Draft Decision

Tasmanian Transmission Network Revenue Cap 2004-2008/09

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Contents

Glossary

ACCC	The Australian Competition and Consumer Commission
ACG	Allen Consulting Group
AR	Allowed Revenue
Aurora	Aurora Energy Pty Ltd
Basslink	Basslink Pty Ltd
Capex	Capital Expenditure
CAPM	Capital Asset Pricing Model
code	National Electricity Code
CPI	Consumer Price Index
DRP	Draft Statement of Principles for the Regulation of Transmission Revenues
EAG	Energy Action Group
EBIT	Earnings Before Interest and Tax
EUAA	Energy Users Association of Australia
GHD	GHD Pty Ltd
GWh	Giga Watt hour
HEC	Hydro-Electric Corporation
IDC	Interest During Construction
kV	Kilovolt
MAR	Maximum Allowed Revenue
MEG	Major Employers Group
Meritec	Meritec Pty Ltd
MNSP	Market Network Service Provider
MRP	Market Risk Premium
MW	Mega Watt
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NOCS	Network Operation Control System
NPV	Net Present Value
Opex	Operating and Maintenance Expenditure
OPGW	Overhead Powerline Ground Wire
OTTER	Office of the Tasmanian Energy Regulator
RAB	Regulatory Asset Base
RNPP	Reliability and Network Planning Panel
S&P	Standard and Poor's
SKM	Sinclair Knight Merz
SPS	System Protection Scheme
TCCI	Tasmanian Chamber of Commerce and Industry
TEC	Tasmanian Electricity Code
TNSP	Transmission Network Service Provider
TPA	Trade Practices Act 1974
Transend	Transend Networks Pty Ltd
TWEM	Tasmanian Wholesale Electricity Market
WACC	Weighted Average Cost of Capital

1 Executive summary

1.1 Introduction

1.1.1 Legal framework

Tasmania intends to join the National Electricity Market (NEM) in 2005.

The Australian and Tasmanian governments have agreed that the Australian Competition and Consumer Commission (ACCC) will regulate Transend Networks Pty Ltd's (Transend) revenue prior to Tasmania's entry into the NEM.

Chapter 6, Part B of the National Electricity Code (code) specifies that the ACCC will regulate the revenues of Transmission Network Service Providers (TNSPs) in the NEM and sets out the relevant principles and mechanisms.

As Tasmania is not expected to enter the NEM until 2005, the provisions of Chapter 6 Part B of the code do not yet apply. Instead, the ACCC will set a revenue cap for Transend in accordance with the Tasmanian Electricity Code (TEC). However, the TEC has been amended to include provisions similar to chapter 6 Part B of the code, so the revenue cap will be consistent with the requirements of the code once Tasmania joins the NEM.

This means that for all practical purposes the ACCC will apply the same regulatory regime to Transend that it applies to mainland TNSPs. Once Tasmania enters the NEM the ACCC will regulate Transend's revenue under the code.

1.1.2 Process

Transend owns and operates the electricity transmission network in Tasmania. It commenced trading on 1 July 1998, following the disaggregation of the Hydro-Electric Corporation (HEC).

Transend submitted its application for a revenue cap on 14 March 2003. The ACCC engaged GHD Pty Ltd (GHD) to review key elements of the application. GHD completed its report on 30 June 2003.

The ACCC has consulted with Transend, interested parties and relevant Tasmanian authorities in making its draft decision. The decision covers the (regulatory) period 1 January 2004 to 30 June 2009.

This draft decision should be read in conjunction with other relevant material on the ACCC's website such as Transend's application, GHD's report and submissions from interested parties.

1.2 Opening asset base

1.2.1 Jurisdictional valuation

Clause 6.2.3(d)(4) of the TEC states that sunk assets are to be valued at the value determined by the Tasmanian minister, provided it does not exceed deprival value. The ACCC accepted the Treasurer's valuation of Transend's asset base as at 31 June 2001 of $522m as it was not satisfied that it exceeded the deprival value.

However, the ACCC notes that this valuation is significantly higher than previous valuations of Transend's asset base. It also notes that the deprival value gives the maximum valuation permitted under the TEC and the code.

The ACCC estimates that the revaluation results in an increase of approximately $7m in Transends annual allowed revenue (AR), which will result in higher transmission charges.

1.2.2 Comparison of different valuations

Table 1.1 Comparison of asset base valuations 30 June 2001 ($m, June 2001)

Valuation	**$m**
SKM (for OTTER 1999 Pricing Determination[1])	453
SKM (for Transend)	563
Meritec (for Tasmanian Treasury[2])	525
Transend's application[3]	522

1. In 1999 Sinclair Knight Merz (SKM), engaged by the Office of the Tasmanian Energy Regulator (OTTER), valued Transend's RAB as at 1 July 1998 at $333m. This amount, after adjusting for actual capex, depreciation and disposals, results in $410m as at 30 June 2001 (table 3.4 shows the details). In 30 June 2001 dollars, this equates to $453m.
2. In 2002 SKM, engaged by Transend, revalued the RAB at $563m. However, Meritec engaged by Tasmanian Treasury, reviewed the valuation and recommended $525m. This valuation was adopted by the Tasmanian government.
3. Meritec valuation less customer contributed assets of $3.3m.

The main reasons for the higher valuation over the OTTER valuation include:

- an increase in the easement valuation, mainly easement acquisition costs (accounting for about half of the increase)
- revaluation and reinstatement of previously depreciated assets
- an increase in equipment unit replacement costs.

The ACCC is particularly concerned with the valuation of easement acquisition costs. In its Victorian[1] and South Australian[2] decisions the ACCC did not allow claims for such costs.

1.2.3 GHD's review of the roll-forward

GHD reviewed Transend's roll-forward of the jurisdictional valuation to 31 December 2003. It found that assets were appropriately categorised and depreciated, and acquisitions and disposals were treated consistently.

GHD found that indexation for inflation was appropriate except for one error, requiring an adjustment of $0.3m. It also found that easement acquisition costs had not been depreciated with the assets but had been indexed with easement compensation costs, recommending an adjustment of $5.9m.

Therefore, GHD recommended reducing Transend's proposed opening RAB, at 31 December 2003, to around $598m.

1.2.4 Comments by interested parties

Interested parties strongly objected to the revaluation of the RAB by the Tasmanian government. They consider that such a large increase would result in greater revenue and profits for Transend without any improvement in service for its customers.

1.2.5 ACCC's assessment of opening RAB

As stated earlier, the ACCC has decided to adopt the minister's valuation of the RAB.

For the roll-forward, the ACCC accepted GHD's recommendation regarding inflation indexation but not the recommendation regarding easements. Hence the asset base value as at 31 December 2003 is $604m and not $598m.

Table 1.2 shows the calculation of the RAB at 31 December 2003.

Table 1.2 RAB as at 31 Dec 2003 ($m, nominal)

Jurisdictional valuation 30 June 2001[1]		521.6
From 1 July 2001 to 31 Dec 2003:	Capital additions	120.3
	Disposals	(8.4)
	Depreciation	(29.9)
RAB as at 31 December 2003		603.6

1. Meritec valuation less customer contributed assets of $3.3m.

1 ACCC, *Victorian Transmission Network Revenue Caps 2003-2008 - Decision*, 11 December 2002.

2 ACCC, *South Australian Transmission Network Revenue Cap 2003-2007/08 - Decision*, 11 December 2002.

1.3 Capital expenditure

1.3.1 Application

Transend has separated its capex into two categories.

- A fixed program of $331m, consisting of projects that Transend considers are almost certain to be carried out during the regulatory period. These include development, renewals and non-network expenditure (e.g. information technology systems).

- Variable projects with probabilities ranging from 10 to 80 per cent. Transend has asked that these projects be funded on a pass-through basis, as and when they occur. It estimated the total cost of these projects to be around $150m in its application. However, as Transend has asked for pass-through for this category of projects, the amount is indicative only, as actual capex would be rolled into the asset base. The expected (probability weighted) value of these projects is estimated to be $60m over the regulatory period.

1.3.2 GHD's review

GHD recommended a maximum of $341m over the regulatory period. In determining this amount GHD:

- reduced variable capex to about $13m, excluding those projects:
    - associated with generation connection
    - based on high load growth scenarios
    - having a very low probability of eventuating
    - beginning near the end of the regulatory period

- deferred some renewals work until the next regulatory period ($3m)

- removed an error relating to substation development costs ($2.5m)

- reduced non-network expenditure by around ($3m)

- reallocated some refurbishment to capex ($6m).

GHD states that Transend's proposed capex program is technically feasible. However, it found that Transend had not considered the trade-offs between costs and risks or involved its customers in rationalising the program. Therefore, GHD recommended that the ACCC consider $341m as an unrationalised maximum, and reduce it considering non-technical factors.

Table 1.3 compares the capex program proposed by Transend and the maximum recommended by GHD.

Table 1.3 Capex allowance for the regulatory period ($m, 2002-03)

Category	Application	GHD's recommendation
Development	109.2	109.2
Renewals	194.9	189.3
Reallocation of refurbishment[1]	-	6.2
Non-network	26.7	23.6
Total fixed capex	**330.8**	**328.3**
Variable	Pass- through[2]	12.6
Total	**330.8**	**340.9**

1. GHD recommended that $6.2m of refurbishment expenses be transferred from opex to capex.
2. Transend's initial estimate of total project expenditure $150m, but on a probabilistic basis the expected value reduces to $60m.

1.3.3 Comments by interested parties

Interested parties pointed out that Transend's capex program is much larger than its past programs and that Transend has been unable to deliver these (smaller) programs. Therefore they doubt Transend's ability to efficiently deliver its proposed program.

Some interested parties also note that Transend's proposed program is weighted towards the early part of the regulatory period. They are concerned that Transend may not have the resources to manage such a large increase in expenditure and that if this expenditure is deferred, it will result in Transend gaining unearned revenue.

Transend believes that the GHD's report contains sound analysis of Transend's capital forecast. However, it considers that GHD's recommendations are based on a number of mistakes and misunderstandings. Transend was most disappointed with GHD's recommendation that the ACCC subjectively reduce the $341m capex allowance.

Transend also claims that some of GHD's reasoning to reduce the variable capex allowance is not robust.

1.3.4 ACCC's assessment of capex

Transend proposes that its variable capex should be funded, essentially, on a pass-through basis. It believes this approach more appropriately shares the risks between itself and its customers.

The ACCC disagrees with this approach, primarily as it:

- goes against the philosophy of a revenue cap, whereby the ACCC approves a fixed allowance over the regulatory period
- could expose customers to increases in charges that they cannot anticipate
- would require more intrusive regulation.

Therefore, consistent with its previous decisions, the ACCC prefers to use the expected value (probabilistic approach) to estimate Transend's capex.

The ACCC recognises that a secure and reliable transmission system is vital to an efficient electricity market. It also notes Transend's claim that it requires more investment than its historical levels.

Despite this, the ACCC accepts the GHD recommendation to reduce the capex allowance below $341m. The ACCC considers that an across-the-board reduction of 10 per cent (resulting in an allowance of $307m) will more appropriately balance the interests of consumers and Transend. The reasons for this view follow.

- GHD believes that Transend has the ability to deliver its proposed program. However, most interested parties doubt this. The ACCC considers that, although Transend may be able to complete the projects in a technical sense, efficient delivery would be quite difficult to achieve. Cost control becomes difficult when programs expand significantly, especially when there is competition for limited resources. The ACCC notes that $307m represents about a 25 per cent increase over historical capex levels. It also notes that Transend has significantly underspent its previous smaller capex allowances.

- Transend's customers strongly object to the size of the capex program, indicating that they consider that there is inadequate value for money for the (resulting) charges.

- The renewals category accounts for about 60 per cent of Transend's fixed capex proposal. There is insufficient evidence to support this large increase.
    - Tasmania's load growth is minimal. Also there would be no increase in the quality of supply, rather Transend claims that the large capex is required to maintain the existing quality.
    - The distribution company in Tasmania (Aurora) states that most outages occur in the distribution network. It points to the disparity in the size of capex programs between itself and Transend and argues that better outcomes could be achieved by reallocating capex in a more balanced manner.
    - Some projects in the renewal program have benefits other than transmission (e.g. the overhead powerline ground wire (OPGW) project used for communications).
- Transend's capital program is proportionately larger (relative to the RAB) than those allowed for both the South Australian and Victorian networks.

- The 10 per cent reduction is consistent with the reduction OTTER applied in its previous determinations.

Given the large size of the capex, the ACCC would like to flag the following.

- Currently renewal expenditure, unlike augmentations, does not have to undergo external review (e.g. regulatory test). However, given the size of the renewals program, the ACCC considers that Transend should be required to demonstrate

that its renewal expenditures are economically justified and that there are no better alternatives. It considers that the jurisdictional regulator's interests in Transend's asset management could be expanded to allow for such a process.

- At the end of the regulatory period the ACCC will compare the actual capex with the allowance and consider clawing back any underspend in the next regulatory period.

1.3.5 Alternative capex approach

The ACCC recognises that Transend may be required to connect wind-farms to its network during the regulatory period. One way of accommodating such projects is to have a slightly different regulatory approach to determining the capex allowance.

The current approach does not distinguish between:

- assets whose funding is shared —costs are recovered from a particular class of users or all users

- assets funded by individuals—costs are recovered from an individual user.

Individual users have little control over the charges resulting from the shared component of the network. Hence the ACCC has a role to balance the interests of the users with that of the TNSP. The current approach to capex is suitable in this case.

However, a more light-handed regulation may be appropriate for individually funded assets, if the users are capable of effectively negotiating with TNSPs. The ACCC considers that such assets could be funded on a pass-through basis. Details of the proposed scheme are at section 4.10 and appendix C.

The ACCC will consider this approach in making its final decision.

1.4 Operating and maintenance expenditure

1.4.1 Application

In estimating the operating and maintenance expenditure (opex) allowance, Transend chose not to consider its past opex. Instead, it assessed the expenditure requirements of each of its business units and totalled the amounts (i.e. it undertook a bottom-up assessment). The resulting opex allowance is about $193m over the regulatory period or on average about $35m per annum (table 1.4).

Currently the system controller function is co-located with, but ring-fenced from, Transend. Its costs (approximately $10m per annum) are charged directly to market participants. A substantial amount of this function will be undertaken by Transend upon NEM-entry. The ACCC has taken into account this increase in scope in making comparisons.

1.4.2 GHD's review

Key findings of GHD include that:

- the increase sought by Transend is primarily due to expenses relating to NEM-entry and increased maintenance
- Transend could not substantiate how future cost efficiencies had been built into forecasts
- processes for technical assessment of maintenance were reasonable but more consideration needed to be given to alternative levels of service and risk.

GHD developed its own forecast of Transend's opex requirements based on an analysis of Transend's past opex trend.

It started with the opex in Transend's latest audited financial statements (2001-02), adjusted it for one-off expenses and arrived at a base opex amount of $18.5m. It then adjusted the base opex (in the following order) for:

- inflation to 2002-03
- an efficiency dividend of two per cent per annum
- additional tasks, including NEM-entry and participation, increased maintenance and telecommunication costs.

GHD's recommended allowance is shown in table 1.5. Total opex for the regulatory period is $158m, about $35m less than the total amount sought by Transend. This averages about $29m per annum, peaking in 2005-06 at $31m because of NEM-entry costs, and then reducing to about $27m by the end of the regulatory period.

1.4.3 Comments by interested parties

Interested parties generally consider the opex proposed by Transend to be an ambit claim. They request that the ACCC reduce it to reasonable and efficient levels.

Interested parties also complain that Transend's application contains only high level information which has limited their ability to effectively comment on it.

Transend has several concerns with GHD's trend analysis, mainly that the recommendation to reduce its total claim by $35m over the regulatory period was unattainable without compromising service levels.

Transend considers that its proposed opex increase is justified, as its operating environment will change considerably after NEM-entry.

1.4.4 Transend's historical opex

Transend has asked for a major increase in opex compared to previous years levels (table 1.4).

Its actual opex has averaged around $20m over the last four years, which excludes the system controller function. As stated earlier, once Transend enters the NEM it will absorb a large part of this function, the incremental cost of this function which is estimated to be about $5m annually. Therefore comparable historical opex is about $25m per annum.

GHD's recommendation of $29m therefore represents a 16 per cent increase on comparable historical opex.

Table 1.4 Transend's historical opex ($m, 2002-03)

Year	Allowance [1]	Actual	Forecast[2]
1999-00	19.3	18.9	
2000-01	19.1	19.4	
2001-02	18.7	20.8	
2002-03	18.7	22.7	
Transend proposed			35.0
GHD recommended			29.0

1. Opex allowances exclude avoidable costs associated with system operation that Transend will be required to perform in the future. Approximately $5m needs to be added to these allowances to make them comparable with Transend proposed and GHD's recommended opex forecasts.
2. Average of Transend's and GHD's forecast opex across the regulatory period, includes the above mentioned costs.

1.4.5 ACCC's benchmarking of opex

In benchmarking Transend's opex against that of other TNSPs the ACCC has calculated a suite of ratios such as opex per unit of circuit length, opex as a proportion of asset base, opex per substation, opex per unit of electricity transported and opex as a proportion of system peak demand.

Given the differences among TNSPs, any one ratio is unlikely to reflect the difference in performance. Each ratio has its limitations.

However, the ACCC believes that some ratios provide a more useful insight into relative performances. The ACCC considers that opex as a proportion of asset base and opex per unit of circuit length, while having some limitations, are more useful than the other ratios. Figures 1.1 and 1.2 show these two ratios for TNSPs.

Figure 1.1 Opex per RAB

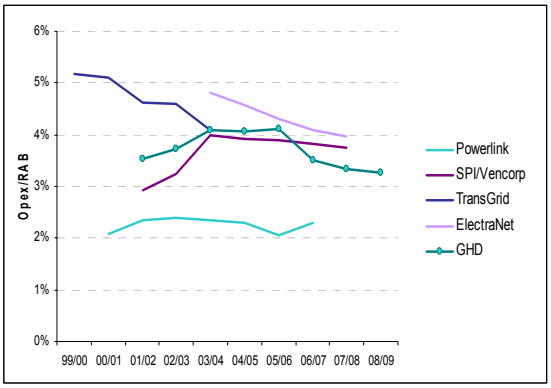
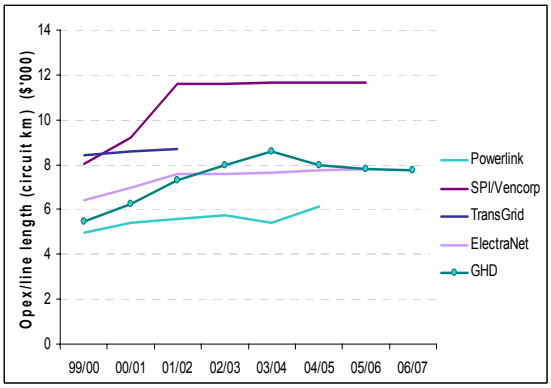


Figure 1.2 Opex per line length



The ACCC is aware that there are legitimate reasons for differences between TNSPs such as operational and scale differences. Therefore, the fact that some of these ratios are higher or lower than others does not, of itself, suggest that Transend's efficiency is higher or lower than those of other TNSPs.

The ACCC does not use benchmarking to establish opex allowances, but rather as a guide to assess whether the allowance is reasonable. Figures 1.1 and 1.2 show that the opex allowance recommended by GHD appears appropriate.

1.4.6 ACCC's assessment of opex

The ACCC does not use a cost-plus approach to determine opex. Rather, it focuses on efficient costs based on its consultant's expert advice, the application, submissions by interested parties, historical opex levels, and its own analysis (including benchmarking).

The ACCC reviewed GHD's trend analysis and considers it to be appropriate as it:

- provides historical context (by using a base year, in this case 2001-02) - the choice of year is appropriate given that it is the most recent year where audited accounts are available and appropriate adjustments have been made to that year
- provides for scope increases from the base year by allowing costs for new activities such as NEM-entry and increased maintenance
- incorporates a reasonable efficiency factor, noting that the large development and renewals program should result in some opex efficiencies and that OTTER has applied a similar efficiency factor in the past.

The ACCC agrees with Transend that its operational environment will change during the forthcoming regulatory period, as Tasmania enters the NEM. However, it considers that Transend's core business will not change substantially.

Given the above, the ACCC considers that the increase recommended by GHD is appropriate. The ACCC's benchmarking also supports this view.

GHD considered grid support costs and recommended that such costs be allowed as a pass-through. The ACCC, however, prefers to include a fixed amount for grid support.

Based on a preliminary estimate by Transend, the ACCC has included a fixed amount of $2m per annum for grid support and included it as opex. However, at the time of this draft decision, Transend is still negotiating with Hydro Tasmania about the cost for this service. This allowance will be monitored to ensure that it is spent efficiently.

The ACCC estimates an allowance of $0.57m per annum for equity raising costs and $0.42m per annum for debt raising costs.

The ACCC will monitor Transend's opex through its annual reporting requirements.

Table 1.5 ACCC's opex allowance ($m, 2002-03)

	Jan-Jun 2004	2004-05	2005-06	2006-07	2007-08	2008-09	Total
Application[1]	16.0	33.4	36.5	36.9	35.0	35.2	193.0
GHD forecast[2]	13.1	29.8	30.9	29.7	27.2	27.1	157.8
Equity raising costs	0.24	0.52	0.56	0.58	0.62	0.63	3.2
Debt raising costs	0.18	0.39	0.42	0.43	0.46	0.46	2.4
Grid support	1.0	2.0	2.0	2.0	2.0	2.0	11.0
Total	**14.5**	**32.7**	**33.9**	**32.7**	**30.3**	**30.2**	**174.4**

1. Transend's opex forecast includes equity raising costs but not debt raising or grid support costs. Its debt raising costs were included in its calculation of the WACC.
2. GHD's opex forecast does not include grid support, equity raising costs or debt raising costs.

1.5 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 1.6 contains the parameters used to determine the weighted average cost of capital (WACC). It compares the parameters proposed by Transend in its application with the ACCC's draft decision.

Table 1.6 Comparison of WACC parameters

Parameter	Application	Draft decision
Nominal risk-free interest rate (R_f)	5.24 %	5.43 %
Expected inflation rate (F)	1.95 %	2.21 %
Debt margin (over R_f)	1.45 %	0.80 %
Cost of debt $R_d = R_f$ + debt margin	6.69 %	6.23 %
Market risk premium (MRP)	6.00 %	6.00 %
Gearing ratio	60 %	60 %
Value of imputation credits (γ)	50 %	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

The above parameters vary over time, according to market conditions. They will be revised on the date of the final decision. The parameters have been calculated in accordance with the ACCC's Draft Statement of Principles for the Regulation of Transmission Revenues (DRP) and are consistent with its previous decisions.

Table 1.7 compares the WACC proposed by Transend with that of the draft decision.

Table 1.7 Comparison of the WACC

	Application (%)	Draft decision (%)
Nominal post-tax return on equity	11.96	11.41
Post-tax nominal WACC	-	6.63
Pre-tax real WACC	-	6.51
Nominal vanilla WACC	8.80	8.30

1.6 Total allowable revenue

The ACCC has determined a revenue allowance for Transend that increases from $95m in 2003-04 to $142m in 2008-09, as shown in table 1.8. As can be seen, the ACCC's decision includes the six month period 1 January 2004 to 30 June 2004. The revenue figure for 2003-04 was obtained by appropriately adjusting the six-month revenue amount of $48.5m.

Table 1.8 Transend's smoothed AR from Jan 2004 to 2008-09 ($m, nominal)

	Jan-Jun 04	2004-05	2005-06	2006-07	2007-08	2008-09
Smoothed AR	**48.5**	**102.88**	**111.44**	**120.71**	**130.76**	**141.63**

The draft decision is based on forecast inflation and applies a smoothing factor. Actual inflation figures will be substituted for the forecasts when they become known.

The final maximum allowed revenue (MAR) will be determined by adding (or deducting) the service standards reward (or penalty) amount to the above AR.

Table 1.9 summarises the key elements of the ACCC's draft decision.

Table 1.9 Allowable revenue and its components

	Application ($m)	Draft decision ($m)
RAB at 31 December 2003	604	604
Capex pa[1] (Avg)	71	56
Opex pa[2] (Avg)	35.0	29.5
Debt raising costs pa (Avg)	0.4	0.4
Grid support pa[3]	2.0	2.0
Total opex pa	37.4	31.9
Nominal vanilla WACC	8.80 %	8.30 %
Allowable revenue (2004-05)[4]	**113**	**103**

1. Includes fixed and variable components on a probability weighted basis.
2. Includes equity raising costs.
3. Estimate, amount still to be negotiated between Transend and Hydro Tasmania.
4. Allowable revenue in first full year of revenue cap.

1.7 Changes in total revenue

This section illustrates the changes in Transend's revenue. Adjustments and estimates have been made to make the revenues comparable. Therefore figures 1.3 to 1.5 are approximate and for illustrative purposes only.

Figure 1.3 Revenue comparison 2003-04 to 2008-09 ($m, nominal)

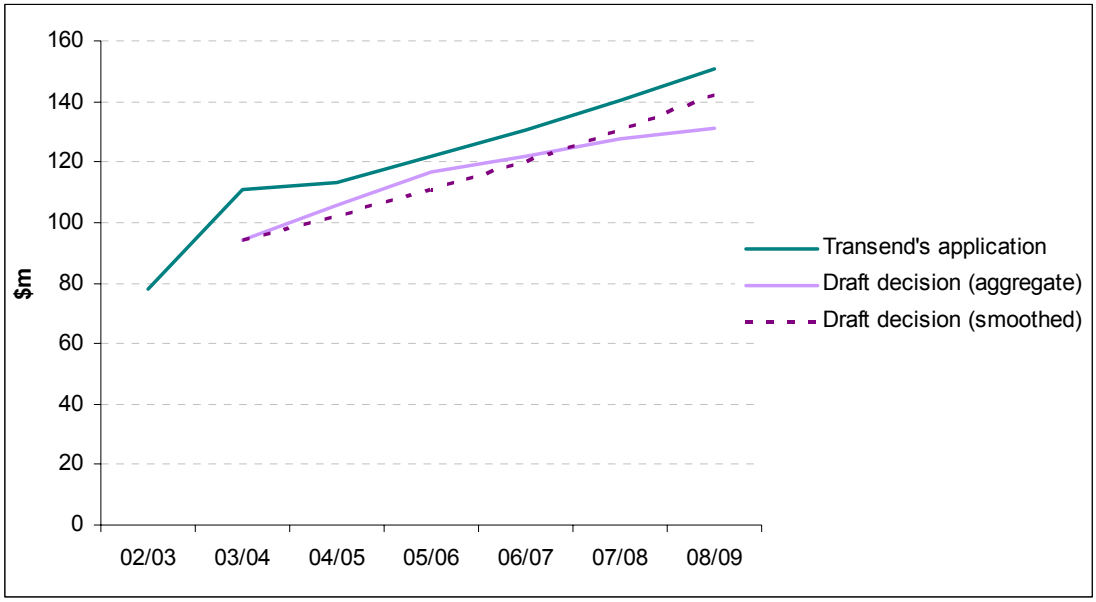
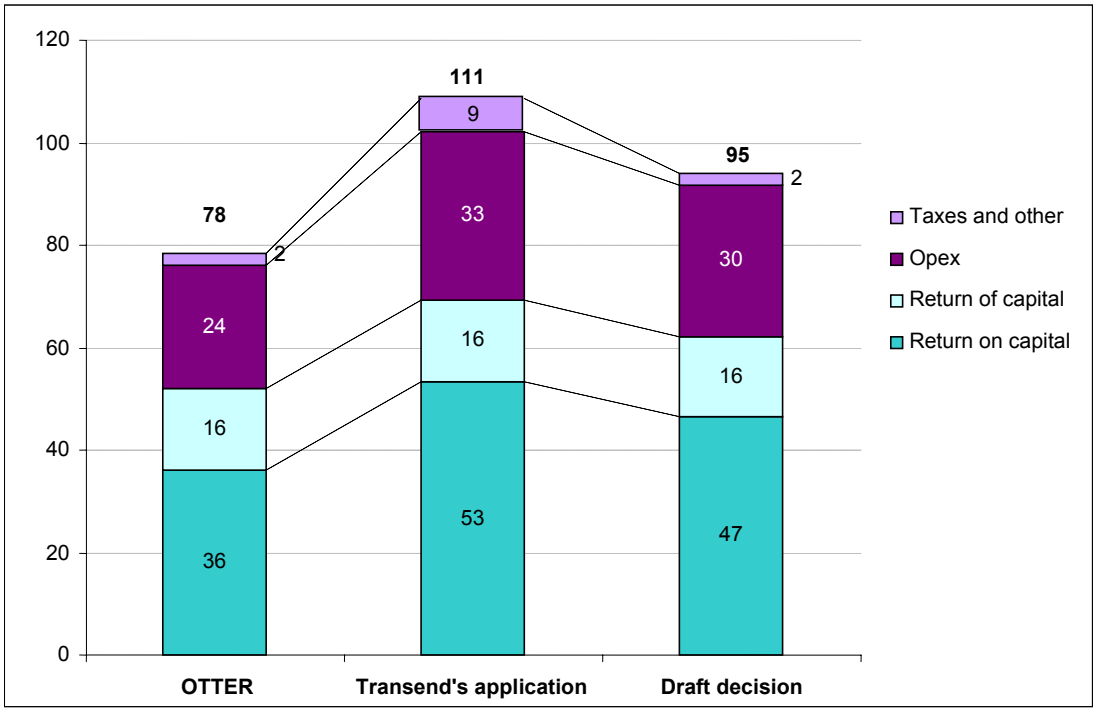


Figure 1.4 Comparison of building block components of revenue ($m, nominal)



Transend's AR is currently around $71m (2003 calendar year). The incremental costs of the system controller function amounting to about $5m and taxes of $2m are added to make Transend's 2003 revenue comparable with forecasts.

Transend, in its application, has asked for an AR of $111m in 2003-04. In the ACCC's draft decision for 2003-04 an AR of $95m (section 1.6) has been allowed.

The decision allows a significant increase in revenue (about 20 per cent) in the first year. The revaluation of the RAB is a major contributor to this steep increase. However, as stated earlier the ACCC has adopted the minister's valuation.

Subsequent increases in revenue over the regulatory period are significant, though not as steep (about an 8 per cent increase per annum in nominal terms over the period). This is mainly driven by the large capex program.

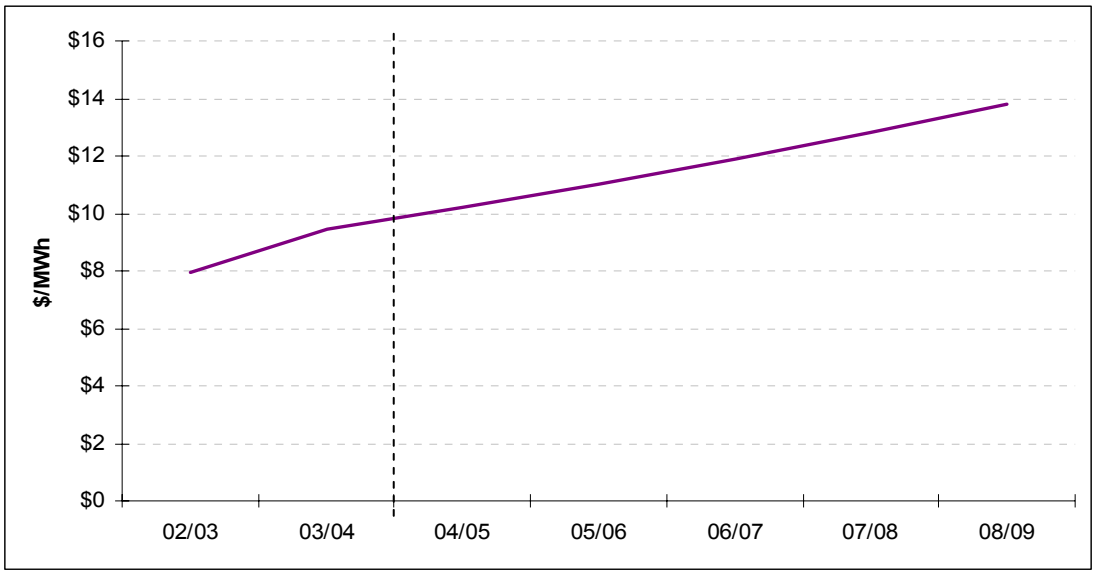
In summary Transend's revenues will increase substantially. Managing this cash flow will require significant engineering, finance and project management expertise.

1.7.1 Impact on transmission charges

Several forecasts for Tasmania indicate that load growth will be minimal over the regulatory period. Therefore increases in AR will translate to increases in charges to transmission customers generally. The effect on individual customers will depend on the pricing mechanism used.

The ACCC estimates that its draft decision results in a 10 per cent increase (in nominal terms) on average in transmission charges over the regulatory period.

Figure 1.5 Illustrative price path 2003-04 to 2008-09 ($m, nominal)



1.8 Service standards

1.8.1 The ACCC's scheme

The code requires the ACCC to take into account service standards when setting revenue caps. The ACCC has developed a scheme that reduces the incentive for TNSPs to achieve cost reductions at the expense of service levels.

The scheme is based on five performance indicators, of which three are currently operational. The average performance during the previous three to five years becomes the benchmark. TNSPs are rewarded for improvements over performance targets and penalised for deteriorations. The maximum penalty or reward is one per cent of the AR. Overall, the scheme is designed to have an expected value of zero.

1.8.2 GHD's review

GHD considered the service indicators chosen by Transend to be appropriate and in accordance with the ACCC's draft service standards guidelines. However, it concluded that the performance targets chosen by Transend did not appear to be challenging when compared with past performance. GHD recommends alternative targets be adopted, based on some allowance for reasonable improvements in performance due to current and planned capex and improved work practices.

1.8.3 ACCC's assessment

The ACCC agrees with GHD that the service indicators proposed by Transend are appropriate. It also agrees with GHD that current and planned investment, as well as improved work practices, should result in a net improvement in Transend's service performance. Therefore, the ACCC accepts the alternate targets and weightings recommended by GHD.

2 Introduction

2.1 Background

This document sets out the ACCC's draft decision on Transend's revenue cap application.

Transend owns and operates the electricity transmission network in Tasmania. OTTER is currently responsible for regulation of the electricity supply industry in Tasmanian.

Basslink Pty Ltd is constructing a direct current undersea electricity cable connecting Tasmania with the mainland. The Basslink project is expected to be completed by November 2005.

Basslink will operate as a Market Network Service Provider (MNSP).

Tasmania will join the NEM six months prior to the completion of Basslink. After this, as stipulated by the code, the ACCC will regulate Transend.

However, the Australian and the Tasmanian governments have agreed that the ACCC will begin to regulate Transend from 1 January 2004. As this is before Tasmania enters NEM, the provisions of the code do not apply. Hence regulation will be under the provisions of the TEC. The legislative and regulatory arrangements that enable this are outlined in appendix A.

Part B of chapter 6 of the code has been incorporated into the TEC to ensure that Transend's revenue cap will be consistent with the requirements of the code. Hence for all practical purposes the ACCC will apply the same regulatory regime to Transend as it applies to mainland TNSPs.

2.2 Code requirements

The code establishes a regulatory framework which:

- provides that the ACCC will determine the revenue caps to be applied to the non-contestable elements of participating TNSPs
- sets out how those regulated revenues will be translated into network charges.

Objectives and principles of the regulatory regime

The code establishes that:

1. the transmission revenue regulatory regime must achieve outcomes which:
   - (a) are efficient and cost effective
   - (b) are incentive based, including the sharing of efficiency gains between network users and owners as well as the provision of a reasonable rate of return (without monopoly rents) to network owners
   - (c) foster efficient investment in the transmission sector and upstream and downstream of it
   - (d) foster efficient operation, maintenance and use of network assets
   - (d) recognise pre-existing government policies on asset values, revenue paths and prices
   - (e) promote competition
   - (f) are reasonably accountable, transparent and consistent over time.
2. the regulation of aggregate revenue of transmission networks must:
   - (a) be consistent with the regulatory objectives (see 1 above)
   - (b) address monopoly pricing concerns, wherever possible, through the competitive supply of network services but otherwise through a revenue cap
   - (c) promote efficiency gains and a reasonable balance between network augmentations and supply and demand side options
   - (d) promote a reasonable rate of return to network owners on an efficient asset base where:
   - (i) the value of new assets is consistent with take-or-pay contracts or augmentation determinations
   - (ii) the value of existing assets are determined by jurisdictional regulators and must not exceed than their deprival values
   - (iii) any asset revaluations undertaken by the ACCC are consistent with Council of Australian Government decisions.
3. the form of the economic regulation shall:
   - (a) be a revenue cap with a CPI-X incentive mechanism, or some other incentive based variant, for each network own and/or service provider
   - (b) have a regulatory control period of not less than five years
   - (c) take into account expected demand growth, service standards, weighted average cost of capital, potential efficiency gains, a fair and reasonable risk adjusted return on efficient investment and ongoing commercial viability of the transmission industry
   - (d) only apply to those services the ACCC does not expect to be offered on a contestable basis.

Source: National Electricity Code, clauses 6.2.2 - 6.2.5.

In May 1999 the ACCC published its DRP[3], setting out how it proposes to regulate transmission network revenues. The ACCC is currently reviewing them and has released a discussion paper for public consultation.[4]

Transend's revenue cap has been determined using a building block approach. That is, various components (building-blocks) of the revenue cap are assessed individually on an accrual basis and then combined. Discussion of the building blocks is contained in chapter 7.

2.3 Process issues

The ACCC will set a revenue cap for Transend from 1 January 2004 until 30 June 2009. A period of five and a half years has been chosen in order to align Transend's regulatory period with the Australian financial year (ending 30 June). This will simplify the reporting and forecasting processes outlined in the ACCC's Information Requirements Guidelines[5], thus minimising compliance costs.

The ACCC's subsequent decisions are likely to cover a five year period.

This draft decision does not extend to assets owned and operated by Aurora, which is the electricity distribution and retail company in Tasmania. Aurora will continue to be regulated by OTTER.

Revenue cap setting process

As part of the revenue cap setting process the ACCC:

- received an application from Transend on 12 February 2003
- engaged GHD to assess Transend's RAB roll-forward, capital and operational expenditure forecasts and proposed service standards
- invited interested parties to comment on the application and GHD's report
- consulted with Transend, other interested parties and relevant government agencies such as OTTER and the Tasmanian Treasury
- released this draft decision on 26 September 2003.

The ACCC seeks submissions from interested parties on its draft decision. The closing date for submissions is 24 October 2003.

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3 ACCC, *Statement of Principles for the Regulation of Transmission Revenues – Draft*, 27 May 1999.

4 ACCC, *2003 Review of Draft Statement of Principles for the Regulation of Transmission Revenues – Discussion Paper*, 28 August 2003.

5 ACCC, *Statement of Principles for the Regulation of Transmission Revenues - Information Requirements Guidelines*, 5 June 2002.

Transend has requested that a public forum be held on its draft decision. The Commission therefore intends to hold a public forum on its draft decision in Hobart on 17 October 2003.

The ACCC expects to make a final decision in December.

A copy of Transend's application, GHD's report and submissions are available on the ACCC's website.[6]

2.4 Structure

The structure of this draft decision is shown in table 2.1.

Table 2.1 Report Structure

Chapter	Description
3	Establishing the regulated asset base at 31 December 2003
4	Estimating the capex allowance for the regulatory period
5	Estimating the opex allowance for the regulatory period
6	Calculating the weighted average cost of capital
7	Calculating the total revenue
8	Establishing service standard incentives

2.5 Overview of Transend's network

History

Before 1998, the Hydro-Electric Corporation (HEC) of Tasmania was the sole provider of the entire electricity service (i.e. generation, transmission and distribution/retail) in Tasmania.

On 1 July 1998 the HEC was disaggregated into:

- Transend (for transmission)
- Aurora (for distribution and retail)
- Hydro (for generation).

Transend's network

Transend transports electricity from 28 power stations to substations around Tasmania. It owns 3 500 circuit kilometres of transmission lines covering 2 300 route kilometres, 45 substations and 10 switching stations.

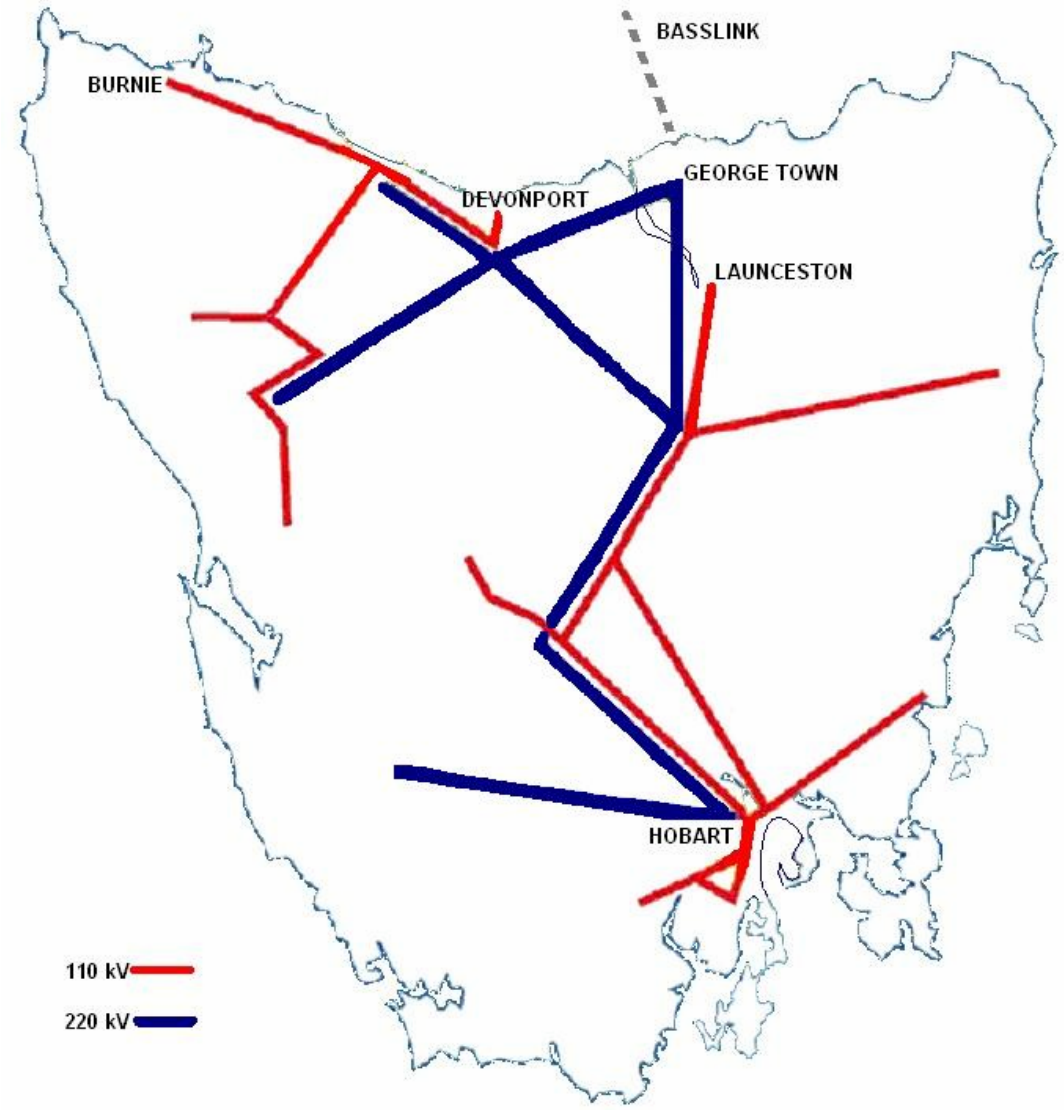
Tasmania has several features which affect the configuration and operation of Transend's network including:

[6] www.accc.gov.au

- Hydrogeneration being the dominant form of generation (resulting in wide dispersion of generation, relatively small generator size, low generation load factor and seasonality of generator operations)
- a relatively small number of large electricity users (the top five electricity users in Tasmania consume about 60 per cent of the total load)
- small, highly dispersed population (Tasmania has a population of 472,000).

Figure 2.1 contains a simplified map of Transend's network, showing the basic layout of the network and the main load centres.

Figure 2.1 Transend's network



3 Opening asset base

3.1 Background

The ACCC must determine the value of Transend's non-contestable transmission assets as at 1 January 2004 as a part of its decision.

OTTER is responsible for regulating Transend until 31 December 2003. It made Transend's last revenue determination in November 1999[7]. Its determination covered the period 1 January 2000 to 31 December 2002 and was subsequently extended for a further year.

For the purpose of the determination, OTTER valued Transend's RAB at $333m as at 1 July 1998. This was based on a valuation undertaken by Sinclair Knight Merz (SKM)[8].

As part of its investigation, OTTER forecast Transend's RAB as at 30 June 2001 to be $433m. OTTER's roll-forward of the 1 July 1998 valuation is shown in table 3.1.

Table 3.1 OTTER's forecast RAB ($m, July 1998)

RAB at 1 July 1999	333
Add: Capital additions	151
Less: Depreciation	46
Less: Asset disposals	5
RAB at 30 June 2001	**433**

Transend was unable to spend the $151m allowed by OTTER. The actual amount it spent from 1 July 1998 to 30 June 2001 was $128m, as shown in table 3.4.

3.2 Code requirements

In determining the opening RAB the ACCC is bound by clause 6.2.3(d)(4) of the TEC.

This clause requires the ACCC to value Transend's sunk assets at a value determined by the Tasmanian minister, provided the value does not exceed deprival value. 'Deprival value' is defined by the code as the lesser of economic value and depreciated optimised replacement cost (ODRC).

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7 OTTER, *Investigation into electricity supply industry pricing policies final report*, November 1999.

8 SKM, Transend asset valuation reference date 30 June 1998, Issue 2, July 1999

The ACCC has limited power to initiate an inquiry into a valuation determined by the Tasmanian minister. The ACCC may seek to have the minister's valuation verified independently through a process agreed to by the National Competition Council. The scope of any independent verification is limited to inquiring whether the minister's valuation exceeds deprival value.

In the past the ACCC has stated that it would accept the jurisdictional valuation determined for the opening RAB. But when there was no such determination, the ACCC had valued the RAB consistent with the RAB established in the participating jurisdiction, provided it did not exceed deprival value. The ACCC adopted the latter approach in its South Australian and Victorian revenue cap decisions.

3.3 Jurisdictional valuation

In 2002 Transend engaged SKM to revalue its RAB as at 30 June 2001. It valued Transend's asset base at $563m.

Tasmanian Treasury then engaged Meritec Pty Ltd (Meritec) to review SKM's valuation. The Tasmanian Treasurer accepted Meritec's valuation of $524.9m. Under the TEC, this is the jurisdictional valuation for Transend. The jurisdictional valuation is summarised in table 3.2 and a Tasmanian Treasury paper on the valuation is available on the ACCC's website[9].

Table 3.2 Jurisdictional valuation as at 30 June 2001 ($m, nominal)

	Replacement cost	Optimised replacement cost	Depreciated replacement cost	Optimised depreciated replacement cost
Substations	509	508	255	254
Transmission lines excluding easements	485	460	221	209
Easement compensation costs	12	12	12	12
Easement acquisition costs	36	36	36	36
Other assets	24	24	14	14
Total	**1,066**	**1,040**	**537**	**525**[1]

1. This includes $3.3m of customer contributions, which results in the RAB value of $521.6m.

3.4 Transend's proposal

In its application, Transend proposes a value of $603.8m at 31 December 2003. Its opening RAB is based on the jurisdictional valuation set at 30 June 2001, plus capital

9 http://www.accc.gov.au

commissioned and less capital retired, depreciation and customer capital contributions. Table 3.3 shows how the RAB has been calculated.

Table 3.3 Transend's RAB roll-forward ($m, nominal)

	2001-02	2002-03	Jul-Dec 2003
Opening RAB (jurisdictional valuation)	521.6	542.2	581.7
Capital addition (net)	34.0	54.7	32.0
Depreciation	(13.4)	(15.2)	(9.9)
Closing RAB	**542.2**	**581.7**	**603.8**

3.5 GHD's review

GHD reviewed Transend's roll-forward of the jurisdictional valuation ($521.6m) to 31 December 2003 and recommended three amendments.

- During the 6 months to 31 December 2003, Transend used a Consumer Price Index (CPI) of 1.95 per cent to roll capex into the RAB but a CPI of 0.97 per cent to roll the RAB forward. GHD suggested 0.97 per cent for both. (The ACCC accepts this recommendation.)
- Acquisition costs for both easement and site should be amortised along with the related assets. Transend inflated the acquisition costs by the CPI to maintain the value in real terms but did not amortise them. These costs were not amortised in the jurisdictional valuation. (The ACCC does not accept this recommendation.)
- Transend provide to the ACCC actual, rather than forecast, capital works commissioned during 2002-03 when it became available, which it has done.

In its application Transend forecast $55m of capital works being commissioned during 2002-03. However, the actual capital commissioned shows that about $12m worth of projects have been delayed until the next financial year.

GHD's roll-forward of the jurisdictional valuation to 31 December 2003 was $598m.

3.6 Issues and interested party submissions

3.6.1 Jurisdictional valuation

Aurora, Tasmanian Chamber of Commerce and Industry (TCCI), Major Employers Group (MEG), Energy Users Association of of Australia (EUAA)/ Energy Action Group (EAG) and Hydro Tasmania state that the jurisdictional valuation of $521.6m is too high. They note that OTTER's forecast RAB value for Transend was only $433m.

Aurora noted that the asset base calculated by OTTER included forecast capex, which Transend did not actually spend. Table 3.4 shows OTTER's forecast RAB, using the actual capex of $128m, rather than the $151m forecast.

Table 3.4 RAB from 1998-99 to 2000-01 ($m, July 1998)

	Amount
RAB as at 1 July 1998	333
add: Capital additions (actual)	**128**
less: Depreciation	46
less: Disposals	5
RAB as at 1 July 2001	**410**[1]

1. Shown in July 2001 dollars in Table.

The ACCC rolled forward OTTER's opening RAB to 1 July 2003. It accounted for actual net capex, depreciation and inflation. The result was a RAB of $502m as shown in table 3.5. The ACCC also rolled forward the jurisdictional valuation to 1 July 2003, adjusting for actual net capex, depreciation and inflation. The result was a RAB of $570m as shown in table 3.5.

The jurisdictional valuation is $68m (or 14 per cent) higher than OTTER's valuation.

Table 3.5 Asset base comparison ($m, July 2001)[1]

	Jurisdictional valuation	OTTER opening RAB plus actual capex
RAB as at 1 July 2001	522	453[2]
add: Net capital additions	**77**	**77**
less: Depreciation	28	28
RAB as at 1 July 2003	**570**	**502**

1 Totals may not add due to rounding.
2 Shown in July 1998 dollars ($410m) in Table 3.5.

Easements

One of the main contributors to the increase in the RAB is the value of easements. The valuation of Transend's easements are summarised in table 3.6

Table 3.6 Changes in easement valuation ($m, nominal)

	OTTER	**SKM 2001**	**Meritec 2001**
Easement compensation costs	-	12	12
Easement acquisition costs	-	58	36
Easements total	**17**	**70**	**48**[1]

1. Value adopted in the jurisdictional valuation.

Optimisation

As a part of its June 2001 revaluation, SKM marked down (optimised) some of Transend's assets to align with their depreciated optimised replacement costs. Meritec considered the results of SKM's optimisation process to be appropriate. Hence the results were adopted in the jurisdictional valuation. The details of which are shown in appendix B.

Reinstatement of fully depreciated assets

As part of the revaluation process, SKM re-valued and reinstated some assets that would otherwise have been fully depreciated.

GHD found that $34.8m worth of revalued assets would have reached the end of their accounting life if not for the jurisdictional valuation. That is, the valuation extended the useful life of these assets reflecting their estimated remaining life. GHD considers that it is not appropriate to reinstate these assets when they reach the end of their new remaining life.

Change in equipment unit rates

SKM used current replacement costs in both valuations. That is, to estimate the value of one kilometre of a particular conductor, SKM used the replacement cost of that conductor at the time of valuation.

For example the unit rate for a 220 kilovolt (kV) single circuit (sulphur) conductor increased from $141 000 /km in 1998 to $171 000 /km in 2001.

3.7 ACCC's considerations

3.7.1 Jurisdictional valuation

As stated in section 3.2, the ACCC is bound by clause 6.2.3(d)(4) of the TEC in determining the RAB.

This clause requires the ACCC to value Transend's sunk assets at a value determined by the Tasmanian minister, provided the value does not exceed deprival value. 'Deprival value' is defined in the code as the lesser of economic value and depreciated optimised replacement cost.

Theoretically, economic value depends on the cash-flows forgone if the asset was not used by the regulated business. The cash-flows, however, depend on the value of the asset. This circularity limits the usefulness of economic value in practice. Therefore the ACCC prefers to use ODRC. It has discussed this issue in the DRP.

As explained in the code, the deprival value gives the maximum value possible for the assets for the purpose of regulation.

On the basis of the material available to the ACCC, it is not satisfied that the Tasmanian Treasurer's valuation exceeds deprival value. Therefore, the ACCC must accept that valuation for the purposes of this draft decision.

However, the ACCC notes that the jurisdictional value is $68m higher than OTTER may have allowed. It estimates that the impact of the increase is about $7m per year to total revenue.

The ACCC has written to the Tasmanian Treasury regarding its concerns about the revaluation. These are explained below. But the ACCC considers that the opening asset base is ultimately a matter for the Tasmanian government.

Easements

The ACCC considers that easements should be valued at actual historical costs adjusted for inflation, consistent with its DRP.

The ACCC used this approach in its last two revenue cap decisions, for the South Australian and Victorian transmission networks. In both cases, the ACCC did not allow easement acquisition costs, which were calculated using estimates at that time.

The easement acquisition costs of $55m included in the RAB at 1 January 2004 would generate about $4m revenue per annum for Transend, accounting for a large proportion of the initial increase in Transend's revenue.

Reinstatement of fully depreciated assets

The ACCC understands that Transend never fully depreciates its transmission assets. Transend stops depreciating them when the assets reach a remaining life of five years.

These assets would continue to provide services. However under the ACCC's building block model, the 'return-of-capital' should not exceed the amount a TNSP actually paid for the asset.

3.7.2 Interest during construction

Customers should not be charged for a return of capital on assets that are not yet commissioned. However TNSPs would normally incur some interest during construction (IDC), which may add to the cost of the asset.

SKM included 6.8 per cent on the construction of lines and substations as IDC in its 2001 RAB valuation[10]. This was based on the construction of a single $10m project with a construction period of 18 months and a commissioning period of one month. The interest rate used was 8.5 per cent, which SKM assumed to reflect Transend's pre-tax nominal WACC.

The ACCC's concern is that the one project selected by SKM may not be representative of the IDC.

However Meritec decided that the IDC estimated by SKM was appropriate. Hence the Tasmanian Treasury included it in the jurisdictional RAB.

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[10] Sinclair Knight Merz, *Transend Networks Pty Ltd asset valuation reference date 30 June 2001 report*, September 2002

3.8 Conclusion

The ACCC considers that the value of the initial RAB is primarily a matter for the Tasmanian Treasurer. Hence it has adopted the jurisdictional valuation at 30 June 2001.

The ACCC then adjusted this amount for actual net capex rolled in, depreciation and inflation to calculate the RAB at 30 June 2003, which was $570m. Further adjustments were made using estimates for capex, depreciation and inflation for the six months to 31 December 2003, resulting in the (opening) RAB of $604m.

Table 3.7 shows the Commission's roll-forward of Transend's asset base over the regulatory period.

Table 3.7 RAB roll-forward 2001-02 to 2008-09 ($m, nominal)[1]

	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Opening asset base	522	542	570	626	693	729	800	822
Capital expenditure [2]	34	43	72	84	56	94	45	39
Depreciation [3]	13	15	15	18	20	23	23	24
Closing asset base	542	570	626	693	729	800	822	838

1. Note totals do not add due to rounding.
2. Net of disposals.
3. Straight line depreciation less inflation.

4 Capital expenditure

4.1 Introduction

This chapter explains the ACCC's considerations in determining Transend's capex allowance. It has assessed whether Transend has struck an appropriate balance between:

- alternatives to capex such as increases in opex, demand-side management and new generation
- appropriate trade-offs between costs and risks, taking into account customer preferences.

4.2 Code requirements

The ACCC's task in assessing Transend's capex is set out in the code. In particular, part B of chapter 6 of the code requires that:

- in setting the revenue cap, the ACCC must have regard to the potential for efficiency gains in expected operating, maintenance and *capital costs*, taking into account the expected demand growth and service standards
- the regulatory regime must seek to achieve efficiency in the use of existing infrastructure, efficient operating and maintenance practices and an efficient level of *investment*
- the regulatory regime must foster an efficient level of *investment* within the transmission sector and the upstream and downstream of it.

[italics added].

Therefore, the ACCC needs to decide on the adequacy, efficiency and appropriateness of the capex proposed by Transend.

GHD reviewed Transend's proposed capex allowance, the results of which are summarised in section 4.4.

4.3 Transend's proposal

Transend has based its forecasts on an assessment of the causes (drivers) for each type of capex, a 'bottom-up' assessment process.

It has also developed a transmission system management plan integrating its capex and maintenance plans.

Transend has broadly classified its capex into development, renewal (replacement and refurbishment) and non-network.

4.3.1 Load, customer connection and generation forecasts

Transend claims that Tasmania will face major changes over the regulatory period because of entering the NEM, the introduction of reticulated gas and the development of wind farms.

Such changes make forecasting load growth and load flows more uncertain. For example, forecasts of timing and location of new generation are normally based on future expected load. In Tasmania, however, new fuel sources (gas/wind) or new technologies (wind turbines) may drive future generation—both of which are far more difficult to predict than load growth.

The system controller's 2002 planning statement contains some guidance on the generation projects that are currently being considered. Transend has worked with Aurora to identify future connections resulting from load growth, security requirements and customer needs.

Transend engaged SKM to prepare its capex proposal. SKM developed three growth scenarios for system load and maximum demand from 2001-02 to 2011-12, summarised in table 4.1. SKM relied on forecasts produced by the System Controller, Aurora and the Australian Bureau of Agricultural and Resource Economics.

Table 4.1 Total forecast load growth over 10 year period (2001-02 to 2011-12)

Growth scenario	System load (%)	Maximum demand (%)
Low	4.4	5.5
Medium	9.8	9.8
High	13.9	13.4

These results do not include the impact of Basslink's export and import capability on the transmission system.

Transend, together with SKM, developed 24 scenarios reflecting different combinations of load growth and generation. Each was assigned a weighting reflecting its probability of eventuating based on:

- load growth (high, medium or low)
- impact of local generation or loss of a major industrial load, in the Hobart area
- possible future wind generation (e.g. sites on the west, north-west and north-east coasts of Tasmania).

SKM then conducted a detailed study of load flow and used Transend's security criteria to identify the required transmission development projects.

4.3.2 Development capex

Transend defines development capex as expenditure on augmenting the network, typically being driven by system security criteria, general load growth, new customer connections, new generation projects and code compliance.

Transend's development projects are categorised as:

- *Fixed projects* - projects that are almost certain to proceed in the regulatory period.
- *Variable projects* - projects with a 10 to 80 per cent probability of proceeding, depending on growth and/or completion of certain projects by others (eg. generation projects).

Transend proposes that its variable projects be included in the RAB on a pass-through basis, if and when they eventuate, as they are outside its control.

Fixed projects

Southern augmentation

This is a large project worth over $55m, which will augment the transmission system in the south of the state. It includes installing a 220 kV line from Liapootah to Lindisfarne.

The project was submitted to the Reliability and Network Planning Panel (RNPP)[11] in December 2002 and was endorsed on 30 January 2003. The main reason for the project is to secure the supply to the Hobart area and southern Tasmania by:

- removing the reliance and overload on the Chapel Street substation
- removing reliance on the availability of the Gordon Power Station
- removing the potential overload on the existing 110 kV circuits from Chapel Street and Creek Road substations to Risdon.

Transend considers that this project would cost-effectively meet the long-term load growth in southern Tasmania.

NEM-entry

A number of development projects are required for NEM-entry, including:

- installing code-compliant wholesale metering at Transend/Aurora interfaces
- installing quality-of-supply monitoring equipment to measure compliance with connection agreements and Schedule 5.1 of the code
- installing back-up protection schemes to prevent the system collapsing in the event of non-credible contingencies

[11] The RNPP was established under Clause 12.8.1(a) of the TEC and is required to monitor, review and report on the performance and reliability of the power system. Development proposals are sent to the RNPP for recommendation, which OTTER uses in determining whether the development capex is justified.

- replacing field transducers associated with the state estimator, to meet the National Electricity Market Management Company's (NEMMCO's) requirement.

Variable projects

Transend states that the list of projects submitted as variable capex was not exhaustive. Since SKM's analysis, which was completed in September 2002, it has received further inquiries for the connection of new generation. Also Aurora has stated that alternative sites may be needed for future load growth.

Transend proposes that any additional or amended projects should also be funded on a pass-through basis.

There are three categories of variable projects.

- *Load-related*—these projects will occur only with medium or high load growth, or in response to customers' connection requirements. The preliminary costing for these projects is approximately $30m.

- *Generation connection requirements*—these projects will take place only if new generation proposals eventuate. Connecting new generation will usually involve constructing assets that have both contestable and non-contestable components. The preliminary costing for the non-contestable component is about $20m.

- *Shared network costs as a result of new generation connections*—these projects may be required, depending on the size of new generation projects in specific regions. Preliminary costing for these projects is about $110m.

4.3.3 Renewal capex

This involves replacing, enhancing and refurbishing existing transmission assets. According to Transend the drivers of these projects are:

- compliance obligations under the relevant legislation and codes, including environmental and safety aspects

- condition of assets

- maintaining asset performance, while monitoring the risks of an ageing asset base

- ensuring that assets are of an age and technology that continue to be supported by manufacturers and service providers

- addressing asset design issues

- optimising the trade-off between maintaining and renewing assets.

Transend has assessed the condition of its equipment to identify whether it is approaching the end of its useful life and/or to predict failures. It states many of its assets need to be replaced or enhanced during the regulatory period and has developed a renewals program.

Transend has targeted the following for renewal: 220kV and 110 kV circuit breakers; supply transformers and network transformers; voltage transformers; post insulators; and transmission line foundations and conductors.

4.3.4 Non-network capex

Transend proposes an allowance for non-network capex of $26.7m. Its main non-network initiatives for the revenue period include the following.

- General information technology: improved plans for disaster recovery for critical business systems; continuing rationalisation of servers and separation of domains. Transend states that these initiatives will improve efficiency of the business and reduce risk.

- Network operation and control system (NOCS)[12]: although expenditure for NOCS has already been substantial, Transend claims that to effectively manage the power system when Basslink and new generation projects are commissioned additional expenditure will be required to continually update NOCS.

- Asset management: Transend intends to further develop an Asset Management Information System to link information about assets, maintenance, system performance, management of works, cost management, decision-support models, capital and operating works programs, and budgets. It considers that this would allow it to manage its assets more effectively and efficiently.

- Accommodation: the construction of new office accommodation (currently Transend staff are located at two separate sites) is planned to be completed mid-2004.

4.3.5 Claim for under-recovery of revenue

OTTER's 1999 price determination for Transend[13] was originally planned to expire on 31 December 2002. However, in 2002, the Tasmanian Government amended its price control regulations to allow OTTER to extend the determination, in real terms, to 31 December 2003.

Transend claims that a crucial assumption in setting its revenue for 2003 was that the impact of capital additions and depreciation would offset each other. However, it states, that additions have exceeded depreciation. Therefore, in its application, Transend estimates that OTTER's 2003 AR understated its revenue requirement by $2.44m.

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[12] Transend has purchased a new network operation and control system (NOCS) that is compatible with NEMMCO's systems.

[13] OTTER, *Investigation into ESI pricing policies – Pricing Determination*, December 1999.

Transend has asked that this be compensated in the first six months of the regulatory period (ie. January to June 2004).[14]

4.3.6 Summary of the capex proposal

Transend claims that the basis for its large program is a combination of:

- development projects to meet growth
- renewal capex to maintain compliance and reliability
- replacement of assets that have become obsolete or have reached the end of their serviceable life.

Transend's proposed capex program is set out in table 4.2.

Table 4.2 Transend's capex proposal ($m, 2002-03)

	Jan-Jun 2004	2004-05	2005-06	2006-07	2007-08	2008-09	Total
Development	2.8	43.2	14.3	48.3	0.6	0.0	109.2
Refurbishment	7.4	6.8	8.7	8.1	4.9	2.1	38.1
Replacement	9.5	23.0	29.9	30.5	32.0	31.8	156.8
Non-network	7.0	6.9	5.5	1.5	2.3	3.5	26.7
Total fixed capex	**26.8**	**80.0**	**58.4**	**88.4**	**39.8**	**37.5**	**330.8**
Variable[1]	0	28.0	10.5	16.9	24.7	29.6	149.6
Total capex	**26.8**	**108.0**	**68.9**	**105.3**	**64.5**	**107.1**	**480.4**

1. Indicative numbers only as Transend seeks actual variable capex to be allowed as a pass-through. The values do not take into account the probability of the variable projects proceeding. If probability weighted, the expected value is about $60m over the regulatory period.

4.4 GHD's review

4.4.1 Overall comments

As a part of its brief, GHD analysed and commented on the appropriateness of Transend's capex program. It concluded that:

- the overall costs estimated by Transend were appropriate based on an assessment of a sample of projects
- although the process for making business decisions within Transend was technically sound, it was lacking in areas such as risk-based assessment

[14] Transend, *Revenue Cap Application for the period 1 January 2004 to 30 June 2009*, March 2003 (pp 96-97).

- Transend has not considered providing alternative levels of service, in conjunction with stakeholders, to create a rational basis for deciding trade-offs between cost, timing and risk
- key stakeholders had limited understanding of how the proposed security and planning criteria would affect capital works
- Transend is capable of delivering its suggested capex forecast, based on recent performance.

On behalf of GHD, ACIL Tasman conducted an independent review of the load forecast used by Transend. It agreed with SKM's assumptions to determine the development plan.

4.4.2 Comparison with historical capex

GHD advised that information on pre-1998 expenditure was difficult to obtain, as the transmission assets were operated and maintained as part of the HEC. However, GHD found that:

- actual capex was about $43m per annum on average from 1998-99 to 2001-02 and renewals expenditure accounted for about half of the amount
- proposed fixed capex (in the application) for the regulatory period is around $60 per annum and renewals expenditure accounts for about 60 per cent of the amount
- therefore the proposed renewals expenditure is much higher than in the past—following a significant reduction in renewals in 2000-01 and 2001-02
- wide variations in total capex have occurred in the past and were expected to occur, with development capex being most volatile
- Transend had planned $55m and projected some $53m capex (in service) in 2002-03.

4.4.3 Development expenditure

Fixed

Transend has proposed 10 fixed development projects over the regulatory period. These are driven by load growth, customer development requirements, code compliance and/or security criteria.

GHD states that there are no capex projects for the connection of Basslink in the program. The necessary works to connect Basslink are subject to an agreement between the Basslink's developer and Transend.

GHD notes that the southern augmentation project is the largest within the development program, costing about $55m. It found possible alternatives are uncertain. Because the ACCC has a claw back mechanism on capex, GHD considers that it is prudent to allow the whole expenditure.

GHD has assessed each of the fixed development projects, taking into account their status with the RNPP and OTTER. It believes that:

- the timing, cost, load forecasts used and scope of work were generally appropriate
- the reactive support program was justified technically and the cost estimates were reasonable
- the George Town and Sheffield projects appear to be technically appropriate but could be delayed by two years so that they are undertaken when capex was low
- the scope and estimated costs for NEM-entry projects were reasonable.

Variable

GHD agrees with the estimated cost of the variable capex projects. It notes, however, that none have been subjected to the regulatory test. The expected value of variable capex is about $60m.

GHD notes that Transend's variable capex proposal contains several projects relating to generation connection including wind, hydro, gas and wood-to-waste energy. It considers that the benefits of these projects are unclear. And as they deliver specific benefits to individual companies they are unlikely to pass a regulatory test. Hence GHD removed the expenditure for generation connection.

GHD also removed the expenditure for the projects based on high load growth, as it considered that this scenario was unlikely to occur.

However, GHD considers that some of the variable projects proposed by Transend may occur and therefore recommends an allowance of about $13m for them.

4.4.4 Renewals

Transend indicates that most of its forecast renewal expenditure is to maintain present levels of reliability rather than to improve them. However, GHD did not have the time to comment on this on detail. However, it noted that reliability was rarely the only driver, others being obsolescence, technical and environmental compliance and growth.

Substation costs

Transend did not provide the documentation showing the drivers for items in the replacement program for 110kV circuit breakers. However, GHD considers that age, and not condition, has been adopted as the primary driver.

GHD considers that replacing 25 per cent of the circuit breakers (worth about $3m) could be deferred to the next regulatory period if a more comprehensive condition assessment was done.

GHD found an error relating to the substation development costs for Creek Road which would reduce capex in 2008-09 by $2.5m. Apart from this, GHD was satisfied with the substation development projects.

Transmission lines

The overhead powerline ground wire (OPGW) project accounts for a major portion of renewal expenditure ($36m). Transend states that it is needed because of the lack of earth wire coverage on 110kV and 220kV transmission lines to protect against lightning strikes and electrical stress.

However, the proposal provides for the installation of an optical fibre cable along the ground wires and this roughly doubles the project's cost.

Although the business case for the project was not complete at the time of its review, GHD considers that its timings and costs are technically appropriate.

Foundation refurbishment accounts for 13 per cent of total capex. This is a continuation of an existing program to replace all defective transmission tower foundations by 2008-09. GHD found that the costs and methods associated with this project were documented and reasonable.

GHD expects Transend to rapidly develop new approaches to renewals by implementing new technology, which would reduce renewals capex over the regulatory period. However, it found that it was not possible to determine the effect of this on costs and therefore made no reductions.

4.4.5 Non-network

GHD recommends that the ACCC allow $23.6m for non-network expenditure compared to the $26.7m proposed by Transend.

This allowance covers information technology systems (including the acquisition and updating of the network operation and control system and an asset management information system) and new accommodation premises.

GHD disallowed the expenditure for standards and procedures and some contingency items as efficiencies generated from adopting them should more than offset their costs.

4.4.6 Overall conclusion

GHD considers that appropriate rationalisation process could defer projects or provide lower cost/service solutions, possibly reducing the capex requirement for the regulatory period. It also notes that reliability of the projects has not been quantified.

GHD recommends that:

- the values it has recommended should be considered a maximum as Transend has not followed an appropriate practice of cost-risk trade-off or budget rationalisation process involving its customers

- although Transend's proposed capex program is technically justified, the ACCC should reduce it based on non-technical factors.

4.4.7 GHD recommended allowance

GHD's recommended capex allowance is shown in table 4.3.

Table 4.3 GHD's maximum capex forecast ($m, 2002-03)

	Jan-Jun 2004	2003-04	2004-05	2005-06	2006-07	2007-08	Total
Development	2.8	43.2	10.3	45.8	4.6	2.5	109.2
Renewal	16.9	29.9	38.6	38.6	35.8	29.5	189.3
Reallocation of refurbishment	0.6	1.1	1.2	1.1	1.1	1.1	6.2
Non-network	6.8	6.0	5.0	1.2	1.4	3.2	23.6
Total fixed capex	**27.1**	**80.2**	**55.1**	**86.7**	**42.9**	**36.3**	**328.3**
Variable	0.0	5.9	0.7	5.4	0.6	0.0	12.6
Total capex	**27.1**	**86.1**	**55.8**	**92.1**	**43.5**	**36.3**	**340.9**

4.5 Submissions by interested parties

4.5.1 Information disclosure

EAG, EUAA, Hydro Tasmania, Comalco and MEG are concerned about the lack of information provided by Transend. They consider that Transend should provide:

- a detailed history and comparison of previous capex forecasts with actuals
- a detailed list of projects including their purpose, scope and timing
- a detailed allocation of costs to each project or class of development work
- information on the approval status of the projects, with the RNPP and OTTER
- information on electricity demand and volume changes for the major regions
- an asset register with detailed age profile of major assets
- a management plan.

Such information would enable them to comment more effectively on the capex proposal, without having to rely on GHD's report.

4.5.2 Historical capex

Interested parties noted that Transend has been unable to spend its previous capex allowances determined by OTTER. Therefore, they questioned the logic of Transend asking for a higher allowance over the forthcoming regulatory period.

MEG found that Transend had completed less than 75 per cent of the capital works approved by OTTER.

It considered that this brought into question Transend's:

- capex forecasting and planning processes
- ability to deliver the program
- resources to manage such a large program.

MEG also claimed that historical expenditure would have fully incorporated new augmentations to accommodate load growth, replacement of ageing assets and reliability improvements.

MEG believes future load growth will be low, as it has been over the past 10-12 years. Therefore, capex growth should match the rate allowed by OTTER with an additional amount for NEM-entry.

4.5.3 Forward loading of program

Hydro Tasmania and MEG were concerned that the proposed capex program was heavily weighted towards the beginning of the regulatory period. If Transend delayed capex to the latter part of the period it would earn a return on projects not yet in service.

4.5.4 Benchmarking

Senator Bob Brown, EUAA, EAG and MEG all proposed that benchmarking be used to assess capex allowance. The proposed capex, compared to the RAB, was very high (especially for a network serving a population of only 472 000).

MEG also noted that Transend was proposing a 95 per cent increase in its RAB over the regulatory period, whereas ElectraNet and SPI were only allowed increases to their RAB of 43 per cent and 27 per cent respectively.

4.5.5 NEM-entry

Aurora, Hydro Tasmania and MEG argued that Transend should demonstrate that the benefits relating to NEM-entry will outweigh its costs.

Hydro Tasmania and MEG recognised the need for some NEM-entry related capex over the regulatory period. However MEG believes such costs should not exceed $4.1m.

4.5.6 Southern augmentation

Hydro Tasmania and MEG claimed that the southern augmentation may not occur in this regulatory period as:

- it has not been fully endorsed by the RNPP, nor approved by OTTER

- RNPP's endorsement is contingent on other developments in the Hobart area
- additional planning and environmental approvals are required.

Hydro Tasmania claims that this delay may provide an opportunity to develop lower cost alternatives including:

- gas-fired generation close to Hobart
- alternative upgrading/modification/reconfiguring of existing transmission infrastructure to increase security (rather than needing to seek new easements for transmission lines)
- capacitor banks and single circuit 220kV development around Hobart
- a load reduction arrangement at Pasminco
- development of plans to mitigate the risk of prolonged outages.

4.5.7 Renewals

Hydro Tasmania and MEG were disappointed that Transend did not provide more information to support the proposed renewals expenditure, particularly as it represents a significant increase over current levels.

Hydro Tasmania also notes that a number of these projects incorporated a significant element of up-rating, rather than just replacement. That is, some of the renewals capex will increase the capability of the network, even though it has not been subject to the regulatory test.

Hydro Tasmania considers that, although the current system may have some shortcomings, there are more cost effective solutions than the OPGW project.

4.5.8 Connection assets

EUAA, EAG, Comalco and MEG are concerned that a substantial amount of the proposed capex was required for specific projects such as Basslink and wind generation.

They consider that because these projects are generation driven their costs, including augmentations to the shared network, should be allocated and charged directly to the generator. Under the principle of user pays, they should not be shared among general consumers.

In particular MEG argues that those projects associated with providing system security in the event of Basslink failure, must be allocated to the Basslink project and not to customers generally.

EUAA, EAG, Comalco and MEG argue that the ACCC should not allow such expenditure in its decision, but rather direct Transend to enter into commercial arrangements with the connecting parties on a full cost-recovery basis.

4.5.9 Price impacts

Aurora and TCCI are concerned that Transend has not considered how its capex program will affect prices paid by consumers.

TCCI notes that most businesses were satisfied with the current operating standard of the network. Aurora also cited its customer research which showed that price impacts would be well outside many customers ability to pay.

They argue that any capital investment that resulting in improved reliability and quality of supply must be balanced against what is affordable.

4.5.10 Reliability

TCCI notes that Tasmania's system performance has generally improved over recent years and that business customers exhibit a high level of satisfaction with their electricity service quality.

Aurora considers that the level of expenditure should result in improved reliability and quality of supply but that there must be a clear balance between the service value delivered to customers and price.

4.6 Transend's response to submissions by interested parties

4.6.1 Information disclosure

Transend believes that it is not feasible to provide the necessary level of detail to substantiate its capex program in a public document. Instead, the ACCC's process provides for a review by an independent consultant, the results of which are made available to interested parties.

Transend states that interested parties have requested far more information than is set out by the ACCC in its information requirements guidelines.

Its application was not intended to provide a detailed justification for each project, but to provide an overview of its proposed capex—and it was for the ACCC and its consultants to scrutinise the plans to ensure that they are fully justified.

4.6.2 Historical capex and benchmarking

Transend agreed that it has been unable deliver the entire capex program during its current regulatory period. However, it claims that this was the result of planning, regulatory and resource issues which have now largely been resolved. It is confident that it will be able to deliver its proposed capex program.

Transend argued that MEG's simplistic projection of future capex based on historic levels was invalid, as capex is lumpy by nature and step changes occur when significant investment is required. It believes that its challenge is not to repeat historic levels of capex, but rather to meet the future requirements of the Tasmanian system.

Transend claims that it is inappropriate to compare the capex program against the RAB, as it does not take into account the nature of the underlying assets, safety obligations or the needs of customers.

4.6.3 NEM-entry

Transend notes that entering the NEM is likely to bring substantial net benefits to Tasmania, but this does not mean that costs will be reduced. On the contrary, it claims that the underlying transmission system needs to be significantly augmented to allow potential benefits from NEM-entry to be realised.

Transend believes that it would be inappropriate to ascribe these costs solely to Basslink as they relate to changes to the operation and management of the power system to facilitate NEM-entry.

4.6.4 Southern augmentation

In response to claims against the southern augmentation project, Norwood-Scottsdale-Derby line and Mowbray substation, Transend states that RNPP has approved these projects under the regulatory test.

Transend states that joint analysis undertaken with Duke Energy about a possible gas fired generator in Hobart indicates that it would not be commercially viable even with grid support payments.

The jurisdictional regulator's endorsement of a project only lasts for 12 months. If construction of the project does not begin before the end of the 12 months then the endorsement lapses. Because the southern augmentation consists of several projects spread out over a number of years the regulator has only endorsed those components which are likely to begin in the 12 months from the date of endorsement.

Transend accepts that there may be merit in revisiting the technical design of projects as new information becomes available.

4.6.5 Service levels

Transend emphasises that it is not seeking to improve service levels but rather maintain existing levels and meet the additional requirements of NEM-entry. It considers that reducing in the proposed renewal capex could result in an unacceptable drop in service quality.

4.7 Submissions in response to GHD's capex report

4.7.1 Interested parties' responses to GHD's capex report

Information disclosure remains a key concern for interested parties. Aurora and Hydro Tasmania believe that this has restricted their ability to comment effectively.

Hydro Tasmania considers that, because OPGW project delivers a new capability rather than asset renewal, it should be classified as new development and be subject to the regulatory test.

Aurora notes that Transend has advised that a large portion of OPGW project's expenditure is necessary to comply with the TEC. However, Aurora considers that sections 4.10.2 and 4.10.3 of the TEC do not specify the need for communications redundancy to all stations, only where specified by the System Controller or where it links to a control centre. It notes that it also does not specify the need for optic fibre cable.

Aurora considers that the project has been over specified and would like to see more detail about the need for an optic fibre network to be funded by customers.

Hydro Tasmania was concerned that GHD had only addressed whether the projects will take place in the revenue period, but not how a delay would affect Transend's AR. Even a short delay would reduce AR significantly. Hydro Tasmania's modelling shows that the proposed capex could be spread out over eight years rather than over the regulatory period of five-and-a-half years, without unreasonable risk.

Hydro Tasmania maintains that Transend's ability to accurately forecast capex is doubtful. In the first year of its OTTER determination, actual capex was 97 per cent of the forecast and in 2002-03 GHD notes that capex spend will be 88 per cent of its allowance.

In Hydro Tasmania's opinion, GHD's assessment of outage availability was optimistic. It states that it will continue to support the efficient operation of Transend's network as far as possible. However, Hydro Tasmania considers that the challenges associated with managing water storage should not be underestimated. Therefore, outage availability is likely to be a critical issue, which could affect the timing of Transend's forecast capex program.

Based on Transend's previous forecasting, Hydro Tasmania agrees with GHD's recommendation that the ACCC rationalise GHD's recommended capex. Hydro Tasmania suggests that this would balance of risk and cost for stakeholders.

4.7.2 Transend's response to GHD's capex report

Transend believes that the GHD report contains sound analysis of Transend's capital forecasts and drivers. However, it considers that GHD's recommendations are flawed by mistakes and misunderstandings relating to:

- Transend's use of security and planning criteria
- non-inclusion and/or delay to some fixed capital projects
- non-inclusion of many variable capital projects.

It is most disappointed by GHD's recommendation that the ACCC undertake a subjective rationalisation of GHD's maximum allowance.

Security and planning criteria

Transend considers that GHD has not understood the purpose of the security and planning criteria. It states that these were developed for forecasting new development

augmentations but not renewals. These criteria are not binding, but only represent what Transend believes could form part of the regulatory test.

Project delays and omissions

Transend considers that the 'cost-risk trade-off' and 'budget rationalisation involving customers' advocated by GHD were unusual processes. It argues that the timing of these projects were forecast using appropriate drivers, including code compliance. Therefore deferring capex was unacceptable.

Furthermore, Transend states that, while GHD considers that condition assessment may make it possible to delay renewals to the next regulatory period, the opposite may also be true.

Variable development projects

Generation-related assets

Transend believes that GHD incorrectly excluded generation-related assets because of its:

- failure to recognise what assets should be regulated
- mistaken understanding of the grounds for passing the regulatory test
- confusion between inclusion in the RAB and the allocation of cost
- confusion about whether connection assets need to pass the regulatory test.

High load growth projects

Transend notes that a new system peak of 1,690 mega watts (MW) was set on 4 July 2003. It states that, as a result, some key nodes within the transmission system were placed under extreme pressure, reinforcing the need for the proposed capex program.

Transend believes that GHD's forecast that Tasmania would reach this level of peak demand only by 2008 is understated and therefore its recommended exclusions are not sound.

Outdated probabilities

Transend notes that its application seeks that the actual costs of variable projects be funded on a pass-through basis. GHD's recommendations were based on a probabilistic analysis conducted by SKM in 2002. But Transend states that since then much progress has been made on some of these projects, affecting the probabilities assigned to them.

4.8 ACCC's considerations

4.8.1 Ability to deliver the proposed program

Transend's proposed capex program totals about $390m over the regulatory period (including the expected value of variable capex). This is more than $70m per annum on average, a substantial increase over $44m per annum, which was the average capex from 1998-99 to 2002-03 (Figure 4.1).

However, historically, Transend has been unable to deliver its forecast capex program:

- between 1998-99 and 2002-03, it spent about 80 per cent of the amount allowed by OTTER
- in 2002-03 it rolled in $43m worth of capex, although it had planned for $53m.

Transend acknowledges that in the past its actual expenditure has been lower than that forecast. However, it claims that it has now addressed the planning, regulatory and resource issues and is confident of delivering its proposed capex program. In its report, GHD states that Transend is capable of delivering its maximum capex allowance of $341m (table 4.3).

The ACCC shares the concerns of interested parties, which claim that, based on Transend's past experience it is unlikely to deliver its proposed capex program.

There are several possibilities which could result in sub-optimal outcomes.

- Transend delivers the whole capex program, but the timing of individual projects may be delayed to the latter part of the regulatory period.
- Transend is unable to deliver the entire capex program. The ACCC in previous decisions has expressed concern over the growing likelihood that TNSPs may be unable to deliver their proposed capex programs. Currently a number of TNSPs and DSNPs have begun or are planning major increases in capex. This is likely to increase competition for limited resources, particularly experienced service providers, major plant items and project management personnel. This issue is also evident in Tasmania, where Transend will need to compete for such resources with Basslink and new generation developments.
- Transend delivers the program, but in doing so pays a premium to obtain the necessary expertise and resources. The ACCC would be concerned if this scenario eventuated.

4.8.2 Transend's proposed capex framework

Transend's capex is categorised into development, renewals (replacement and refurbishment) and non-network.

Development capex is further split into fixed (almost certain to proceed) and variable (probabilities of 10-80 per cent).

Transend proposes that its fixed projects be included in the ACCC's calculations of AR but that its variable projects be funded, essentially, as a pass-through, as and when they occur.

The ACCC disagrees with Transend's approach for the following reasons.

- Pass-through of capex (which can be material) goes against the philosophy of a revenue cap, whereby the ACCC approves a fixed allowance over the regulatory period. Indeed, it would represent a move away from the ACCC's current incentive-based regime towards a cost-plus regime.

- It removes the incentive for TNSPs to plan ahead and estimate a complete set of projects over the regulatory period, which forces them to prioritise and optimise capex at the planning stage.

- A comprehensive plan of capex at the beginning of the regulatory period also gives interested parties valuable information, enabling them to comment effectively.

- It transfers additional risk from Transend to its customers, who could be exposed to increases in charges that they cannot anticipate.

- It would require an annual review of actual expenditure and adjustments to be made to the revenue cap, which goes against the principle of light-handed regulation.

- The code is quite restrictive in terms of pass-throughs, although such an arrangement could be accommodated under the TEC.

- It is inconsistent with the probabilistic approach[15] , which the ACCC has used the in its past three revenue cap decisions.

For the above reasons, the ACCC still prefers to use the probabilistic method to determine an appropriate capex allowance for Transend.

4.8.3 Renewals

Renewals expenditure is about 60 per cent of Transend's fixed capex program, equating to $195m over the regulatory period. Currently, the code does not explicitly require this to be subjected to the regulatory test to be included in the RAB.

GHD's report indicates that much of the renewals work involves some element of enhancement and the ACCC agrees. It also considers that the large increase in renewals expenditure could affect efficient delivery.

GHD considers that Transend has a strong technical culture but that its business decision making processes need to be improved in assessing risk. and identifying the

[15] The probabilistic approach uses expected values (cost of the project multiplied by probability of it proceeding within the regulatory period) to forecast capex requirements.

impact of deferring project implementation. The ACCC agrees and considers that Transend's customers would benefit from a renewals planning process where engineering requirements and risks have been balanced against customer value.

Given the size of the renewals program, the ACCC considers Transend should demonstrate that its renewal expenditures are economically justified and that there are no, more cost effective, alternatives. It considers that the jurisdictional regulator's interests in Transend's asset management could be expanded to include such a process.

4.8.4 Claim for under-recovery of revenue

In 1999 OTTER made a price determination for the electricity supply industry in Tasmania (including Transend) which was effective from 1 January 2000 to 31 December 2002.

In 2002, the Tasmanian Government extended the price determination, maintaining the AR in real terms for an additional year (i.e. until 31 December 2003). To realise this decision, capital additions must equal depreciation for the calendar year 2003—that is, the net worth of the asset base should be maintained.

Transend advises that capex additions will exceed depreciation in 2003. These additions are now included in the RAB. However, OTTER did not provide Transend with a return on or return of capital for the over-spend, which Transend estimates to be $2.44m. It has sought to recover this amount in the first six months of the regulatory period (ie. January to June 2004).

By including the over spend in 2003 in the RAB, the ACCC will provide Transend with a return on and of capital in future years. If the ACCC also provides the additional return on capital and return of capital for 2003, it will, in effect, be reversing the effect of the Tasmanian government's policy decision.

The ACCC also considers that the forecast AR is a significant increase over previous years. Increasing this revenue even further, to compensate for a past under-recovery, does not seem appropriate.

Therefore the ACCC has not made any provision for under-recovered revenues associated with the one year extension of OTTER's 1999 price determination.

4.8.5 ACCC's assessment of capex

In its application, Transend, proposes a fixed capex allowance of $331m plus a variable component, to be funded on a pass-through basis, with an indicative value of $150m (or $60m on a probability weighted basis). Therefore, the total expected value of Transend's capex is about $390m over the regulatory period. GHD suggested an unrationalised maximum of $341m and recommended that the ACCC reduce this amount taking into account non-technical considerations.

The ACCC considers that a secure and reliable transmission system is vital to an efficient electricity market. The Productivity Commission has argued that it is better to err on the side of overinvestment in the event of regulatory uncertainty, as the costs of under investment outweigh the costs of overinvestment.

Transend may require more investment than its historical levels for the following reasons.

- Before disaggregation, the HEC managed generation, transmission and distribution. Its ability to balance these functions, may have enabled it to achieve system security with a relatively low level of transmission investment compared to the three disaggregated entities (Transend, Hydro and Aurora).

- Currently, the Tasmanian electricity transmission system is a self-contained system that serves Tasmanian consumers only, making the load and generation options more predictable. However, this will change when Tasmania enters the NEM. The transmission system will then have the additional function of facilitating electricity trade between Tasmania and the mainland.

Despite this, the ACCC accepts the GHD recommendation to reduce the capex allowance below (the maximum) $341m for the following reasons.

- It provides for a large increase in capex compared to historical levels, representing an average of $62m per annum over the regulatory period, which is substantially more than average actual expenditure in the past few years of around $44m per annum (table 4.4). The ACCC is aware that there are limited resources in Australia to deliver capex programs. Although the program is technically deliverable, effective cost control becomes difficult when programs expand quickly. Interested parties have also pointed out that Transend has been unable to spend its recent capital allowances.

- The ACCC's regulatory regime tries to replicate a competitive market where firms have to earn revenues to cover capital costs. That is, firms have to convince customers to pay for the services generated by capex. However, most of Transend's customers strongly object to the size of the capex program.

- Transend claims that it needs increased capex to maintain its quality of supply. Given that most customers are happy with their current level of service and that Tasmania's load growth is minimal, Transend's capex proposal is on the high side.

- The renewals program accounts for about 60 per cent of the fixed capex—a large increase over previous levels. Some projects in the program may have other functions as well as transmission services (eg. the OPGW project may be used for communication services in addition to monitoring and controlling the network).

- Aurora claims that such a large capex program will result in more efficient outcomes if more appropriately allocated among other participants (e.g. distribution) in the market.

- GHD's unrationalised maximum capex allowance is proportionately larger than those programs allowed by the ACCC for other TNSPs (table 4.5).

Table 4.4 Historical and proposed capex in-service ($m, 2002-03)

Capex type	Historical[1]	T'end proposed	Draft Decision	Change (%)[2]
Development	13.4	19.8	17.8	33
Renewals	27.7	36.1	32.0	17
Non-network	2.6	4.2	3.9	46
Total	**43.7**	**60.1**[3]	**53.7**[3]	**24**

1 Average over five years from 1998-99 to 2002-03.
2 Percentage increase from historical to draft decision.
3 Excludes expenditure associated with variable capex.

Table 4.5 Ratio of capex to opening asset base

TNSP	Capex Program ($m)	Opening Asset Base ($m)	Ratio (%)	Average Demand Growth (%)[1]
Transend	307	604	50.8	1.6
ElectraNet	358	824	43.4	2.5
SPI PowerNet	379	1 836	20.6	2.6
Powerlink	1 041	2 277	45.7	3.5
TransGrid	882	1950	45.6	3.1
EnergyAustralia	54	457	11.8	3.1

1. NEMMCO, 2003 Statement of Opportunities, summer maximum demand growth (p.5).

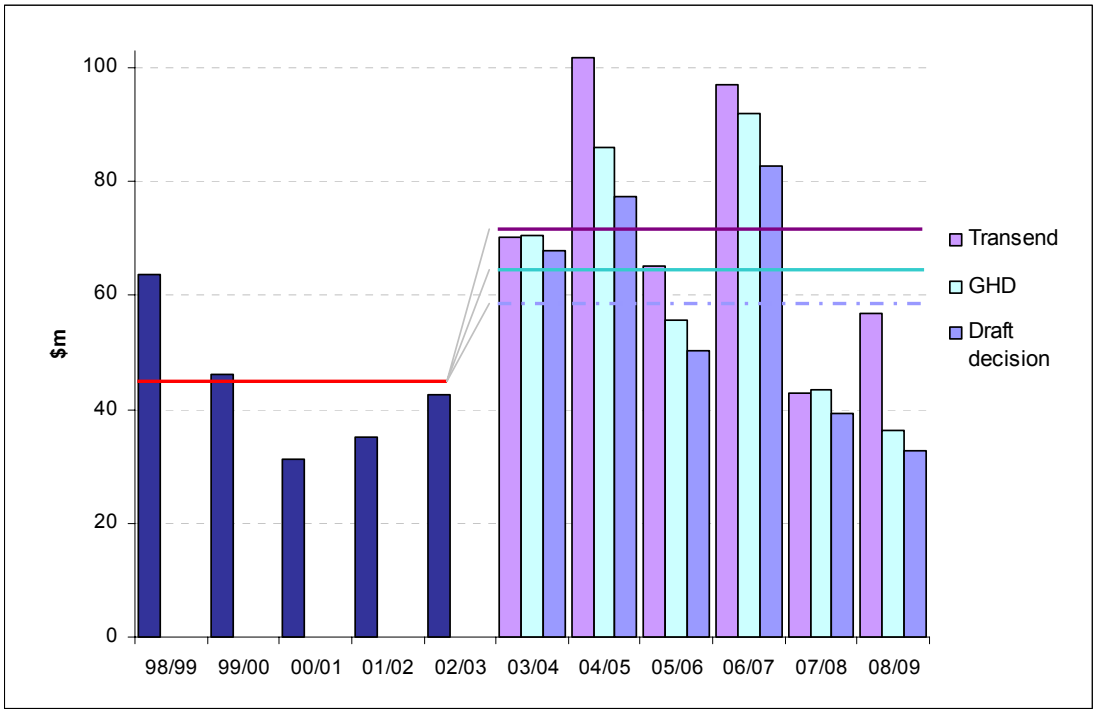
The ACCC agrees with GHD that its capex allowance of $341m represents a maximum allowance and that it should be rationalised taking into account non-technical factors. The ACCC considers that an across-the-board reduction of 10 per cent on GHD's maximum allowance would balance the interests of Transend and its customers more appropriately.

The ACCC notes that OTTER, in its previous determination, also reduced Transend's capex by 10 per cent. However, even with this reduction, Transend has not been able to deliver its forecast capex allowance.

A 10 per cent reduction results in a total capex allowance of $307m over the regulatory period. This represents an average annual allowance of $56m, which still about a 25 per cent increase over Transend's historical capex levels.

Figure 4.1 compares historic capex with that proposed by Transend, GHD and this draft decision.

Figure 4.1 Historic and forecast capex in-service ($m, 2002-03)



4.9 Conclusion

Therefore, based on Transend's application, GHD's findings, interested parties submissions and its own analysis, the ACCC considers that a capex program of around $307m over the regulatory period is sufficient for Transend to meet its obligations under both the code and TEC.

Table 4.6 sets out the capex allowance approved by the ACCC for Transend.

Table 4.6 Transend's capex allowance ($m, 2002-03)

	Jan-Jun 2004	2004-05	2005-06	2006-07	2007-08	2008-09	Total
GHD Rec'd	27.1	86.1	55.8	92.1	43.5	36.3	340.9
10% reduction	2.7	8.6	5.6	9.2	4.4	3.6	34.1
Allowance	**24.4**	**77.5**	**50.2**	**82.9**	**39.1**	**32.7**	**306.8**

In making its decision the ACCC emphasises that:

- Transend must apply the regulatory test or abide by OTTER's planning requirements for each project to justify its inclusion in the RAB
- given the size of the renewals program, Transend should be required to demonstrate that its renewal expenditures are economically justified and that there are no other, more cost effective, alternatives. It considers that the jurisdictional regulator's interests in Transend's asset management could be expanded to include such a process.

- Transend must report its actual capex throughout the regulatory period. As a minimum it must comply with the ACCC's information requirements guidelines.

4.10 Alternative approach to capex

The ACCC considers that where costs are to be borne by groups of users who are not in a position to voluntarily opt in or out, there is a need for regulatory oversight to ensure efficient and equitable outcomes.

However, where a project is subject to even-handed one-on-one negotiation, a more light handed approach may be adequate.

The ACCC's standard approach for the shared cost situation is based on three pillars.

- Prospective estimate of capex requirements by the ACCC. This is based on information provided by TNSPs', consultants' recommendations, comments by interested parties, etc. In the last three revenue caps the ACCC has used the probabilistic method to estimate expected value of capex in the regulatory period. It considers that this approach provides a compromise in terms of flexibility and certainty.

- On-going assessment of individual projects. Either by the application of regulatory test or equivalent (e.g. RNPP approval in Tasmania).

- Retrospective application of prudency test or optimisation.

The ACCC notes that Transend's proposed approach, of funding variable capex on a pass-through basis, circumvents the first pillar. Therefore the ACCC is not convinced that Transend's approach would be prudent at this time for shared-cost projects.

However, the ACCC considers that such an approach may be acceptable in those instances where a project is paid for by a single customer who is capable of effectively negotiating with the TNSP.

Therefore, the ACCC has developed an alternative approach to capex based on the difference in pricing for shared and dedicated assets under the code.

Under the approach, capex would be differentiated depending on whether it would be paid for by an individual customer or shared among users generally. In broad terms a capex allowance would be fixed by the ACCC for shared assets while dedicated assets would be treated on a pass-through basis if the parties were able to reach agreement on the costs. Such an approach is a part of the code that applies to distribution companies.

The ACCC believes that such an approach could address the Transend's concerns caused by new developments, mainly connection assets driven by wind-farm developments.

Further details of this approach are contained in appendix C for consideration by interested parties. The ACCC flags that it may, depending on the feedback received, consider adopting this approach in the final decision.

5 Operating and maintenance expenditure

5.1 Introduction

In setting Transend's AR, the ACCC must assess Transend's capacity to achieve realistic efficiency gains in its proposed operational expenditure (opex). Because opex represents a large proportion of a network's variable costs, it is an important source of savings and productive efficiencies.

5.2 Code requirements

The ACCC's task in assessing Transend's opex is specified in the code. In particular, part B of chapter 6 of the code requires that:

- in setting the revenue cap, the ACCC must have regard to the potential for efficiency gains in expected *operating, maintenance* and capital *costs*, taking into account expected demand growth and service standards
- the regulatory regime must seek to achieve efficiency in the use of existing infrastructure, *efficient operating and maintenance practices*, and an efficient level of investment. [emphasis added]

5.3 Transend's proposal

5.3.1 Key factors in determining opex

Transend considers that its 'bottom-up'[16] assessment of future costs provides better forecasts than relying on recent cost performance. It claims that this approach enabled it to examine the challenges it will face during the regulatory period, such as:

- preparing for NEM-entry
- participating in the NEM
- meeting future demand for Transend's services, including new connection inquiries from customers
- aligning asset management techniques with industry best practice
- improving service performance
- ensuring opex and capex are combined to minimise total life-cycle costs

[16] In developing its 'bottom-up' forecast Transend assessed the expenditure requirements of each of its business units and totalled the amounts.

- delivering efficiency gains, in terms of improved performance and increased output.

In forecasting its opex, Transend states that it has factored in efficiency gains.

5.3.2 Opex categories

Transend's application contains five major opex categories. Its forecasts are based on the assessment of key causes (drivers) for each category. Table 5.1 shows the categories and drivers. Costs relating to NEM-entry and system controller costs are common to several major categories.

Table 5.1 Opex drivers for Transend

Categories	Drivers
Connections and development	NEM-entry; transfer of the system controller function; Basslink connection; new generation; and vesting contracts.[17]
Network	NEM-entry; changing regulatory, community and market environments; alignment with industry best practice; driving existing assets harder; increasing service provider costs; implementing new asset and information management technologies; and improving service performance.
Transmission operations	Preparation for NEM-entry; transfer of the system controller function; additional responsibilities for local operations and system security competencies; and participation in the NEM.
Corporate	NEM-entry; transfer of system controller; market and regulatory systems; and insurance.
Other costs	Grid support; equity raising costs; and dismantling.

Connections and development

Transend states that the scope of work undertaken by the connections and development group has increased substantially since its last pricing determination with more connection inquiries, applications assessed and connection agreements managed. It also states that the process for network augmentation has changed, with more emphasis on public consultation and exploring non-network solutions.

Network Group

Transend states that it has reviewed asset management strategies and asset condition from which it has developed several work plans. It believes that these reviews show a need to increase the Network Group's expenditure.

[17] A vesting contract covers the franchise load obligations of a retailer with a generator. It is typically a fixed forward commodity transaction in the form of a two way swap and provides a mechanism to manage the transition to a deregulated electricity market.

Transmission operations

Transend states that the transfer of system controller functions and NEM-entry will lead to costs increasing in 2004-05 and 2005-06. However, the costs will then decrease in 2006-07 and stabilise when functions move from the operations group to NEMMCO.

Corporate

Transend seeks an increase in corporate costs because it will not be able to recharge overheads to the system controller from 2005-06 onwards, even though it will still incur these costs.

Other costs

Grid Support - Transend expects to start incurring grid support charges in the regulatory period. Previously, Hydro Tasmania provided these services at no cost. As these charges are uncertain, Transend proposes that they be funded on a pass-through basis.

Equity raising cost - in accordance with the ACCC's decisions for ElectraNet and SPI PowerNet, Transend has included an allowance for benchmark equity raising costs.

Energy metering - Transend has not included costs to cover these activities as there is uncertainty as to whether Transend will be the 'responsible person' for metering installations. Transend will provide additional information and cost implications when this activity is determined.

Dismantling - Transend has included costs associated with dismantling assets no longer in service.

5.3.3 Claim for carryover of opex efficiency gain

Transend considers that its current revenue determination, established by OTTER in 1999, significantly underestimated the scope of work required. As a result, its actual (total) opex for the period 1999-00 to 2002-03 has exceeded OTTER's allowance by $5.8m (table 5.4).

Transend claims that the additional tasks relate to increased regulatory compliance work and NEM-entry. It states that it initiated the Tasmanian Wholesale Electricity Market (TWEM)[18] and that OTTER did not anticipate the costs of this project in making the 1999 determination.

Transend's claims, considering the increased scope, that it has significantly improved its efficiency and cost performance compared to allowances provided in its 1999 determination.

It believes that in assessing its efficiency gain a cost allowance that fully recognises the actual scope of work should be considered. However, it accepts that such a

[18] A project created to manage issues associated with Tasmania's entry into the NEM.

theoretically correct approach would involve a degree of conjecture. As a compromise, it seeks an efficiency bonus only on the TWEM costs incurred during its current regulatory period (and not on the additional non-TWEM scope increases).

Transend states that its TWEM costs have averaged around $0.5m a year over the current regulatory period. It proposes that its claimed efficiency bonus for TWEM costs be glide pathed (carried and shared) over the regulatory period allowing the full efficiency gain in the first year (2004-05) and reducing by 20 per cent in each subsequent year (until 2008-09). That is, the efficiency carryover would total $1.5m over the upcoming regulatory period.

5.3.4 Benchmarking

Transend presents analysis conducted by Benchmark Economics which suggests that Transend's total costs, including opex, were low compared to its mainland peers. In comparing these costs, Transend argues that it is essential to take account of factors that influence relative performance, such as economies of scale and network business conditions.

Transend states that to some extent, the conclusions from Benchmark Economics contrasted with the International Transmission Operations and Maintenance Study which tended to show Transend as an average performer.

Transend notes that in its past decisions, the ACCC has compared costs between TNSPs by using a range of measures. However, it considers these measures do not take into account economies of scale or business conditions.

Transend further notes the ACCC has argued that total opex to line length is a more useful ratio than some other ratios as it considers that most of its expenditure is incurred in maintaining substations rather than lines.

5.3.5 Opex allowance proposed by Transend

Transend's proposed opex allowance is shown in table 5.2. It states that NEM-entry and asset management account for most of the cost increase and argues that its analysis of the key cost drivers justify the increase.

Table 5.2 Transend's proposed opex allowance[1] ($m, 2002-03)

	Jan-Jun 2004	2004-05	2005-06	2006-07	2007-08	2008-09	Total
Connections and development	1.9	4.1	4.5	3.6	3.6	3.6	21.3
Network	9.5	19.6	19.7	19.9	19.7	20.0	108.4
Transmission operations	1.6	2.7	4.6	4.3	4.3	4.3	21.8
Corporate	2.7	4.7	6.3	6.7	6.9	6.6	33.9
Dismantling	-	1.9	1.0	1.9	-	-	4.8
Equity raising cost	0.3	0.6	0.6	0.6	0.6	0.6	3.3
Total opex	**16.0**	**33.4**	**36.5**	**36.9**	**35.0**	**35.2**	**193.0**

1. Additions are not exact due to rounding.

5.4 GHD's review

GHD reviewed Transend's proposed opex requirements. Its main findings and recommendation are outlined in section 5.4.1.

5.4.1 Summary of GHD's findings

Opex costs would rise from $19m to $35m by the end of the regulatory period.

GHD has developed an alternative opex forecast based on an allowed historical base of $18.5m per annum for ongoing core activities, less the application of a two per cent efficiency factor, plus costs associated with new activities.

The increase in forecast opex is due primarily to two factors: NEM-entry; and an increase in maintenance as a result of Transend's 'bottom up' review of the condition of all its transmission assets.

Increases in costs will be incurred to provide system control functions and maintain system control backup.

GHD considers that the significant increase in opex proposed by Transend appears unwarranted, even after accounting for major changes to the scope of services.

Information on how future efficiencies were built into opex forecasts were not included in the application and Transend found it difficult to quantify the effects.

There was limited evidence of comprehensive risk/cost/benefit analysis or risk-managed approach to investment decisions.

In GHD's opinion processes for technical assessment of maintenance appear to be reasonable and the majority of the work is technically justifiable. However, it found that Transend had not adequately considered alternative levels of service in order to

provide a rational basis for deciding trade-offs between cost, timing and risk in conjunction with stakeholders and supported by risk based assessment.

Capex to opex allowance totalling $0.6m for the regulatory period results from changes to Transend's capitalisation policy, with an amount of $6.2m considered as most appropriately allocated to capex.

Application of grid support costs is uncertain. Hence GHD concludes that a pass-through allowance, subject to certain conditions, is appropriate.

GHD's report contains details of its assessment of each major opex category and is available on the ACCC's website.

5.4.2 Claim for carryover of opex efficiency gain

GHD considers that it is unnecessary to compensate Transend further for costs which should properly be claimed in the previous revenue period, if indeed they are justified.

It also notes that if an efficiency bonus is provided in addition to claimed opex, it would be difficult to assess the total amount. Hence, it does not recommend an efficiency bonus be allowed.

5.4.3 GHD's assessment of benchmarks

GHD states that benchmarking costs using a range of measures (such as opex per MW capacity or opex per network km) can be difficult as all businesses have their own unique operating environments.

GHD notes that in several reports opex benchmarks showed Transend as a lower to middle cost TNSP in Australia, during 1999-00 or 2001-02. However, if the opex figures from Transend's application are incorporated, its relative position compared to other TNSPs would worsen for the period to 2005-06 before stabilising in later years as one of the higher cost TNSPs.

5.4.4 GHD's assessment of Transend's application

GHD considers that Transend's application provides only high level financial information with extensive narrative about future plans. It considers that interested stakeholders would find it difficult to conduct analysis and come to a judgement on the appropriateness of the application.

5.4.5 GHD's recommended opex allowance

GHD developed its own forecast of Transend's opex requirements based on analysis of Transend's past opex trend. It started with the opex incurred in the latest audited financial statements (2001-02) and excluded one-off expenses to arrive at a base opex of $18.5m. This amount was then adjusted for:

- inflation to 2002-03
- an efficiency dividend of 2 per cent per annum

- additional tasks including NEM-entry and participation, increased maintenance and telecommunication costs.

Table 5.3 shows GHD's recommended opex allowance for the regulatory period.

Table 5.3 GHD's recommended opex allowance ($m, 2002-03)

	Jan-Jun 2004	2004-05	2005-06	2006-07	2007-08	2008-09	Total
GHD's proposal[1]	**13.1**	**29.8**	**30.9**	**29.7**	**27.2**	**27.1**	**157.8**

1. Excludes equity raising, debt raising and grid support costs.

5.5 Submissions by interested parties and Transend's response

5.5.1 Lack of information

Several interested parties consider that there is insufficient information in Transend's application. In particular, they point to a lack of detail on historical opex and NEM-entry costs.

Transend responds that it had provided GHD with further information.

5.5.2 System controller function

MEG questions whether system control function costs were allocated appropriately and whether costs associated with Basslink should be included in Transend's regulated costs.

Transend states that it will have more responsibilities after the transfer of the system controller to NEMMCO, rather than fewer.

5.5.3 Benchmarking

Hydro Tasmania claims that the Benchmark Economics' report used 2003 as the base year, which contains roughly half the average level of Transend's forecast opex. MEG also noted that under the International Transmission Operations and Maintenance Study composite measure, Transend's general performance has improved.

Transend states that the International Transmission Operations and Maintenance studies do not benchmark all costs and that its current costs and revenue are unsustainably low compared to other transmission businesses.

5.5.4 New generation and Basslink driven opex

MEG and EUAA submit that any opex resulting from new generation and Basslink should be allocated directly to those parties and not to customers as Transmission Use of System charges.

Transend argues that inter-connection to the NEM via Basslink will require significant changes to the operation and management of the power system. It would not be appropriate to ascribe these costs to Basslink.

5.6 Submissions by interested parties and Transend on GHD's opex report

5.6.1 NEM-entry costs and the system controller function

MEG has concerns about the $2.39m claim by Transend for NEM participation. It does not accept that additional reporting will be required given that Transend already reports its activity to OTTER regularly.

Transend claims that GHD has misunderstood the duplication of the system controller function. It claims that several roles presently undertaken by the system controller will revert to Transend after NEM-entry. It states that this is not duplication but a change in the cost recovery method.

5.6.2 Base year for assessment

MEG points to the risks of using a single year's financial result as the starting point of any assessment. It prefers to use the average of all years in the previous regulatory period as it considers it provides a disincentive to underspend in the early years and overspend in later years which would inflate the allowance.

5.6.3 Vegetation clearance

MEG believes that Transend has achieved zero fault outages for exposed easements and that this improvement came from a substantial increase in (previous) spending especially on clearing. It therefore argues that the additional allowance should not be granted.

5.6.4 Telecommunications and substation costs

MEG submits that Transend's existing telecommunications arrangements are adequate to operate the network. Therefore it considers that the increase in opex for an independent communications system is not warranted.

MEG also believes that the allowance for substation maintenance is excessive, considering the allowance paid to Aurora who currently provides this service.

5.7 ACCC's considerations

The ACCC has focused on assessing a reasonable level of opex for Transend. Its draft decision relating to opex is based on Transend's application, GHD's review of opex, historical opex levels, benchmarking and submissions from interested parties.

5.7.1 Choice of base year

Transend and MEG both opposed GHD's trend analysis, particularly the choice of 2001-02 as the base year, for different reasons. Transend argued that opex was low in 2001-02 and GHD should have chosen 2002-03 when opex was higher. MEG argues that choosing 2001-02 would advantage Transend, as it would have deferred expenses

to later years of the current regulatory period. It suggests using an average over the current regulatory period would be more appropriate.

The ACCC agrees with 2001-02 as the base year as it reflects the most recent audited financial results, unlike the 2002-03 figures. In also allows the impact of one-off or short term activities to be excluded.

The ACCC also agrees that regulated firms have an incentive to increase their expenditure towards the latter years of the regulatory period with the expectation that this expenditure will be used to determine its allowances for the next period. To some extent, however, GHD's choice of base year overcomes this distortion as it is not the last year of the previous regulatory period.

5.7.2 Historical opex

The amount of opex requested by Transend is much higher than its historical expenditure. Transend's actual opex has averaged around $20m over the last four years. This amount excludes system controller function costs which are currently about $10m a year.

The system controller's primary functions include the provision of ancillary services; power system operation and control; and regulatory compliance reporting. After Tasmania enters the NEM, ancillary services and some system operation functions will be undertaken by NEMMCO.

As stated earlier, Transend will absorb a large part of the system controller functions. The ACCC estimates the costs associated with the remaining system controller functions to be carried out by Transend are about $5m per year. Therefore, comparable historical opex is about $25m per year.

Consequently, GHD's recommendation of $29m per year represents a 16 per cent increase over historical opex levels.

Table 5.4 sets out Transend's historical opex allowance and actual spend. It also includes the average yearly opex allowance proposed by Transend and recommended by GHD.

Table 5.4 Transend's historical opex ($m, 2002-03)

Year	Allowance [1]	Actual	Forecast[2]
1999-00	19.3	18.9	
2000-01	19.1	19.4	
2001-02	18.7	20.8	
2002-03	18.7	22.7	
Transend proposed			35.0
GHD recommended			29.0

1. Opex allowances exclude incremental costs associated with system controller functions that Transend will be required to perform going forward. Approximately $5m needs to be added to

these allowances to make them comparable with Transend proposed and GHD recommended opex forecasts (section 5.7.2).
2. Average Transend and GHD forecast opex across the regulatory period, includes costs associated with system controller functions that Transend will be required to perform going forward.

5.7.3 ACCC's benchmarking analysis

The ACCC is aware that several factors limit the usefulness of comparing opex of transmission companies. These include varying load profiles, load densities, asset age profiles, network designs, local regulatory requirements, topography, climate and accounting practices.

Transend considers that the benchmarking of partial indicators is simplistic as it assumes that there are no economies of scale in electricity transmission. The ACCC understands that comparisons based on a single benchmark indicator are not very meaningful.

Nonetheless, different indicators 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 GHD's opex forecast for Transend. Items such as financing costs and grid support were not included in the benchmarking as they may obscure trends.

The ACCC benchmarked Transend against ElectraNet, Powerlink, SPI PowerNet/VenCorp and TransGrid. The results of the ACCC's analysis are presented in table 5.5.

Table 5.5 Ratio analysis of Transend compared to other TNSPs

		2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Opex/line length	GHD			7.30	8.00	8.58	7.98	7.79	7.76
(circuit $'000/km)	Transend	5.49	6.22	7.13	8.28	9.41	9.30	9.31	9.41
	ElectraNet	6.42	6.99	7.60	7.57	7.64	7.75	7.79	
	Powerlink	4.99	5.40	5.58	5.75	5.43	6.11		
	SPI/Vencorp	8.01	9.19	11.60	11.60	11.66	11.65	11.66	
	TransGrid	8.43	8.57	8.70					
Opex per	GHD			566	620	665	619	604	602
Substation ($'000)	Transend	425	482	553	642	730	721	722	729
	ElectraNet	526	574	623	621	627	636	639	
	Powerlink	657	711	735	758	716	805		
	SPI/Vencorp	1193	1368	1727	1727	1736	1734	1736	
	TransGrid	1394	1417	1439					
Opex/asset base	GHD			4.09	4.07	4.12	3.50	3.34	3.26
(%)	Transend	3.53	3.73	3.99	4.21	4.52	4.07	3.99	3.96
	ElectraNet	4.56	4.76	4.82	4.57	4.31	4.09	3.97	
	Powerlink	2.34	2.40	2.36	2.29	2.06	2.30		
	SPI/Vencorp	2.92	3.24	3.99	3.92	3.90	3.82	3.75	
	TransGrid	4.63	4.60	4.10					
Opex/MW peak	GHD			15.62	17.12	18.36	17.08	16.66	16.61
($'000/MW)	Transend	11.75	13.31	15.26	17.72	20.14	19.89	19.93	20.12
	ElectraNet	12.56	13.68	14.87	14.83	14.96	15.16	15.25	
	Powerlink	8.48	9.18	9.49	9.78	9.24	10.39		
	SPI/Vencorp	6.40	7.34	9.26	9.26	9.31	9.30	9.31	
	TransGrid	9.21	9.35	9.50					
Opex/GWh	GHD			2.47	2.71	2.90	2.70	2.64	2.63
($'000/GWh)	Transend	1.86	2.11	2.41	2.80	3.19	3.15	3.15	3.18
	ElectraNet	3.00	3.27	3.56	3.54	3.58	3.63	3.65	
	Powerlink	1.38	1.50	1.55	1.60	1.51	1.70		
	SPI/Vencorp	1.02	1.16	1.47	1.47	1.48	1.48	1.48	
	TransGrid	1.62	1.65	1.68					

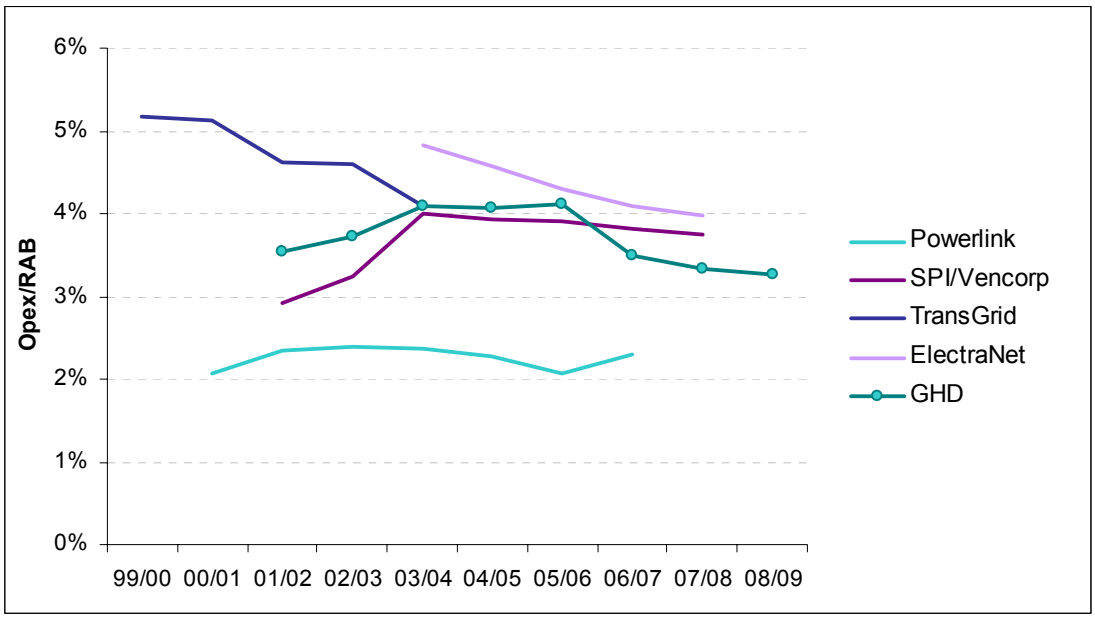
Note: Refurbishments, financing and grid support have been excluded from Transend's, GHD's recommended, ElectraNet's and Powerlink's opex figures.

Source: 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* ($real).
TransGrid opex figures from 25 January 2000 *NSW and ACT Transmission Network Revenue Caps 1999/00-2003/04* decision ($nominal).
Transend opex figures from application ($real).
GHD recommended opex figures from GHD's *Transend Regulatory Review* ($real).

The ACCC considers that opex as a proportion of asset base and opex per unit of circuit length, while having some limitations, are more useful measures than the other ratios. Figures 5.1 to 5.5 compare the level of opex recommended by GHD 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.

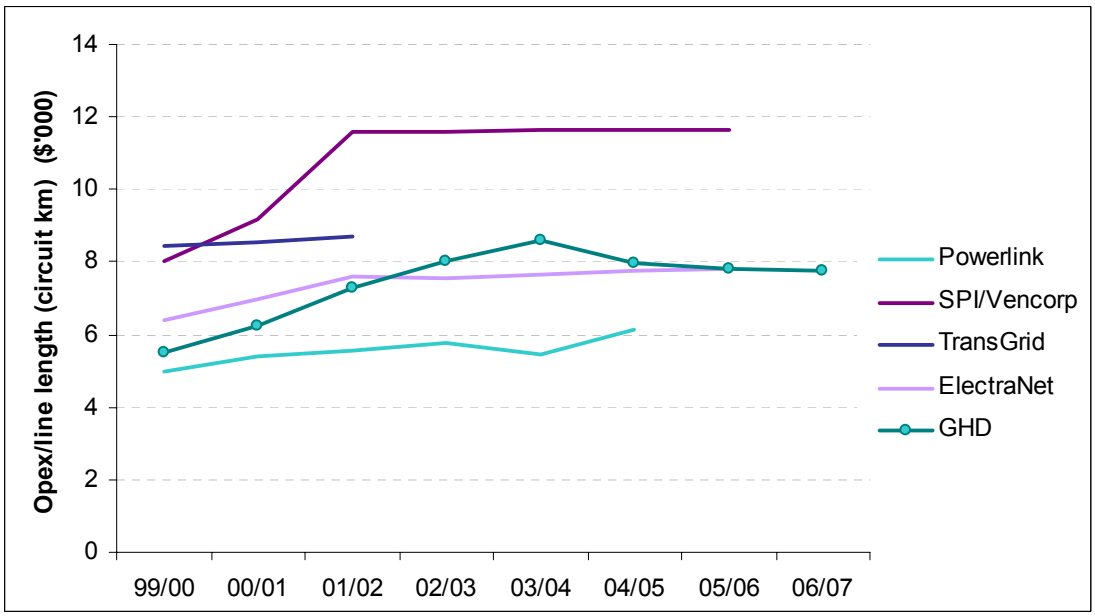
Figure 5.1 shows GHD's recommended opex as a percentage of its asset base over the regulatory period is reasonable compared with other TNSPs. The ACCC notes that the Tasmanian authorities' revaluation of Transend's asset base has resulted in a significantly higher asset base compared to OTTER's valuation. The increased RAB results in an improved ratio.

Figure 5.1 Comparison of TNSP's opex per asset base



Figures 5.2 and 5.3 show that Transend's opex (as recommended by GHD) is about average compared to other TNSPs. But the relative position is trending upwards from previous years to 2005-06 and then stabilising. These results are consistent with similar assessments by GHD, Transend and interested parties.

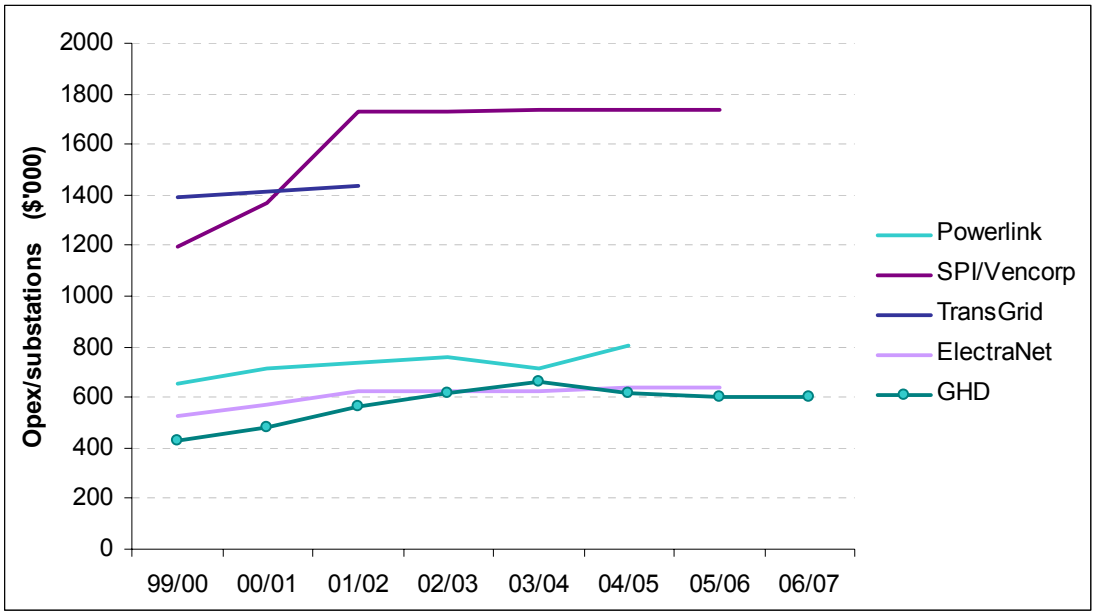
Figure 5.2 Comparison of TNSP's opex per line length



The ACCC is mindful that the above opex/circuit length chart may show Transend in a better light than it actually is for the following reason. The ACCC, in its South

Australian revenue cap decision, used opex per circuit length benchmark. Tasmania has a high proportion of double circuit lines - higher than many mainland TNSPs (except for SPI). Hence one may expect Transend to have a lower opex/circuit length ratio. But there may be other valid reasons which could make Transend's opex high. If opex/route length was used, it would show Transend's relative position in a worse light.

Figure 5.3 Comparison of TNSP's opex per substation



Transend believes that opex to substation is a more useful ratio because more of Transend's expenditure is for maintaining substations. However, the ACCC notes that Transend has quite a large number of small substations while TransGrid and SPI PowerNet have a small number of large substations. This perhaps explains why Transend would show up well in the opex/substation ratio.

Figure 5.4 Comparison of TNSP's opex per GWh

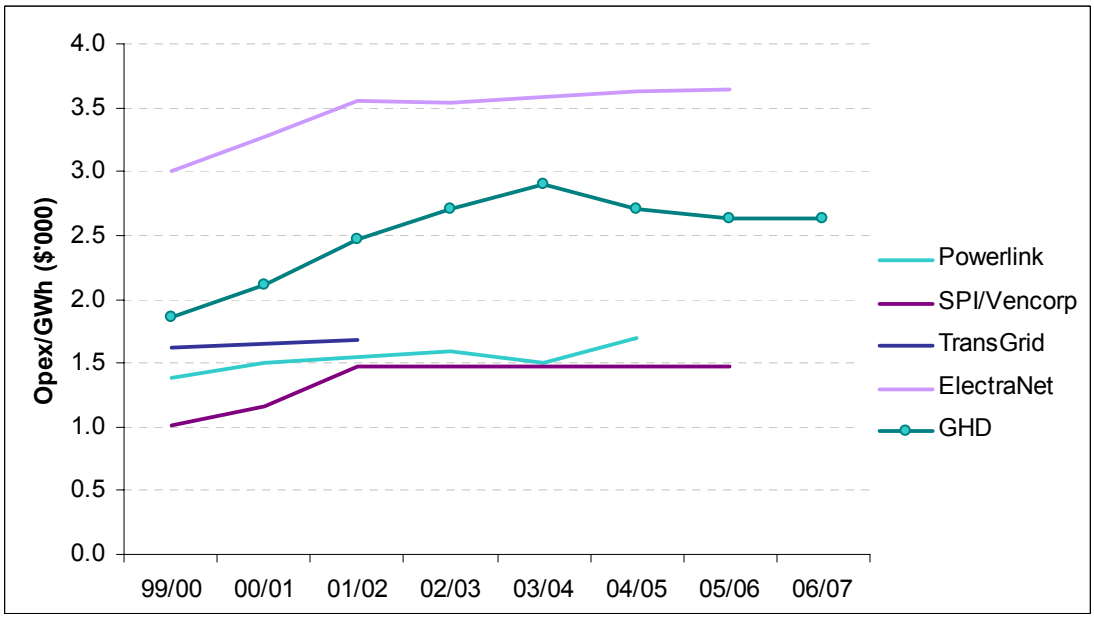
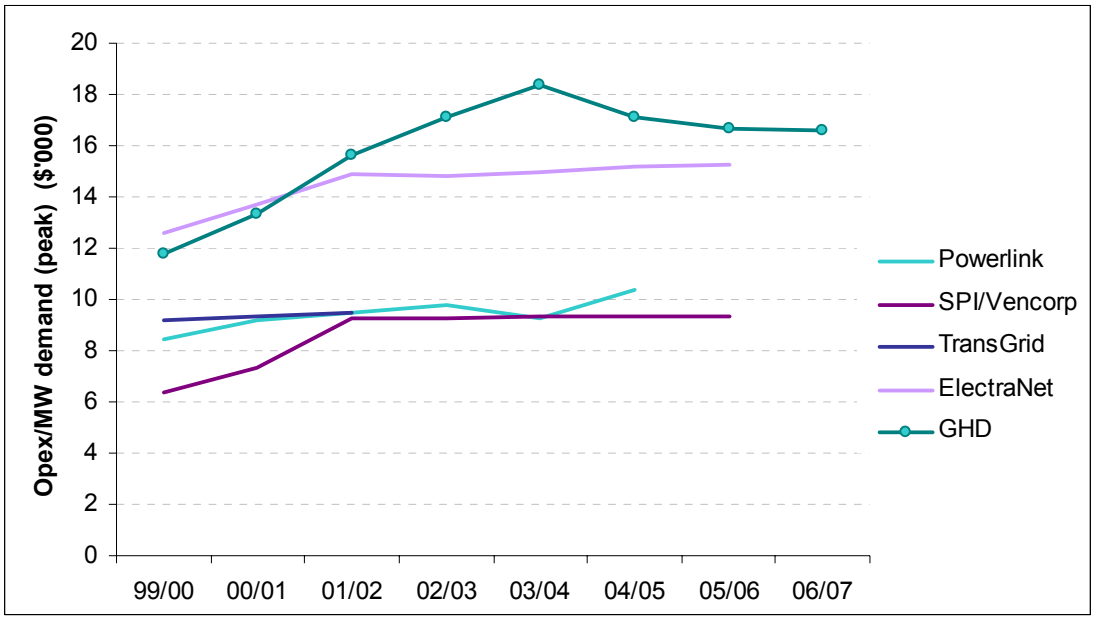


Figure 5.5 Comparison of TNSP's opex per MW



The ACCC recognises that differences in operating conditions and scale may explain why some ratios are higher or lower. As such, they 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 in a reasonable range.

However, overall the ACCC considers that its benchmarking shows, particularly in relation to opex per asset base, opex per line length and opex per substation, that GHD's recommended opex allowance is reasonable.

5.7.4 Opex to capex reclassification

In its application Transend treated expenses incurred in transformer overhauls and post insulator upgrades ($6.2m) as opex. It treated the expenses in this way as it claims that they do not improve the performance, capacity or useful life of the asset.

GHD disagreed. It argued that such refurbishments would increase the efficiency of the asset and therefore recommended that the costs be capitalised.

The ACCC accepts GHD's recommendation as it considers that these costs will either improve the capacity or useful life of the asset.

5.7.5 Opex efficiency factor

GHD's alternative opex recommendation applied an efficiency factor of two per cent per annum to the base year forecasts.

Transend disagreed with this recommendation, arguing that GHD has not provided any justification for the proposed efficiency factor it has recommended. It claimed that the achievement of the proposed cumulative efficiencies would compromise service levels.

The ACCC accepts the two percent efficiency factor on the base level opex commencing in 2003-04, as recommended by GHD. The ACCC notes that in the past, OTTER has applied an efficiency factor of comparable magnitude in its regulatory decision. The ACCC also considers that the large renewals program should result in some opex efficiencies.

The ACCC also notes that the full costs estimated by Transend for activities relating to NEM-entry and participation, increased maintenance and telecommunication costs, have been included by GHD in its recommended opex. GHD considers that some further efficiencies could reduce future costs in these activities.

5.7.6 Claim for carryover of opex efficiency gain

Transend claims that it has delivered a substantially increased output (in terms of unanticipated scope increases) at a slightly increased cost. On this basis it believes that it deserves an efficiency bonus, glide pathed over the forthcoming regulatory period.

The ACCC's DRP[19] foreshadows that it will consider the use of an incentive mechanism where a TNSP is able to demonstrate that management induced opex efficiencies.

The ACCC does not consider that an efficiency bonus is justified for the following reasons.

- Transend's scope of work may have increased. However, the ACCC considers that this could have been at the expense of some of Transend's usual work. For example, the ACCC understands that resources required for the TWEM project have been drawn from other areas within the business. Also Transend was unable to deliver its planned capex program. As such it is unclear whether or not the increase in scope was offset by a reduction in output in some normal activities (substitution effect). Hence it is difficult to establish whether management induced efficiency gains were actually achieved.

- The purpose of an efficiency incentive mechanism is to encourage a firm to reveal its actual efficient costs, resulting in cost reductions over time. In Transend's case its opex costs are increasing substantially from its current regulatory period to the forthcoming period. Hence the ACCC considers that the value of an efficiency mechanism is not clear until such time as Transend's opex costs stabilise.

The ACCC notes that it intends to examine incentive mechanisms more broadly as part of its current review of its *Statement of Principles for the Regulation of Transmission Revenues*. As part of this process the ACCC will seek interested parties' views on incentive mechanisms and the properties they should contain.

The ACCC will monitor annually Transend's opex, as per its *Information Requirements Guidelines*. Using this and other relevant information the ACCC will assess any claims for efficiency gains at Transend's next revenue reset.

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[19] ACCC, *Draft Statement of Principles for the Regulation of Transmission Revenues*, 27 May 1999, pp. 93 – 95.

5.7.7 Pass-through events

Transend proposes a pass-through mechanism for five categories of events: insurance, grid support, tax change, service standards and terrorism. Transend's proposed pass-through events are detailed in Schedule 1 of Appendix 1 of its application.

Although the ACCC is concerned about the muting effect that pass-through has on incentives, it recognises that certain events may be better addressed on this basis. As such, the ACCC considers that it is reasonable to allow funding for certain events on a pass-through basis after a case by case appraisal.

The ACCC has considered Transend's proposal regarding pass-through events and notes that they are consistent with its recent decisions. However, the ACCC requires minor amendments which are set out in appendix D.

5.7.8 Grid support

In its application Transend requests that grid support be funded on a pass-through basis.

GHD considers that as grid support is so uncertain that it should be funded on a pass-through basis subject to certain conditions. It states that the conditions should require that Transend justifies the amount of the pass-through requested each year, and demonstrates that the lowest net cost option was selected for the project.

At the time of the draft decision, Transend was negotiating with Hydro Tasmania for the provision of grid support services over the regulatory period but no amount had been finalised. Once the details have been agreed between the parties the ACCC will assess the amount sought and make a decision on its reasonableness.

For the purposes of this draft decision the ACCC has allowed an amount of $2m per annum for grid support. This is based on a preliminary estimate.

The ACCC intends to monitor grid support annually.

5.7.9 Equity and debt raising costs

As outlined in chapter 6, the ACCC will allow Transend equity and debt raising costs over the regulatory period. These costs are calculated by applying benchmarks and gearing ratios to the asset base, and are treated as benchmark operational expenses. As indicated in table 5.6, over the regulatory period the equity raising cost average about $0.57m per annum and the debt raising cost average about $0.42m per annum.

5.7.10 System Protection Scheme

In its application Transend states that it is currently working with Basslink Pty Ltd to install a system protection scheme (SPS). It states that SPS will ensure the security of the Tasmanian power system in the event of a transmission failure relating to Basslink. Transend claims that without the SPS its capex requirements would be much higher.

GHD considers that the operational costs associated with Basslink should be directly recoverable from Basslink Pty Ltd. Hence it considers that costs associated with Basslink commissioning, maintenance of the SPS and communications for the SPS, totalling $4.39m, should be excluded from the revenue cap.

The ACCC considers that the costs associated with the SPS could be regulated in a more light-handed manner, for example through a connection agreement between Basslink Pty Ltd and Transend.

5.8 Conclusion

The ACCC uses the building-block approach to determine TNSPs' revenue caps. This is part of the light-handed incentive-based regulation preferred by the ACCC. Under this approach TNSPs are given a sum of money enabling them to earn a reasonable return when they are functioning efficiently. The approach also enables them to earn higher returns than those envisaged by the ACCC, if they are operating more efficiently than they are expected to. The converse is also true.

The ACCC prefers to use efficient costs, rather than actual costs, based on its consultant's advice, historical opex levels, interested parties' submissions and its own analysis (including benchmarking).

As the ACCC does not adopt a cost-plus approach to regulation, the details of actual costs are of secondary importance to efficient costs. If this were not the case, a more heavy handed and interventionist approach to the verification of costs would be necessary.

The ACCC has reviewed GHD's trend analysis. It considers the opex forecast by GHD is reasonable. The ACCC notes that the GHD forecast provides historical context, allows for new activities and ensures that an appropriate efficiency factor is incorporated into the forecast. The ACCC's benchmarking also supports the conclusion that GHD's opex forecast is reasonable.

The ACCC agrees with Transend that its operational environment will change during the forthcoming regulatory period when Tasmania enters the NEM. However, it considers that Transend's core business will not change substantially and that Tasmania's load growth is likely to be minimal.

Taking into account all of the above, the ACCC considers an average figure of $31.7m per annum (including $2m per year for grid support, $0.565m per year for equity raising cost and $0.42m per year for debt raising cost) to be an appropriate opex allowance for Transend over the forthcoming regulatory period (table 5.6).

The ACCC acknowledges that this figure is much higher than the opex allowance for the previous regulatory period. However, it incorporates several new activities that Transend will be required to deliver in the forthcoming regulatory period.

Table 5.6 Transend's opex allowance ($m, 2002-03)

	Jan-Jun 2004	2004-05	2005-06	2006-07	2007-08	2008-09	Total
Transend's proposal[1]	16.0	33.4	36.5	36.9	35.0	35.2	193.0
GHD's proposal[2]	13.1	29.8	30.9	29.7	27.2	27.1	157.8
Equity raising cost	0.24	0.52	0.56	0.58	0.62	0.63	3.2
Debt raising cost	0.18	0.39	0.42	0.43	0.46	0.46	2.4
Grid support	1.0	2.0	2.0	2.0	2.0	2.0	11.0
Total Opex	**14.5**	**32.7**	**33.9**	**32.7**	**30.3**	**30.2**	**174.4**

1. Transend's opex forecasts included equity raising costs but not debt raising or grid support costs. Its debt raising costs forecasts were included in the WACC.
2. GHD's forecast does not include grid support, equity raising costs or debt raising costs.

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 consider the weighted average cost of capital (WACC) of the transmission network.

The ACCC therefore uses the risk adjusted rate of return required by investors in commercial enterprises facing similar business risks to establish the WACC.

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 AR.

If the return on equity is too low, the regulated network will be unable to earn sufficient returns to the owner, reducing the incentive to reinvest in the business. Conversely, if the return on equity is too high, networks will have a strong incentive to overcapitalise, creating inefficient investment.

AR translates into prices for users. Eventually AR would mean higher prices. Therefore, correctly assessing the WACC is important.

6.2 The weighted average cost of capital

In the DRP[20] the ACCC outlines its view on the appropriate return on equity to be achieved and how it is to be used for deriving the AR, summarised in statement 6.3:

> 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 removed the parameters relating to business income tax from the WACC formula (referred to as 'vanilla WACC') and applied it to post-tax cash flows (i.e. cash flows adjusted for tax and franking credits).

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

where:

r_e = required rate of return on equity

r_d = cost of debt

E = market value of equity

[20] ACCC, *Draft Statement of Principles for the Regulation of Transmission Rev*enues, 27 May 1999, p. 84.

D = market value of debt

V = market value of equity plus debt.

Transend has adopted the ACCC's post–tax approach to setting the WACC, using nominal after tax cash flows in its application.

6.3 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 return on equity (r_e), as outlined under schedule 6.1(2.2.2) of the code, for example, price to earning ratio, dividend growth model and arbitrage pricing theory. However, the code indicates that the 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
- market's own volatility
- 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)—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 both equity and debt. Therefore by including the cost of debt as well we can derive the overall return on capital employed. This is known as the WACC (see section 3.2).

6.4 Estimate of the risk-free interest rate

The yield on government bonds is considered to be risk-free, because governments can honour all interest and debt repayments.

6.4.1 Sampling period

All information used for deriving the rate of return using the CAPM (the CAPM parameters) should be as up-to-date as possible. Financial markets continually determine parameters such as interest rates and inflationary expectations. Statement 6.7 of the DRP states:

> The risk free rate will be normally based on a 40 trading 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.

Transend proposed a 10-day averaging period to estimate the risk-free rate.

The ACCC understands the limitations of using either an 'on the day' rate or an 'historical average' to calculate the risk free rate.

The CAPM specifies the use of *ex-ante* returns, which is best estimated by using the on the date rate, and theoretically the on-the-day rate is more appropriate.

However this rate reflects short-term fluctuations that may differ from the long-term trend. Averaging the rates over some time before the regulatory period starts can reduce such volatility. Several regulators use an average rate as the risk-free rate.

In the DRP the ACCC suggested a 40-day moving average and used it in early revenue cap decisions. However the ACCC used a 10-day averaging period in its *Victorian*[21] and *South Australian*[22] decisions last year.

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

6.4.2 Selection of the bond rate

Submissions by interested parties

Transend states that:

- a number of arguments support the use of a 10-year bond rate as a proxy for the risk-free rate and, importantly, it should be set on a basis consistent with other variables in the CAPM notably the MRP
- the Lally report assumes that the interest rate risk is the only one facing the business and does not account for cost uncertainty and regulatory risk

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

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

- regulators should err on the side of caution in estimating the WACC to ensure that investment continues,[23] hence they should use the (usually slightly higher) 10-year bond rates.

The MEG considers that the ACCC's previous approach, using a bond (for bond rate) the term of which matches the regulatory period, is sensible. MEG also claims that Transend prefers a longer bond rate only because it is usually higher.

ACCC's considerations

The WACC is calculated at the beginning of each revenue reset and is applied throughout the regulatory period. The risk-free interest rate is a component of the WACC and is estimated by using the yield on Commonwealth securities. Therefore the term of the bond should match the length of the regulatory period. In the case of Transend it is five-and-a-half years. Some finance experts support this view.

Other experts believe that bond rates with terms matching the life of the assets should be used. The effective lives for most transmission assets far exceed 10 years, so these experts suggest that 10-year bond yields should be used in the calculation as it represents the most liquid bond with the maturity comparable to the life of the assets.

Australian state regulators use a 10-year bond rate, and the code also appears to support this view.[24]

In the DRP the ACCC stated that yields on bonds matching the regulatory period should be used in the CAPM model. It applied this approach in its previous revenue cap decisions regarding Queensland, Victoria and South Australia because:

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

Associate Professor Martin Lally advised that the ACCC's approach in establishing the risk-free rate is theoretically correct and appropriate in practice, given the financial framework used.[25] That is, the five-year bond rate is appropriate if the regulatory period is also five years.[26]

Several interested parties criticised Lally's assumptions. In response, the ACCC engaged Professor Kevin Davis to examine these criticisms.[27]

In his report, Davis considered that long-term interest rates will, on average, exceed short-term interest rates for reasons other than expectations of future increases in

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23 Further discussion by Transend and NECG about the appropriate risk-free rate to use can be found in Appendix 7 of its Revenue Cap Application.

24 code, Schedule 6.1.

25 Associate Professor Martin Lally is an academic staff member of the School of Economics and Finance, Victoria University of Wellington.

26 Lally, *Determining the risk free rate for regulated companies*, a paper for the ACCC, July 2002.

27 Davis, *Report on Risk-Free Interest Rate and Equity and Debt Beta Determination in the WACC*. Report for ACCC, May 2003

interest rates. Therefore, the use of the longer term interest rate as a proxy for the risk-free rate will lead to higher regulatory cash flows than if the short-term rate were used.[28]

Davis demonstrated that using the interest rate on bonds with maturity periods equalling the regulatory period, to derive the required return for the regulated asset, generates expected cash flows which are fairly priced in net present value terms. Furthermore, using a maturity period which exceeds the regulatory period provides excess returns for the regulated asset if there is a positive term premium in the yield curve, unrelated to interest rate expectations.

The ACCC has discussed this matter in detail in the DRP and its previous revenue cap decisions. After considering both arguments, it prefers, on balance, to use a term matching the regulatory period. However, the ACCC accepts that this is a matter in which experts can have different views.

Maturity dates on the nominal and indexed bonds rarely correspond and require realignment using either interpolation or extrapolation, i.e. 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, using the nominal five-and-a-half year, 10-day moving average for Commonwealth government bond rates results in a risk free rate of 5.43 per cent.

There are no Commonwealth bonds with a period matching the current regulatory period of five-and-a-half years. However the 5 and 1/2-year bond rate was estimated by interpolating the 5-year and 10-year bond rates.

To calculate the required risk-free rate-of-return, the ACCC calculated the 10 day moving average of the 5 and 1/2-year bond rate. At the time of the draft decision this was 5.43 per cent.

6.5 Expected inflation rate

The expected inflation rate is not an explicit parameter in the return on equity calculation. But it is a component of the risk-free rate and the cost of debt. It can be estimated by the:

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

Statement 6.11 of the DRP states:

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[28] Davis, *Report on Risk Free Interest Rate and Equity and Debt Beta Determination in the WACC*, Report for ACCC, May 2003.

> 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 2.21 per cent per annum.

6.6 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.

Statement 6.10 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.

6.6.1 Submissions by interested parties

Transend considers that a credit rating of BBB+ would be fair given that gearing is assumed to be 60 per cent. Therefore it asked for a cost of debt of 132 basis points above the nominal risk-free rate.

Hydro Tasmania argues that Transend's estimate of the cost of debt is particularly high and results in a WACC higher than for other TNSPs, in recent decisions.

The EUAA and EAG state that the debt margins provided in recent decisions were not consistent. They seek a consistent and reasoned approach.

6.6.2 ACCC's considerations

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).

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

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 credit-worthiness is partly under managerial control.

Transend's application provided a sample of firms, including three with gearing of 60 per cent or higher and credit ratings of BBB or BBB+ (ElectraNet, (75 per cent, BBB+), Envestra (80 per cent, BBB) and GasNet (67 per cent, BBB+)).

However, similar firms have gearing well below 60 per cent but have (similar) credit ratings of BBB or BBB+ (Origin (29 per cent, BBB+), AlintaGas (49 per cent, BBB)).

The ACCC considers relevant Australian electricity transmission and distribution companies should be used as the basis for a benchmark.

Table 6.1 Credit ratings of electricity companies

Company	Long-term rating	Actual Gearing (%)
Ergon Energy	AA+	46.9
Country Energy	AA	66.7
EnergyAustralia	AA	52.5
Integral Energy	AA	55.8
SPI PowerNet	A+	82.4
Citypower Trust	A-	65.4
ETSA Utilities	A-	62.4
Powercor Australia	A-	42.9
United Energy	A-	41.9
ElectraNet	BBB+	74.9

Source: Standard and Poor's, *Australian Report Card Utilities*, April 2003

Table 6.1 shows that the average credit rating of these entities is about A and their average gearing is about 59 per cent which is close to the benchmark of 60 per cent. Standard and Poor's states that the A rated entities are generally stable network or transmission businesses.[29]

Accordingly, the ACCC considers that an A credit rating represents an appropriate proxy for the benchmark electricity company.

Having established a proxy credit rating, a benchmark 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 margin applied by the ACCC in its previous decisions (EUAA and EAG raised this issue).

Consistent with the ACCC's approach to estimating the debt margin in its recent Victorian and South Australian revenue cap decisions, the current 10-day moving average benchmark spread over the government bond yields, for A rated corporate

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

bonds with a maturity of five-and-a-half years, is 80 basis points[30]. Combined with the nominal risk-free rate of 5.43 per cent, it suggests a nominal cost of debt figure of 6.23 per cent for use in the WACC estimate.

The ACCC calculated the current 10-day moving average debt margin, by using (benchmark) debt margins on 51/2-year (equivalent) corporate bonds of S&P's A rated companies. The resulting debt margin was 80 basis points.

To calculate the nominal cost of debt, the ACCC added the debt margin to the nominal risk-free rate of 5.43 per cent (section 6.4.2). The resulting cost of debt of 6.23 per cent will be used to estimate the WACC.

The calculation of the debt margin is consistent with the ACCC's approach in recent Victorian and South Australian revenue cap decisions.

6.7 Debt and equity raising costs

Debt and equity raising costs

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

According to a consultancy undertaken by Macquarie Bank on behalf of the ACCC, TNSPs often incur advisory fees, agency fees, arrangement fees, credit rating costs and syndication expenses.[31] In addition, TNSP's 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.[32]

6.7.1 Submissions by interested parties

Transend noted that recent regulatory decisions provided an allowance for equity raising costs. It argued for 12.5 basis points, applying the same assumptions about the debt issue used in the ACCC's GasNet decision.

The MEG points out that Transend is claiming equity raising costs of $0.6m per annum, despite obtaining its assets debt free and without having to raise equity.

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30 CBASpectrum website: www.cbaspectrum.com

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

32 *Ibid*, p. 10.

6.7.2 ACCC's consideration of debt raising costs

The ACCC considers that TNSPs should be given an allowance for debt raising costs, based on a benchmark for current market costs.

Some commercial banks indicated that debt raised on capital markets is likely to incur 8-12.5 basis points of the amount as fees as well as the debt margin.

Consistent with its recent Victorian and South Australian decisions, the ACCC considers an allowance of 10.5 basis points per year for debt raising costs as a reasonable benchmark for a TNSP.

In past decisions, the ACCC added the debt raising costs to the debt margin, to form a part of the return on capital. In this draft decision, however, the ACCC prefers to provide the debt raising costs as an allowance as a part of the opex (see section 5.7.9 of chapter 5). This does not change the revenue allowance, i.e. it is revenue neutral. It is also more transparent and is consistent with the ACCC's approach of providing equity raising cost in the opex allowance.

The allowance for debt raising cost is about $0.42m per year on average over the regulatory period. This is based on an opening RAB of $604m and the assumed benchmark gearing ratio of 60:40.

6.7.3 ACCC's consideration of equity raising costs

As with debt raising costs, the ACCC considers it is appropriate to provide a benchmark allowance for equity raising costs.

The ACCC has researched equity raising costs. In particular, it collected information on several major Australian infrastructure equity raisings (table 6.2.) Recent costs for Australian infrastructure equity issues fall between 2.10 per cent and 5.77 per cent of the equity raised, or 0.123 per cent to 0.344 per cent when amortised in perpetuity.

Table 6.2 Equity raising costs

	Date of offer	Details of offer	Raising cost ($m)	Total offer ($m)	Raising cost as % of total offer	Raising cost per year (%)[4]
United Energy	March 1998	IPO-stapled securities	20[1]	968.2	2.1	0.123
Macquarie Communications Infrastructure Group	July 2002	IPO-stapled securities	13	310	4.2	0.250
Australian Pipeline Trust	May 2000	IPO-units	12	488	2.5	0.147
Envestra	July 1999	Rights offer, convertible notes and placement issue	10.1[2]	310	3.258	0.194
GasNet	October 2001	IPO-units	15[3]	260.16	5.77	0.344
Average			**14.02**	**467.27**	**3.548**	**0.212**

Source: Company prospectuses; ACCC calculations.

1. Includes underwriting fees, selling fees, advisory fees, legal fees, accounting fees, printing, advertising and other expenses.
2. Underwriting fees, advisory fees, legal fees, accounting fees, printing, advertising, stand duty and other expenses.
3. Includes the Joint Lead Manager's commissions and fees, accounting fees, legal fees, lodgement fees, listing fees, fees for other advisers, prospectus design, printing and other miscellaneous expenses (including taxes and other government charges).
4. Amortised in perpetuity using a real vanilla WACC of 5.96 per cent.

The ACCC considers that an average of these annual costs represent an appropriate benchmark for this draft decision. Accordingly, equity raising costs of 0.212 per cent per year should be used.

This amounts to an average allowance of $0.565m per year over the regulatory period, based on an opening RAB of $604m and (benchmark) gearing of 60:40.

This benchmark equity raising cost is included in the opex allowance (see section 5.7.9 of chapter 5).

The ACCC notes that debt and equity raising costs have been recently included in revenue caps, and will analyse these issues further and may reconsider them in future decisions in light of new information and comments from interested parties.

6.8 Market risk premium

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 6.8 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 six per cent.

Multiplying WACC by the RAB to determine the return on capital for a regulated business is a forward-looking concept. 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 to estimate the MRP.

6.8.1 Submissions by interested parties

Transend argues that the historical MRP range favoured by finance professionals is 6 per cent to 8 per cent. It states that evidence suggested a figure at the high end of the range. Transend further argues that evidence suggesting a short-term decline did not provide valid support for policy setting.

Transend believes it is important to estimate MRP on a basis consistent with the bond yields used to set the risk-free rate, that is 10-year bond yields. It stated that as the ACCC uses a 5-year rate, MRP should be adjusted to compensate for the difference between the 5 and 10-year bond yields. However, Transend recognised the ACCC's precedent and used a MRP of six per cent in the application.

Conversely, the EUAA and EAG cite international comparisons, pointing out that the UK regulators have used an MRP of 3.5 per cent. They also claim that it is logically inconsistent to look backwards for the MRP but forward for other CAPM parameters.

Similarly, MEG highlights the UK experience and points to increasing evidence that the 6 per cent MRP used in the ACCC's previous decisions is too high. It considers that a range of 3 to 4 per cent is more appropriate.

6.8.2 ACCC's considerations

The ACCC's assessment of the MRP, although based on more traditional views, still remains between 5 per cent and 7 per cent. The ACCC has chosen the mid-point of this range i.e. 6 per cent.

This is consistent with the Lally study for the ACCC, which recommended an MRP of 6 per cent.[33]

Several parties have commented that MRP is calculated by deducting long-term risk free rates (typically 10-year government bond rates) from historical returns on a market portfolio. Therefore, they claimed that 10-year bond rates should be used.

However, Davis has argued against this position.[34] In particular, he notes that although historical estimates of the MRP have been calculated as a historical average of the actual market return over some risk-free rate, namely the 10-year government bond, this does not require that the same maturity bond be then used to estimate returns of shorter maturity.

The ACCC accepts that UK regulators have used an MRP of about 3.5 per cent. However, it is satisfied that the MRP in Australia will be different because:

- despite global markets, a perception of segmented stock markets still exists and investors may require a higher premium to invest in the Australian market
- a domestic CAPM version is used in estimating the required cost of equity
- the UK adopts a 'real' CAPM, therefore direct comparisons are not as straight forward.

A number of surveys have supported the ACCC's MRP estimate. For example, the Jardine Fleming capital markets survey on professional market practitioners' MRP

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

34 Davis, *Report on Risk Free Interest Rate and Equity and Debt Beta Determination in the WACC*, Report for ACCC, May 2003.

expectations found that it was 5.87 per cent on average.[35] The survey also found the expected future MRP is about 1 per cent below this figure. However, the ACCC considers that these reduced expectations reflect substantial uncertainty and are not persuasive enough to revise its estimate.

6.9 Value of franking credits

Australia has a full imputation tax system under 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) has a major effect on the WACC 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.

6.9.1 Submissions by interested parties

Transend has asked the ACCC to continue to use 0.5 for γ. It claims that a zero value is consistent with the marginal shareholder being an international investor but acknowledges that a γ of 0.5 (or below) is well established in Australian regulatory decisions. Transend also believes that it is too early to assess the impact of recent changes to capital gains tax and the full flow-through of imputation credits.

6.9.2 ACCC's considerations

The γ incorporates dividend payouts carrying imputation credits and the proportion of credits that could be used. Australian academics and practitioners do not agree about adjusting the rate of use of imputation credits.

Given that the value of γ lies between zero and one, the ACCC prefers to maintain its position on γ of 0.5.

6.10 Gearing

The ACCC must use a benchmark gearing, rather than the 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.

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

6.10.1 Submissions by interested parties

Transend states that it has little debt and hence a low gearing. However, it used the ACCC's benchmark gearing of 60 per cent in its application. Transend argues that other variables in the WACC must be consistent with this benchmark gearing.

6.10.2 ACCC's considerations

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

Typically regulators have assumed a gearing of 60 per cent (table 6.3) to calculate the WACC. This WACC should still apply within reasonable range of actual gearing, say of 40 per cent to 70 per cent (see above paragraph).

Table 6.3 Gearing levels adopted in regulatory decisions

Entity	Industry	Debt/Debt+Equity
ACCC (2002)	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%

Transend is very lowly geared. Its latest financial statements show a gearing of three per cent.

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

A survey conducted by Standard and Poor's suggests that gearing ratios for transmission and distribution businesses should be between 65 per cent and 55 per cent.[36]

Therefore, the ACCC has decided to adopt a gearing of 60 per cent.

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

6.11 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.

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 compared 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, and the company's return is compared to the market return. (Market return is calculated in the same way, i.e. by adding the dividends and changes in values of all the companies listed in the stock exchange.)

Calculating equity betas for unlisted firms is more complicated, as their returns cannot be calculated directly. Therefore, 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 depend on its capital structure. 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—that is as if the firm were to have no 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:[37]

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

The debt beta captures the systematic risk of debt, just like equity beta capturing 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.

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

6.11.1 Submissions by interested parties

Transend disputes whether current market observations for listed utility firms in Australia are relevant when determining a beta value for a regulated firm such as Transend, given the volatility of beta values. It argues that regulatory precedent and consideration of international beta values suggest a range of 0.4 to 0.5 is appropriate for Transend's asset beta. Therefore Transend has used an asset beta of 0.45 given factors suggesting high systematic risk and its relative size to other transmission companies. The 0.45 asset beta equates to an equity beta of 1.12.[38]

The MEG notes that the regulated utilities are now listed in the 'utilities' sector on the Australian Stock Exchange and believes that there is a strong case for the equity beta of this sector to be significantly below 1.0 and probably closer to the range of 0.4 to 0.5.

MEG also notes that the Allen Consulting Group's (ACG) report concentrates on gas transportation but electricity transport is more revenue stable than gas. This is because the revenue of gas companies can vary depending on the volume of gas transported, whereas electricity companies are given a fixed revenue cap, which effectively eliminates volume risk.

The EUAA states that Transend has included data showing beta of comparable companies to be one or below in its application, but then recommends using values substantially higher than one claiming differences affecting its business.

The EUAA further states that overseas regulators do not accept that any regulated energy company faces more risk than the share market as a whole.

6.11.2 ACCC's considerations

Betas

Equity beta

The ACCC has used an equity beta of one in its previous revenue cap decisions, suggesting that the TNSPs face the same volatility as the market. However, there is a view that gas and electricity transmission businesses are less risky as their earnings are more stable than the market portfolio—suggesting an equity beta of less than one.

Asset beta

The asset beta is only relevant within the de-relevering/ re-levering process. The asset beta is simply the equity beta for a firm that is 100% 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. From this information, the ACCC considers that an appropriate range for electricity asset betas is between 0.3-0.5.

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[38] Further discussion by Transend and NECG about beta can be found in its Revenue Cap Application-Appendix 7.

Accordingly, the ACCC proposes to maintain the asset beta at 0.4 for the purpose of this decision which corresponds to an equity beta of one for the WACC calculation.

Table 6.4 Recent regulatory decisions on asset betas for electricity industry

Decision	Network Type	Asset Beta
ESC, price determination	Distribution	0.40
ACCC, Snowy Mountains	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 has used a debt beta of zero in its previous electricity revenue cap decisions. Given that the risk of debt is primarily related to default risk, the ACCC considers that the systematic risk of debt is low. Therefore it believes that a relatively low debt beta is appropriate and treated it as a residual parameter. A report prepared by ACG for the ACCC suggested that an appropriate range for the debt beta would be between zero and 0.15.[39]

Nonetheless, if the value of debt beta used between the de-levering and re-levering process is consistent, then the effect on the equity beta is generally negligible.

Consistent with previous practice and Transend's application, the ACCC considers that in this draft decision an appropriate value for the debt beta is zero, in the de/re-levering process. A debt beta of zero coupled with an asset beta of 0.4, in accordance with the Monkhouse formula, provides a re-levered equity beta of 1.0.

The systematic risk of debt is low, because it is primarily related to default. Therefore a very low debt beta is appropriate. A report prepared by ACG for the ACCC suggested that the debt beta should be between zero and 0.15.[40]

The debt beta is difficult to estimate. Therefore the ACCC treated it as a residual parameter. Further, as long as the value of the debt beta is consistent between the de-levering and re-levering process, its effect on the equity beta is negligible.

Therefore the ACCC used a debt beta of zero in its previous electricity revenue cap decisions. It is still of the same view. Using the Monkhouse formula, a debt beta of zero and an asset beta of 0.4 results in a re-levered equity beta of 1.0.

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

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

Estimating equity beta from market data

The ACG report, based exclusively on market evidence,[41] suggested an equity beta of just under 0.7 for Australian gas transmission companies. ACG also examined the data for comparable businesses in the USA, Canada and UK, which suggested lower betas. Therefore, ACG concluded that the Australian estimate was not understated.

ACG recommended that Australian regulators retain a conservative approach to beta estimation with an equity beta estimate of one. However ACG 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.[42]

The ACCC notes the sample betas calculated in Transend's application. It also derived betas from comparable Australian firms, using data from the Australian Graduate School of Management (AGSM) for December 2002 and March 2003.

To derive equity betas, the ACCC first started with unadjusted betas of a small sample of companies. It de-levered and then re-levered the equity beta, assuming the debt beta to be zero and using Standard and Poor's[43] (corresponding) gearing levels. The resulting estimates, shown in table 6.5, suggest that the ACCC has been generous in its previous decisions.

Table 6.5 Sample betas

		December 2002 AGSM data			March 2003 AGSM data		
Company	**Gear. level**	**Unadjusted β_e**	**Delevered β_a**	**Relevered β_e**	**Unadjusted β_e**	**Delevered β_a**	**Relevered β_e**
Australian Pipeline Trust	65.40	0.24	0.08	0.21	0.34	0.12	0.29
Envestra	81.40	0.33	0.06	0.15	0.34	0.06	0.16
Alintagas	52.60	0.15	0.07	0.18	0.20	0.09	0.24
Australian Gas Light	56.30	0.08	0.03	0.09	0.06	0.03	0.07
United Energy	47.60	0.25	0.13	0.33	0.08	0.04	0.10
Average	**60.66**	**0.21**	**0.08**	**0.19**	**0.20**	**0.07**	**0.17**

The ACCC considers that it may be premature to rely on market data exclusively when determining the equity beta. Therefore, for this decision, the ACCC considers that an equity beta of one, while biased in favour of the service provider, is appropriate for Transend.

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41 ACG, *Empirical evidence on proxy beta values for regulated gas transmission activities*, Final report for the ACCC, July 2002, p. 46.

42 Ibid, p. 43.

43 Standard & Poor's, *Australia & New Zealand CreditStats,* May 2002.

The ACCC is currently considering the merits of relying more on market data to estimate beta for TNSPs. Thus future decisions may incorporate equity betas which reflect market information more accurately.

Size effect and CAPM

The ACCC acknowledges that debate in finance theory explores the possibility that the predictions of CAPM are not consistent with observed returns and anomalies such as the January effect and the Size Effect. The evidence suggesting that small firms tend to realise higher rates of return than those predicted by CAPM is linked to the January effect in the empirical literature. The empirical literature also predicates that this anololy is explained by tax-loss selling, as the financial year ends in December in the US and therefore explains the phenomenon.

Even if the evidence of the size effect was conclusive, the ACCC notes that while Transend is smaller than the other TNSPs in the NEM, it is not small compared to companies in the Australian economy generally. For example, in terms of revenue, Transend ranks about 1 340 out of the top 5 000 companies in Australia.[44] Similarly, it is not small in terms of assets also.

The ACCC would prefer to continue to use the standard domestic version of CAPM in its regulatory decisions. This is because the model explains the asset returns by using the asset's correlation with the market portfolio in a simple way, it is easy to use, and it provides a 'fair and reasonable' rate of return for a regulated entity.

Therefore, the ACCC does not consider that Transend should be compensated for size effect when using the CAPM framework.

Conclusion

Transend's proposed equity beta of 1.12 suggests that it has a higher risk than the market portfolio. In past electricity decisions, the ACCC has consistently applied an equity beta of one. The ACCC does not propose to compensate Transend for other risks (e.g. small company size) claimed in its application.

Therefore, for the purposes of this draft decision, the ACCC will adopt an asset beta of 0.4 and a debt beta of zero, which equates to an equity beta of approximately one. However, in future, the ACCC may rely more on market data may to determine a (proxy) equity beta for TNSPs.

6.12 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 concessions that lessen or defer tax liabilities. In any year, the assessable income for tax can be quite different from the accounting income of the business.

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[44] *The Business Who's Who of Australia*, Dun and Bradstreet Marketing Pty Ltd.

The inflation rate also substantially affects the effective tax rate, due to timing effects and because taxes are calculated on nominal income.

In its early decisions, the ACCC applied the statutory company tax rate of 30 per cent. This was because it was difficult to determine a satisfactorily accurate long-term tax rate as part of the pre-tax real framework being used at the time. However, effective tax-rate for electricity utilities have been less than the statutory tax rate in the past due to their capital-intensive nature.[45]

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.

6.12.1 ACCC's considerations

Based on the ACCC's approach to modelling the effective tax rate, the ACCC has derived an effective tax rate of 21.69 per cent.

[45] According to IPART 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, p. 9).

6.13 Conclusion

The ACCC has carefully considered the values that should be assigned to Transend's cost of capital, given the nature of its business and current financial circumstances. The parameter values used for the draft decision are shown in table 6.6.

Table 6.6 Comparison of cost of capital parameters

Parameter	Draft decision	Transend's proposal
Nominal risk-free interest rate (r_f)	5.43 %	5.24 %
Expected inflation rate (f)	2.21 %	1.95 %
Debt margin (over r_f)	0.80%	1.445 %
Cost of debt $r_d = r_f$ + debt margin	6.23 %	6.69 %
Market risk premium (r_m-r_f)	6.00 %	6.00 %
Debt funding (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	11.41 %	11.96 %
Post-tax nominal WACC	6.63 %	-
Pre-tax real WACC	6.51 %	-
Nominal vanilla WACC	8.30 %	8.80 %

7 Total allowable revenue

7.1 Introduction

The main components of Transend's revenue cap were discussed in detail in the proceeding chapters. This chapter explains the ACCC's calculation of Transend's allowable revenue (AR) from 1 January 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 to (or from) the AR. Further detail on how the financial incentive component is calculated is in chapter 8.

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 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

$$\mathbf{MAR_t} = \text{(allowed revenue)} + \text{(financial incentive)}$$

$$= \left(\mathrm{AR}_t\right) + \left(\frac{(\mathrm{AR}_{t-1} + \mathrm{AR}_{t-2})}{2} \times S_{ct}\right)$$

where:
- MAR = maximum allowed revenue
- AR = allowed revenue
- S = service standards factor
- t = regulatory period (appendix G)
- ct = calender year (appendix G)

7.3 Transend's proposal

In its application, Transend proposes a revenue of $111m in 2003-04, increasing to $151m in 2008-09. In 2003, Transend's comparable AR is around $78m.

Transend claims that a substantial revenue increase is required over the regulatory period and that that increase can be expressed in five components:

- base revenue requirement – based on the valuation of its assets at the start of the regulatory period and its budgeted opex for 2002-03. Transend notes that this base revenue requirement exceeds the allowance provided by OTTER in 2003-04, which it states adopted a lower asset value and under-estimated opex
- additional opex requirements – Transend states that a principal component of this cost is the additional work to be undertaken by the Network Group to maintain and improve services for customers
- impact of NEM-entry
- 2003 revenue shortfall and efficiency glide-path
- impact of forecast capex.

Transend states that the forthcoming regulatory period brings new challenges and that its proposed program will meet them and bring substantial benefits to its customers, to the NEM and to Tasmania as a whole.

7.4 ACCC's assessment of building blocks

7.4.1 Opening asset base

To establish the appropriate return on capital, the ACCC modelled Transend's asset base (over the life of the regulatory period) and WACC (estimated on the basis of the most recent market financial information).

As explained in chapter 3, the ACCC has determined the value of Transend's asset base as at 31 December 2003 to be $604m.

7.4.2 Capital expenditure

As explained in chapter 4, the ACCC considers that a capex allowance of $306.8m (in real terms) over the regulatory period is sufficient for Transend.

7.4.3 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 7.1.

7.4.4 Operating and maintenance expenses

As explained in chapter 5, the ACCC has included an opex allowance of about $29m per annum (in real terms) on average over the regulatory period. It has also allowed $2m a year for grid support and $1m a year for financing costs.

7.4.5 Weighted average cost of capital

The ACCC's estimate of Transend's WACC is explained in chapter 6.

The ACCC has given careful consideration to the nature of Transend's business and its current financial circumstances in establishing the WACC. It notes that, although there is a well recognised theoretical model for establishing WACC, there is less than full agreement on the precise magnitude of the various financial parameters used.

The ACCC has applied a post-tax nominal return on equity of 11.41 per cent, which equates to a nominal vanilla WACC of 8.30 per cent (table 6.6).

7.4.6 Estimated taxes payable

Tax estimates relate to the network's regulated activities only. The ACCC anticipates that Transend would be paying income tax during the regulatory period, based on Transend'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 Transend's actual gearing. The ACCC's estimates of Transend's tax payments are shown in table 7.1.

7.5 ACCC's considerations

The ACCC proposes an unsmoothed revenue allowance that increases from $95m in 2003-04 to $131m 2008-09 as shown in table 7.1.

Table 7.1 Transend's unsmoothed AR 2003-04 to 2008-09 ($m, nominal)

	Jan-June 2004	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Return on capital	24.7	47.3	52.0	57.5	60.4	66.4	68.2
Return of capital	7.8	15.5	18.0	20.3	22.6	23.3	23.8
Operating expenses	14.8	29.7	34.2	36.2	35.7	33.7	34.4
Estimated taxes payable	2.4	4.9	5.6	6.4	7.0	7.9	8.3
Value of franking credits	1.2	2.5	2.8	3.2	3.5	3.9	4.2
Unadjusted revenue allowance	**48.5**	**95.0**	**107.0**	**117.2**	**122.3**	**127.3**	**130.6**

7.6 Conclusion

Transend's 2003 (calendar year) comparable revenue is around $78m (including $5m for the incremental costs associated with the system controller function and $2m of taxes).

The ACCC has determined a smoothed revenue allowance for Transend that increases from $95m in 2003-04 to $142m in 2008-09, as shown in table 7.2. The draft decision is based on forecast inflation and applies a smoothing factor.

Transend must adjust the opening revenue figures annually by actual inflation (the eight weighted capital city CPI).

Table 7.2 Transend's smoothed AR, 2003-04 to 2008-09 ($m, nominal)

	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
Smoothed AR	**94.98**	**102.88**	**111.44**	**120.71**	**130.76**	**141.63**

The final MAR will be determined by adding (or deducting) the service standards incentive (or penalty) amount to the above AR.

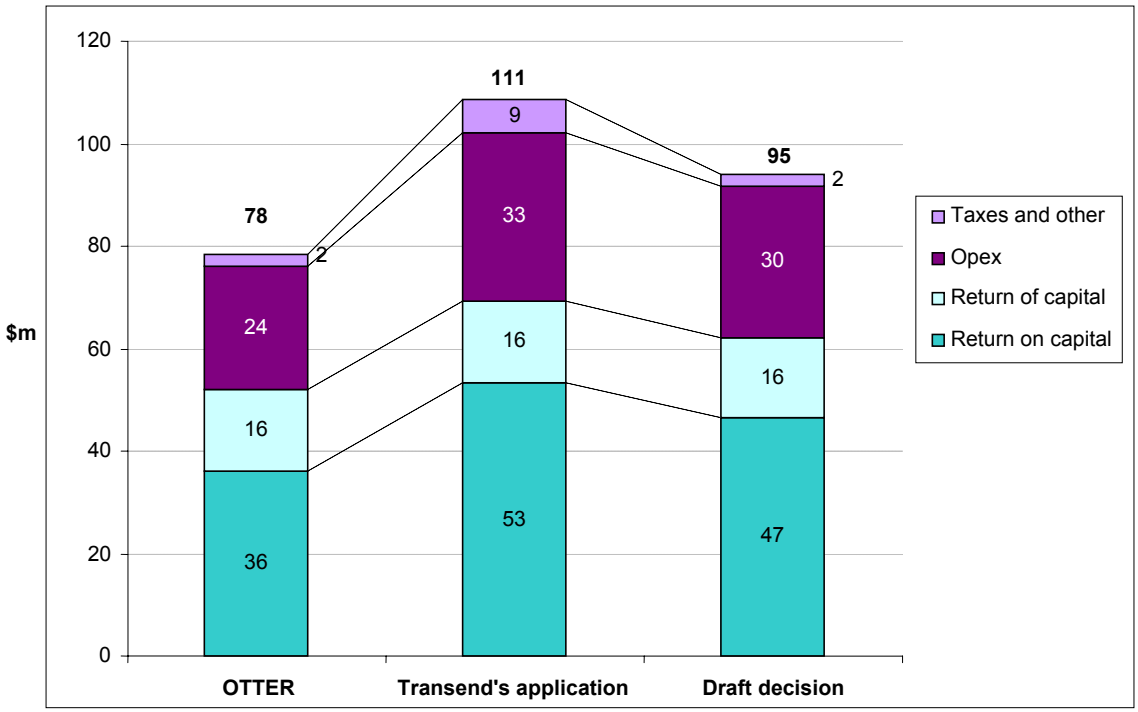
The overall revenue increase over the regulatory period consists of:

- an initial increase of about 20 percent in the first year (mainly due to increases in the asset base, opex and capex)
- a subsequent increase of around eight per cent per annum on average during the remainder of the regulatory period.

The ACCC estimates that its draft decision will result, on average, in a 10 per cent per annum increase (in nominal terms) in transmission charges over the regulatory period. Transmission charges represent approximately 10 per cent of end user electricity charges. This increase in transmission charges is primarily the result of revenues increasing a faster rate than the growth in electricity transported.

Figure 7.1 compares Transend's current revenue allowance for 2003, its proposed revenue allowance for 2003-04 and the revenue allowed by this draft decision in 2003-04. The figure is for illustrative purposes only.

Figure 7.1 Building block comparison of revenues ($m, nominal)



The major change between the revenue proposed by Transend and the draft decision is in the area of return on capital. The reduction in return on capital is due to:

- a lower WACC than that proposed by Transend (table 6.6)
- a reduction in capex program proposed by Transend from $390 to $307m.

The ACCC believes that the total revenue it has allowed will not financially degrade Transend's business. Appendix E contains the ACCC's examination of Transend's likely credit rating under the revenue cap.

8 Service standards

8.1 Introduction

TNSPs cannot increase their revenues above the MAR set by the ACCC. Therefore, the only way TNSPs can increase their profits (on regulated activities) is by reducing costs. Such cost reductions could result in a decline in service quality which can impose much larger costs on other market participants.

On 28 May 2003, the ACCC released its draft service standards guidelines[46]. This performance incentive scheme aims to reduce the incentive for Transend to achieve cost reductions at the expense of other participants. It is based on five performance indicators, of which three are currently operational. The average performance during the previous three to five years becomes the benchmark.

TNSPs are rewarded for improvements over performance targets and penalised for detiorations. The maximum reward or penalty is one per cent of the AR. Overall the scheme is designed to have an expected value of zero.

The ACCC's draft guidelines are based on a consultancy report produced by SKM[47]. Both documents can be found on the ACCC's website. In its report SKM recommended performance standards (or targets) for Transend over the forthcoming regulatory period based on historical data provided by Transend. These targets can be found in the ACCC's draft service standards guidelines decision and also are shown in Table 8.1.

Table 8.1 SKM's recommendation

Measure	Unit	Weight	Target
Circuit availability (transmission lines)	%	0.25	99.05
Circuit availability (transformers)	%	0.15	99.05
Loss of supply event frequency index > 0.1 min	No	0.20	15
Loss of supply event frequency index > 2.0 min	No	0.40	2

8.2 Transend's application

In its application, Transend states that its performance incentive scheme should be based on several years of past performance data. Transend advised the ACCC that it does not have performance information before 1998 and that this should be taken into account in setting its targets. However OTTER's July 2003 submission to the ACCC showed Transend's performance since 1996.

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46 ACCC, *Statement of Principles for the Regulation of Transmission Revenues, Service Standard Guidelines – Draft Decision,* 28 May 2003.

47 SKM, *Transmission Network Service Providers – Service Standards,* March 2003

Transend engaged TransGrid to assess which indicators should be applied to it. Following this assessment Transend considers that its performance incentive scheme should be based on circuit availability and loss of supply frequency measures. It believes that circuit availability measures will be of particular interest to the wholesale generation market and that the measure will increase in importance following NEM-entry. Transend also considers that loss of supply event frequency measures are of most interest to end users and retailers.

Transend does not propose to use the other performance measures recommended by SKM. It gives a higher weighting to loss of supply measures, as it considered that customers place more value on those measures then on circuit availability measures.

Table 8.2 Transend's proposed performance targets

Measure	Unit	Weight	Performance for maximum penalty	Lower deadband	Upper deadband	Performance for maximum bonus
Circuit availability (transmission lines)	%	0.25	98.8	99	99.1	99.3
Circuit availability (transformers)	%	0.15	98.8	99	99.1	99.5
Loss of supply frequency (> 0.1 minute)	No	0.20	20	16	14	10
Loss of supply frequency (> 2.0 minute)	No	0.40	5	3	2	0

8.3 GHD's review

8.3.1 Selection of performance measures

GHD agrees with the performance measures proposed by Transend as they are consistent with those contained in the ACCC's draft service standards guidelines. GHD considers that the outage duration measure may not be appropriate for Transend, as there have been a small number of significant events in recent years making the measure quite volatile.

8.3.2 Analysis of historical performance

In assessing Transend's proposal, GHD applied Transend's proposed performance incentive scheme to Transend's historical data for the past four years. The results, shown in table 8.3, indicate that the number of rewards would exceed the number of penalties. GHD also notes that the majority of past outages were planned and therefore have less impact on the market than unplanned outages.

Table 8.3 Rewards and penalties historically (Transend's targets)

Measure	1998-99	1999-00	2000-01	2001-02
Circuit availability (transmission lines)	Reward	Reward	Penalty	Reward
Circuit availability (transformers)	Penalty	Penalty	Reward	Reward
Loss of supply frequency (> 0.1 minute)	Reward	Indifferent	Indifferent	Indifferent
Loss of supply frequency (> 2.0 minute)	Reward	Penalty	Indifferent	Reward

8.3.3 Alternative performance incentive scheme

GHD found that the performance targets chosen by Transend did not appear to be that challenging when compared with past performance. It recommended that alternative targets be adopted, based on some allowance for reasonable improvements in performance due to current and planned capex and improved work practices (eg. the performance of in-service maintenance).

Table 8.4 contains GHD's recommended performance targets. The targets that differ from those proposed by Transend are in bold.

Table 8.4 GHD's recommended performance targets

Measure	Unit	Weight	Performance for maximum penalty	Lower deadband	Upper deadband	Performance for maximum bonus
Circuit availability (transmission lines)	%	0.25	**98.9**	**99.1**	**99.2**	**99.4**
Circuit availability (transformers)	%	0.15	98.8	99	99.1	99.5
Loss of supply frequency (> 0.1 minute)	No	0.20	20	16	**13**	**9**
Loss of supply frequency (> 2.0 minute)	No	0.40	5	3	2	0

The results of applying GHD's performance targets, in terms of rewards and penalties, are shown in table 8.5. Under GHD's scheme rewards and penalties are more evenly matched compared to those resulting from Transend's proposed targets (Table 8.3).

Table 8.5 Rewards and penalties historically (GHD's targets)

Measure	1988-89	1999-00	2000-01	2001-02
Circuit availability (transmission lines)	Indifferent	Indifferent	Penalty	Indifferent
Circuit availability (transformers)	Penalty	Penalty	Reward	Reward
Loss of supply frequency (> 0.1 minute)	Indifferent	Indifferent	Indifferent	Indifferent
Loss of supply frequency (> 2.0 minute)	Reward	Penalty	Indifferent	Reward

8.4 Submissions by interested parties

All submissions made by interested parties are available on the ACCC's website. Service standards issues raised by interested parties are summarised in appendix F.

8.5 ACCC's considerations

The ACCC has considered all information put to it by interested parties, Transend and GHD.

8.5.1 Stretched targets to reflect improved service levels

The ACCC's service standard scheme was based on the premise that the TNSPs should be rewarded for increased service levels resulting from operational efficiencies. Therefore it considers it is not appropriate to reward Transend for performance improvements that are a result of the capex allowed.

The ACCC accepts the argument by several interested parties that the large amount of renewal capex proposed by Transend would result in improved service quality. It also accepts Transend's claim that capex could result in outages in the short term. However, overall the ACCC is satisfied that there would be a net improvement in service quality over the regulatory period and that this should be reflected in increased targets.

The ACCC agrees with GHD's assessment that the increased renewal capex, together with work practice improvements, should result in a net improvement in service levels. Therefore, it accepts the stretched targets recommended by GHD. It concurs with the interested parties that without stretched targets Transend may be rewarded inappropriately.

In this context, the ACCC considers that Transend could provide improved supply in certain areas and provide better customer service generally. For example, Transend could publish a service charter, like most other TNSPs, including its processes for dealing with connection inquiries.

8.5.2 Possible additional performance measures

A number of interested parties believe that the performance measures proposed by Transend are insufficient and that several other performance measures should be adopted, such as:

Connection point performance

Hydro Tasmania believes that the aggregate performance measures proposed are less effective due to the 'stringyness' of Transend's network. It believes that performance at connection points is a more appropriate measure as it provides the right performance incentives. Hydro Tasmania seeks the ability to negotiate higher (or lower) levels of service at their connection points for increased (or decreased) connection charges.

The ACCC notes that TNSPs on the mainland can do this already. It considers that such individual agreements are best left to the TNSP and its customers and prefers to focus on matters that apply to the market generally.

The ACCC also notes that Hydro Tasmania prefers an agreement regarding operations of the system protection scheme (SPS). Given the general benefits of the SPS scheme, the ACCC considers that an agreement between Hydro Tasmania and Transend would be beneficial. However it is a matter for the parties to negotiate.

Intra-regional constraints

Several interested parties claimed that a performance measure on intra-regional constraints was required.

However, the ACCC does not have the appropriate information, at this stage, to design incentives for Transend to minimise constraints and maximise performance at connection points.

Transend states that it does not object to collecting data on intra-regional constraints and agrees that it might be appropriate to have performance targets on specific connection points. However, it claims that such information would be costly to collect.

The ACCC considers that Transend should already have a system to analyse constraints and performance at connection points. Therefore it requires Transend to report this information as part of its Information Requirements Guidelines, so that such data will be available at its next regulatory reset.

Average outage duration

A number of interested parties noted that Transend has excluded the average outage duration measure on the basis that a small number of significant outages distort the measure. Interested parties considered that Transend should focus on reducing this type of outage.

The ACCC accepts GHD's advice that, although the measure may not be appropriate for inclusion now, the ACCC should collect information on the measure and consider including it in Transend's next revenue cap decision.

The ACCC notes that the two performance measures proposed by Transend in their performance incentive scheme are consistent with GHD's recommendation.

8.6 Conclusion

The ACCC agrees with GHD's assessment that the performance measures proposed by Transend are appropriate. However, to aid future revenue cap decisions the ACCC would like Transend to report on two other performance measures (average outage duration and intra-regional constraints) contained in the ACCC's draft service standards guidelines. It notes that the inter-regional constraints measure is not relevant to Transend as its system is not connected to a regulated interconnector.

The ACCC also agrees with GHD and interested parties that current and planned investment, as well as improved work practices, should result in a net improvement in Transend's service performance over the regulatory period. On this basis, it accepts the targets and weightings recommened by GHD (table 8.4).

The ACCC also flags its intention to develop performance measures that more closely align with those time periods that are more important to transmission customers. For example, future information needs of the ACCC may include such measures as:

- constraints during times that out-of-merit order generation dispatch occurs
- availability and loss of supply during peak times
- availability and loss of supply on the 10-40 highest demand days during the year
- availability of critical circuits in peak times/days.

The ACCC and interested parties agree that the ACCC's draft service standard guidelines provide a practical starting point for the further development of the performance incentive scheme. It is recognised that the scheme will require improvements in the long-run to improve its overall effectiveness.

Appendix A Overview of regulatory arrangements

Introduction

This attachment explains the regulatory arrangements underpinning the ACCC's revenue cap setting process for Transend.

OTTER is the state body currently responsible for regulating the entire electricity supply industry in Tasmania. Tasmania intends to join the NEM in 2005. Upon NEM-entry the ACCC will assume responsibility for regulation of the Tasmanian Transmission Network Service Provider, Transend.

However, as Transend's current revenue determination ends on 31 December 2003 the Tasmanian Government has asked the ACCC to set a revenue cap for Transend to apply from 1 January 2004. As it is not part of the NEM, the code does not yet apply.

Over the past two years ACCC staff have consulted with Tasmanian Treasury, Commonwealth Treasury, OTTER and Transend about the necessary steps required for the ACCC to take over responsibility for regulation of Transend's revenues both before and after Tasmania's entry into the NEM.

Agreement made between the Australian and Tasmanian Governments

To enable the ACCC to set a revenue cap for Transend before Tasmania's entry into the NEM it was necessary for the Australian and Tasmanian Governments to enter into an agreement to that effect.

Section 44ZZM of the Trade Practices Act 1974 (TPA) provides that the ACCC may perform functions and exercise powers under State legislation that establish an access regime with the agreement of that state and the Commonwealth. The Australian and Tasmania Governments have made such an agreement. In order to give effect to this agreement a number of amendments have been made to the following Tasmanian regulatory instruments.

- *Electricity Supply Industry Act*

  The Electricity Supply Industry Act defines the Tasmanian regulator's functions, roles, powers in relation to electricity supply businesses in Tasmania. It also gives OTTER powers under the electricity supply industry price control regulation (regulation) and the Tasmanian electricity code (TEC). Amendments have been made to the Electricity Supply Industry Act to provide that the State Minister may specify that the ACCC will perform the functions of the regulator in relation to transmission revenues in Tasmania.

- *Electricity Supply Industry Act (Price Control) Regulation*

  The Electricity Supply Industry Act (Price Control) Regulation (Regulation) provides the process that the regulator must follow to regulate transmission and distribution businesses. This includes administrative issues such as freedom of information, declaration of service to be regulated, matters to be considered, etc.

The regulation has been amended to provide different processes for the regulation of transmission and distribution businesses. This amendment has been made so that the ACCC may adopt the approach it has used for regulation under the code.

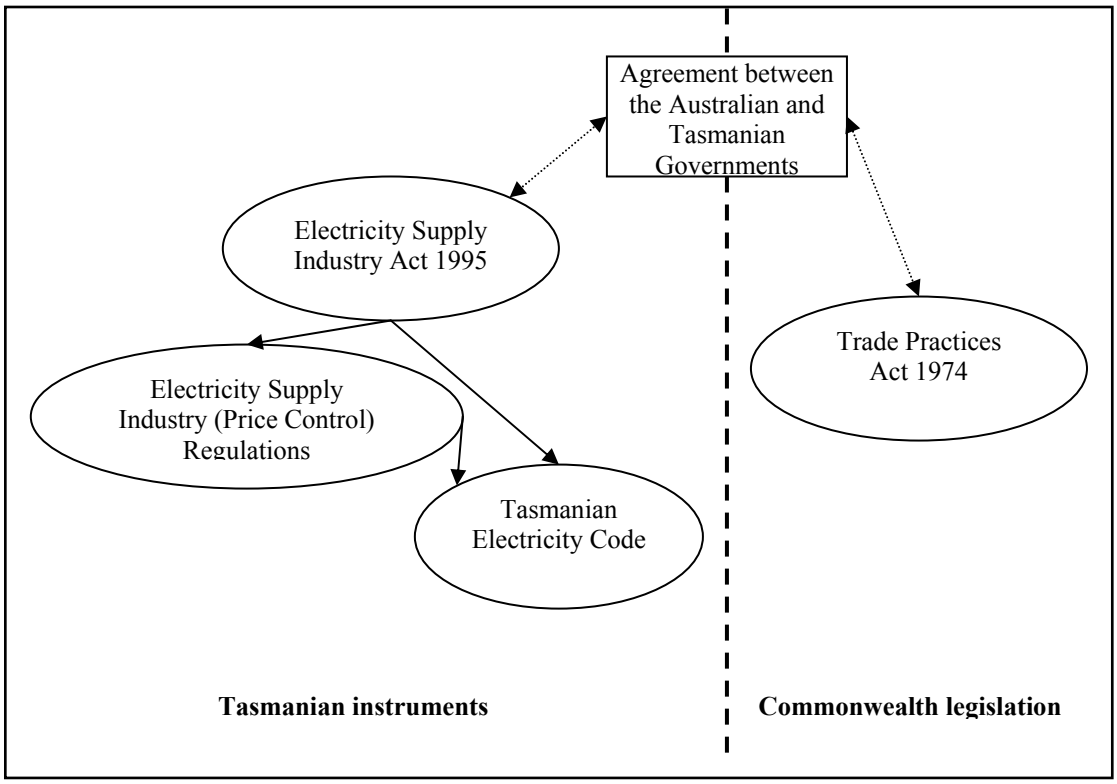
- *Tasmanian Electricity Code*

  The TEC is an adaptation of the code and it largely reflects the provisions of the code. OTTER has amended the TEC to reflect, more closely, Part B of Chapter 6 of the code (ie. the provision that prescribes how the ACCC shall decide revenue caps).

Pre-NEM regulation

Given the powers and functions that the Australian Government has agreed to, the ACCC will decide a revenue cap for Transend to apply from 1 January 2004 to 30 June 2009. These powers and functions will be specifically prescribed in the Electricity Supply Industry Act, the regulation and the TEC. Effectively, the ACCC will make this decision and OTTER will enforce the decision until NEM-entry occurs. Figure 1 shows the relationship between the Tasmanian regulatory framework and the TPA before Tasmania's entry into the NEM.

Figure 1 Regulation of transmission revenues in Tasmania (Before NEM-entry)



NEM-entry

Tasmania plans to enter the NEM in mid-2005, approximately six months before Basslink is commissioned.

The ACCC has accepted an access undertaking from Basslink, in which it undertakes to comply with the code upon NEM-entry.

To provide for NEM-entry the Tasmania authorities will need to legislate National Electricity Law to mirror the South Australian Act, which gives power to the code. Tasmanian electricity businesses will also have to register as NEM participants with NEMMCO and, in the case of network service providers, submit an access undertaking to the ACCC.

In November 2001, the ACCC granted authorisation to Tasmanian derogations, which will form part of the code when Tasmania joins the NEM.

The derogations provide that any decision made by the ACCC before Tasmania's NEM-entry can be deemed to be a valid decision made under the code (e.g. revenue cap decisions). However the ACCC imposed a condition of authorisation (C5.15) to enable:

> "… the ACCC to re-open or disallow such a decision if it would be materially different to a decision made in accordance with Chapter 6 Part B of the Code, and to specify a revised date, no later than the start of the National Electricity Market in Tasmania, for the purposes of clause 6.2.3(d)(4)(iii) of the Code"

NEM regulation

Upon NEM-entry:

- Tasmania would be required to abide by the code, including its derogations
- the ACCC would officially become the regulator of transmission in Tasmania
- the ACCC's pre-NEM decision would be deemed to be a valid NEM decision under the code.

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Appendix B Results of SKM's optimisation

Transmission Lines ($ July 2001)

Line		Line Description	Optimised Description	Reduction ($000)	
No.	Location			R C	D R C
400	Waddamana to Lindisfarne	86km of SC (Paralleled) and SC 19/.083	86km of SC Tern	938	260
402	Waddamana to Bridgewater Junction	86.1km of SC (Paralleled) of 19/.092	86.1km of SC Goat	1 415	118
409	Waddamana to Parknook	39.7km of SC 19/.083	Part of Line 410	4 278	1 306
410	Waddamana to Palmerston	36.3km of SC19/.083	36.3km of DC 19/.083		
417	Tarraleah to New Norfolk (East)	23km of SC 19/.092	11.5km of DC 19/.092	890	222
418	Tarraleah to New Norfolk (West)	23km of SC 19/.092	11.5km of DC 19/.092	832	208
425	Waddamana to Tungatinah (North)	33.7km of SC 19/.116	33.7km of DC 19/.116	3 255	814
426	Waddamana to Tungatinah (South)	33.7km of SC 19/.116	Part of Line 425		
427	Lake Echo Spur (East)	1.2km of SC 19/.083	1.2km of DC 19/.083	288	72
428	Lake Echo Spur (West)	1.2km of SC 19/.083	Part of Line 427		
436	Knights Road to Kermandie	20.2km of DC (one circuit strung) Hyena	20.2km of SC Hyena	187	66
462	New Norfolk to Chapel Street Junction	15.6km of DC 19/.092 (two circuits in parallel)	15.5km of SC Goat	361	90
463	New Norfolk to Creek Road	3.1km of 19/.116 (two circuits in parallel)	3.1km of SC Goat	116	29
468	Electrona to Knights Road	15.6km of DC (one circuit strung) 7/.097	15.6km of SC 7/.097	153	38
469	Electrona Spur	12.5km of DC (one circuit strung) 7/.097 Cu	12.5km of SC 7/.097	111	28
500	Liapootah to Chapel Street	63.4km of SC Goat	31.7km of DC Goat	3 097	1 032
523	Farrell to John Butters	39.1km of DC Sulphur	39.1km of DC Tern	1 855	1 577
		11.4km of SC Sulphur	11.4km of SC Tern	316	268
524	Tribute Spur	11.4km of SC Sulphur	11.4km of SC Goat	434	383
527	Liapootah to Palmerston No.2	77.2km of DC (one circuit strung) Sulphur	30km SC Sulphur and 33.7km of DC (one circuit strung) (i)	4 363	4 219
	TOTAL			22 890	10 729

1. Part of the second circuit is to be strung before next Reset Period to provide for dismantling a non compliant 110kV line between Waddamana and Palmerston

Substations/ transformers ($, July 2001)

Transformer	Description	Optimised Description	Reduction ($000)	
			R C	D R C
Palmerston 220/110kV - load 56MVA		Replace 1 x 150/200MVA with 1 x 90/150MVA	290	245
Bridgewater 110/22-11kV - firm capacity 42MVA - load 24MVA	2 x 21/35MVA	2 x 10/20MVA	360	200
New Norfolk 110/22-11kV - firm capacity 38MVA - load 21MVA	2 x 19/31.5MVA	2 x 10/20MVA	280	200
Queenstown 110/22kV - load 5.7MVA		Replace 1 x 17/22.5MVA with 1 x 10/20MVA	200	49
TOTAL			1 130	693

Appendix C Alternative capex approach

1. Purpose

The purpose of this paper is to encourage discussion about an alternative proposal to assess capex allowance. The ACCC will examine the responses from Transend and other interested parties, and consider applying this approach in the final decision.

Under this proposal capex is categorised into shared and individually funded components, with a more light-handed regulatory approach applying to the latter.

2. Background

In its application Transend asked for certain capex, including capex relating to dedicated connection assets for wind-farm projects, to be funded on a pass-through basis during the regulatory period.

Transend argued that this approach would result in a better allocation of risks between itself and customers. Hence it declined to adopt the probabilistic method used by the ACCC in its three previous revenue cap decisions.

The ACCC, however, considers that such a pass-through mechanism has several disadvantages, as explained in the draft decision.

GHD suggested an unrationalised maximum amount of $341 million and recommended that the ACCC reduce the amount. The ACCC considers that a 10 per cent reduction is appropriate and allowed $307m in the draft decision.

In estimating capex, GHD disallowed some assets either because they were connection assets or on the basis that they were unlikely to pass the regulatory test. In both cases, GHD argued that the cost would have to be met by the proponent.

Transend argued that:

- even though the above costs may have to be borne by the proponents, they still have to be part of the revenue cap if they relate to non-contestable assets
- under certain circumstances renewals relating to connection assets could be shared among the same class of users (see section 3).

These are valid arguments. The code position and a possible alternative approach are discussed below.

In this paper, certain terms such as *augmentation*, *prescribed services* and *shared network* are used as defined in the code.

3. Code requirements

Shared network augmentations, other than funded augmentations, are subject to the regulatory test. Once rolled into the asset base the costs are recovered from all customers as Transmission Use of System charges.

The treatment of connection assets in the code is not entirely clear. However they:

- are not subject to the regulatory test
- may be included in the RAB and the costs recovered:
    - solely from the proponent in the form of connection (exit and entry) charges or
    - from the same class of users where there is no agreement covering cost allocation with a user (under clauses 6.4.1 and 6.4.2 of the code)
- may not be included in the RAB provided there is a suitable connection agreement.

Funded augmentations and dedicated connections can either be funded by a capital contribution (up front payment), an annual charge (exit/entry) or some other arrangement.

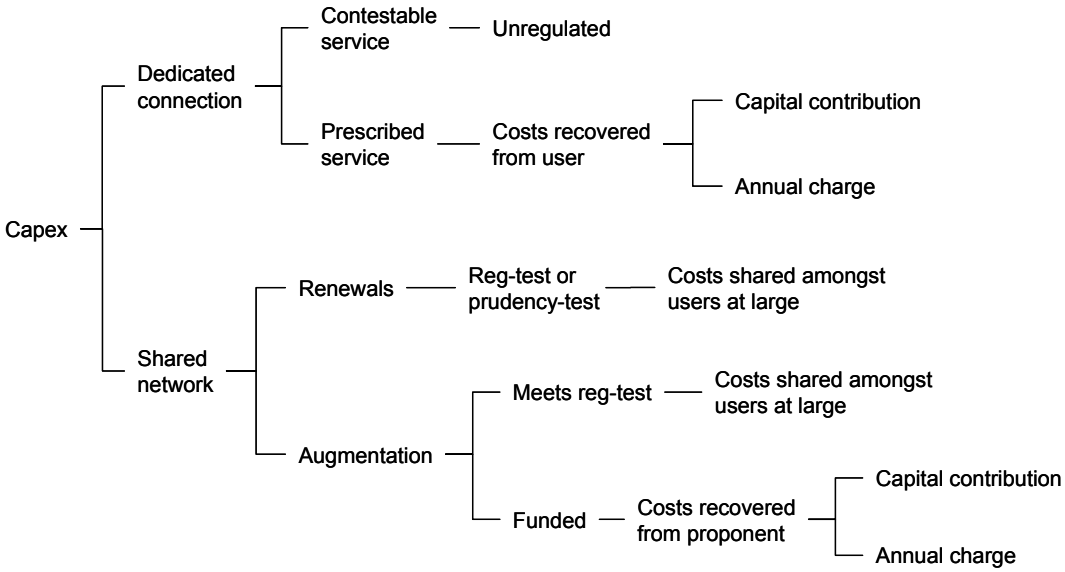
The code contains considerable detail about what costs individual users should bear and what should be shared (part C of chapter 6). However, it does not make this distinction in relation to revenue caps.

However, the revenue cap can be effectively segregated into two components.

- shared:
    - to be recovered from users at large, according to the provisions of Part C of Chapter 6—via settlement residues, usage charges, common service charges and general charges or
    - recovered from a particular class of users under clauses 6.4.1 & 6.4.2 of the code
- individually funded: to be recovered only from the relevant individual users—via connection charges and negotiated use of system charges.

Each component will cover the return of, and return on, capital plus operations and maintenance expenditures. This classification broadly reflects the pricing provisions of the code.

Illustration of code requirements



4. The probabilistic approach

To estimate the capex required for TNSPs during their revenue cap decisions, the ACCC used a probabilistic approach in its last three decisions.

That is, the ACCC considered a portfolio of possible projects, costed them and estimated the probability of their being carried out. The expected value of the portfolio (total of individual project costs multiplied by their probability) was given as the capex allowance. This approach estimated the total capex required by the TNSP during the regulatory period.

This was the first line of regulating capex. This allowed the TNSP and the users to examine the *total* amount required and balance the costs and benefits.

Before spending, TNSPs had to undergo the required processes for *individual* projects, such as regulatory test, prudency assessments, etc. This was the second line of regulation of capex.

There was also an ex-post threat of optimisation. That is, if the investment turned out to be unnecessary, the value of the asset could be written down to reflect its usage value.

Essentially the Commission has used the three mechanisms mentioned above to regulate the capex of TNSPs.

5. Shared and individually funded components of revenue cap

A probabilistic approach can be useful in regard to assets where the resulting charges are to be recovered from all users. It provides TNSPs with some management flexibility and the customers some certainty as to charges that they are likely to incur. Combined with appropriate arrangements it can impose a balanced set of incentives to undertake efficient investment at optimum cost to users.

On the other hand, the probabilistic approach may detract from efficient outcomes in the case of assets whose costs can be attributed to specific users (specific assets). Assets of this type can include dedicated, non-contestable, connection assets and funded augmentations. In such cases, the existence of a willing user, who is satisfied with the price being asked by the TNSP, provides reasonable evidence that the expenditure is justified and should proceed. A probabilistic approach may interfere with this outcome in two ways. For example, in circumstances where the probabilistic allocation has already been exhausted, the approach may delay efficient expenditure.

Therefore, segregating the revenue cap into the shared and individually-funded components can be useful.

6. Treatment of shared and individually funded assets

Assets whose costs are shared

Individual users have very little control over the charges resulting from the shared component of the network. Therefore the ACCC has a role to balance the interests of the users against the interests of TNSPs.

Augmentation to the shared network should either be considered on a detailed actual project basis[48] or on a probabilistic basis[49]. An allowance for such expenditure would then be included in the revenue cap calculations and rolled into the asset base subject to meeting the regulatory test. Cost recovery would then be determined by the provisions outlined in chapter 6 part C of the code.

This paper argues that the above process for shared assets should continue.

So far the ACCC has not seen adequate evidence to change from the probabilistic approach it has used in its past decisions.

Individually funded assets

Some dedicated connection assets and fully funded augmentations may warrant a more light handed regulatory approach, since they are usually fully funded by

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[48] As in the ACT NSW transmission revenue cap decision

[49] As in the Queensland, South Australian and Victorian transmission revenue cap decision

individual users who have the opportunity to participate or not.[50] This is consistent with the ACCC's light handed regulatory approach.

It appears that in the case of these individually funded assets, it may be better to allow pass-through on presentation of evidence that the relevant network user is willing to accept full responsibility for all costs (including opex and capex).

These assets could be rolled into the asset base every year subject to:

- agreement from the proponent to fully cover the associated costs
- the tabling of the proponent's signature to such an agreement
- the demonstration that the augmentation will have no negative impact on any other users
- establishment of auditing arrangements to ensure appropriate capex and opex classifications, and revenue sharing.

7. Similarity with distribution companies

The ACCC understands that the distribution network service providers (DNSP) use a similar mechanism. Revenue caps apply to prescribed services only. Others referred to as excluded services cover:

- contestable services, which are not regulated
- non contestable services—these services are of a contestable nature, however due to some technical or market reasons there is no effective competition. When a DNSP provides this service for the benefit of the specific customer a light handed regulation is applied.

8. Application to Transend—illustration

The ACCC applied the above approach on a very rough basis to Transend and arrived at the following scenario. The main objective of this exercise is to illustrate how the above approach will work, thus facilitating comments from Transend and other interested parties.

The ACCC might use this approach in the final decision, if it considers this to be a better option at that time. The ACCC will, as usual, consider the response to this paper by the interested parties in reaching a conclusion.

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[50] The Commission notes, however, that the user may not be in a position to negotiate on an even handed basis with a monopoly TNSP. The Commission therefore reserves the right to regulate the asset valuations and/or annual revenues, if the network users and the network service provider have been unable to reach agreement.

About a quarter of fixed capex program relates to connections. The balance relates to shared assets. If this proportion was applied to the GHD's recommended allowance of $341m, the shared component of the AR should be about $256m.

This assumes that connection costs will be borne by the relevant users, as the code normally intends (e.g. see schedule 6.2).

If it decides to proceed, the ACCC will require more robust figures. Meanwhile the ACCC did a sanity check on the proportion of shared capex, by examining the Transend's current revenue allocation.

If the code's pricing arrangements were applied to Transend, approximately a third of its revenue would be charged to specific customers and the balance shared among all users generally. This may imply that connection assets account for about one-third of the asset base. Hence the estimate of one-quarter of capex, as relating to connection appears to be reasonable for this very rough estimate.

Based on the above, the ACCC would use about $256m of capex in calculating AR. To compensate for the reduction from $307m, which is the capex allowance in the draft decision, Transend will be allowed an unlimited pass-through of individually funded capex subject to tabling of satisfactory information detailed in section 6.

The ACCC considers that this approach must be applied in a financially neutral way. Especially the (general) transmission charge to all users under this approach and the one taken in the draft decision must be broadly similar, despite the different revenue cap numbers. Also, neither the TNSP nor other interested parties should be systematically advantaged or disadvantaged.

The approach should result in an overall net benefit due to better regulation.

Way forward

In this revenue cap, the approach could only apply to capex. However, in the long-run the approach could evolve to encompass the entire RAB. The focus of the revenue cap should be on the shared assets where individual users have limited influence compared to the monopoly suppliers (i.e. TNSPs). A more light handed approach will be used in the case of assets which are used to serve a specific customer or a small group which can effectively negotiate with TNSPs.

Appendix D Pass-through rules

In relation to an insurance event, Transend defines such an event to mean:

> An insurance event occurs in any relevant financial year if the aggregate cost of Insurance (including, without limitation, premiums and deductibles) is higher or lower than $950,000 per annum expressed in 2002-2003 prices.

The ACCC considers that the definition of an insurance event should be amended (inserted as bold) as follows:

> An insurance event occurs in any relevant financial year if the aggregate cost of **efficient** Insurance (including, without limitation, premiums and deductibles) is **materially** higher or lower than $950,000 per annum expressed in 2002-2003 prices.

Transend must provide sufficient documentary evidence of a change in insurance costs to the ACCC.

Transend defines a tax change event as:

> A tax change event occurs where there is:
>
> (a) A change in the way or rate at which a Relevant Tax is calculated (including a change in the application or official interpretation of Relevant Tax); or
>
> (b) the removal or imposition of a Relevant Tax,
>
> to the extent that the change or imposition:
>
> (i) occurs after the date of the Determination; and
>
> (ii) results in a change in the amount Transend is required to pay or is taken to pay (whether directly, under any contract or as part of the operating expenses or other cost inputs of Transend's revenue cap) by way of Relevant Tax.
>
> Relevant Tax means any tax, rate, duty, charge, levy or other like or analogous impost that is:
>
> (a) paid, to be paid, or taken to be paid by Transend in connection with the provision of transmission services; or
>
> (b) included in the operating expenses or other cost inputs of Transend revenue cap;
>
> but excludes
>
> (i) income tax (or State equivalent tax) and capital gains tax;
>
> (ii) penalties and interest for late payment relating to any tax, rate duty, charge, levy or other like or analogous impost;
>
> (iii) fees and charges paid or payable in respect of a Service Standards Event;
>
> (iv) stamp duty, financial institutions duty, bank accounts debits tax or similar taxes or duties;

(v) any tax, rate, duty, charge, levy or other like or analogous impost which replaces the taxes and charges referred to in (i) to (iv).

The ACCC considers some minor amendments (inserted as bold) are required as follows:

A tax change event occurs where there is:

(a) A change in the way or rate at which a Relevant Tax is calculated (including a change in the application or official interpretation of Relevant Tax); or

(b) the removal or imposition of a Relevant Tax,

to the extent that the change, **removal** or imposition:

(i) occurs after the date of the Determination; and

(ii) results in a change in the amount Transend is required to pay or is taken to pay (whether directly, under any contract or as part of the operating expenses or other cost inputs of Transend's revenue cap) by way of Relevant Tax.

Relevant Tax means any tax, rate, duty, charge, levy or other like or analogous impost that is:

(a) paid, to be paid, or taken to be paid by Transend in connection with the provision of transmission services; or

(b) included in the operating expenses or other cost inputs of Transend revenue cap;

but excludes

(i) income tax (or State equivalent tax) and capital gains tax;

(ii) penalties and interest for late payment relating to any tax, **rate,** duty, charge, levy or other like or analogous impost;

(iii) fees and charges paid or payable in respect of a Service Standards Event;

(iv) stamp duty, financial institutions duty, bank accounts debits tax or similar taxes or duties;

(v) any tax, rate, duty, charge, levy or other like or analogous impost which replaces the taxes and charges referred to in (i) to (iv).

Regarding a terrorism event, Transend defines such an event to mean:

A terrorism event is an act of terrorism, which includes threats associated with terrorism.

The ACCC considers it is reasonable to include the impact of a terrorism event in the pass-through mechanism and as such, requires Transend to amend its definition as follow:

Terrorism event means an act, including but not limited to the use of force or violence and/or the threat thereof, of any person or group(s) of persons, whether acting alone or on behalf of or in connection with any organisation(s) or governments(s), which from its nature or context is done for, or in connection with, political, religious, ideological, ethnic or similar purposes or reasons, including the intention to influence any government and/or to put the public, or any section of the public, in fear.

Appendix E Financial indicators

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."

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 1 provides the same financial indicators based on Transend's AR.

Table 1 assumes a business profile of above average[51], which results in a minimum credit rating of 'A'. Hence the ACCC believes that its revenue cap for Transend will not adversely affect either the ongoing financial viability or Transend's ability to access capital markets. Other reasons for this include:

- The ACCC understands that Transend, as a government owned business, sources finance through State government arrangements
- The ACCC is satisfied that, by setting an appropriate WACC, it has already addressed Transend's ability to obtain credit. In determining Transend's WACC, the ACCC benchmark Transend's gearing at 60 per cent and sets the debt margin based on a benchmark credit rating of 'A'.

[51] The Commission considers Transend's business profile lies between excellent and above average, given the likely stability of its earnings and the lack of competitors for its services.

Table 1 Financial indicators

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09
EBIT[52] to Revenues (%)	68.75	66.78	67.52	70.40	74.20	75.73
EBITD to Revenues (%)	85.11	84.28	85.72	89.10	92.01	92.54
EBIT to Funds Employed (%)	11.46	10.97	10.86	11.67	12.13	13.05
EBIT to regulated assets (%)	11.46	10.97	10.86	11.67	12.13	13.05
Pre-tax interest cover (times)	3.07	2.93	2.91	3.12	3.25	3.49
Funds Flow Net Interest Cover (times)	3.80	3.70	3.69	3.95	4.02	4.27
S&P Rating	AA	AA	AA	AA	AA	AAA
Funds Flow Net Debt Pay Back (years)	6.26	6.52	6.57	5.96	5.82	5.36
S&P Rating	A	A	A	A	A	A
Internal Financing Ratio (%)	80.60	74.42	125.90	88.50	210.83	281.68
S&P Rating	AA	A	AAA	AA	AAA	AAA
Gearing	0.60	0.60	0.60	0.60	0.60	0.60
Payout Ratio	0.00	0.00	0.00	0.00	0.00	0.00

Note: Financial indicators formulae:

EBIT/funds employed	EBIT/(debt + equity)
Dividend payout ratio	Dividends/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 2 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 ave.	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 ave.	X	4.25	3.50	3.00	X	4.0	5.5	7.0	X	100	100	75
Vulnerable	X	X	4.00	3.50	X	X	4.0	6.0	X	X	100+	90

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.

[52] Earnings Before Interest and Tax

Appendix F Service standards issues

Major issue	Transend	Interested parties	GHD
Adequacy of current service levels	About 60 per cent of energy in Tasmania is consumed by five major industrial customers directly connected to the transmission system hence highly sensitive to the transmission performance. Therefore performance should be improved.	Majority of the retail consumers are satisfied with the current service levels (TCCI) implying transmission services are adequate. In some areas current levels may be inadequate for large customers (MEG) but not at the cost that Transend has claimed.	See below.
Additional expenses to *maintain* current levels.	Current levels may be adequate but if additional expenses are incurred service levels would fall to unacceptable levels.	Tolerance for price increases is very limited both major industrial and retail customers. To achieve efficient service spending should be balanced across all market—generation, transmission and distribution— rather than spending large amounts in transmission at the expense of others.	Targets to be further stretched taking into account additional capex and process improvements.
Impact of capex program.	Could lead to more planned outages in the short term.	Should lead to improved service levels.	Both were considered.
Additional measures.	No additional measures recommended.	Measures in the guidelines are inappropriate for a stringy network.	Some modifications to SKM but no new measures.

Appendix G Calculating the financial incentive

Incorporating the penalty or reward into the MAR

The ACCC requires each TNSP to report annually on its service standards indicators. Accordingly, Transend must report the actual performance for the indicators defined in appendix I.

Table 1 Timing of financial incentives

Allowed revenue [1] (Financial year) (t)	Financial incentive [2] (Calender year) (ct)
1 January 2004 - 30 June 2004	-
1 July 2004 - 30 June 2005	1 January 2003 - 31 December 2003
1 July 2005 - 30 June 2006	1 January 2004 - 31 December 2004
1 July 2006 - 30 June 2007	1 January 2005 - 31 December 2005
1 July 2007 - 30 June 2008	1 January 2006 - 31 December 2006
1 July 2008 - 30 June 2009	1 January 2007 - 31 December 2007

1. The allowed revenue for regulatory period t is based on the financial year listed.
2. The financial incentive for regulatory period t is based the calender year listed.

The MAR is calculated as follows:

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 in (Table 1)

ct = calender year (Table 1)

This calculation does not allow the effect of 'S' to be compounded into future periods. That is, each annual service standards reward or penalty will only affect revenues in one year. Further, the calculation of the financial incentive uses the allowed revenue for the period in which performance is measured. That is, the revenue for the calendar year in which service standards are measured is the time weighted average of the relevant AR for the overlapping regulatory year. Appendix H shows how 'S' is calculated.

Appendix H Calculating the service standards factor

When calculating 'S', the performance for each calendar year must be used.

The following equations should be used to calculate 'S'.

Where $S = S_1 + S_2 + S_3 + S_4$

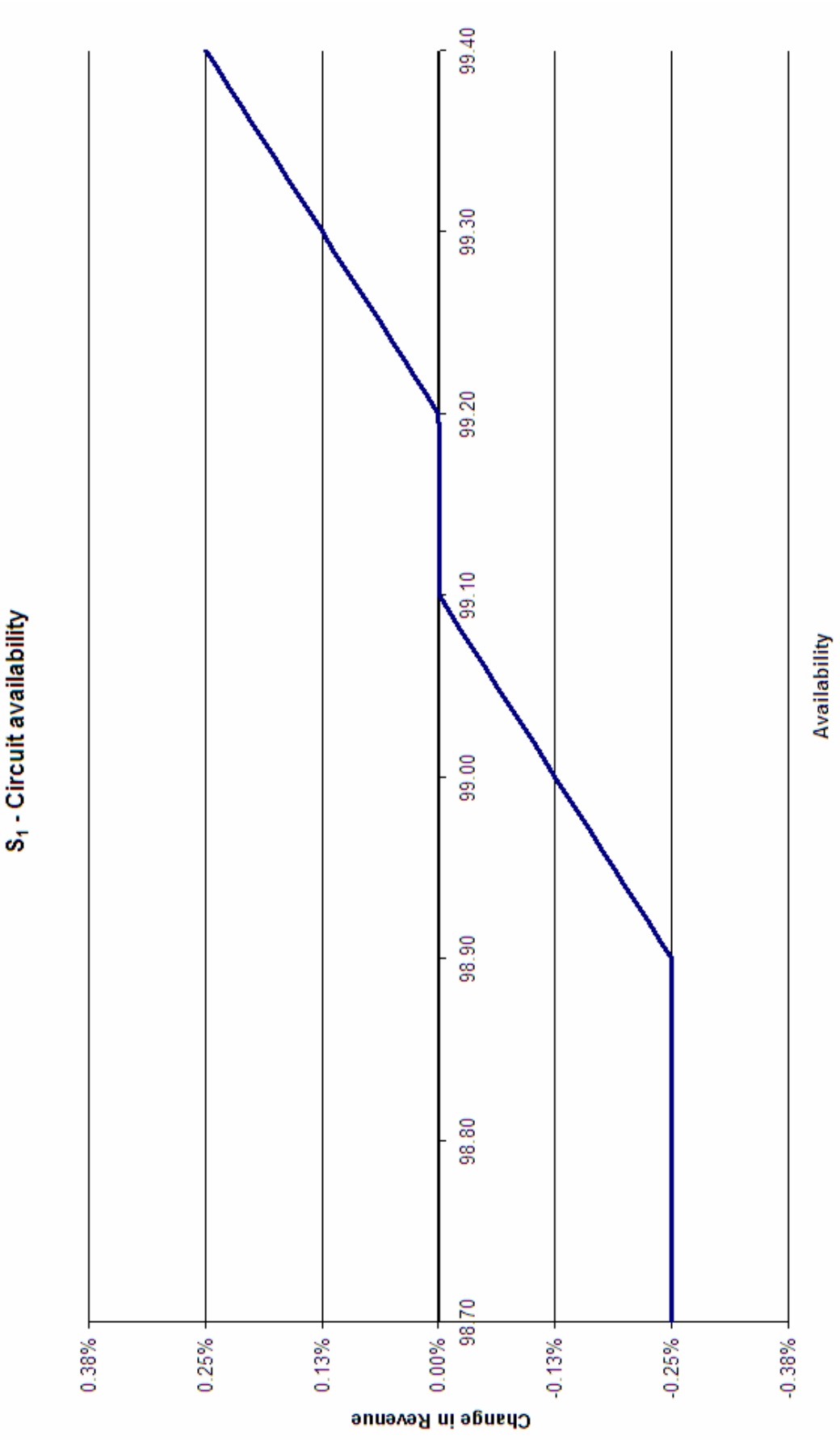
Transmission circuit availaibility											
S_1	**=**	**Gradient**	**x**	**Performance**	**+**	**Intercept**	**Where:**				
S_1	=	0.0025							Availability	>	99.4
S_1	=	0.0125	x	Availability	-	1.24000	99.2	<	Availability	≤	99.4
S_1	=	0.0000					99.1	≤	Availability	≤	99.2
S_1	=	0.0125	x	Availability	-	1.23875	98.9	≤	Availability	<	99.1
S_1	=	-0.0025							Availability	<	98.9

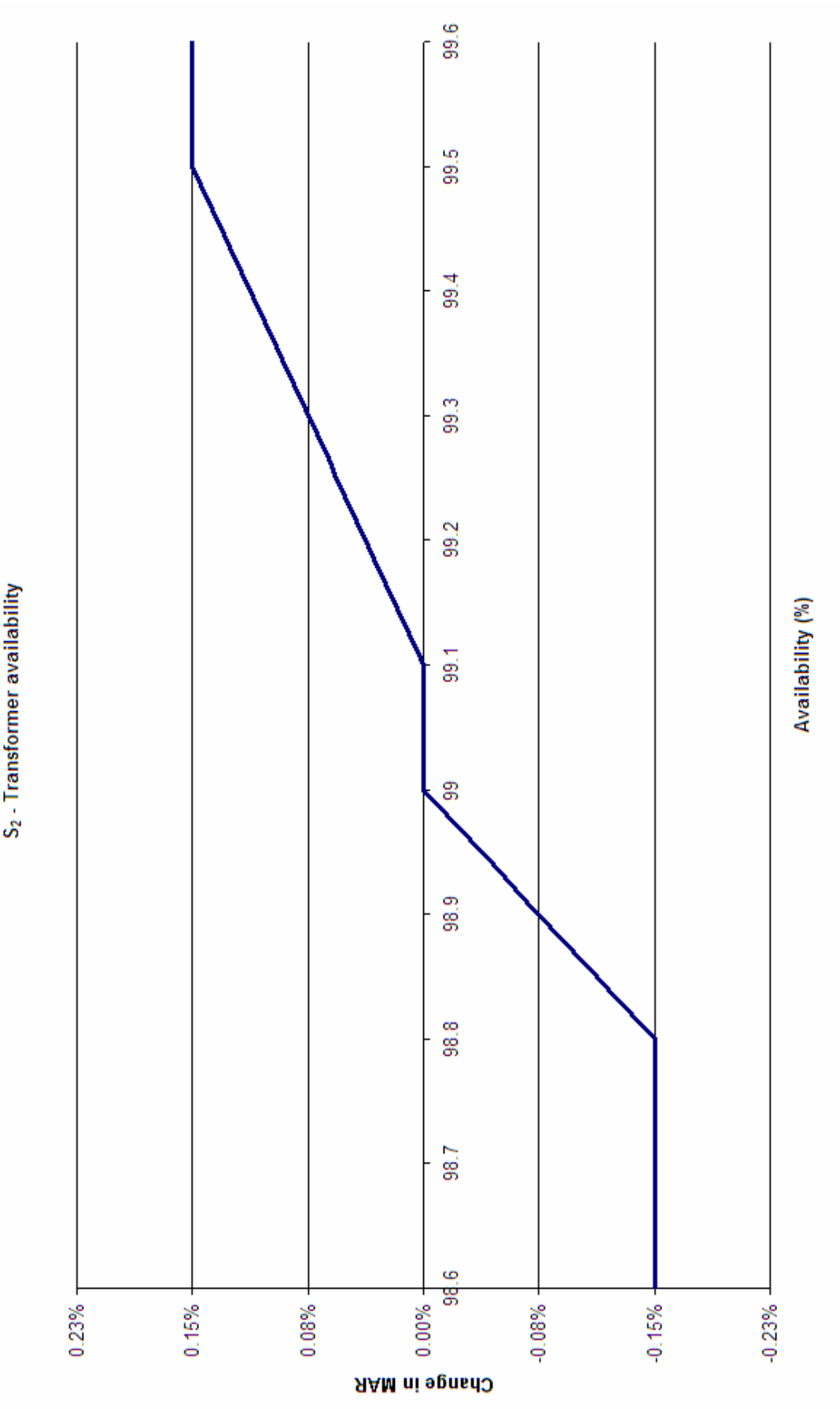
Transformer availability											
S_2	**=**	**Gradient**	**x**	**Performance**	**+**	**Intercept**	**Where:**				
S_2	=	0.00150							Availability	>	99.5
S_2	=	0.00375	x	Availability	-	0.371625	99.1	<	Availability	≤	99.5
S_2	=	0.00000					99.0	≤	Availability	≤	99.1
S_2	=	0.00750	x	Availability	-	0.742500	98.8	≤	Availability	<	99.0
S_2	=	-0.00150							Availability	<	98.8

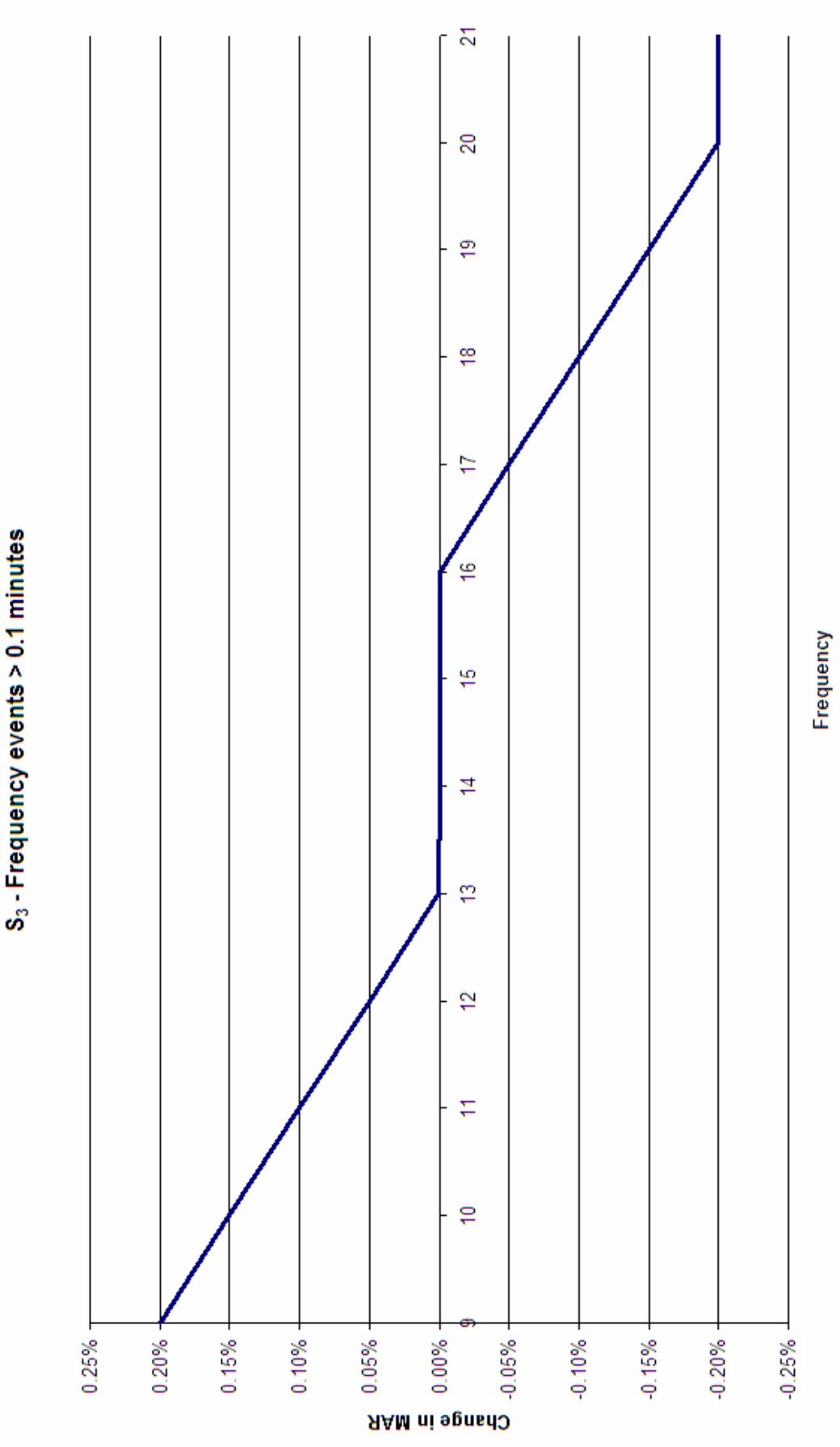
Frequency of loss of supply for events > 0.1 minutes											
S_3	**=**	**Gradient**	**x**	**Performance**	**+**	**Intercept**	**Where:**				
S_3	=	0.0020							Frequency	<	9
S_3	=	-0.0005	x	Frequency	+	0.0065	9	≤	Frequency	<	13
S_3	=	0.0000					13	≤	Frequency	≤	16
S_3	=	-0.0005	x	Frequency	+	0.0080	16	<	Frequency	≤	20
S_3	=	-0.0020							Frequency	>	20

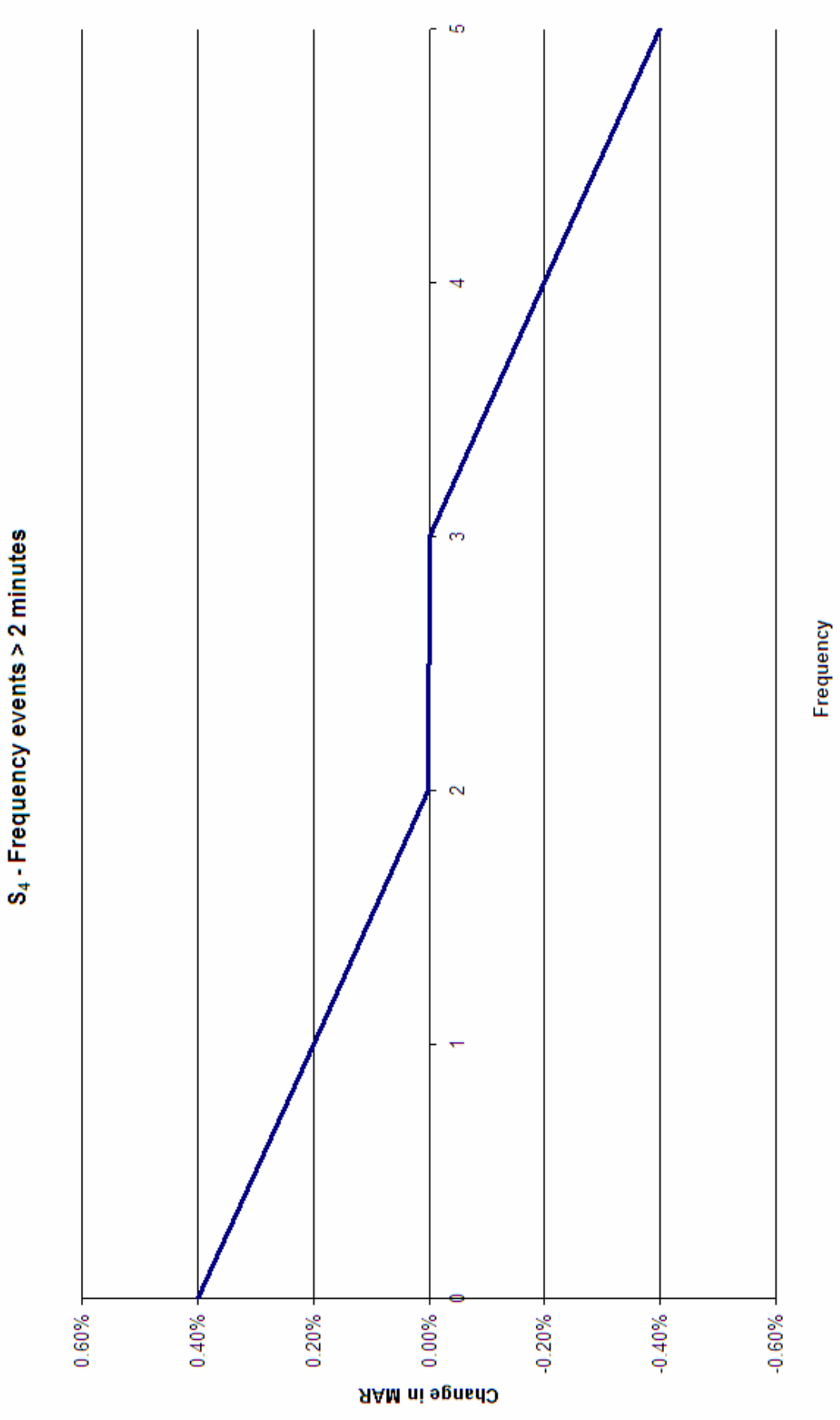
Frequency of loss of supply for events > 2 minutes											
S_4	**=**	**Gradient**	**x**	**Performance**	**+**	**Intercept**	**Where:**				
S_4	=	0.0040							Frequency	<	0
S_4	=	-0.0020	x	Frequency	+	0.004	2	>	Frequency	=>	0
S_4	=	0.0000					2	=<	Frequency	=<	3
S_4	=	-0.0020	x	Frequency	+	0.006	5	=>	Frequency	>	3
S_4	=	-0.0040							Frequency	>	5

Note: These equations are displayed graphically on the following pages.


S1 - Circuit availability
Change in Revenue
0.38%
0.25%
0.13%
0.00%
-0.13%
-0.25%
-0.38%
98.70
98.80
98.90
99.00
99.10
99.20
99.30
99.40
Availability


S2 - Transformer availability
Change in MAR
0.23%
0.15%
0.08%
0.00%
-0.08%
-0.15%
-0.23%
98.6
98.7
98.8
98.9
99
99.1
99.2
99.3
99.4
99.5
99.6
Availability (%)


S3 - Frequency events > 0.1 minutes
Change in MAR
0.25%
0.20%
0.15%
0.10%
0.05%
0.00%
-0.05%
-0.10%
-0.15%
-0.20%
-0.25%
9
10
11
12
13
14
15
16
17
18
19
20
21
Frequency


S4 - Frequency events > 2 minutes
Change in MAR
0.60%
0.40%
0.20%
0.00%
-0.20%
-0.40%
-0.60%
0
1
2
3
4
5
Frequency

Appendix I Performance measure definitions

Measure 1	**Transmission circuit availability**
Sub-measures	▪ Circuit availability ▪ Transformer availability
Unit of measure	Percentage of total possible hours available
Source of data	Transend
Definition/formula	Formula: $\left(\frac{\text{No. hours per annum circuits are available}}{\text{Total possible no. of defined circuit hours}}\right)\times 100$ Definition: The actual circuit hours available for defined, divided by the total possible defined circuit hours available
Exclusions (to be reported annually)	▪ Exclude unregulated transmission assets ▪ Exclude from 'circuit unavailability' any outages shown to be caused by a fault or other event on a '3rd party system' e.g. intertrip signal, generator outage, customer installation (Transend to provide list) ▪ Force majeure events
Inclusions	▪ 'Circuits' includes overhead lines, underground cables, power transformers, phase shifting transformers, static var compensators, capacitor banks, and any other primary transmission equipment essential for the successful operation of the transmission system (Transend to provide lists) ▪ Circuit 'unavailability' to include outages from all causes including planned, forced and emergency events, including extreme events

Measure 2	Loss of supply event frequency index
Sub-measures	▪ Frequency of events where loss of supply exceeds 0.1 minutes ▪ Frequency of events where loss of supply exceeds 2 minutes
Unit of measure	Number of events per annum
Source of data	Transend
Definition/formula	▪ Frequency of events where loss of supply exceeds 0.1 minutes ▪ Frequency of events where loss of supply exceeds 2 minutes
Exclusions	▪ Exclude unregulated transmission assets ▪ Exclude any outages shown to be caused by a fault or other event on a 'third party system' (e.g. intertrip signal, generator outage, customer installation) ▪ Planned outages ▪ Force majeure events
Inclusions	▪ All unplanned outages exceeding the specified impact (that is, 0.1 minutes and 2 minutes) ▪ Includes outages on all parts of the regulated transmission system ▪ Includes extreme events

Force majeure

For the purpose of applying the service standards performance-incentive scheme, 'force majeure events' means any event, act or circumstance or combination of events, acts and circumstances, which (despite the observance of good electricity industry practice) is beyond the reasonable control of the party affected by any such event, which may potentially include, without limitation, the following:

- fire, lightning, explosion, flood, earthquake, storm, cyclone, action of the elements, riots, civil commotion, malicious damage, natural disaster, sabotage, act of a public enemy, act of God, war (declared or undeclared), blockage, revolution, radioactive contamination, toxic or dangerous chemical contamination or force of nature
- action or inaction by a court, government agency (including denial, refusal or failure to grant any authorisation, despite timely best endeavour to obtain same)
- strikes, lockouts, industrial and/or labour disputes and/or difficulties, work bans, blockades or picketing

- acts or omissions (other than a failure to pay money) of a party other than the TNSP which party either is connected to or uses the high voltage grid or is directly connected to or uses a system for the supply of electricity which in turn is connected to the high voltage grid

- where those acts or omissions affect the ability of the TNSP to perform its obligations under the service standard by virtue of that direct or indirect connection to or use of the high voltage grid.

In past revenue caps the ACCC has provided guidance as to how to apply the definition of force majeure. It does not intend to provide formal guidance here. Any event excluded from the performance results should be justified by Transend to the ACCC in writing.

Appendix J Submissions received

In response to the ACCC's call for submissions on Transend's application and GHD's report, submissions were received from:

- Aurora Energy
- Major Employers Group
- Hydro Tasmania
- Senator Bob Brown
- Tasmanian Chamber of Commerce and Industry
- Energy Users Association of Australia and Energy Action Group (combined submission)
- Office of the Tasmanian Energy Regulator
- Headberry and Partners
- Tasmanian Treasury