 330/132 kV transformer and associated switchgear at Tuggerah substation, with the former undertaken in the current regulatory period, and the latter proposed in 2008/09.
The project has been subjected to a Regulatory Test which assumed a capital cost of $28 million. The line component was estimated between $10-$11 million. The actual cost of the line component is $11.9 million.

The assessment of this project is set out as follows:

- section one reviews TransGrid's assessment of this need for this project;
- section two reviews TransGrid's Regulatory Test assessment for the Tuggerah – Sterland 330kV line and compares the actual project to that assessed in the Regulatory Test; and
- the final section sets out the considerations and conclusions on the prudency of TransGrid's investment in the Tuggerah – Sterland 330 kV line, and the amount to be included in the RAB.

2.3.1 TransGrid's assessment of the need for this project

This section focuses on whether there was a justifiable need for this investment.

EnergyAustralia currently supplies the Central Coast of NSW via a network of 132 kV feeders owned. TransGrid's 330/132 kV substations located at Tuggerah, Munmorah and Sydney East provide the 132 kV power source for connection of the EnergyAustralia feeders. The Tuggerah 330/132 kV transmission substation is supplied via a single 330 kV transmission line meeting the Munmorah – Sydney North circuit at Sterland. A single 330/132 kV transformer is installed at Tuggerah and Munmorah transmission substations.

The current network has sufficient spare capacity to meet expected demand until approximately 2013 if all elements are in service. TransGrid state that the project is required to maintain the statutory "N-1" reliability standard [77] as the load in the

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[77] The three critical outages are:

- Outage of the 330kV line to Tuggerah or the Tuggerah 330/132 kV transformer. If either is out of service, the capacity of the 132 kV network supplying the area is limited by the thermal ratings of feeder 957 and 97E. It is expected that with the forecast level of load growth, these feeders will both be loaded to their sustained emergency in the summer of 2008/09. The Commission understands that the Wyong load affects the timing of this.

Central Coast region continues to grow at around 4.5 per cent per annum for summer (14MW to 20MW), and 3 per cent per annum for winter. Furthermore, mining developments are possible in the area and if these occur it could advance the need for this project.

In response to the ACCC's request, planning studies were provided to justify the timing for this project. In the absence of any large point loads, the planning studies provided indicate that the project will be required to be commissioned by summer 2008/09. The planning studies show the 132 kV Munmorah – Charmhaven feeder exceeding its emergency rating and low volts at West Gosford substation, with the 330 kV line to Tuggerah Substation out of service during summer 2008/9. In addition the Vales Point – Ourimbah 132 kV line is at 97 per cent of its emergency rating.

Therefore, based on the information provided to it, the ACCC considers that there is a need for this investment by the summer of 2008/09. The ACCC's consultant GHD also considered the timing for this investment to be appropriate. The issue to be considered, which is discussed in the sections that follow, is whether it was appropriate for TransGrid to bring forward the construction of the Tuggerah – Sterland 330 kV line to 2003/04, when this investment is only needed in 2008/09.

2.3.2 Regulatory test assessment and the actual constructed project

This section of the assessment examines the way in which TransGrid and EnergyAustralia determined the most efficient project to meet the need in the Central Coast area. It focuses on the analysis underlying the Regulatory Test assessment, and compares the selected solution to the actual project constructed.

TransGrid, in conjunction with EnergyAustralia conducted a Regulatory Test assessment. A total of three options were assessed in the Regulatory Test.[78] The option with the lowest net present cost was option 1, which entails the establishment of a second Tuggerah – Sterland 330 kV connection.

In terms of non-network options, TransGrid states that generation options were not considered feasible given that there is no appropriate fuel source, and are likely to cost

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- Outage of the 330/132 kV transformer at Munmorah or the Munmorah-Charmhaven 132 kV line. If either of these is out of service, the capacity of the 132 kV network supplying the area is limited by the thermal rating of the Tuggerah transformer. Again, the timing of this contingency is affected by the timing of the Wyong load.
- Outage of the 957 Vales Point-Ourimbah 132 kV line. If EnergyAustralia's 957 line is out of service, the capacity of the 132 kV network supplying Gosford and Ourimbah is limited by the rating of the Tuggerah transformer and the two 132 kV lines running south from Tuggerah. Again, the expected occurrence of this constraint is dependent on the Wyong load.

[78] Option 1: establishment of a second Tuggerah to Sterland 330kV connection
Option 2: Somersby 330/132 kV substation together with the construction of a new 132 kV line and reconstruction of parts of the existing 132kV line from the Gosford and Ourimbah substation. Two routes were considered under this option.
Option 3: reconstruction of the existing 957 132 kV line with two new 13 2kV lines.

more then the network options considered in this instance. Furthermore, the ACCC understands that EnergyAustralia investigated demand side options in the area, but initial studies showed there was insufficient demand side management potential.[79] The ACCC agrees that the exclusion of non-network options appears to be appropriate. Therefore, based on TransGrid' Regulatory Test assessment, the ACCC is satisfied that option 1 is the most appropriate. This option is in the process of being developed by TransGrid.

The full project was estimated to cost between $22 million and $23 million, with the line component estimated at between $11 million and $12 million, and the substation works estimated at $11 million. TransGrid has advised that the projected expenditure in the 1999/00 to 2003/04 regulatory period will be $11.9 million, which relates to the construction of the new dual circuit 330 kV transmission line. The ACCC understands that the remaining $5 million relates to works on EnergyAustralia's network, which was assessed as part of the Central Coast Regulatory Test assessment.

The ACCC notes that the actual project cost is close to the Regulatory Test cost estimate. This can be compared to other projects including the MetroGrid project, Molong project, and Kempsey – Coffs Harbour 132 kV line. The ACCC understands that since its last regulatory review, TransGrid has reviewed and revised its planning processes, and has included an additional phase to review project costing. This project was implemented under the new planning process, and shows that such an additional step has improved the planning and costing of options.

As noted above, one of the ACCC's concerns with respect to this project is that the initial expenditure (construction of the 330kV line from Tuggerah to Sterland) is well in advance of project timing as indicated by the planning studies, which is 2008/09. The main concerns stems from the fact that investment is being undertaken based on forecast load growth in five years time, which may not eventuate or may vary from the forecast load projection.

The ACCC has been advised that the reason for the construction of the second 330kV Tuggerah-Sterland line well in advance of the project timing as indicated by the planning studies, is that a window of opportunity exists in 2003/04, when, during periods of low load, the existing 330kV transmission line from Sterland to Tuggerah can be taken out of service to allow the new dual circuit line to be constructed. TransGrid has provided information which verifies the need to construct the dual circuit 330kV line in 2003/04. GHD agreed with this.

2.3.3 ACCC's consideration and conclusion on the prudency of this project

Based on the assessment above, the ACCC concludes that the construction of a second Tuggerah to Sterland 330kV line was prudent. The need to carry out the

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[79] EnergyAustralia's investigation into demand side management indicated that there is a potential for between 3 MVA and 5 MVA of mainly summer peak demand reductions by about 2005, and around 3.5MVA of winter peak demand reduction by winter 2004. TransGrid advised that demand reductions of 9MVA to 18MVA in summer and 10MVA in winter would be needed to defer or avoid network investment.

transmissions line duplication work now is considered prudent, and therefore such capital expenditure should be included in the regulatory asset base.

2.4 Molong 132/66kV substation and 132kV line

This section of the Draft Decision sets out the assessment of the prudency of TransGrid's investment in the Molong 132/66kV substation and 132kV transmission line from Molong to Manildra, and sets out the ACCC's Draft Decision on the amount to be included in the regulatory asset base.

The Molong project involves the construction of a 132kV line from Molong to Manildra which replaces the existing Country Energy 66kV line. The project also involves the construction of a 132/66kV substation near Molong.

In the ACCC's 2000 Revenue Cap Decision for TransGrid, the ACCC provided an allowance of $4.41 million for augmentation works to the Orange substation, with an expected commissioning date of 2001/02. However, the Orange substation works have been deferred due to the establishment of the Molong substation and transmission line.

A Regulatory Test was conducted on this project. The final cost of the Molong project was $14.7 million ($5.8 million for the 132/66kV substation and $8.9 million for 132kV line). The Regulatory Test assumed a capital cost of $9 million for these works.

The assessment of the Molong project is set out as follows:

- section one reviews TransGrid's assessment of the need for the project;
- section two reviews TransGrid and Country Energy's Regulatory Test assessment for the Molong project and compares the actual project to that assessed in the Regulatory Test; and
- section three sets out the ACCC's consideration and conclusions on the prudency of TransGrid's investment in the Molong project and the amount to be included in the RAB.

2.4.1 TransGrid's assessment of the need for this project

In this section, the assessment focuses on whether there was a justifiable need for this investment.

Prior to this investment, Country Energy's (then known as Advance Energy) 66kV distribution network supplied the areas in Molong, Manildra, Cumnock and Cudal.[80]

[80] This network consists of a 66kV line from TransGrid's Orange substation to Country Energy's Molong 66kV substation, and a 66kV line from Molong substation to Country Energy's Manildra 66kV substation, and a 66kV line from Molong substation to Country Energy's Cumnock 66kV

The ACCC understands that the primary reason for this augmentation was to accommodate an expansion of the Manildra flour mill in December 2000, and to relieve the loading on Country Energy's ageing Orange-Molong and Molong-Manildra 66kV line. The ACCC however has been advised that the establishment of the mill is behind schedule, but that the 132kV line has been built.

Country Energy's load forecast for the area at the time of the investment Decision was 1-2 per cent. The Manildra load increase was 3.5MW in December 2000, Cudal Winery load increase is 0.5MW in December 2000 and 0.7MW in December 2001. The ACCC understands that TransGrid accepted the load growth forecast of 1-2 per cent plus the timing for the Manildra mill.

The ACCC understands that the acceptance of the load forecast and the planning standard[81] adopted by TransGrid and Country Energy for this area means that TransGrid would have needed to implement the project by 2002. However GHD questioned the timing of the project on the basis of the information provided by TransGrid. However, GHD notes that this is partly out of TransGrid's control as it is guided by advice from Country Energy with regard to spot load timing. At this stage of its review, the ACCC is satisfied that there is a need for this investment based on the load information, however the ACCC is not satisfied that the project needs to have been built at the time that it was built. The ACCC is still looking into this aspect, but for the purposes of this Draft Decision the ACCC has accepted the timing of this development by TransGrid.

2.4.2 Regulatory test assessment and actual constructed project

This section of the assessment examines the way in which TransGrid and Country Energy determined the most efficient project to meet the need in the area. It focuses specifically on the analysis underlying the selection, the costing and comparison of the various options included in the Regulatory Test assessment, and compares the selected solution to the actual project constructed by TransGrid.

TransGrid, in conjunction with Country Energy, conducted a Regulatory Test assessment. In response to its consultation paper, TransGrid received two submissions from interested parties, SEDA and AGL which made submissions on non-network options. These comments were factored into TransGrid's final report.

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substation. The townships of Molong, Manildra, Cumnock, Cudal and surrounding areas are supplied by 11kV distribution networks from the Molong, Manildra and Cumnock substations.

[81] At the time, Country Energy's criterion for loads had been an N-1 criterion for loads less than 10MVA and N-1 for loads above 10MVA. The ACCC understands that the load in the area was approximately 10MVA at the time of the Regulatory Test assessment. Furthermore, the objective planning criterion used on the cost effectiveness analysis is that all options considered should satisfy an N security level criterion for the Molong – Manildra – Cumnock and Cudal load areas. However, TransGrid notes that preference would be given to options that fully or partially satisfy an N-1 planning standard where the NPC of two or more options are similar.

The ACCC notes that AGL was willing to be a proponent for the option that involved the construction of a gas fired power station at Manildra. Based on information provided by TransGrid, it appears that this option was a feasible non-network alternative.

Three options were considered in the Regulatory Test assessment, covering both network and non-network options. The options considered included:

- Option 1 – the construction of a 132kV substation near Molong and the construction of a 132kV transmission line from Molong to Manildra; and
- Option 2 – the reconstruction of the existing Orange to Molong and Molong to Manildra 66kV line
- Option 3 – the construction of a gas pipeline from Orange to Manildra and a gas fired power station at Manildra.

Based on TransGrid's net present cost assessment, TransGrid concluded that the option with the lowest net present cost was option 1, a network option, at a capital cost of $9 million. Based on its historic capex program, option 1 was subsequently undertaken by TransGrid.

The costs associated with the Manildra power station (including the capital cost, operational cost and fuel costs) for the purposes of the Regulatory Test assessment were based on a report prepared for Country Energy and TransGrid by GreenPower Service Pty Ltd. Both SEDA and AGL, in their submissions to the consultation, considered such estimates to be reasonable. The ACCC therefore is of the view that it has no reason to doubt the costing of the non-network options as used in the Regulatory Test assessment.

TransGrid and Country Energy estimated the capital costs of the transmission equipment for the purposes of the Regulatory Test. The final report stated that the budgeted estimates for the network options were based on TransGrid and Country Energy's experience with similar projects. However, the ACCC notes that the actual cost of this project was $14.7 million ($5.8 million for the 132/66kV Molong substation, and $8.9 million for the Molong to Manildra 132kV line).

The GHD report notes that the only difference between the final project and that proposed in the Regulatory Test is the use of a second-hand transformer at Molong substation, whereas the Regulatory Test assessment made provisions for a new unit. However, even though there has been no scoping change since TransGrid's Regulatory Test assessment, the capital cost of this project ($14.7 million) is $5.7 million more than the cost assumed in the Regulatory Test. The ACCC has sought to understand why the actual cost was so much higher than that identified in the Regulatory Test. TransGrid has advised that this was due to "community, environment and property owner issues" which required some refinement to the route length which increased by 25 per cent, construction of a double 132 kV transmission line for approximately 12.3 km of the transmission line, and other amendments to the design and costs of the project. The ACCC is still considering the prudency of the additional $5.7 million.

The ACCC notes GHD's comment that there appears to be a step missing in the process in that once a selected option is subjected to a detailed engineering costing, TransGrid did not reassess whether the option is still the most economic. This is especially clear in this project. If the options were reconsidered and the final capital cost of the selected option were included in the analysis then the gas generation option and the selected option would have had similar a net present cost. That is, the net present cost in the base case was about $11.5 million for both the generation option and selected network option. The ACCC also modelled this outcome, and its results confirmed that the gas generation option and the selected option had similar net present costs. Therefore based on this assessment, either one of these options would have been appropriate to proceed with it. The ACCC at this stage does not have information that shows that one option would have been a "better solution" than the other.

However, the ACCC is concerned about the objectivity and rigour of TransGrid's Regulatory Test assessment. The actual cost of this project is significantly above the Regulatory Test assumption. There is no reason to believe that the mis-estimation was restricted to one project alone. The ACCC has a reason to believe that if any of the other possible projects were to have been developed, their actual costs would have turned out quite differently from the Regulatory Test assumption, whether higher or lower. A more accurate assessment of the likely cost of the different projects would therefore, quite plausibly, have resulted in the selection of a different project.

2.4.3 ACCC's conclusion on the prudency of this project

The ACCC considers that this investment was necessary based on the information provided by TransGrid. However, the ACCC is not convinced that the timing of the implementation of this project is justified. For the purposes of this Draft Decision, however the ACCC has made no adjustment in view of the timing of the development of this project.

As discussed above, the ACCC's main concern is that an inadequate analysis of the cost of the possible investment options was conducted at the time of the Regulatory Test. However, the ACCC has not yet decided whether it would be appropriate to exclude part of the cost of the project from the regulatory asset base. However, based on the ACCC's assessment at this stage, for the purposes of this Draft Decision the ACCC proposes to roll in the full cost of the Molong project into TransGrid's regulatory asset base.

2.4.4 Operation of the 132kV line from Molong to Manildra

The other issue that the ACCC wishes to raise with respect to this project was identified in GHD's Final Report. GHD notes that the 132kV line which was built to replace Country Energy's 66kV line, has been built and paid for by TransGrid on the basis that it will later form a connection to Parkes to relieve constraints in that area, predicted to arise in 2007/08.

However, the ACCC understands that in the meantime Country Energy is operating the line. GHD raises the issue of whether TransGrid should be paying all the capital

costs for a 132kV line used by Country Energy which is not at this stage benefiting all TransGrid customers.

The main concern that the ACCC had with respect to this issue is whether the assets in question (132kV line from Molong to Manildra) are being accounted for in both the Country Energy and TransGrid asset bases.

The ACCC notes that the line seems to operate on a leased arrangement to Country Energy. Therefore it seems appropriate that TransGrid should obtain a lease payment for this line representing the cost of the line. As far as the ACCC is aware, no such contractual arrangement exists. Thus, TransGrid users are not benefiting from income which rightfully should flow to TransGrid's network. The ACCC is still considering this issue and will finalise its view in the Final Decision.

2.5 Miscellaneous items

The ACCC understands that TransGrid utilise a condition based maintenance philosophy for the maintenance of all its network assets, which replaced the traditional time based maintenance approach adopted over a decade ago. To support this maintenance philosophy, TransGrid has developed a comprehensive asset management process supported by appropriate software that has considerably extended the service life of TransGrid's electrical equipment and over time has increased the service levels/availability of the network. This process is reviewed regularly using the standard quality "continuous improvement processes".

2.5.1 Substation Projects (Misc Subs)

In its 25 January 2000 Revenue Cap Decision the ACCC provided an allowance for the miscellaneous substations of $40.09 million. TransGrid has claimed an expenditure of $66.1 million.

The ACCC considers that the items included in the miscellaneous substation amount should only include minor substation capex. However, the ACCC understands that included in this amount are some property purchases, such as the inclusion of $9.85 million for the Haymarket substation site of the MetroGrid project. The ACCC considers that this amount should have been included in the MetroGrid project costings. There are also other smaller easement purchases included under this heading.

In addition, some project completion costs have been included in this account, for example an amount of $643,000 relating to remedial and minor capex for QNI. If these types of costs are netted out, the actual minor substation expenditure is approximately $50 million, which includes the purchase and refurbishment of system spares, and the replacement of minor electrical equipment such as batteries, surge diverters, condition monitoring equipment, and fire systems.

The ACCC considers that the remainder of the works incorrectly allocated to this account should be re-allocated to their correct accounts.

The ACCC at this stage does not have evidence to suggest that the additional expenditure on the miscellaneous substations was not prudent. The ACCC considers that the majority of the actual minor substation capex was carried out in accordance with relevant maintenance strategies, and that the additional works not included in the original estimates, but which were identified during the regulatory period, were also carried out in accordance with appropriate maintenance strategies.

The ACCC highlights that the amount projected to be spent during the period on this work is substantially lower that the amount allowed in the ACCC's 2000 Decision which would have been based on information supplied by TransGrid in its Application.

2.5.2 Transmission Line Projects (Miscellaneous T/L)

In its 25 January 2000 Revenue Cap Decision the ACCC provided an allowance for the miscellaneous transmission line projects of $1.07 million. TransGrid has claimed an expenditure of $21 million.

The ACCC considers that this account should only be used for minor capital works on transmission lines the expenditure was found to contain compensation for sterilisation of coal beneath a transmission line of $5.5 million, QNI cleanup costs of $2.5 million, data collection of $0.1 million, and easement acquisition costs of $3.3 million. As a consequence the ACCC considers that these costs should be netted out and be reallocated to their correct cost allocations. If the appropriate costs are netted out, the actual amount spent on Miscellaneous transmission lines during the period is $9.6 million.[82]

One of the main items of expenditure in the Miscellaneous transmission line project account was the introduction of a wood pole replacement strategy which accounts for $7.5 million of the actual expenditure. This strategy was introduced by TransGrid because the current condemnation rate of poles of 0.5 per cent was indicating an average pole life of in excess of 100 years. The ACCC understand that TransGrid commissioned a statistical model based on wider industry knowledge and detailed field data which indicated the condemnation rate would likely rise to 4 per cent in the years 2010 -2020. The wood pole replacement strategy addresses this issue and other long term issues such as the phasing out of timber poles altogether. The ACCC considers that this is a prudent approach to managing the issue of an ageing pole population.

For the additional expenditure for Miscellaneous Transmission Lines, the ACCC at this stage has no evidence which suggests that these investments were not prudent. However, the issue again is that TransGrid appeasr to have seriously under estimated the quantity of work that was eventually carried out.

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[82] The QNI costs allocated to Miscellaneous Accounts total $3.1 million, which should be re-allocated to the QNI account, bringing the actual total expenditure to $151.2 million compared to the Commission's allowance in the first Revenue Cap Decision of $131.8 million.

2.5.3 Transformers Additions and Replacements

In its 25 January 2000 Revenue Cap Decision the ACCC provided an allowance for the Transformer Additions and Replacements category of $2.32 million. TransGrid has claimed an expenditure of $37.8 million.

The ACCC understands that this account is primarily used for transformer replacement works where the existing transformer/s are replaced with larger transformers, the purchase of system spares, and for the replacement of service life expired transformers. The account also contains $10 million for the purchase of the third transformer for the MetroGrid Project and associated switching and cooling equipment. This expenditure should be re-allocated to the MetroGrid account, leaving the actual expenditure on the Transformer Additions and Replacements account at $27.8 million.

The main expenditure in this account was as follows:

- Tumut ($2.1 million) – Replacement of two 30MVA transformers with two 60 MVA transformers. This work was load driven and one of the replaced transformers was scrapped and the other kept as a system spare.

- Queanbeyan ($0.8 million) – A fourth transformer was installed in the substation. he work was load driven.

- Sydney West #5 Transformer ($4.2 million) – The installation of this transformer was load driven.

- Sydney South #5 and #6 Transformers ($9.7 million) – Two service life expired 250MVA transformers were replaced by 375MVA 3 phase transformers.

- Armidale ($3 million) – This transformer had extensive oil leaks and was replaced for environmental reasons.

- System Spares ($2.8 million) – This item include the purchase of 330/132 kV 375 MVA and 132/66 kV 60 MVA system spares.

- Taree and Port Macquarie ($4.1 million) – This item refers to the replacement of four 132/33kV service life expired transformers at Port Macquarie and Taree substations.

The ACCC understands that these replacements were based on either load data or condition based monitoring results and hence considered prudent from an engineering perspective. However, the issue again is that TransGrid appears to have seriously under estimated the quantity of work that was eventually carried out.

2.5.4 Circuit Breakers and Current Transformers

In its 25 January 2000 Revenue Cap Decision the ACCC provided an allowance for the Circuit Breakers and Current Transformers category of $26.7 million. TransGrid has claimed an expenditure of $42.6 million for these.

The ACCC believes that this account is used for charging costs associated with the replacement of circuit breakers and current transformers. TransGrid advised that these works originated as a result of the condition based monitoring program and the fault experience of particular manufacturer's equipment. Furthermore, TransGrid stated that the replacement programs across classes of like equipment are prioritised and scheduled according to the availability of resources and the likely impact of equipment failure.

TransGrid provided the ACCC with a detailed listing of the additional works during the reset period which accounted for the over expenditure which approached $16 million. One of the cases outlined by TransGrid during the reset period involved one type of Tyree current transformers which started to explode in service, TransGrid had to erect barriers around these particular current transformers in order to ensure staff safety and commence a replacement program.

The ACCC considers that the additional works were all associated with asset maintenance strategies and appear to have been technically prudent to execute. However, the issue again is that TransGrid appear to have seriously under estimated the quantity of work that was eventually carried out.

2.5.5 Miscellaneous items – General Comments

The ACCC considers that in many instances, where an allowance was made for refurbishment works in TransGrid's first Revenue Cap Decision, TransGrid has spent substantially more than the allowance. As the ACCC's Decision would have been based on TransGrid's Application this implies that TransGrid seriously underestimated either the quantity or costs of refurbishment work required to be carried out during the period. The ACCC would expect a certain degree of uncertainty when compiling estimates of this nature, but in many cases the project expenditure has exceeded the allowance by substantially more than accepted estimating variations.

The ACCC notes that in these refurbishment accounts there appears to be a large amount of misallocation of expenditure identified. For example the purchase of land for easements should be allocated to the easement account. The ACCC considers that land purchased for substations should be allocated to the account for the construction of that asset. The costs associated with the final completion of major projects seem to end up in one of these miscellaneous accounts when the job number for the project is closed off. Often these completion amounts are substantial and should be placed in a clearance account to be distributed back to the project account when the work is completed. The ACCC highlights that these costs can have a significant impact on final project costs.

2.6 Telecommunications

In its 25 January 2000 Revenue Cap Decision the ACCC provided an allowance for Telecommunications expenditure of $54.85 million. TransGrid has claimed an expenditure of $41.7 million.

The majority of this amount relates to the replacement of TransGrid's microwave radio systems with a fibre optic (OPGW) network. TransGrid has advised that this investment was required because the Australian Government had sold some of the 1.8GHz band which was being occupied by TransGrid.

The main areas of expenditure in this account were:

- Northern Microwave Replacement. Expenditure on this project was $16.6 million.
- Southern Microwave Replacement. Expenditure on this project was $16.8 million.
- Western Microwave Replacement. Expenditure on this project was $5.3 million and the project budget was $5.05 million.
- Telecommunications Network Extension and Electronics. The expenditure on this project was $1.8 million.
- OPGW Backup Northern and Western. The expenditure on this project was $0.9 million.

The ACCC would have expected a vigorous cost-benefit analysis of this major investment. At the least, TransGrid should have provided some justification for the Decision to build its OPGW network rather than lease the capacity from another service provider. The ACCC has not been provided with evidence to indicate any meaningful investment analysis.

The ACCC understands that TransGrid has installed OPGW with either 24 or 12 fibres and that its requirement at this point in time is 12 fibres for the provision of regulated services. TransGrid has advised the ACCC that the remaining fibres could be leased on a commercial basis. The ACCC considers that fibres used for unregulated services should not be included in the regulated asset base. The cost of the fibres which could be leased on a commercial basis is $3.2 million.

2.6.1 Conclusion

At this stage, the ACCC considers it appropriate not to include in the RAB the amount of $3.2 million for the fibres which could be leased on a commercial basis but has rolled in the rest of the investment for Telecommunication assets. The ACCC will continue to examine this investment between the Draft and Final Decisions.

2.7 Yass substation

This section of the Draft Decision sets out the assessment of the prudency of TransGrid's investment in the Yass 330/132kV substation and explains the amount to be included in the regulatory asset base.

The Yass substation project relates to the replacement of two 330/132kV, 200 MVA transformers, one 330kV Reactor and a new 132/66kV transformer at the Yass substation. TransGrid has advised that provisions can be made for a future third transformer[83] The actual cost of the project is $34.3 million.[84] In its 25 January 2000 Revenue Cap Decision the ACCC did not provide an allowance for the Yass substation project.

In 2001, TransGrid conducted an economic assessment which found that due to the aging of the substation it was in urgent need of refurbishment.

The assessment of the Yass projects is set out as follows:

- sub-section one reviews TransGrid's assessment of the need for the project;
- sub-section two reviews whether TransGrid proposed the most efficient project to meet the need; and
- the final sub-section sets out the ACCC's considerations and Decision.

2.7.1 TransGrid's assessment of the need for this project

In this section, the assessment focuses on whether there was a justifiable need for this investment.

The Yass substation is a major 330/132kV TransGrid substation in the supply to the South West of the state and a key network element for the NSW/Victoria/Snowy Mountains power interchange. The substation also supplies the Yass town load and 132kV substations in the Yass-Wagga Area via three 132kV lines.

TransGrid has advised that the reconstruction of the Yass substation was primarily due to the aging of the substation. Further, TransGrid stated that it was having difficulty maintaining the equipment and infrastructure.

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[83] Reference is made throughout the information provided by TransGrid on the Yass substation that provision will be made for a third 330/132kV transformer in case SNI proceeds. TransGrid has advised that the cost estimate provided by TransGrid in respect of the Yass substation does not include any provision for a third 330/132kV transformer. TransGrid further advised that in relation to the 330kV switchbay and switchgear for the proposed 330kV Yass Wagga line which is included in the reconstruction of the Yass substation, that these costs have not been included in the works for the Yass substation project.

[84] TransGrid has spent $7.5 million on the Yass substation in 2002/03. TransGrid propose to spend $23.6 million in the year 2003/04. This is unlikely to occur, hence this expenditure will be deferred to the next regulatory period.

It is quite clear that the refurbishment of the Yass substation was required due to the aging of the assets. The ACCC considers that the condition of the Yass substation presented major risks to staff safety, risks to network stability as a result of the poor fault clearance times of the ageing switchgear, and risks to the operation of the NEM due to equipment failures, in particular an interruption to the NSW/Vic/Snowy interchange.

2.7.2 TransGrid's cost effectiveness assessment

TransGrid considered six options for the reconstruction of the Yass substation and it was decided that the best outcome could be achieved by reconstructing the substation on the existing site.

The ACCC considers that there is no evidence to suggest that the reconstruction of the substation on the existing site was not the best option. Further, the ACCC considers that TransGrid's classification of the project as a replacement not an augmentation is appropriate. The ACCC notes that in relation to the 330/132kV transformers which are currently rated at 150MVA, a like for like replacement would now involve replacing these transformers with 200 MVA units as they are the closet stock available.

2.7.3 ACCC's consideration and conclusion

The ACCC believes it is quite clear that the refurbishment of the Yass substation was required.

The ACCC notes that for TransGrid's first revenue cap it did not apply for an allowance for the Yass substation. The ACCC considers that given the large expenditure and the obvious need to reconstruct the Yass substation, TransGrid should have forecasted this project whilst applying for its first revenue cap. This issue is further highlighted by the fact that TransGrid proposed the replacement of the Yass substation in the 2000 NSW Annual Planning Statement[85], only having been set a revenue cap by the ACCC the previous year. In saying this, the ACCC does recognise that TransGrid has addressed some of the forecasting issues by developing the 30 year Network Management Plan.

2.8 Sydney West Static Var Compensator

This section sets out the assessment of the prudency of TransGrid's investment in the Sydney West Static Var Compensator (SVC), and the amount to be included in the regulatory asset base.

The Sydney West SVC is a replacement project, which involves the installation of a new 330kV switchbay and the installation of a SVC is to replace two synchronous condensers at the Sydney South substation. In the ACCC's 2000 Revenue Cap Decision, no provision was made for this project.

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[85] NSW Annual Planning Statement APR 2000, pg. 40.

The assessment of this project is set out as follows:

- section one reviews TransGrid's assessment of this need for this project;
- section two reviews TransGrid's cost/benefit assessment for the SVC and compares the actual project to that assessed in the cost/benefit assessment; and
- the final section sets out the ACCC's consideration and conclusions on the prudency of TransGrid's investment in the Sydney West SVC and the amount to be included in the RAB.

2.8.1 TransGrid's assessment of the need for this project

In this section, the assessment focuses on whether there was a justifiable need for the SVC.

The ACCC understand that the two synchronous condensers at Sydney South substation have been in service since 1962.[86] The synchronous condenser equipment is ageing and replacement spares are not available, thus expensive modifications are required to keep the units in service.[87] The 16kV switchgear is also reaching the end of its service life and spare parts and control valves are no longer available. TransGrid has advised that the requirements in both staff time and material costs were rising whilst service availability of the condensers was falling.

The issue in establishing the need for the SVC is to determine whether there will be an affect on voltage support if the synchronous condensers are not functioning. The SVC currently operating at Kemps Creek provides voltage support at times of NSW exports, overcoming transient stability limitations. However, a conflict may arise where it is required for both transient stability control but is also essential for voltage support at the same time. Thus there is a need for an additional dynamic source of reactive power.

System studies were undertaken by TransGrid, which showed a need for approximately 150Mvar of additional dynamic capacitive power support in Sydney. Furthermore, planning studies undertaken by TransGrid indicate that by summer 2002/03 there would be of the order of 500MW of load at risk on the system unless an SVC is installed.

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[86] Since commissioning in 1962 the synchronous condensers at Sydney South have undergone extensive refurbishment. The cost of these works has exceeded $3.5 million.

[87] The stator windings are insulated using a bitumastic compound and there are indications that this insulation is breaking down and hence requires continual monitoring. The estimated cost to rewind the stators is $4 million.

The ACCC concludes that the synchronous condensers need to be replaced given that they appear to be at the end of their life, and the SVC at Kemps Creek is not sufficient to ensure both voltage support and transient stability in NSW.

2.8.2 Economic assessment and the actual constructed project

This section of the assessment examines the way in which TransGrid determined the most efficient project to meet the need. The ACCC notes that this project is classified as a project replacement. This means that the ACCC, under the Code, is not required to conduct a Regulatory Test assessment and consult with interested parties through the Code consultation procedures outlined in clause 5.6 of the Code. However, an economic assessment was undertaken by TransGrid to determine the appropriate option to meet the need.

Three options were considered in TransGrid's cost/benefit review, including:

- do nothing – maintain synchronous condensers and limit sustainable system loading;
- maintain synchronous condensers in service, and install a small SVC; and
- retire the synchronous condensers and install a 280 Mvar SVC[88]

Based on its assessment, TransGrid considered that the third option provided the lowest total cost. Furthermore, TransGrid considered that the SVC would enable continued support of the NSW load, and the synchronous condensers have a limited life and would ultimately need to be replaced with a modern alternative. TransGrid subsequently undertook the installation of the SVC, and due to space and environmental considerations, decided to install the SVC at Sydney West instead of Sydney South.

A recurring theme in TransGrid's assessment is that the cost of network options in an economic assessment in most occasions differs significantly to the actual cost after implementation of the project. This is also the case for this project. The SVC installation was expected to cost $15-$18 million, and was based on TransGrid's experience with the Armidale SVC installation. However, the actual cost of the SVC installation ($24.5 million) is at least $6.5 million above that estimated in TransGrid's cost/benefit assessment.

When the actual cost of the selected option was included in the cost/benefit assessment, the second and third option would have had similar total costs. That said, TransGrid's preferred option was to replace the synchronous condensers rather than augment the system with a smaller SVC due to the difficulty in maintaining the

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[88] High level consideration of other options was noted in TransGrid's cost/benefit report. This included demand side management, local generation, transmission line development, and reactive power installation in local distributor systems. However, these options were not considered to be appropriate by TransGrid. Based on the information provided by TransGrid, the Commission concurs with this Decision at this stage of its review.

existing synchronous condensers due to higher maintenance costs. Furthermore, the replacement of the synchronous condensers is advantageous where the system power transfer capability is constrained. Therefore, while the actual cost of the developed project has turned out to be much higher than that established in the cost/benefit assessment, this is unlikely to have affected the investment Decision. The ACCC therefore considers, based on the information before it at this stage of its review, that the appropriate project was developed.

2.8.3 ACCC's consideration and conclusions on the prudency of this project

The ACCC considers that there was a genuine need to replace the synchronous condensers given that they were at the end of their service lives, and spares are not available thus expensive modifications would be required to keep the units in service. The ACCC considers that the Decision to replace the synchronous condensers with the modern equivalent SVC was also appropriate. The ACCC therefore proposes to roll in the final cost of the SVC of $24.5 million into the RAB.

2.9 Other Sydney Projects

The ACCC understands that the Other Sydney Projects category involves works such as the instalment of security equipment such as closed television cameras and motion detectors at substation sites.[89] In its Application, TransGrid proposed to spend $11.1 million on this project in 2003/04. The Other Sydney Projects is part of a much wider security program estimated by TransGrid to cost $54.6 million over six years commencing in 2003/04.

TransGrid provided information on the wider security program which claims that $4.6 million rather than $11.1 million will only be spent in 2003/04.The ACCC therefore concludes that the amount to be rolled into the asset base at this time is $4.6 million.

2.10 Information Technology (IT) Expenditure

This section of the Draft Decision sets out the assessment of the prudency of TransGrid's information technology capital expenditure, and sets out the amount to be included into the regulatory asset base.

The IT capex consists of five items:

- computer application enhancements – $20.9 million;
- computer equipment – $16.4 million;

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[89] The ACCC understands that TNSPs have formed a working group under the auspices of the Electricity Supply Association of Australia (ESAA) to develop a guide on security arrangements for substations. This has been a reaction to events such as September 11 and the heightened awareness of terrorism by governments in Australia re-appraising the security arrangements for critical infrastructure. In order to abide by these guidelines TransGrid has commenced installing security equipment such as closed television cameras and motion detectors at its substations.

- corporate data network - $8.4 million;
- state records and security upgrades - $3.9 million; and
- storage, server and PC upgrades - $6.9 million.

TransGrid's total spend on IT over the current regulatory control period (1999/00 to 2003/04) amounts to $55.5 million. This compares to the ACCC's 2000 revenue cap allowance of $16.8 million for IT capex.

The assessment of these projects focuses on whether there was a need for TransGrid to undertake this expenditure, and whether the most economical solution was undertaken to meet the need. The final section sets out the ACCC's consideration and conclusions with respect to the prudency of these projects.

2.10.1 TransGrid's assessment of the need for these projects

The ACCC understands that during the period to 2000, the internal focus of TransGrid was on consolidating the legacy systems inherited from Pacific Power. For the period to 2002, the focus was on developing and exploiting these systems. From 2002 onwards, TransGrid had an IT Strategic Plan 2000-2004, which outlined an integrated basis for future developments of IT systems within TransGrid.

The ACCC considers, consistent with GHD's findings, that to some extent, TransGrid needed to respond to a changing external environment, with old systems and hardware becoming obsolete and unsupported by suppliers and service providers. Furthermore, changes by public communication carriers for landline and microwave links necessitated a review of network connections, with extension of the TransGrid optical fibre (OPGW).[90]

The ACCC notes that the need for significant IT investment is attributable to the replacement of the hardware and IT systems due to obsolescence, and to improve system integration and system response, and standardisation and developing network connections and web-based systems. Therefore the need for IT expenditure over the current regulatory period appears to be justified.

2.10.2 Business case justification

This section of the assessment examines the way in which TransGrid determined the most economic and efficient project to meet the need.

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[90] The Commission's assessment of the prudency of TransGrid's investment in telecommunications is assessed under the replacement capex category.

While no specific business cases were presented, TransGrid provided an IT benchmarking study undertaken by KPMG in 2002.[91] The study shows that TransGrid's IT proportion of total capex was slightly below average for the group (5.3 per cent vs 6.5 per cent), and TransGrid had a high proportion of total IT budget allocated to capex compared to other utilities (52 per cent vs 28 per cent). This information does not show that TransGrid's IT spend over the current regulatory period is efficient, but that TransGrid's IT budget allocated to capex is high.

Furthermore, the ACCC notes that a 2003 review of TransGrid's IT Governance Strategy was undertaken by Business Catalyst International. The review highlighted that the past focus on the objectives of rationalization of IT infrastructure and legacy systems and improving service delivery had largely been achieved or were being addressed by current projects. However, the report also noted that TransGrid had not progressed to achieving improved business performance from IT investment and that the IT infrastructure group delivered minimal improvement.

The ACCC highlights the significant difference between the ACCC's 2000 revenue cap allowance and the outturn expenditure for this line item. In the ACCC's 2000 revenue cap, an allowance of $16.8 million was provided for IT expenditure. The ACCC notes that such an allowance would have been based on TransGrid's estimate for this line item. However, as has been seen with a number of line items, the outturn capex was greater than the ACCC's allowance ($55.5 million). The ACCC considers that the costs of a number of these projects should have been foreseen at the time of TransGrid's last revenue cap Application, given that at that time TransGrid was reviewing its internal IT Strategy.

The ACCC notes that the information before it at this time of the review suggests that TransGrid's IT spend is high when compared to other utilities. The ACCC has not been provided with evidence which indicates that the IT spend is prudent and efficient.

2.10.3 ACCC's consideration and conclusion

Based on its assessment at this stage of the review, the ACCC considers that TransGrid has been able to justify that there was a need to implement such IT expenditure in the current regulatory period due to the need to replace hardware equipment and upgrade due to obsolescence to ensure continuity, improve system integration and system response. While no explicit business cases were presented which outlined the cost and benefits of the implementation of these projects, benchmarking information provided by TransGrid shows that TransGrid's IT proportion allocated to capex is high compared to other utilities. The ACCC has not been provided with evidence to indicate that TransGrid's IT spend is prudent and efficient. At this stage the ACCC has rolled in the total amount but will examine this further between the Draft and Final decisions.

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[91] The benchmarking study comprised 13 Australian water, electricity and gas businesses).

2.11 Motor Vehicles

In its 25 January 2000 Revenue Cap Decision, the ACCC provided an allowance for Motor Vehicles expenditure of $30.9 million. TransGrid has claimed an expenditure of $37.4 million.

The ACCC understands that TransGrid's expenditure over the current regulatory period for Motor Vehicles is the actual purchase cost of the cars. The ACCC understands that TransGrid has only capitalised the net cost of the motor vehicles that is the purchase cost ($37.4 million) less the trade-in-value. This calculation is evident in Attachment 8 of TransGrid's Application. The net cost of the motor vehicles is the actual "cost of service" for the motor vehicles which consumers should be paying for, not the purchase cost.

The ACCC found that vehicles for private use which are funded through salary sacrifice arrangements are also included in the expenditure on vehicles. The ACCC considers that the use of private vehicles should be considered unregulated assets and the value excluded from the approved amount. The net value of the private use vehicles (purchase cost less trade-in value) for the current regulatory period is in the order of $0.9 million. The ACCC therefore considers it appropriate to not include $0.9 million into the regulated asset base.

2.12 South Australia – NSW Interconnector

In its 25 January 2000 Revenue Cap Decision, the ACCC did not provided an allowance for South Australia – NSW Interconnector (SNI). TransGrid has claimed an expenditure of $11.2 million.

Given that the SNI project is unlikely to proceed, the ACCC is currently considering whether the costs incurred during the current regulatory period ($11.2 million) should be treated as a capital cost or as an expense.

Appendix 3 Pass through rules

3.1 Introduction

Under the Code, the ACCC is required to administer an incentive-based form of regulation. Incentives are created for managers to pursue ongoing efficiency gains through controlling their expenditures. However, some costs are essentially uncontrollable by nature and therefore cannot properly be subject to the same incentive measures.

Cost pass-throughs provide a mechanism for dealing with this problem. As an alternative to receiving an allowance in its cash flows, a TNSP may transfer the financial impact of the event to parties that are better placed to handle those costs.

The ACCC envisages that the range of potential pass through events will be limited. It seeks to achieve a balance between the interests of TNSPs and customers, with no windfall gains or losses accruing TNSPs as a result of events beyond their control.

The remainder of this chapter:

- discusses the general operation of pass-through mechanisms;
- summarises the Draft Decision concerning the pass-through events to be allowed as well as the information considered in arriving at that conclusion. This includes:
  - TransGrid's pass-through proposal;
  - submissions by interested parties;
- sets out the considerations relevant to this Decision; and
- presents the conclusions for the purposes of the Decision.

3.2 General operation of pass through mechanisms

In assessing a proposed pass through mechanism as part of a revenue cap, the ACCC is guided by, amongst other things, the objectives in clause 6.2.2, principles in clause 6.2.3 and mechanism in clause 6.2.4 of the Code. These provisions suggest that, in general, pass through events should have the following characteristics:

- the event should be identified in advance with its scope precisely defined, this enables the following tests to be applied and is considered necessary for good, transparent regulation. A high degree of certainty is provided where the ACCC and the TNSP agree up front on the events to be covered by pass through arrangements.
- the event should be beyond the control of the TNSP, these are exogenous, unpredictable events, the cost of which cannot be built into the TNSP's expenditure forecasts, requiring an alternative mechanism to deal with them.

- the financial impact of the event should be material. These are the type of events that may occur infrequently but can have a significant financial impact on the business. Setting a materiality threshold limits the applications a TNSP can make for the purposes of administrative efficiency.

- the event affects the TNSP, and not the market generally, systematic or market risk should be addressed in the WACC parameters.

- the financial impact of the event is better borne by parties other than the TNSP. By its nature a pass-through transfers risk to other parties. This will only be appropriate where the TNSP cannot reasonably be expected to bear the risk itself, for example, in the case of uncontrollable events that may affect the commercial viability of the business.

The following matters are, in general, important features of an efficient and equitable pass-through mechanism:

- the ACCC reserves the right to initiate pass through reviews at its discretion.

- the pass through mechanism should accommodate both positive and negative amounts in the interests of both TNSPs and customers.

- a 40 business day assessment period to allow full assessment of pass through event applications, including public consultation where appropriate, to be undertaken by the ACCC. The ACCC, at its discretion, may also extend this period to adequately assess pass through proposals.

- the provision by the TNSP of detailed documentary evidence in support of any pass through application. Sufficient detailed information must be provided which substantiates that the aggregate costs facing the TNSP have increased or decreased as a consequence of the claimed pass through event. This information should also be placed in the public domain, subject to confidentiality.

- all or part of the cost should not be passed on if the TNSP, through an imprudent act or omission, caused or aggravated the pass through event.

- a TNSP must annually (at least 50 business days prior to the start of the financial year) provide the ACCC with a copy of insurance premium invoices, irrespective of whether a pass-through event application has been submitted in that year.

3.3 TransGrid's pass through rules as originally proposed

TransGrid proposes that the pass through mechanism would operate for five categories of events:

- a Change in Taxes Event;

- a Service Standards Event;

- an Insurance Event;

- an Unforseen External Event (including, but not limited to, events caused by terrorism); and

- Grid Support payments.

TransGrid's proposed pass through rules were originally detailed in its Application to the ACCC on 26 September 2003.

On 26 March, TransGrid provided amended pass through rules which included proposals for three new pass through events and argued as follows:

- Accounting Standards event. Changes in Accounting Standards are external events over which TransGrid has no control, but which can have very significant impacts on the costs of capturing, recording, processing and reporting management and financial information. As such TransGrid proposes that changes in Accounting Standards which have a material impact on its costs should be eligible for pass through.

- Easements risk. This pass through would cover events which resulted in cost changes arising from changes in the use of land relating to easements. There are a range of easement risk events proposed by TransGrid.

- NewVic 3500. This is a proposed capex project which was mentioned as a possible pass through by TransGrid. Detailed information has not yet been forwarded to the ACCC on this matter.

3.4 Submissions by interested parties on TransGrid's Application

The ACCC received submissions on TransGrid's proposed pass through arrangements from Ergon Energy and the Energy Markets Review Forum (EMRF).

The EMRF does not agree with the implementation of a cost pass through mechanism for unexpected costs. It considers that to allow this will take away any incentive by TransGrid to minimise operational costs and runs counter to the exposure within which businesses in a competitive environment operate. Where there is competition, there is no pass through of costs, as each enterprise seeks to maintain or enhance its market position.

Ergon Energy has concerns about unlimited pass through of costs during the regulatory period and considers that cost pass throughs should only be allowed in exceptional circumstances. A pass through should not be used to recover losses incurred as a result of poor management, growth forecasts or inadequate risk/insurance cover.

3.5 ACCC's considerations

The ACCC has assessed TransGrid's proposed pass through arrangements against the general considerations detailed above, which focus on events that are essentially uncontrollable, unpredictable, material in financial impact and which are particular to the TNSP itself.

The ACCC has assessed TransGrid's proposals against the general considerations detailed above, which focus on events that are essentially uncontrollable, unpredictable, material in financial impact and which are particular to the TNSP itself. The ACCC has also considered TransGrid's proposals in the light of its recent Transend, Murraylink and SPI PowerNet decisions.

For the purposes of this Decision, pass-throughs have been approved for:

- a Change in Taxes Event;
- a Service Standards Event;
- a Terrorist Event;
- an Insurance Event; and
- Grid Support Payments.

The precise wording of the pass through rules to be included in the revenue cap will need to be settled prior to the ACCC's Final Decision.

Exclusion of certain events as pass-through events

The following pass through events have not been approved:

Unforseen External Event

The definition of an external event is ambiguous and broad in scope. It does not comply with the ACCC's guideline that a pass through event must be identified in advance with its scope precisely defined. Hence, it is difficult to assess whether the external event is beyond the control of the TNSP, financially material, non-systematic, better borne by parties other than the TNSP and in line with Code objectives and principles. It is also not clear that there is no overlap between the external event pass through and other risk management strategies.

The scope of pass through events should be as specific as possible to ensure that the provision does not lead to later uncertainty over whether an event is admissible or not. For this reason, the ACCC rejects the external event pass through provision; in favour of maintaining the more precisely defined terrorism event and application thereof, as specified in the amended pass through rules, consistent with recent Murraylink, Transend and SPI PowerNet decisions.

Accounting standards

The proposed Accounting Standards Event has not been approved given that such changes standards are typically raised sufficiently in advance of implementation to enable a prudent TNSP to plan for any changes. The costs of such changes could therefore be incorporated as opex or capex.

Easement risk

Easement risk has not been approved as a pass through event. This is because the planning for and purchase of easements typically occurs years in advance of the project for which they are intended and a prudent TNSP should have sufficient time to make any necessary adjustments to spending to account for these changes.

New Vic 3500

The ACCC has not received material supporting a pass-through for New Vic 3500. The Commission expects forward capex issues to be dealt with in TransGrid's Supplementary Application later this year.

Appendix 4 Financial indicators

4.1 Code requirement

The Code requires that the ACCC consider various issues when setting a revenue cap for a TNSP. One requirement when considering the TNSPs revenue requirement is "any other financial indicators" as prescribed by clause 6.2.4(c)(9) of the Code.

> *"6.2.4 (c) In setting a separate revenue cap to be applied to each Transmission Network Owner and/or Transmission Network Service Provider (as appropriate) in accordance with clause 6.2.4(b), the ACCC must take into account the revenue requirements of each Transmission Network Owner and/or Transmission Network Service Provider (as appropriate) during the regulatory control period, having regard for:*
>
> *(1) ……*
>
> *(9) any other relevant financial indicators."*

4.2 Previous financial indicator analysis

In previous Revenue Cap Decisions the ACCC has calculated and analysed various financial indicators. The purpose of this analysis was to predict the impact of the allowed revenue on the TNSP's ability to obtain credit. Consistent with previous revenue caps, table 4.1 provides the same financial indicators based on TransGrid's AR.

Table 4.1 assumes a business profile of above average[55], which results in a minimum credit rating of 'A'. Hence the ACCC believes that its revenue cap for TransGrid will not adversely affect either the ongoing financial viability or TransGrid's ability to access capital markets.

The estimated credit ratings are set on the basis of the Standard's and Poor's ratings shown in Table 4.3. The individual financial ratios have been calculated using the formulae in Table 4.2.

The ACCC is satisfied that, by setting an appropriate WACC, it has already addressed TransGrid's ability to obtain credit. In determining TransGrid's WACC, the ACCC has benchmarked TransGrid's gearing at 60 per cent and sets the debt margin based on a benchmark credit rating of 'A'.

The ACCC considers that TransGrid's credit rating is likely to be above that suggested in Table 4.1 because of the stability of its earnings and the lack of competitors for its services.

Table 4.1 Financial Indicators

	2004/05	2005/06	2006/07	2007/08	2008/09
EBIT to Revenues (%)	72.69	73.77	74.81	75.80	77.06
EBITD to Revenues (%)	84.36	86.48	88.42	89.08	90.85
EBIT to Funds Employed (%)	10.76	11.10	11.18	10.99	11.01
EBIT to regulated assets (%)	10.76	11.10	11.18	10.99	11.01
Pre-tax interest cover (times)	2.65	2.74	2.76	2.71	2.71
Funds Flow Net Interest Cover (times)	3.08	3.21	3.26	3.18	3.20
S&P Rating Above average business profile	BBB	BBB	A	BBB	BBB
S&P Rating Excellent business profile	A	A	AA	A	A
Funds Flow Net Debt Pay Back (years)	7.12	6.70	6.56	6.78	6.73
S&P Rating Above average business profile	BB	BBB	BBB	BBB	BBB
S&P Rating Excellent business profile	A	A	A	A	A
Internal Financing Ratio (%)	124.20	91.63	71.98	82.69	91.01
S&P Rating Above average business profile	AAA	A	BBB	BBB	A
S&P Rating Excellent business profile	AAA	AA	A	AA	AA
Gearing	0.6	0.6	0.6	0.6	0.6
Payout Ratio	14.50	14.50	14.50	14.50	14.50

Table 4.2 Financial ratio formulae

EBIT/funds employed	Earnings Before Interest and Tax/(debt + equity)
Dividend payout ratio	Dividends/Net Profit After Tax (NPAT)
Funds flow interest cover	(NPAT + depreciation + interest + tax)/interest
Funds flow net debt pay back	(Debt - (investments + cash))/(NPAT + depreciation)
Internal financing ratio	(NPAT + depreciation - dividends)/capex
Pre-tax interest cover	EBIT/interest
Gearing	Debt/(debt + equity)

Table 4.3 Standard and Poor's key indicators

Utility business profile	Funds flow interest cover (times)				Funds flow net debt payback (years)				Internal financing ratio (per cent)			
	AAA	**AA**	**A**	**BBB**	**AAA**	**AA**	**A**	**BBB**	**AAA**	**AA**	**A**	**BBB**
Excellent	4.00	3.25	2.75	1.50	4.0	6.0	9.0	12.0	100	70	60	40
Above average	4.25	3.50	3.00	2.00	3.5	5.0	7.0	9.0	100	80	70	50
Average	5.00	4.00	3.25	2.50	3.0	4.0	5.5	7.0	100	100	90	55
Below average	-	4.25	3.50	3.00	-	4.0	5.5	7.0	-	100	100	75
Vulnerable	-	-	4.00	3.50	-	-	4.0	6.0	-	-	100+	90

Note:
AAA Extremely strong capacity to meet financial commitments.
AA Very strong capacity to meet financial commitments.
A Strong capacity to meet financial commitments but somewhat susceptible to adverse economic conditions and changes in circumstances.
BBB Adequate capacity to meet financial commitments but more susceptible to adverse economic conditions however is not considered vulnerable.
Ratings in the BB, B, CCC, CC and C categories are regarded as having significant speculative business, financial and economic conditions.

Appendix 5 Calculating the financial incentive

When calculating 'S', the following equations should be used.

Where S = S1 + S2 + S3 + S4+ S5 + S6.

For each individual performance measure, **S = Gradient x Performance + Intercept**. TransGrid's TNSP's performance against these measures will determine whether 'S' will be calculated as a bonus or penalty.

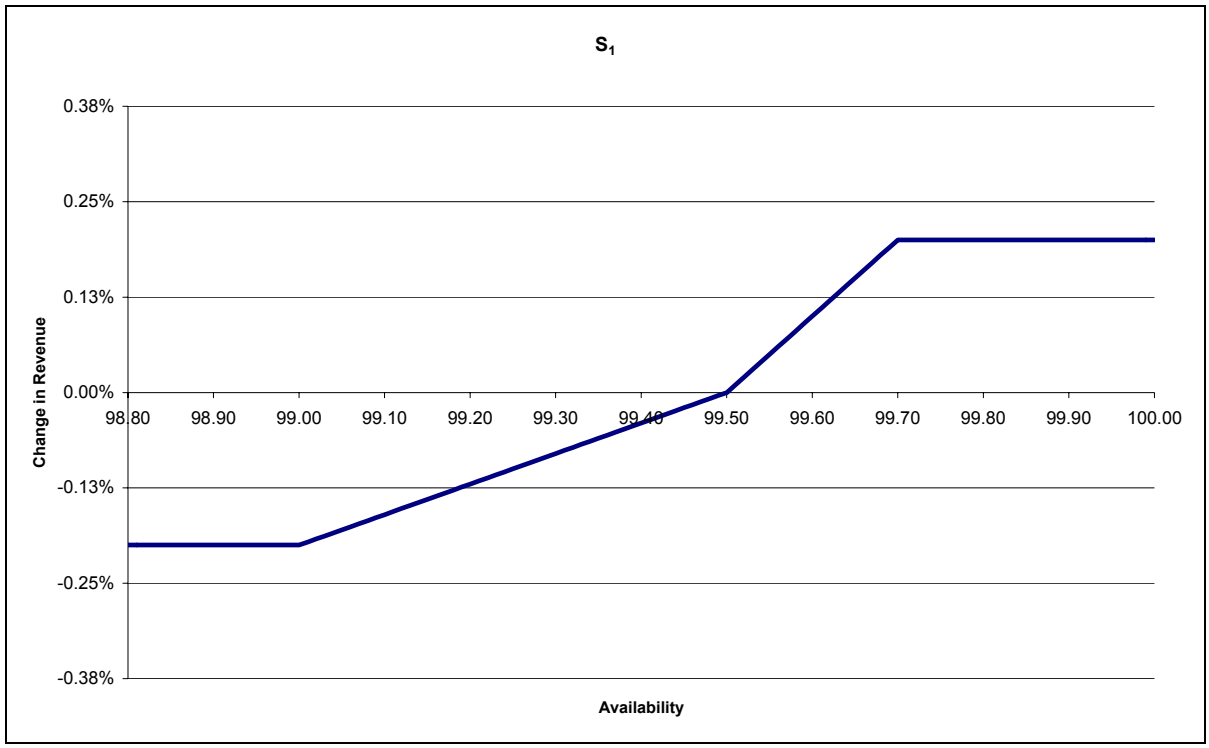
The equations for each individual performance measure are given in the tables below.

S1 = Transmission line availability

% change in MAR	=	Gradient	x	Performance	+	Intercept	Where:				
0.0020									Availability		99.70
0.0008	=	0.004	x	99.69	+	-0.3980	99.00	<	Availability	=<	99.50
0.0000							99.50	<	Availability	=<	99.50
0.0019	=	0.010	x	99.69	+	-0.9950	99.00	<	Availability	=<	99.70
-0.0020									Availability		99.00

The financial incentives for TransGrid's performance in relation to Transmission Line Availability, as implied by the above equation, are demonstrated in Figure 5.1.

Figure 5.1 Financial incentive curve - Transmission Line Availability

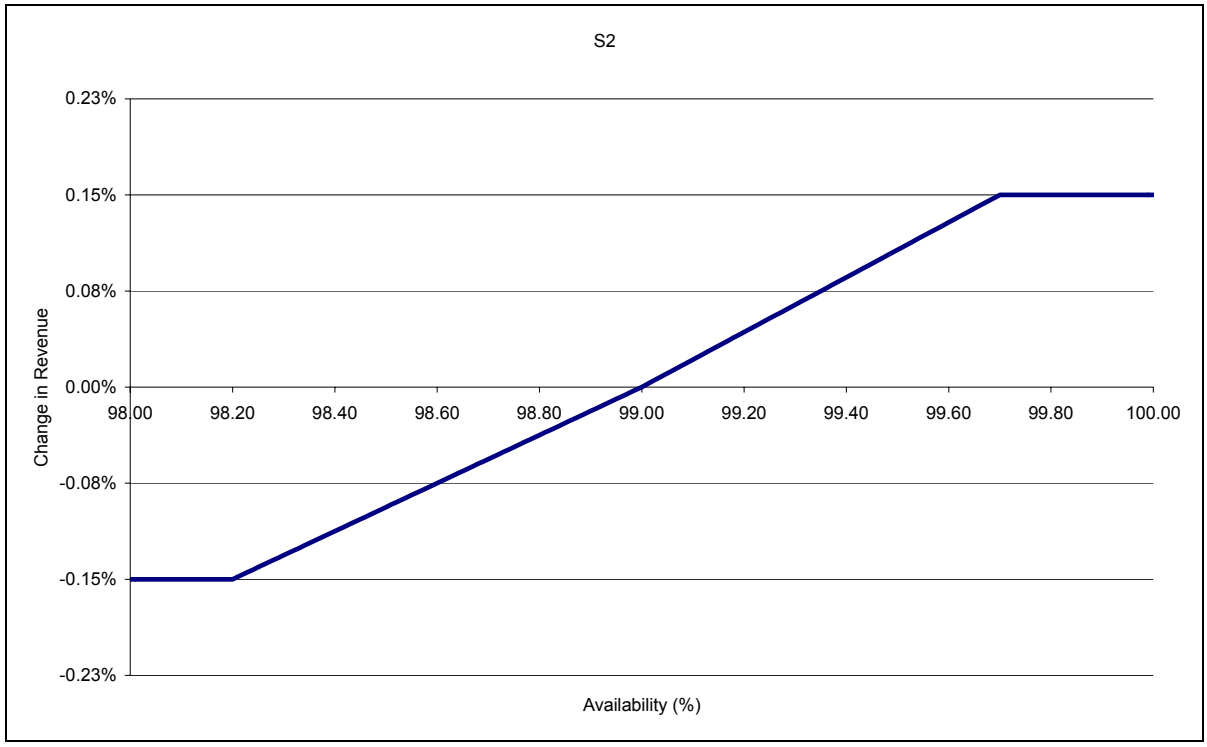


S2 = Transformer availability

% change in MAR	=	Gradient	x	Performance	+	Intercept	Where				
0.0015					+				Availability		99.70
0.0021	=	0.00214	x	100.00	+	-0.212143	99.00	<	Availability	=<	99.70
0.0000							99.00	<	Availability	=<	99.00
0.0019	=	0.00188	x	100.00		-0.185625	98.20	<	Availability	=<	99.00
-0.0015									Availability		98.20

The financial incentives for TransGrid's performance in relation to Transformer Availability, as implied by the above equation, are demonstrated in Figure 5.2.

Figure 5.2 Financial incentive curve - Transformer Availability

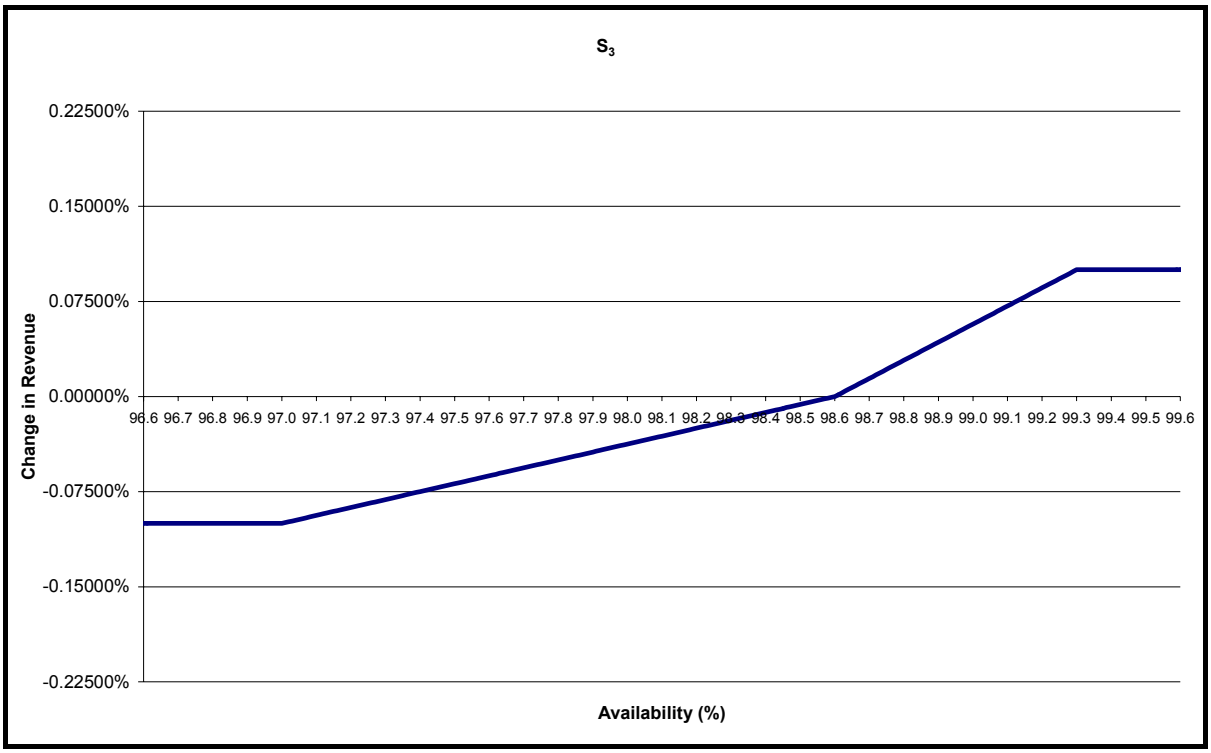


S3 = Reactive plant availability

% change in MAR	=	Gradient	x	Performance	+	Intercept	Where				
0.0010									Availability		99.30
0.0020	=	0.00143	x	100.00	+	-0.140857	98.60	<	Availability	=<	99.30
0.0000							98.60	<	Availability	=<	98.60
0.0009	=	0.00063	x	100.00	+	-0.061625	97.00	<	Availability	=<	98.60
-0.0010									Availability	<	97.00

The financial incentives for TransGrid's performance in relation to Reactive Plant Availability, as implied by the above equation, are demonstrated in Figure 5.3.

Figure 5.3 Financial incentive curve - Reactive Plant Availability

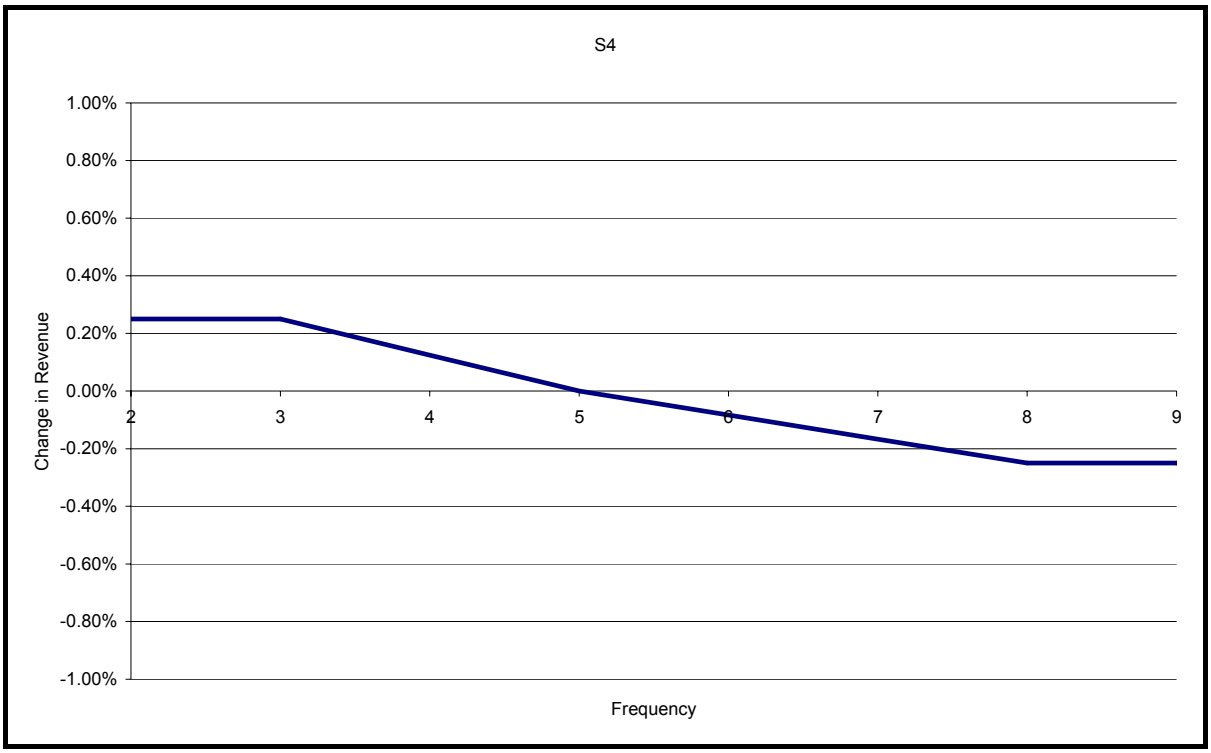


S4 = Reliability (Events >0.05 system minutes)

% change in MAR	=	Gradient	x	Performance	+	Intercept	Where				
0.0025									Frequency		3.00
-0.0063	=	-0.00125	x	10.00	+	0.006250	3.00	>	Frequency	>=	5.00
0.0000							5.00	>	Frequency	>=	5.00
-0.0042	=	-0.00083	x	10.00	+	0.004167	5.00	>	Frequency	>=	8.00
-0.0025									Frequency	>	8.00

The financial incentives for TransGrid's performance in relation to Reliability Events (> 0.05 system minutes), as implied by the above equation, are demonstrated in Figure 5.4.

Figure 5.4 Financial incentive curve - Reliability Events (> 0.05 system minutes)

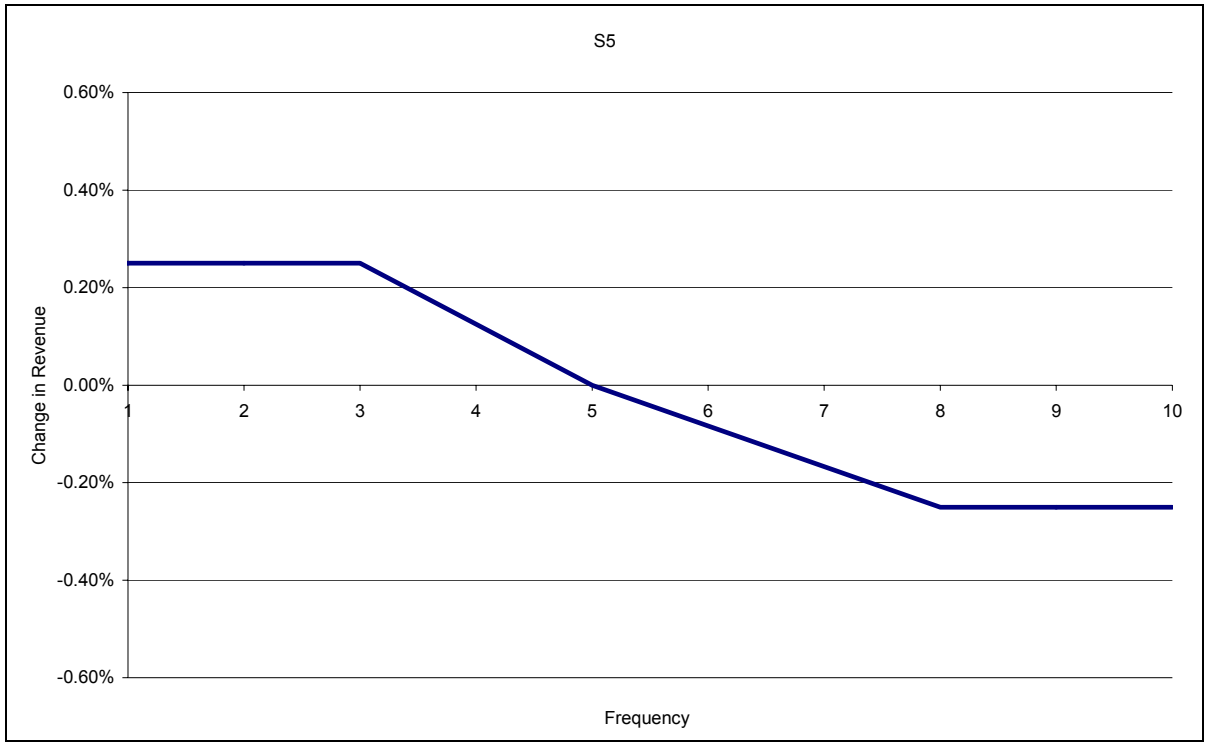


S5= Reliability (Events >0.4 system minutes)

% change in MAR	=	Gradient	x	Performance	+	Intercept	Where				
0.0020	=								Frequency	<	0.00
-0.0080	=	-0.00200	x	5.00	+	0.0020	0.00	>	Frequency	>=	1.00
0.0000							1.00	>	Frequency	=	1.00
-0.0080		-0.00200	x	5.00	+	0.0020	1.00	>	Frequency	>=	2.00
-0.0020									Frequency	>	2.00

The financial incentives for TransGrid's performance in relation to Reliability Events (> 0.04 system minutes), as implied by the above equation, are demonstrated in Figure 5.5.

Figure 5.5 Financial incentive curve - Reliability events (> 0.04 system minutes)

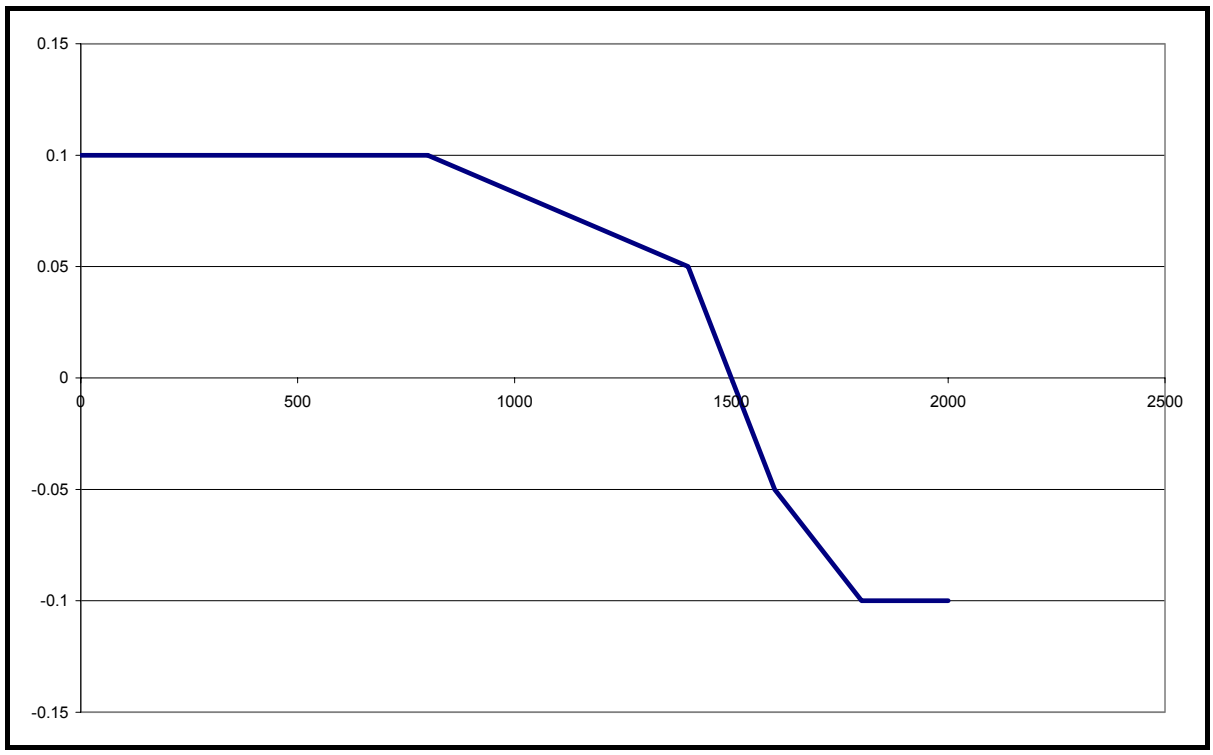


S6 = Average Outage Restoration Time (7 day cap per event)

% change in MAR	=	Gradient	x	Performance	+	Intercept	Where				Duration
0.0010	=		x					>=	Duration	<	800.00
0.0167	=	-0.00008333	x	1800	+	1.6666667	800.00	>	Duration	>	1400.00
-0.1500		-0.00050000	x	1800	+	0.75000000	1400.00	<	Duration	>=	1600.00
0.0000		-0.00025000		1800	+	0.45000000	1600.00		Duration	>=	1800.00
-0.0010									Duration	>=	1800.00

The financial incentives for TransGrid's performance in relation to Average Outage Restoration Time, as implied by the above equation, are demonstrated in Figure 5.6.

Figure 5.6 Financial incentive curve - Average Outage Restoration Time



Total S factor

As noted above, the total 'S' factor is equal to the sum of the individual 'S' factors for each performance target. According to the performance measures that have been recommended by GHD, the total 'S' factor is 0.0101%.

Appendix 6 Forecast indicative timetable for the assessment of TransGrid's Application and Supplementary Application

Early May 04	ACCC releases Draft Decision on TransGrid's initial Application and invites submissions. Interested parties have 14 days from the release of the Draft Decision to request a public forum.
Early July 04	Close of submissions on Draft Decision.
End October 04	TransGrid resubmits future capex application. ACCC releases TransGrid's revised application for public consultation.
Mid December 04	ACCC releases consultant's report on TransGrid's Application for public consultation.
Mid January 05	Close of submissions on TransGrid's Application and consultant's report.
Mid February 05	ACCC releases Supplementary Draft Decision and invites submissions.
Early March 05	Public forum on Supplementary Draft Decision (if requested).
End March 05	Close of submissions on Supplementary Draft Decision.
Mid April 05	ACCC releases Final Decision.