TRANSEND

TRANSEND TRANSMISSION REVENUE PROPOSAL

For the Regulatory Control Period 1 July 2009 to 30 June 2014

TRANSEND

Produced by Transend Networks Pty Ltd

Transmission Revenue Proposal:
Regulatory Control Period commencing 1 July 2009

May 30, 2008
TRIM Reference D08/46227
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Transend Networks Pty Ltd
ABN 57 082 586 892

7 Maria Street, LENAH VALLEY, TASMANIA, 7008, Australia
PO Box 606, MOONAH, TASMANIA, 7009, Australia

Telephone	1300 361 811
Overseas callers	+61 3 6274 3849
Facsimile	(03) 6274 3900
Internet	www.transend.com.au

Cover photographs: Argent Photography

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EXECUTIVE SUMMARY

Introduction

Transend Networks Pty Ltd (Transend) is the electricity transmission network service provider (TNSP) in Tasmania.

Despite the substantial challenges and costs of entering and operating in the National Electricity Market (NEM) in 2005 and ensuring the successful connection of Basslink, Transend has continued to maintain a clear focus on customer service, performance and the efficient delivery of its capital and operating works program, to the benefit of all customers.

Transend is planning in the forthcoming regulatory control period, to invest further on a variety of transmission projects around the State to ensure that it continues to provide a reliable and secure electricity transmission service that meets customer expectations now and in the future.

In accordance with chapter 6A of the National Electricity Rules (Rules), this document is Transend's revenue proposal for the forthcoming regulatory control period, which commences on 1 July 2009 and ends on 30 June 2014.

Overview of Transend

Transend's vision is to be a leader in developing and maintaining sustainable networks and its mission is to:

- efficiently provide a reliable and secure electricity transmission service at a cost commensurate with appropriate and sustainable returns to shareholders; and
- develop new business opportunities building on our established strengths.

The vision and mission underpin the service outcomes and expenditure plans detailed in this revenue proposal.

Transend's transmission system comprises 3,650 circuit kilometres of transmission line connecting power stations to customers in Tasmania and to the wider Australian electricity market via Basslink. The Tasmanian transmission system includes 47 substations, nine switching stations and two transition stations.

Unlike most other Transmission Network Service Providers (TNSPs), Transend's transmission system includes sub-transmission assets operating at lower voltages down to 6.6 kV. The large number of assets operating at these lower voltage levels results in Transend unavoidably incurring higher operating and maintenance expenditure, relative to the costs incurred by TNSPs whose transmission assets operate at higher voltage levels (namely 66 kV and above).

The development of Transend's transmission system has been shaped largely by the nature of Tasmania's hydro-based generation system, which is characterised by:

- geographically dispersed generation (determined by the location of suitable water-catchment sites);
- a large number of relatively low capacity generators; and
- seasonal variations and climatic factors affecting generator operation.

These factors result in more network investment and maintenance effort being needed in Tasmania to connect generation and load than would be the case if generating capacity were predominantly thermal.

Because of Transend's operating environment, sub-transmission asset ownership and operation, and its connections to geographically dispersed generators, caution needs to be taken when applying standard industry benchmarks and when comparing Transend's performance with that of other TNSPs.

Transend's recent cost and service performance

Transend's operating environment has changed significantly since Tasmania joined the NEM, resulting in an increase in Transend's operational activities. Transend's role as a TNSP is now materially more complex compared to pre-NEM conditions.

The following are some of the highlights of Transend's achievements over the current regulatory control period:

- The level of capital investment is larger than previously undertaken by Transend. Transend has demonstrated that it can manage and deliver an increased program of works.
- Transend is forecasting to commission a total of $451 million ($2008–09) worth of capital investment over the current regulatory control period.
- Transend's investment expenditure represents a prudent and efficient capital program which has:
  - renewed assets that were in poor condition, delivering improved transmission system performance and reduced maintenance requirements;
  - enabled Transend to efficiently cater for demand growth and develop or modify prescribed connection sites; and
  - addressed capacity constraints, safety and environmental issues in accordance with all regulatory compliance requirements, and good electricity industry practice.
- Transend has maximised the capability of the existing transmission system through the development of transmission line dynamic ratings and the application of innovative network control schemes. These approaches have provided a very cost-effective means of increasing the useable capacity of the transmission system and deferring capital expenditure. The use of transmission line dynamic ratings, as further developed by Transend, is considered to be leading edge and is now being widely adopted by other TNSPs to deliver operational benefits where appropriate.

- Transend has met increasing compliance requirements in areas such as financial reporting, emergency management, critical infrastructure protection, and safety and environment management. These factors, together with other cost pressures which principally relate to the labour market, have placed significant upward pressure on Transend's operating expenditure requirements during the current regulatory control period. Other upward pressures on operating expenditure were foreseen and included in Transend's previous revenue application. Transend's operating expenditure during the current regulatory control period closely aligns with that proposed by Transend in 2003.
- Transend's service performance against the performance incentive scheme measures has generally met or marginally exceeded the targets set by the Australian Competition and Consumer Commission (ACCC) with small rewards being received under the scheme.

Transend's total revenue requirements

This revenue proposal sets out Transend's expenditure plans for the future. In doing so, however, it must also address issues that arise from the current regulatory control period and Transend's transition to the new regulatory framework.

Transend's proposed maximum allowed revenue represents an increase of approximately 28.5 per cent in 2009–10, relative to the maximum allowed revenue for 2008–09 under the current revenue determination, and 6.4 per cent per annum thereafter in real terms.

The increase in the revenue requirement in the first year of the forthcoming regulatory control period of 28.5 per cent consists of the following three components.

- 5.5 per cent is due to Transend's proposed increase in activity levels in terms of operating expenditure and capital investment.
- 13.9 per cent is as result of technical changes to the regulatory framework relating to the treatment of work-in-progress (WIP) and financial market-driven changes to the cost of capital, both factors being beyond Transend's control.
- 9.1 per cent relates to an operating expenditure shortfall that arises because the ACCC's 2003 revenue cap decision provided an insufficient operating expenditure allowance for Transend to meet its obligations as a TNSP.

Figures E.1 and E.2 below show Transend's revenue requirements for the forthcoming regulatory control period and the impact of the increases in 2009–10 associated with the three components described above.

Figure E.1: Increase in revenue requirement after adjusting the present revenue cap to reflect Transend's actual (efficient) operating expenditure over the current regulatory control period ($2008–09)

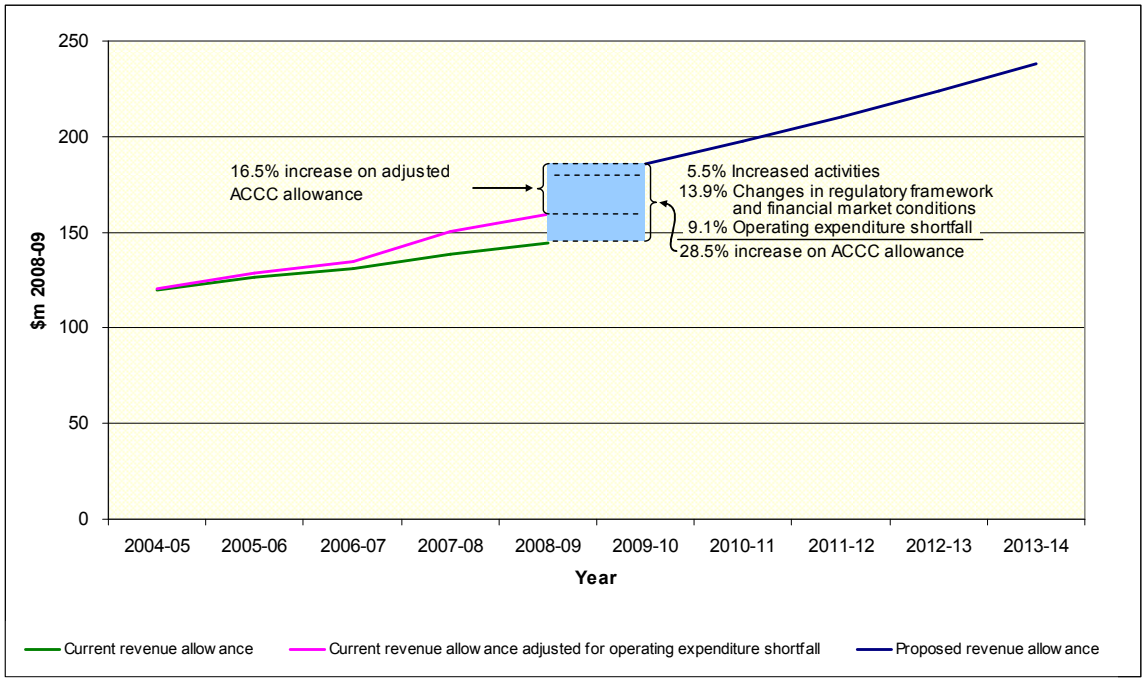


Figure E.2: Simplified representation of increase in revenue for the first year of the forthcoming regulatory control period

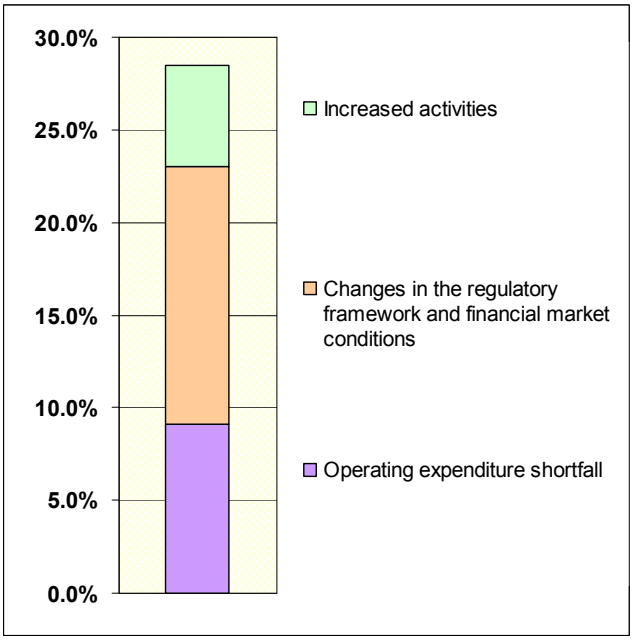
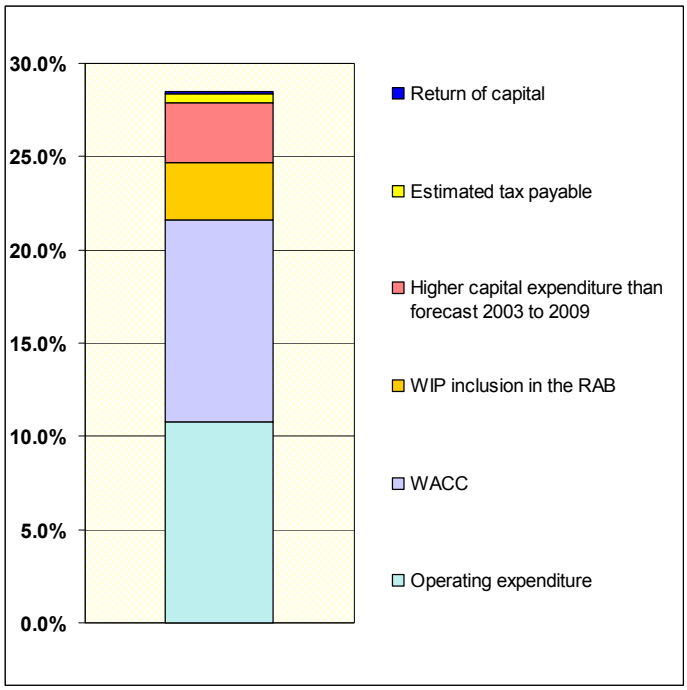


Figure E.3 provides a more detailed breakdown of the 28.5 per cent increase in Transend's revenue requirements in the first year of the forthcoming regulatory control period. As noted previously, almost half of the required increase in Transend's revenue (that is, 13.9 per cent) results from:

- a change in the regulatory approach to capital expenditure, with WIP to be included in the opening regulatory asset base (RAB). This change results in the inclusion of $57.9 million of WIP, including accumulated finance during construction; and
- a change in financial market conditions that has led to an increase in the cost of capital.

These two changes do not directly relate to the operation or performance of the transmission system, even though they have a large impact on Transend's required revenue.

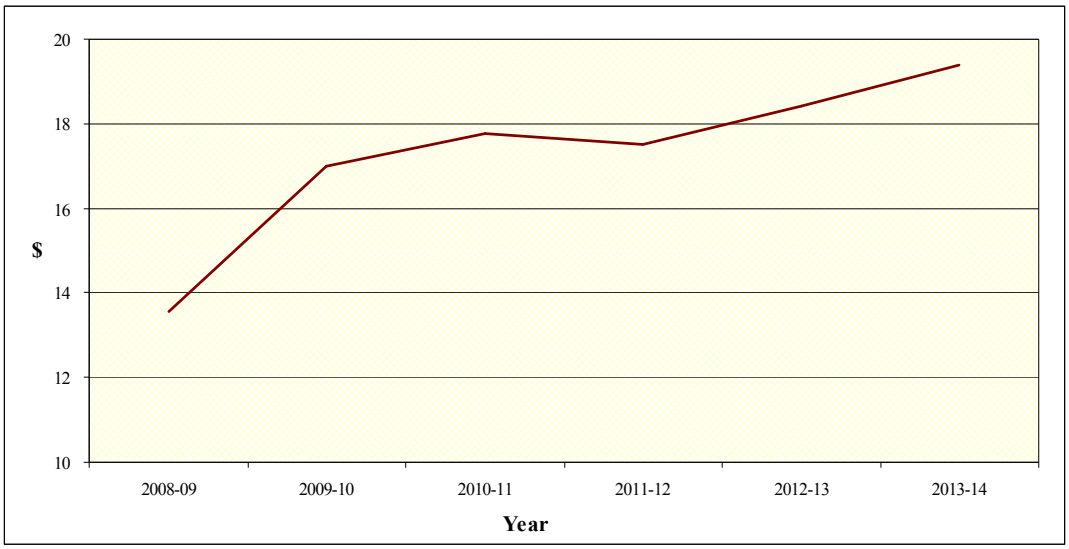
Figure E.3: Composition of revenue increase for the first year of the forthcoming regulatory control period



Average price impact

Taking into account forecast demand, the proposed maximum allowed revenue equates to an increase in average prices of approximately 25.2 per cent in 2009–10, relative to the average price level for 2008–09, and 3.4 per cent per annum thereafter in real terms. This is shown in Figure E.4.

Figure E.4: Average price impact of revenue proposal ($/MWh 2008–09)



Cost to customers

Transmission costs in Tasmania represent approximately 12 per cent of the total delivered price for the typical residential customer.

The impact of Transend's revenue proposal on the total delivered price for a typical residential customer is estimated to be an increase of 3.0 per cent or approximately $42 in 2009–10, and annual increases of less than $6 for the remainder of the forthcoming regulatory control period, in real terms.

It is recognised that for many commercial and energy intensive customers, transmission costs represent a greater percentage of the total delivered price.

While Transend recognises that the future price path for transmission services will increase over the forthcoming regulatory control period, Transend believes that its revenue proposal reflects a prudent and efficient expenditure program that is focused on the long term needs of the transmission system and Transend's customers.

Building Block Calculations

The proposed values of the components that comprise Transend's annual building block revenue requirement for each year of the forthcoming regulatory control period are shown in Table E.1 ($nominal) and Table E.2 ($2008–09).

Table E.1: Components of the annual building block revenue requirement, 2009–10 to 2013–14 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Return on capital	105.1	120.4	137.8	148.1	159.6
Return of capital (economic depreciation)	24.9	26.0	22.6	27.9	31.1
Operating expenditure	55.1	57.5	58.9	64.1	67.1
Net tax allowance	5.4	6.3	6.8	7.8	8.6
Annual building block revenue requirement—unsmoothed	**190.5**	**210.2**	**226.0**	**247.9**	**266.4**

Table E.2: Components of the annual building block revenue requirement, 2009–10 to 2013–14 ($m 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14
Return on capital	102.5	114.5	127.8	133.9	140.8
Return of capital (economic depreciation)	24.3	24.8	21.0	25.3	27.5
Operating expenditure	53.7	54.7	54.6	58.0	59.2
Net tax allowance	5.3	6.0	6.3	7.0	7.6
Annual building block revenue requirement—unsmoothed	**185.8**	**199.9**	**209.7**	**224.3**	**235.0**

Transend's forecast capital and operating expenditure

Transend's Grid Vision project is an important input to developing the long-term planning requirements for the transmission network and ongoing review of the capital works program. The project identifies the need for substantial investment in the Tasmanian transmission system over the next 30 years, even under the most conservative assumptions. Consideration of long-term requirements therefore guides the development of solutions to short-term network constraints, and also highlights future strategic land and easement requirements.

Transend faces the prospect of a very tight market for procuring equipment, contracted services and skilled labour. Against this backdrop, Transend needs to invest in a number of critical transmission projects around the State to achieve the required reliability and security of prescribed transmission services, now and in the future.

Transend has a robust investment governance and asset management framework which it continues to develop and refine in accordance with good business practice. The framework results in prudent and efficient capital and operating expenditure which meets service requirements and satisfies the capital and operating expenditure objectives of the Rules.

A summary of the capital expenditure forecast by category is shown in Table E.3.

Table E.3: Capital expenditure forecast by category ($m 2008–09).

Category	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Augmentation	70.8	82.7	29.4	16.1	28.6	**227.6**
Connection	31.5	35.0	37.0	16.5	1.7	**121.8**
Land and easements	0.0	0.0	0.0	10.5	10.3	**20.9**
Asset renewal	29.8	39.4	25.7	62.4	69.3	**226.6**
Physical security/compliance	5.1	2.0	2.4	0.8	0.4	**10.7**
Inventory/spares	9.6	0.4	0.5	0.2	1.0	**11.7**
Operational support systems	4.6	4.8	3.2	3.6	6.1	**22.3**
Total network	**151.4**	**164.2**	**98.3**	**110.2**	**117.5**	**641.6**
Information technology	2.7	5.1	3.6	4.0	5.9	**21.3**
Business support	3.9	4.1	4.5	4.3	1.0	**17.8**
Total non-network	**6.6**	**9.2**	**8.2**	**8.3**	**6.9**	**39.1**
Total	**158.0**	**173.4**	**106.5**	**118.5**	**124.3**	**680.7**

The Waddamana–Lindisfarne 220 kV transmission line project is the largest project included in the capital works program and comprises approximately 52 per cent of the augmentation capital expenditure for the forthcoming regulatory control period and approximately 17 per cent of the planned total capital expenditure. This project has passed the market benefit limb of the regulatory test and is currently being implemented. It is planned to be completed in the 2010–11 financial year. Other augmentation projects are primarily driven by compliance obligations and to cater for demand growth.

Analysis of the demand forecast and the joint planning process with the Distribution Network Service Provider (DNSP), Aurora Energy Pty Ltd (Aurora), has identified a number of key areas where connection sites need to be established or modified to meet customer demand. To meet this need, seven new connection sites and modifications to a number of existing connection sites are required over the forthcoming regulatory control period.

Transend's asset renewal program is a long-term program that comprises a combination of targeted asset replacement and substation redevelopment projects that are critical to sustaining transmission system performance and the reliability of electricity supply to customers. This program is a continuation of the comprehensive asset renewal program that has progressed in the current regulatory control period.

In 2007, Transend implemented a consolidated works planning system that registers the long-term operating and capital works plans for transmission lines, substations, and protection and control assets. The works planning system delivers a single, integrated mechanism for registering every preventive and corrective work task. It also includes works associated with capital projects and this allows Transend to plan and optimise its works plan efficiently, taking into consideration asset replacements and additions, asset management strategies and practices, and individual asset requirements.

The development of the works planning system included a detailed re-evaluation of the discrete work tasks performed on individual asset categories. This resulted in considerable change to the nature and description of planned maintenance and condition assessment activities (work tasks) required to sustain asset performance. This revised approach represented a significant change with respect to the manner in which the works planning process is administered. Transend's operating expenditure forecast has explicitly taken account of this change by adopting a zero-based budgeting approach for field operations and maintenance.

Transend's approach to forecasting operating expenditure for the forthcoming regulatory control period is similar to the approach accepted by the Australian Energy Regulator (AER) in recent revenue cap decisions. In particular, the approach builds on recent actual operating expenditure by making adjustments for scope changes, scaling factors and cost escalation forecasts.

Table E.4 presents a summary of Transend's total operating expenditure forecast for the forthcoming regulatory control period.

Table E.4: Transend's operating expenditure forecast ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Field operations and maintenance	16.4	17.5	17.9	18.3	19.3	**89.5**
Transmission services	7.8	8.1	8.4	8.7	9.0	**42.0**
Transmission operations	5.1	5.3	5.5	5.7	5.9	**27.5**
Asset management	6.6	6.9	8.5	10.5	9.7	**42.2**
Corporate	9.9	10.0	10.1	10.5	10.9	**51.3**
Total controllable	**45.7**	**47.9**	**50.3**	**53.7**	**54.8**	**252.3**
Network support	3.9	2.6	0.0	0.0	0.0	**6.6**
Debt raising costs (benchmarked allowance)	0.9	1.0	1.1	1.2	1.2	**5.4**
Equity raising costs (benchmarked allowance)	2.4	2.4	2.4	2.4	2.4	**12.0**
Self-insurance	0.8	0.8	0.8	0.8	0.8	**3.9**
Total	**53.7**	**54.7**	**54.6**	**58.0**	**59.2**	**280.2**

Overall, Transend is forecasting a higher operating expenditure requirement than was allowed in the current regulatory control period. This includes the combined effect of the volume of work and price of work cost drivers and reflects the particular operating conditions and challenges that Transend will face in the forthcoming regulatory control period.

Transend participates in the AER's service target performance incentive scheme (STPIS). The parameter values proposed in this revenue proposal have been developed in accordance with the STPIS guideline and it provides sufficient incentive to drive performance improvement over the forthcoming regulatory control period.

Other building block parameters

To establish Transend's revenue requirement for the forthcoming regulatory control period a number of other important building block parameters must be resolved. These building block parameters are:

- Transend's RAB;
- Transend's return on capital;
- allowed depreciation; and
- corporate tax allowance.

Each of these parameters has been developed in accordance with the Rules, and Transend has also taken account of recent regulatory practice where appropriate.

Regulatory asset base

Transend's RAB as at 1 July 2009 (the commencement date of the forthcoming regulatory control period) has been calculated in accordance with the roll forward model provided by the AER. The RAB value for each year of the forthcoming regulatory control period is set out in Table E.5. This data reflects Transend's capital expenditure forecast and expected depreciation over the forthcoming regulatory control period.

Table E.5: RAB roll forward 1 July 2009 to 30 June 2014 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
RAB (start period)	987.3	1,130.7	1,294.0	1,390.6	1,498.8
Inflation on opening RAB	25.1	28.7	32.9	35.3	38.1
Nominal capital expenditure as incurred	168.3	189.4	119.2	136.1	146.4
Nominal straight-line depreciation	-50.0	-54.8	-55.5	-63.3	-69.2
RAB (end period)	1,130.7	1,294.0	1,390.6	1,498.8	1,614.1

Return on capital

Transend's return on capital has been calculated by applying the post-tax nominal vanilla weighted average cost of capital (WACC) to the opening regulatory asset base in each year consistent with the AER's post-tax revenue model.

Transend estimates that its post-tax nominal vanilla WACC is 10.65 per cent in accordance with the requirements of the Rules. The key parameters and variables underlying the cost of capital calculation are summarised in Table E.6.

Table E.6: Proposed WACC parameters and variables

Parameter	Proposed
Risk free rate (nominal)	6.37%
Expected inflation	2.54%
Debt risk premium	3.13%
Market risk premium (MRP)	6%
Gearing (D/V)	60%
Gamma	0.50
Equity beta	1.00
Corporate tax rate	30%
Vanilla WACC (nominal)	**10.65%**

The resulting return on capital calculation is shown in Table E.7.

Table E.7: Return on capital from 1 July 2009 to 30 June 2014 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Opening RAB	987.3	1,130.7	1,294.0	1,390.6	1,498.8
Return on capital	105.1	120.4	137.8	148.1	159.6

Depreciation

The AER's post-tax revenue model calculates economic depreciation by subtracting the indexation of the opening asset base from the depreciation for each regulatory year. A summary of this calculation is shown in Table E.8.

Table E.8: Total depreciation forecast from 1 July 2009 to 30 June 2014 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Straight-line depreciation	50.0	54.8	55.5	63.3	69.2
Indexation	-25.1	-28.7	-32.9	-35.3	-38.1
Economic depreciation	24.9	26.0	22.6	27.9	31.1

Corporate tax allowance

For the purpose of estimating the cost of corporate income tax, Transend has calculated tax depreciation in accordance with tax law on a straight-line basis, using the AER's tax asset base roll forward model. The corporate tax allowance for the forthcoming regulatory control period is shown in Table E.9.

Table E.9: Forecast tax allowance ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Income tax payable	10.8	12.5	13.6	15.6	17.1
Imputation credit	-5.4	-6.3	-6.8	-7.8	-8.6
Tax allowance	**5.4**	**6.3**	**6.8**	**7.8**	**8.6**

Concluding comments

This revenue proposal represents a continuation of the progress Transend has made in recent years to efficiently provide a reliable and secure electricity transmission system at a cost commensurate with appropriate and sustainable returns to shareholders.

Transend is confident that this revenue proposal demonstrates that it develops and manages Tasmania's electricity transmission system in a way that meets the long term interests of electricity consumers.

1 INTRODUCTION

1.1 Purpose of this document

Transend Networks Pty Ltd (Transend) is the electricity Transmission Network Service Provider (TNSP) in Tasmania.

Transend is presently subject to a revenue cap in accordance with a decision made by the Australian Competition and Consumer Commission (ACCC) in December 2003[1]. That revenue cap expires on 30 June 2009.

Under chapter 6A—*Economic Regulation of Transmission Services*—of the National Electricity Rules (Rules), Transend is required to submit to the Australian Energy Regulator (AER) a revenue proposal in relation to the regulatory control period which commences on 1 July 2009 (the forthcoming regulatory control period).

This document is Transend's revenue proposal for the forthcoming regulatory control period.

1.2 Coverage, duration and basis of this revenue proposal

This revenue proposal is submitted in accordance with the requirements of chapter 6A of the Rules and relevant guidelines[2] issued by the AER pursuant to chapter 6A. Transend considers it has diligently applied the Rules and is confident this revenue proposal complies with the requirements of the Rules, including:

- chapter 6A;
- the transitional arrangements in chapter 11;
- the guidelines published by the AER; and
- the planning and operational requirements of schedule 5.1.

Relevant aspects of the Rules are explained in further detail in subsequent chapters of this revenue proposal.

Appendix 2 sets out checklists that demonstrate the compliance requirements of this revenue proposal with all applicable provisions of the submission guidelines.

Pursuant to schedule S6A.1.3(9) of the Rules, this revenue proposal relates to a five year regulatory control period that commences on 1 July 2009 and ends on 30 June 2014.

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1 ACCC, *Tasmanian Transmission Network Revenue Cap 2004–2008/09*, 10 December 2003.

2 These are: the post-tax revenue model referred to in clause 6A.5.2; the roll forward model referred to in clause 6A.6.1; an efficiency benefit sharing scheme referred to in clause 6A.6.5; the service target performance incentive scheme referred to in clause 6A.7.4; submission guidelines referred to in clause 6A.10.2; and cost allocation guidelines referred to in clause 6A.19.3.

In accordance with chapter 6A of the Rules, this revenue proposal relates to the prescribed transmission services provided by Transend.

These services must be provided by Transend in accordance with the requirements and standards prescribed in the Rules. In addition, Transend's provision of these services must also be in accordance with the *Electricity Supply Industry Act 1995* (the ESI Act) along with other industry-specific Tasmanian legislation and regulatory instruments. Further details of these requirements, along with an overview of the regulatory provisions governing Transend's network planning responsibilities are provided in Appendices 5 and 6.

In addition to chapter 6A of the Rules, clauses 11.6.9 and 11.6.10, which relate to the determination of the regulatory asset base (RAB) and the calculation of a carry-over mechanism to reward efficiency improvements are applicable to Transend's revenue proposal.

All costs and revenues quoted in this revenue proposal are exclusive of goods and services tax (GST), and numbers in tables throughout the proposal may not add up due to rounding.

1.3 Structure of this document

This revenue proposal for the forthcoming regulatory control period is structured as follows:

- Chapter 2 provides an overview of Transend's business environment, its key achievements and the future challenges it is facing.
- Chapter 3 describes Transend's asset management and investment processes.
- Chapter 4 sets out information regarding Transend's cost and service performance, and the efficiency gains achieved by the company over the current regulatory control period.
- Chapter 5 sets out details of Transend's forecast capital expenditure, along with contingent projects and their associated trigger events.
- Chapter 6 sets out details of Transend's forecast operating expenditure.
- Chapter 7 provides details of the proposed service target performance incentive scheme.
- Chapter 8 provides details of Transend's proposed efficiency benefit sharing scheme.
- Chapter 9 provides information regarding the value of the RAB at the commencement of the forthcoming regulatory control period, and the rolling-forward of the RAB value during the period.
- Chapter 10 provides information relating to regulatory depreciation.

- Chapter 11 sets out information regarding the cost of capital and tax.
- Chapter 12 provides an overview of Transend's total revenue and X factor.
- Chapter 13 contains a glossary of terms.
- Chapter 14 presents a table of appendices that contains information to support this revenue proposal.

In addition to providing the information set out above, Transend is required to submit the following information accompanying its revenue proposal:

- the completed roll forward model;
- the completed post-tax revenue model (PTRM);
- Transend's proposed pricing methodology; and
- Transend's proposed negotiating framework.

This information has been provided under separate cover.

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2 BUSINESS ENVIRONMENT

2.1 Introduction

This chapter provides an overview of Transend's business characteristics, key achievements and future challenges. This background provides the foundation for more detailed information regarding Transend's performance and its future expenditure requirements, set out in subsequent chapters of this revenue proposal.

This chapter is structured as follows:

- Section 2.2 provides an overview of Transend and the Tasmanian transmission system.
- Section 2.3 outlines Transend's service obligations.
- Section 2.4 provides an overview of the key achievements over the current regulatory control period.
- Section 2.5 concludes the chapter by providing a brief overview of the future challenges facing Transend.

2.2 Overview of Transend and the Tasmanian transmission system

Transend owns and operates the electricity transmission system in Tasmania.

Transend's vision is to be a leader in developing and maintaining sustainable networks and its mission is to:

- efficiently provide a reliable and secure electricity transmission service at a cost commensurate with appropriate and sustainable returns to shareholders; and
- develop new business opportunities building on our established strengths.

The vision and mission underpin the service outcomes and expenditure plans detailed in this revenue proposal. In pursuit of its vision and mission, Transend has placed substantial effort into developing the business processes and systems necessary to efficiently and effectively manage its transmission system infrastructure.

Transend has also continually reviewed the effectiveness and appropriateness of its business model, taking into account the changing business environment. More recently, this has resulted in the strengthening of functional accountabilities with an emphasis on asset and customer management, program planning and project management functions.

Transend is registered with the National Electricity Market Management Company (NEMMCO) as a participant in Australia's National Electricity Market (NEM). The NEM operates on an interconnected power system that extends from Queensland to South Australia, including connection to Tasmania in 2006 via Basslink. Basslink is a privately owned Market Network Service Provider (MNSP) interconnector with supply and

demand capability. A pictorial overview of the interconnected NEM is provided in the inset of Figure 2.1.

The generation sector in Tasmania currently features three main market participants: Bell Bay Power Pty Ltd, Hydro Tasmania, Roaring 40s Pty Ltd and mainland generators connected via Basslink. A number of other small generators that are directly connected to the distribution system are also licensed to operate in Tasmania. Alinta Energy is also constructing a new gas-fired power station at Bell Bay.

Aurora Energy Pty Ltd (Aurora) is the sole Distribution Network Service Provider (DNSP) in Tasmania.

At present, five companies are licensed to retail electricity in Tasmania: Aurora, Integral Energy, Country Energy, TRUenergy and ERM Power Retail Pty Ltd. The main participants in the Tasmanian market are listed in Table 2.1.

Table 2.1: Major participants in the Tasmanian electricity supply industry

Generation	Transmission	Distribution	Retail
Bell Bay Power	Basslink (MNSP)	Aurora	Aurora
Hydro Tasmania	Transend Networks		Country Energy
Roaring 40s			ERM Power Retail Pty Ltd
Mainland generators via Basslink			Integral Energy
			TRU energy

The Tasmanian transmission system is characterised by a backbone network predominantly operating at 220 kV that connects main generators to major load centres, including major industrial customers. A transmission network predominantly operating at 110 kV provides connections to other generators and regional load centres.

Load is concentrated in the north and south–east of the state. Main load centres are connected to the 220 kV transmission network at Burnie, Chapel Street (Hobart), George Town, Hadspen (Launceston and north–east) and Sheffield. Other load centres are connected via the 110 kV peripheral transmission network. A summary of the composition of Transend's transmission system infrastructure is provided in Table 2.2.

Table 2.2: Transend's transmission system infrastructure

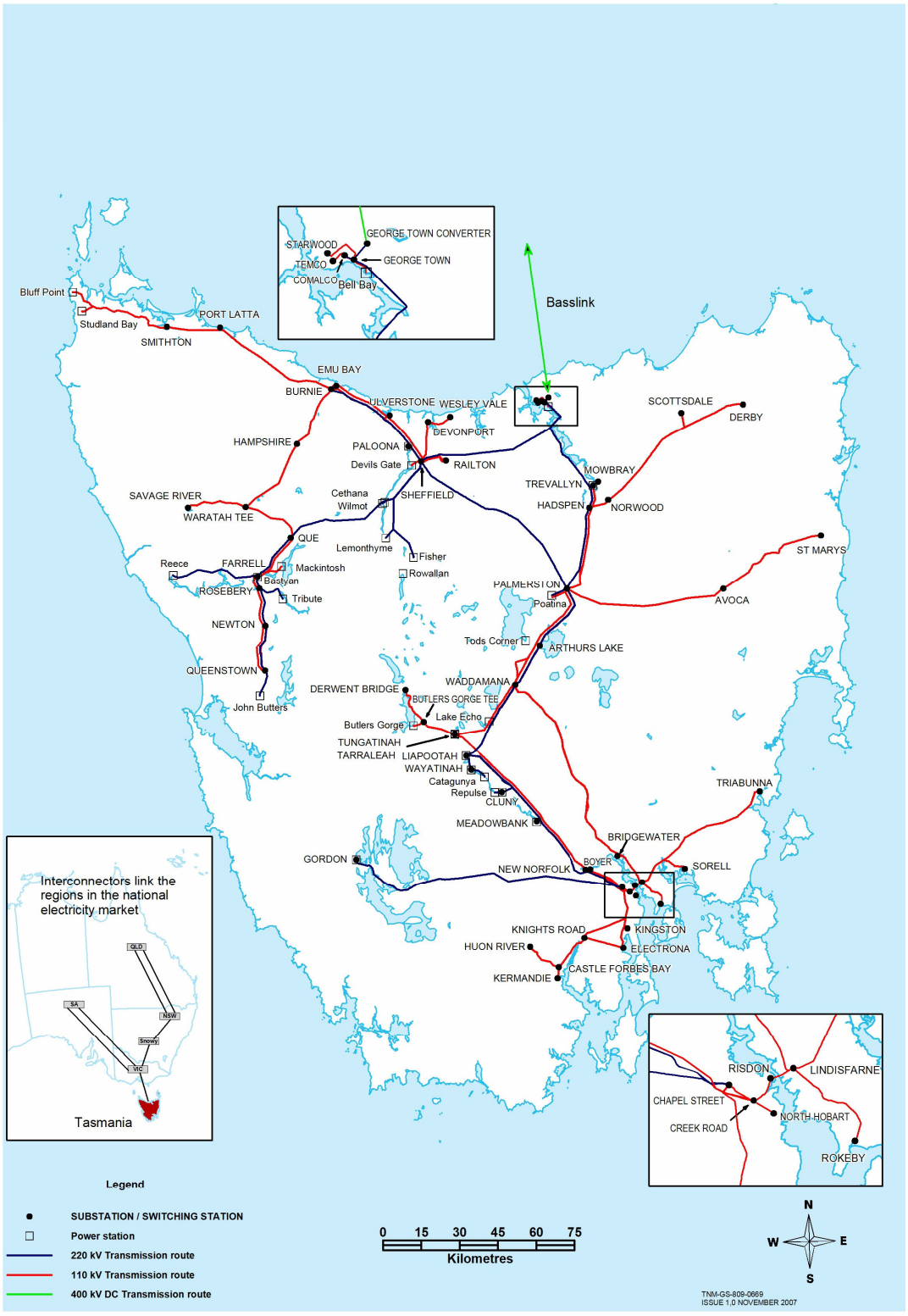
Assets	Quantity
Number of substations	47
Number of switching stations	9
Number of transition stations	2
Circuit kilometres of transmission lines	3,650
Route kilometres of transmission lines	2,350
Easement area (Ha)	10,500

Unlike most other TNSPs, Transend's transmission system includes sub-transmission assets that operate at voltages of 6.6 kV, 11 kV, 22 kV, 33 kV and 44 kV. Substations operating at these voltages connect the transmission system to the distribution system. In total, there are 495 circuit breaker bays that are owned and operated by Transend at these voltage levels. The large number of these lower voltage assets results in Transend unavoidably incurring higher operating and maintenance costs, relative to the costs incurred by TNSPs whose transmission assets operate only at higher voltage levels (namely 66 kV and above).

The evolution of Tasmania's transmission system has been heavily influenced by the location of geographically dispersed power stations and load centres. In particular, a number of generators located at remote sites require extensive transmission infrastructure that traverses through inhospitable terrain and environmentally sensitive areas (including World Heritage). The sensitivity of performing maintenance activities in these areas due to the nature of terrain, access limitations and modified work practices, contributes to increased operating costs. Because of the geographically dispersed generators and load centres, large parts of the north-west, north-east and south-west are not strongly linked to the backbone transmission network.

Figure 2.1 presents a map of the 2008 Tasmanian electricity transmission system.

Figure 2.1: Tasmanian electricity transmission system



As noted, Transend's transmission system has been shaped largely by the nature of Tasmania's generation system. The supply of electrical energy in Tasmania is dominated by Hydro Tasmania's hydro generators. Hydro Tasmania's generators are usually energy constrained rather than capacity constrained. This means that even with sufficient installed capacity to meet peak demand, the Tasmanian power system might not be able to meet future energy needs due to water unavailability.

There is, however, increasing diversity as other sources of generation make significant contributions to meeting the total demand, in particular imports via Basslink and increased outputs from gas-fired and wind generation. The trend to more diversity in the generation mix is expected to continue as proposed new capacity (including gas-fired thermal and wind generation) is brought on line. Table 2.3 summarises the energy supply combination by source, as a percentage of total energy supplied in Tasmania for the 2005–06 and 2006–07 financial years, and shows the trend to more diversity in the generation mix[3].

Table 2.3: Energy supply in Tasmania (GWh)

Generator	Source	2005–06		2006–07	
		Energy (GWh)	Total (per cent)	Energy (GWh)	Total (per cent)
Hydro Tasmania	Hydro	9,824	90	8,322	72
Basslink (import)	Various	277	3	1,995	17
Bell Bay Power	Gas	598	5	974	8
Roaring 40s	Wind	246	2	274	3

Despite the increase in diversity of the generation mix, hydro generation remains the predominant source of generation to meet Tasmanian load, and is expected to remain so over the forthcoming regulatory control period.

Power systems reliant on hydro generation create a set of operating conditions for transmission systems that differ from those of thermal-based generation. Features that have a substantial influence on the configuration and operating conditions of Transend's transmission system are:

- the geographic dispersion of generation (determined by the location of suitable water-catchment sites);
- the large number of relatively low capacity generators;
- seasonal variations and climatic factors affecting generator availability;
- transmission constraints created by the variability of load flows; and

[3] Note that Basslink commenced commercial operation on 28 April 2006.

- increased planning uncertainty due to varying climatic conditions.

A relatively large number of small generators with varying output levels at dispersed locations, remote from load centres means more network investment and maintenance effort is needed in Tasmania to connect generation and load than would otherwise be the case.

Because of Transend's operating environment, sub-transmission asset ownership and operation, and its connections to geographically dispersed generators, caution needs to be taken when applying standard industry benchmarks and when comparing Transend's performance with that of other TNSPs.

2.3 Transend's service obligations

Transend's operating environment has changed significantly since Tasmania joined the NEM. In particular, new or extended obligations now apply to Transend, as a TNSP, in the following areas:

- system controller functions including:
  - forecast demand and generation reporting for Tasmania to the Tasmanian Energy Regulator (the Regulator);
  - residual power system security responsibility; and
  - incident and performance reporting to the Regulator;
- limit equation development and management;
- 13-month outage planning and notification to NEMMCO;
- data compliance under chapter 5 of the Rules;
- performance reporting to the AER; and
- wholesale market metering.

In addition to these specific obligations, Transend's operational activities have increased as a result of NEM entry. In terms of transmission planning, for example, Transend has additional responsibilities through the Inter-Regional Planning Committee (IRPC) and, like other jurisdictional planners, is now required to publish an Annual Planning Report (APR) in accordance with clause 5.6.2A of the Rules.

In terms of operational activities, Tasmania's entry to the NEM has led to a substantial increase in the application of constraint equations. In fact, more than one quarter of NEMMCO's constraint equations are specific to the Tasmanian power system, with power system frequency considerations being a particular driver of Tasmanian constraints. The number of constraint equations in proportion to those of other states reflects a number of factors specific to the Tasmanian power system including:

- the particular load and generation profiles, and locations in the state;

- the configuration of the transmission system; and
- technical issues relating to the capacity of the Basslink interconnector.

Transend has minimised the impact of these factors with the application of innovative solutions such as the use of transmission line dynamic ratings and network control schemes.

In addition to NEM-specific obligations, compliance obligations on Transend and TNSPs generally have increased over the current regulatory control period. These include compliance requirements with respect to financial reporting, emergency management, critical infrastructure protection and safety and environmental management.

Transend's NEM specific obligations are set out in the Rules. In particular, schedule S5.1 of the Rules prescribes the mandatory network performance requirements that apply to Transend.

Under the terms of its licence issued by the Regulator, Transend is also required to comply with the *Electricity Supply Industry (Network Performance Requirements) Regulations 2007*. These regulations set minimum network performance requirements including:

- limitations on the amount of load impacted by credible contingency events and single asset failures;
- limitations on the exposure of loads to interruption;
- limitations on the use of load shedding;
- planning criteria for the impact of withdrawal of equipment for repair or replacement; and
- maximum transformer and transmission line repair or replacement times.

All of the factors described above influence the manner in which Transend operates and maintains its transmission system, and have a direct impact on Transend's performance, operational decisions and costs. Further details on the jurisdictional regulatory arrangements and network performance requirements are contained in Appendices 5 and 6 respectively.

In summary, Transend's service obligations and role as a TNSP are now materially more complex compared to pre-NEM conditions. Notwithstanding this, Transend has met the challenges of complying with these new obligations whilst investing substantially in new transmission system infrastructure and focussing on delivering high standards of service to its customers over the current regulatory control period.

2.4 Key achievements for the current regulatory control period

The current regulatory control period, which commenced in January 2004, has been a time of very significant change for Transend and for the Tasmanian electricity supply industry. In addition to the matters previously noted, during this period:

- Transend played a key role in ensuring the successful entry of Tasmania into the NEM in May 2005.
- In April 2006, Basslink commenced commercial operation, allowing Tasmania to fully participate within the NEM. Transend played a vital role in facilitating this major project.

Connection of Basslink and continued growth in Tasmanian demand have contributed to a significant increase in power transmitted by Transend's transmission system, and the achievement of the following milestones:

- a new record for energy transmitted[4] in a year: 11,565 GWh in 2006–07;
- a new maximum Tasmanian demand (half hour average): 1,821 MW on 18 June 2007; and
- a new total maximum demand (Tasmania plus export via Basslink—half hour average): 2,415 MW on 18 June 2007.

Despite the substantial challenges and costs of entering and operating in the NEM and ensuring the successful connection of Basslink, Transend has maintained a clear focus on customer service, transmission system performance, and efficient delivery of its capital and operating works programs.

In its 2003 revenue cap application to the ACCC, Transend proposed to apply two categories of service performance indicators. The ACCC agreed that the performance measures proposed by Transend were appropriate, but applied more challenging targets to both measures. Over the current regulatory control period, Transend's service performance against the performance incentive scheme measures has generally met or marginally exceeded the target levels set by the ACCC, with small rewards being received under the performance incentive scheme.

Due to Transend's well developed and efficient work practices and process improvements introduced over the period, Transend has delivered its capital and operating works program, while customers have benefited from improved transmission system performance and will continue to do so in the future.

Transend is forecasting to commission a total of $451 million ($2008–09) worth of capital investment over the current regulatory control period, involving substantial

[4] Energy transmitted for the year is measured by adding all flows over the transmission system from Tasmanian generation plus Basslink import as applicable, to meet Tasmanian load plus Basslink export as applicable, noting that Basslink flows change with market conditions.

renewal of the transmission system, as well as capacity augmentation to meet demand growth and to deliver market benefits. The level of investment and scope of projects undertaken by Transend over the regulatory control period generally accord with the capital expenditure proposals set out in the 2003 revenue cap application, recognising that the operating environment has changed from that anticipated in the lead up to the last revenue cap decision.

In addition to undertaking substantial asset renewal and development, Transend has maximised the capability of the existing transmission system through the innovative use of transmission line dynamic ratings and the application of network control schemes. These approaches enable transmission system assets to be loaded to levels above their nominal ratings without undue risk to the security of the transmission system or the integrity of the assets. These approaches have provided a very cost-effective means of increasing the useable capacity of the transmission system and have facilitated the deferment of capital expenditure. Transend has been instrumental in developing a national guideline for the application of transmission line dynamic ratings and this innovative approach is now being widely adopted by other TNSPs to deliver operational benefits where appropriate.

The projects completed and the initiatives undertaken by Transend are the latest highlights in an ongoing works program to achieve the operating and capital expenditure objectives.

2.5 Future developments and challenges

In Transend's current revenue cap, the ACCC acknowledged the need for continued investment in Tasmania's electricity transmission system[5]. The need to renew and develop the transmission system is an ongoing activity and will continue beyond the current regulatory control period. Transend forecasts continuing demand growth and an average annual increase in maximum demand of 2.2 per cent to 2021.[6] The report also identifies the location and indicative timing of the occurrence of transmission constraints. Projects to address these constraints require an increase in the level of capital and resources to that expended over the current regulatory control period.

The capital expenditure program completed by Transend in the current regulatory control period is one of the most significant of any Tasmanian company in recent years. As already noted, since the beginning of 2004, Transend is forecasting to commission $451 million ($2008–09) worth of capital investment to upgrade and modernise the transmission system in Tasmania. Over the forthcoming regulatory control period, Transend is planning to invest a further $681 million ($2008–09) on a variety of

[5] The ACCC's December 2003 revenue cap decision included a capital expenditure allowance for the current regulatory control period that was over 25 per cent higher than Transend's average actual capital expenditure over the five years previous to the current regulatory control period.

[6] Refer to *Transend 2008 Annual Planning Report*

transmission projects around the State, to ensure that Transend continues to be able to provide a reliable and secure electricity transmission service, that meets customer expectations now and in the future.

Against this backdrop, Transend has prepared a long-term Grid Vision which aims to identify the strategic actions required to enable the company to respond efficiently to medium term (15 year) trends that are already emerging, and a range of long-term (30 year) possible scenarios that cannot yet be clearly foreseen. The vision provides guidance to ensure that Transend is sustainable well into the future, and has helped define the long-term context for this revenue proposal. The Grid Vision, which has been developed using a consultative approach that engaged key stakeholders, is included as Appendix 8.

The Grid Vision project highlights that even under the forecast business-as-usual scenario, in 30 years time the transmission system will need to be able to supply almost twice the current electricity demand. This will drive significant ongoing investment in the provision of additional capacity requirements, in addition to the investment required to maintain the present transmission system's operating capability.

In terms of operating challenges over the forthcoming regulatory control period, Transend must respond to:

- continued growth of demand for transmission services and consequential cost impacts on the business;
- the need to enhance works program support functions, to efficiently deliver the continuing capital works program, including continuing improvements to medium and long-term system planning and strategic asset management functions;
- skills shortages within the industry; and
- input costs increasing above inflation.

Across the capital and operating expenditure programs, Transend faces the prospect of a very tight market for procuring equipment, contracted services and skilled labour at a time when Australian transmission and distribution network service providers have committed to unprecedented levels of investment in the renewal and expansion of their networks.

Transend also faces a rapidly evolving regulatory environment, with prospective new compliance obligations including those associated with the new National Transmission Planner, Regulatory Investment Test, national reliability standards and revised Tasmanian frequency standards.

3 ASSET MANAGEMENT AND INVESTMENT

3.1 Introduction

This chapter details Transend's asset management and investment processes for both operating and capital expenditure. This information demonstrates Transend's robust approach to asset management and investment, which, in turn, delivers prudent and efficient expenditure.

This chapter is structured as follows:

- Section 3.2 provides an overview of Transend's asset management processes.
- Section 3.3 provides an overview of Transend's asset management documentation relevant to this revenue proposal.
- Section 3.4 describes Transend's investment governance processes.
- Section 3.5 sets out concluding comments regarding Transend's investment and asset management processes.

3.2 Asset management processes

Transend has placed considerable effort into further developing its asset management processes over the current regulatory control period. Transend has established an asset management framework that is modelled around the total asset management process as presented in the International Infrastructure Management Manual (IIMM). This has provided Transend with an end-to-end asset management framework and has enabled it to adopt a structured approach to defining and prioritising its asset management improvement program, to further improve its asset management processes and practices.

Transend has developed and continues to refine its asset management information system (AMIS) program over the current regulatory control period. The objective of this program is to deliver improved business systems and business processes to further improve the efficiency of asset management activities on an ongoing basis.

Together, these two initiatives have facilitated the achievement of many asset management improvements leading to considerable cost efficiencies. The following are some of the major initiatives realised during the current regulatory control period:

- The integration of a number of previously fragmented asset management systems, leading to efficiency improvements.
- Improvements in asset condition assessment techniques and the ongoing development of asset management plans for each asset category, leading to improved asset management strategies and decisions.

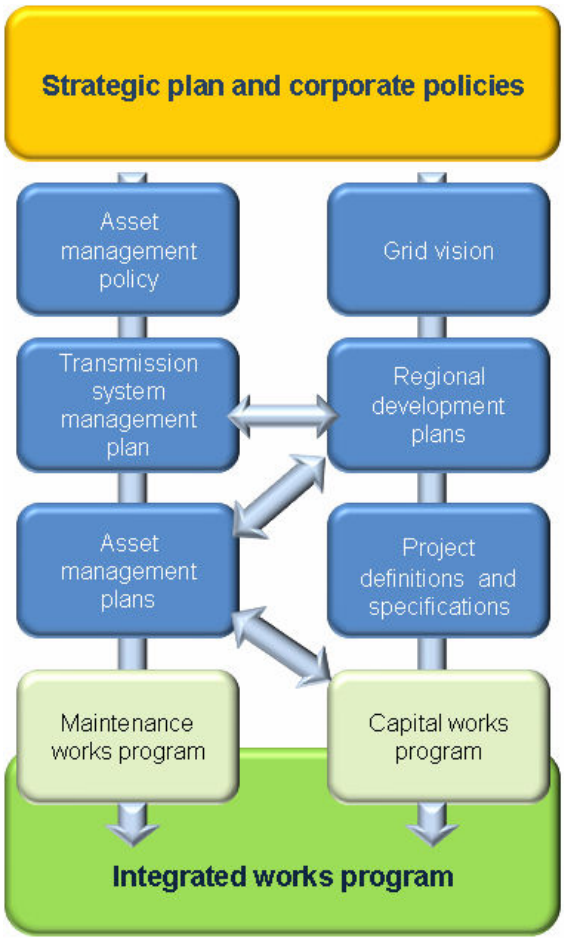
- The establishment of regional development plans that identify future transmission system augmentations and new or modified connections.
- The development of a works planning system that provides a consolidated and optimised operating and capital works plan.
- Improved transmission system and asset performance monitoring including tangible linkages to asset management strategies to enhance decision-making and ultimately improve transmission system performance.
- Significant improvement in long-term planning, facilitated through the Grid Vision project.
- Development of a capital project prioritisation tool that assists in ensuring the optimum sequencing of investments.

Transend intends to continue to further develop and refine its asset management program over the forthcoming regulatory control period.

3.3 Asset management documentation

Figure 3.1 provides an overview of Transend's approach to asset management and the documents that support the process. This is an area where Transend continues to further develop and improve the information in the respective documents. The diagram highlights the existence of, and interdependence between, strategic, tactical and operational planning documentation.

Figure 3.1: Asset management documentation



An overview of the purpose of each of the key documents is summarised below.

Strategic plan and corporate policies

The strategic plan sets out Transend's vision and mission, and the strategic performance objectives that Transend aims to achieve in terms of service delivery performance, management and development of the transmission system, and delivery of shareholder returns. The corporate policies guide the approaches and specific actions that Transend must adopt (in key areas such as environment protection, health and safety, risk management and asset management), in order to achieve the strategic performance objectives set out in the strategic plan.

Asset management policy

The asset management policy is a high-level statement that sets out Transend's overall objectives and approach in relation to the efficient management and development of its assets to meet the present and future needs of network users.

Grid Vision

The Grid Vision aims to identify the strategic actions required to enable Transend to respond efficiently to medium term (15 year) trends that are already emerging, and a range of long-term (30 year) possible scenarios that cannot yet be clearly foreseen.

Transmission System Management Plan

The Transmission System Management Plan (TSMP) provides information about the environment in which Transend operates and the asset management framework and systems that Transend uses to manage the delivery of prescribed transmission services to customers. It also provides an overview of the assets that comprise the electricity transmission system and summarises the key issues and corresponding strategies that must be implemented to address identified safety and environmental risks, and to sustain or improve the performance of the electricity transmission system.

A copy of the 2007–2012 TSMP is included as Appendix 9 to this proposal.

Asset management plans

Asset management plans cover the existing asset base and are prepared for each asset category. They identify the performance issues and risks presented by each asset type within the category and define specific actions that must be undertaken to sustain asset and transmission system performance. The asset management plans also summarise the asset renewal and operating expenditure requirements for each asset category and are supported by detailed condition assessment reports and maintenance standards where necessary, to ensure transmission system assets are maintained appropriately. Transend's program of condition assessment, together with its AMIS have provided a stronger foundation for the formulation of asset management plans that are aligned with good industry practice.

Regional development plans

Transend prepares a development plan for each of the five Tasmanian regions based on the transmission system configuration, taking into account different planning scenarios that could affect development in each region. The regional development plans consider the Grid Vision, future demand forecasts, customer connection requests, generation impacts, compliance obligations and planned asset renewals. Relevant information on the projects identified in the regional development plans is published in the Annual Planning Report (APR).

Project definition and specifications

Project definition and specifications are compiled for each capital expenditure project included in the capital works plan. These provide a project overview and define the scope of works to be performed. The project specifications include the design and technical details required to meet the objectives for the preferred option of the project.

Capital works program

The capital works program contains all of the development and renewal projects identified in the regional development and asset management plans.

Maintenance works program

The maintenance works program covers all of the assets that comprise the transmission system and is derived through the application of the maintenance strategies detailed in the asset management plans. All of the tasks that comprise the maintenance works program, including preventive, corrective and emergency response activities are included in the works planning system.

Integrated works program

Both capital and maintenance works programs are consolidated in the works planning system. This consolidation allows the works program to be integrated and optimised, ensuring that planned maintenance activities are not performed on assets that are scheduled for replacement and that the synergies between operating and capital activities are optimised. This approach also provides details of the quantum of the works program and its deliverability, and ensures that outage requirements and market impacts are appropriately considered.

3.4 Investment governance processes

Over the current regulatory control period, Transend has continued to improve its investment governance processes to ensure that all transmission system investments are justified, prudent, efficient, and adequately monitored and controlled. Transend rigorously applies its technical, managerial and financial governance processes to ensure that its capital and operating expenditure meets the following governance objectives to:

- meet the mandated legal and regulatory obligations in a cost-effective manner and in accordance with the specific capital expenditure objectives and criteria stipulated in the Rules;
- provide a reliable electricity transmission service, that efficiently provides for forecast demand growth, caters for new or modified connections to the network and provides the necessary systems to run an efficient transmission business;
- maintain the required operating capability of the network in accordance with good electricity industry practice, undertaken using a collaborative and consultative approach with stakeholders and supported by soundly-based policies, practices and procedures; and
- deliver prudent and efficient asset management and investment.

The key investment approvals and governance arrangements are summarised below.

Organisational responsibilities

Transend's board approves the organisation structure, delegations, strategic policies and plans, thereby establishing clear expectations around management accountabilities and responsibilities.

The organisation structure comprises three functional groups that are responsible for transmission system planning and development (Connections and Asset Management), transmission works management and delivery (Transmission Services), and real-time operation of the transmission system (Transmission Operations). A further three groups provide essential business and support services.

Delegations framework

The board has reserved some items for its collective decision-making and/or monitoring. Board approval is required for major capital programs, projects and transactions involving the acquisition or disposal of major assets. Delegated powers are listed in Transend's Delegations Manual, which provides information relevant to financial and non-financial authority levels and reserved functions.

Approved budgets

Transend's board approves an annual capital and operating budget, taking into consideration the long-term interests of customers and shareholders consistent with Transend's mission statement. Transend's management, staff and agents must ensure that their delegated expenditure levels remain within the approved budget.

The development of capital and operating expenditure forecasts is an extensive exercise undertaken in accordance with predefined asset management processes previously noted.

Capital review team

Transend's capital review team comprises predominantly executive managers with responsibility for regulation, compliance, finance, customers, works and asset management, and strategic planning. This team reviews capital-related strategy papers and business cases for investment prior to board submission, and the overall capital program. As required, the team assists with prioritisation of individual capital projects and identifies opportunities for improving the capital works delivery process.

Capital working team

The capital working team comprises managers tasked with ensuring that a fully integrated investment plan is developed and updated on an ongoing basis. The resulting capital works program is derived from:

- reviewing the investment plan so that constraints to its delivery can be identified;
- integrating the development and renewal investment forecasts to form an integrated transmission system investment plan;

- integrating the transmission system investment plan with the non-transmission system investment plan to form a whole-of-business investment plan for management review and as input into the annual budgeting process;
- reviewing the investment plan so that priorities can be validated with any conflicts advised to management for final determination;
- reviewing the investment plan so that opportunities for optimisation are identified; and
- reviewing the integrated investment plan so that work schedules can be monitored and tracked.

Project steering committees

All major projects are overseen by a project steering committee to:

- maintain and monitor project costs;
- support project managers in resolving project and contract issues;
- oversight progress on the project; and
- give direction as required.

Capital expenditure investment process

Transend's investments generally progress through each of five process phases, namely issues identification, options analysis and project identification, project initiation and development, project implementation, and project finalisation. There are a range of documented requirements for each phase.

Control activities

A range of control activities, procedures and management mechanisms are applied to investments in capital and operating expenditure throughout the life–cycle of a project or works program. For example, in the development phase of a project or works program the following control activities may be undertaken: project initiation and risk workshops, project definition processes, establishment of project steering committees, and where appropriate examination by the capital review team or executive management team and deliberation at the board level.

Monthly financial and project management reporting is undertaken at project steering committee, management and board level until completion and finalisation of the project or works program. Quarterly reviews of the operating and capital expenditure program are undertaken by the executive management team and capital review team respectively. In November and March each year, the likely end-of-year forecast for the operating and capital expenditure program is revised and reported to the board.

The board audit and risk committee oversees an internal audit program to ensure compliance obligations are met and business risks are appropriately managed. One focus

of that program is to ensure Transend's capital and operating expenditure internal control framework is operating as intended.

Continual improvement

Improving investment governance is an ongoing activity. During the current regulatory control period, Transend has further:

- Improved its issues identification, options analysis and project identification processes, methodologies and documentation. Further details are provided in the description of Transend's capital expenditure forecasting methodology in section 5.5.
- Implemented improved project initiation processes to ensure timely and effective stakeholder consultation, and fewer scope changes through the implementation and finalisation phases of projects.
- Implemented a revised cost estimation process that is structured and comprehensive, and has provided better quality and more accurate estimating outcomes.
- Developed a project management manual that covers the implementation phase of projects and ensures that project managers are aware of the tools and processes to be used when implementing projects to ensure high quality, efficient outcomes are achieved.
- Established project steering committees to facilitate better decision making, resolve project and contract issues and monitor projects to ensure efficient and timely project delivery.
- Implemented improved budgeting, cost tracking and reporting mechanisms and processes.

Transend recognises that having robust investment governance processes in place is vital to effectively and efficiently manage business risks. Transend intends to continually improve its investment governance processes as necessary to ensure that the governance objectives stated earlier continue to be met.

3.5 Concluding comments

Transend has a robust asset management and investment framework which continues to be developed and refined in accordance with good electricity industry practice. The framework results in prudent and efficient operating and capital expenditure which meets service requirements and satisfies the capital and operating expenditure objectives defined in the Rules. In summary, the framework assists Transend to:

- efficiently provide for expected demand for prescribed transmission services;
- comply with regulatory obligations;
- maintain the quality, reliability and security of supply; and

- maintain the reliability, safety and security of the transmission system.

Details of recent and future expenditure, and service requirements are discussed further in chapters 4, 5 and 6.

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4 COST AND SERVICE PERFORMANCE FOR THE CURRENT REGULATORY CONTROL PERIOD

4.1 Introduction

This chapter sets out details of Transend's expenditure, service performance and efficiency gains over the current regulatory control period.

The chapter is structured as follows:

- Section 4.2 presents a summary of the Rules requirements.
- Section 4.3 presents an analysis of Transend's allowance and actual capital expenditure.
- Section 4.4 sets out information to demonstrate the prudence of Transend's capital expenditure.
- Section 4.5 identifies the capital expenditure efficiency improvements achieved by Transend.
- Section 4.6 presents an analysis of Transend's allowance and actual operating expenditure.
- Section 4.7 identifies the operating expenditure efficiency improvements achieved by Transend.
- Section 4.8 presents a review of Transend's performance to date against service standards.
- Section 4.9 presents concluding comments.

4.2 Rules requirements

Clauses 6A6.6(e)(5) and 6A6.7(e)(5) of the Rules require the AER to have regard to the actual and expected operating and capital expenditure respectively during any preceding regulatory control period. Similarly schedules S6A1.1(6) and S6A1.2(7) require Transend's proposal to include the capital and operating expenditure respectively for each of the first three regulatory years and the expected expenditures for the last two years of the current regulatory control period. The information provided in this chapter fulfils these requirements.

Section 2.8(b) of the submission guidelines states that the AER requires that an audit of the historical capital and operating expenditure information is to be provided to the AER. The relevant regulatory audit report is provided in Appendix 7.

4.3 Analysis of allowance and actual capital expenditure

This section provides a high-level analysis of Transend's estimate of capital expenditure in the current regulatory control period, compared to the capital expenditure allowance contained in the ACCC's 2003 revenue cap decision.

Recognising the uncertainties inherent in forecasting demand and generation development, and in the absence of the Rules framework that now provides for contingent projects, Transend's capital allowance for the current regulatory control period was based on a probabilistic approach. The ACCC approved a capital expenditure allowance for the five and a half year regulatory control period of $306.8 million in $2002–03 or $362.1 million in $2008–09.

The capital expenditure forecast and the allowance provided in the ACCC's determination were developed using an as-commissioned basis, which reflected the approach adopted by the ACCC at that time. Under that approach, capital expenditure is recognised when the assets come into operational service and the capital expenditure includes financing costs incurred during construction.

It is important to note that Transend's capital expenditure forecast and the ACCC's allowance were not based on a single list of projects. The probabilistic approach recognises that the future is uncertain and that project priorities are subject to change. The allowance was also set under the ex-post capital expenditure regime, where all prudent capital expenditure will be rolled into the regulatory asset base at the commencement of the forthcoming regulatory control period. Changes to regulatory accounting requirements under the Rules mean that prudent work-in-progress (WIP) expenditure for the current regulatory control period will also be rolled into the opening asset base.

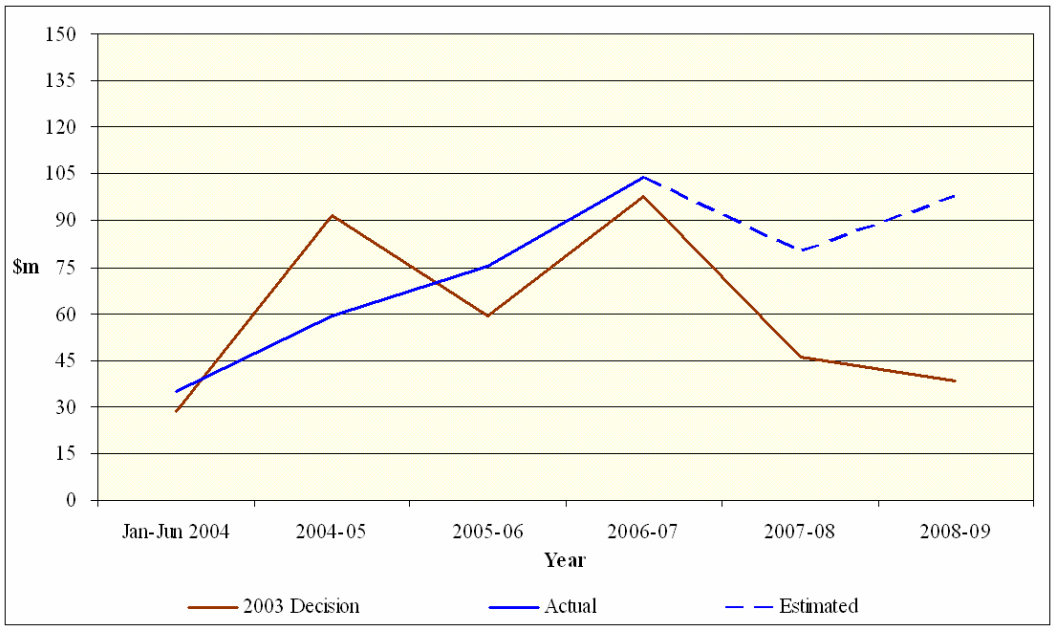
Table 4.1 and Figure 4.1 compare Transend's actual commissioned capital expenditure over the current regulatory control period with the amount allowed by the ACCC in its 2003 revenue cap decision.

Table 4.1: Actual commissioned capital expenditure and regulatory allowance for January 2004 to June 09 ($m 2008–09)

	Jan–Jun 2004 (a)	2004–05 (a)	2005–06 (a)	2006–07 (a)	2007–08 (f)	2008–09 (f)	Total
Actual	35.0	59.6	75.0	104.0	80.0	97.9	**451.5**
Allowance	28.8	91.5	59.3	97.8	46.2	38.6	**362.1**
Difference	**6.2**	**-31.9**	**15.8**	**6.1**	**33.8**	**59.3**	**89.4**

Note: (a) actual, (f) forecast

Figure 4.1: Actual capital expenditure and regulatory allowance for 2004 to 2008–09 ($m 2008–09)



The timing of Transend's actual expenditure differs to the ACCC's forecast due to a number of factors, including the following:

- There have been some unexpected delays in projects caused by difficulties in obtaining planning approvals, increased lead times for major plant and equipment (for example transformers) and meeting changing regulatory requirements.
- Some projects have been deferred to ensure appropriate integration of development and renewal works with customer and generator requirements.
- The largest forecast transmission project (Waddamana–Lindisfarne 220 kV transmission line) for the current regulatory control period which is now being implemented will not be commissioned until the forthcoming regulatory control period. The project has been delayed due to further analysis being required due to changes in regulatory and planning requirements. This delay has resulted in significant increases in project costs. In light of the increased costs, Transend revisited its original regulatory approval, to ensure the project still satisfied the Rules requirements and the regulatory test.

The capital expenditure allowance for the current regulatory control period was separated into augmentation, renewal and non-network expenditure categories. An analysis of the allowance compared to total expenditure for each category is shown in Table 4.2.

Table 4.2: Comparison of commissioned capital for the current regulatory control period by category ($m 2008–09)—average commissioned per annum

Category	ACCC decision	Actual
Development	23.6	20.6
Renewal	37.8	56.4
Non-network	4.7	5.1
Total	**66.1**	**82.1**

Table 4.2 shows a level of capital expenditure that principally reflects the higher-than-expected input costs incurred over the period since 2003–04. The significant level of investment activity in electricity infrastructure nationally has lead to a tight contracting market and has contributed to increased input costs. Upward pressure on input costs, including wages, copper, aluminium, steel, and transmission plant and equipment is a trend common to all network infrastructure businesses in Australia.

Table 4.3 shows Transend's commissioned capital expenditure by investment category for each year of the current regulatory control period.

Table 4.3: Commissioned capital by category ($m 2008–09)

Category	Jan–Jun 2004 (a)	2004–05 (a)	2005–06 (a)	2006–07 (a)	2007–08 (f)	2008–09 (f)	Total
Development	1.4	5.2	29.0	48.6	0.0	29.2	**113.5**
Renewal	32.2	43.0	42.6	53.9	74.3	63.9	**309.9**
Non-network	1.4	11.4	3.4	1.4	5.7	4.8	**28.0**
Total	**35.0**	**59.6**	**75.0**	**104.0**	**80.0**	**97.9**	**451.5**

Note: (a) actual, (f) forecast

The annual commissioned capital by regulatory asset class for each financial year is presented in Table 4.4.

Table 4.4: Commissioned capital by regulatory asset class ($m 2008–09)

Asset Class	Jan–Jun 2004 (a)	2004–05 (a)	2005–06 (a)	2006–07 (a)	2007–08 (f)	2008–09 (f)
Transmission lines	14.8	1.0	7.8	42.7	27.2	6.0
Substations	3.7	23.8	34.3	33.7	39.0	73.7
Protection and control	0.2	14.3	6.2	10.1	6.2	10.4
Refurbishment	14.6	6.3	14.4	2.6	0.0	0.0
Other–IT	0.6	3.7	5.9	4.6	7.6	4.8
Other–general	0.8	2.3	1.4	1.0	0.0	0.0
Other–buildings	0.5	8.1	5.2	5.3	0.0	3.0
Land and easements	0.0	0.0	0.0	3.9	0.0	0.0
Total	**35.0**	**59.6**	**75.0**	**104.0**	**80.0**	**97.9**

Note: (a) actual, (f) forecast

In aggregate, Transend expects to spend more than the capital expenditure allowed for in the ACCC's 2003 revenue cap decision. As noted above, Transend's actual capital expenditure has been higher than expected principally because of increases in input costs. Transend has implemented efficiency improvements across the capital program, including increased bundling of works to help offset cost increases.

4.4 Prudence of capital expenditure

The Statement of Regulatory Principles (SRP)[7] provides for a prudency test to be applied by the AER to the actual capital expenditure undertaken by Transend during the current regulatory control period before that expenditure is permitted to be included in the Regulatory Asset Base (RAB).

Accordingly, the AER must make an assessment of the prudency of Transend's capital expenditure before the opening asset base value (that will apply at the start of the forthcoming regulatory control period) can be determined.

In accordance with the approach set out in Appendix B of the SRP, the prudency test involves a systematic examination of a TNSP's decisions in selecting and delivering investments. The purpose of the examination is to establish whether the TNSP made decisions at each stage of the investment process that were consistent with good industry practice. The examination consists of three sequential stages and is applicable to projects regardless of whether or not they have undergone the regulatory test. The three stages are:

- Assess whether there is a justifiable need for the investment. This stage examines whether the TNSP correctly assessed the need for investment against statutory rules

[7] AER, *Statement of Regulatory Principles*, http://www.aer.gov.au/content/index.phtml/itemId/660012, AER, 8 December 2004, accessed 20 May 2008

and obligations. The assessment focuses on the need for investment, without specifically focusing on what the correct investment to meet that need is. An affirmation of the need for an investment does not imply acceptance of the specific project that was developed.

- Assuming the need for an investment is recognised, assess whether the TNSP proposed the most efficient investment to meet that need. The assessment reviews whether the TSNP objectively and competently analysed the investment to a standard that is consistent with good industry practice.
- Assess whether the project that was found to be the most efficient was developed, and if not, whether the difference reflects decisions that are consistent with good industry practice. This assessment examines the factors that caused changes in the project design and/or delivery and assesses how the TNSP responded to those factors relative to what could be expected of a prudent operator.

Transend's investment governance processes described in section 3.4 of this proposal demonstrates that Transend has the robust processes in place to ensure that prudent and efficient investment decisions are made at the right time.

The majority of Transend's capital program has been sourced through a competitive tendering process. This process ensures that selected contractors are those that best meet Transend's evaluation criteria. Criteria includes contractors' presentation of solutions that are cost-effective and efficient, demonstrated resource capacity and capability, robust project implementation methodology, and demonstrated good performance and systems for managing safety, environmental, quality and project risks.

Transend anticipates that the AER will adopt a similar approach to that adopted in recent revenue reviews, in conducting a prudency review of Transend's capital expenditure during the current regulatory control period. In this regard, Transend is confident that the AER's review will confirm that actual capital expenditure undertaken over the current regulatory control period has been prudent and meets the requirements for incorporation into the RAB.

A summary of Transend's major investments over the current regulatory control period is provided in Table 4.5.

Table 4.5: Major investments over the current regulatory control period

Investment	Overview
Southern power system security program	This program comprises a suite of projects to augment the southern transmission network. The last major project in this program is to establish a second 220 kV supply to the Hobart area by constructing a new transmission line between Waddamana and Lindisfarne substations. This project has passed the regulatory test, has received planning approvals and is now being implemented.

Investment	Overview
North-east Tasmania supply upgrade program	This program comprised the redevelopment of Derby, Norwood, and Scottsdale substations and replacement of the Norwood–Scottsdale–Derby 88 kV transmission line with a new 110 kV transmission line. This project has significantly improved the security and reliability of electricity supply to north-east Tasmania.
High voltage switchgear replacement program	This program replaces high voltage switchgear that is in poor condition, susceptible to failure and presents a safety risk. High voltage switchgear has been replaced at 11 substations, significantly improving the reliability of electricity supply to customers and addressing significant safety risks.
Transmission line compliance program	The completion of Transend's transmission line compliance program has been a major achievement. The purpose of the program was to eliminate substandard conductor-to-ground clearances on transmission lines throughout the state to ensure that they comply with contemporary design and safety standards.
Substation redevelopments	The substation redevelopment program is targeted at replacing transmission assets that are in poor condition, susceptible to failure and present a safety or environmental risk. During the period six substations were redeveloped, significantly improving the reliability of electricity supply to customers and addressing the identified safety and environmental risks.
Hobart area supply upgrade program	A long-term program to upgrade and strengthen the electricity supply to the Hobart area was completed. Major works in this period included the establishment of a new 33 kV connection at Risdon Substation.
Launceston area supply upgrade program	Significant components of the long-term program to upgrade and strengthen the electricity supply to the Launceston area were completed. Major works included construction of the new Mowbray Substation and the associated Trevallyn–Mowbray 110 kV transmission line, along with a new connection site at Hadspen Substation.

Transend has prudently delivered the capital program, in an environment of significantly increasing input costs.

4.5 Capital expenditure efficiency improvements

Transend has achieved many efficiency improvements in capital expenditure over the current regulatory control period. Two key initiatives that are highlighted are:

- the adoption of transmission line dynamic ratings for transmission lines; and
- the installation of high temperature conductor.

4.5.1 Dynamic transmission line ratings

Transmission line current ratings are set so that lines do not heat to such an extent that they sag below the allowable conductor-to-ground clearance, taking into account the heating effect of the current flowing through the lines, ambient air temperature, solar radiation reflected radiation, and the cooling effect of wind and emitted radiation.

All of Transend's transmission lines are rated in real-time. This means that wind speed and ambient temperature are continuously measured at representative locations and used to recalculate the conductor current ratings. Real-time transmission line ratings are telemetered at one minute intervals, and data are transmitted directly to NEMMCO where they are used in an automated process to determine generator dispatch.

The use of transmission line real-time or dynamic ratings allows Transend to make more efficient use of its transmission line infrastructure by taking advantage of the cooling effects of lower ambient temperatures and wind. This enables transmission lines to be loaded, most of the time, at higher current levels than would be possible if static ratings were used.

The adoption of transmission line dynamic ratings has enabled Transend to achieve effective rating increases of 10 to 20 per cent for much of the time on all of Transend's transmission circuits. The increase in capacity provided by this approach is particularly important in facilitating the efficient management of contingent events on heavily loaded power corridors, to facilitate planned outages, and to improve peak power transfer capability. The approach maximises the available capacity of existing infrastructure, thereby deferring the need for transmission system augmentations.

The implementation of transmission line dynamic ratings has clearly increased transmission network capacity that would otherwise only have been made available through capital investment in new or augmented transmission lines.

4.5.2 Installation of high temperature conductor

The double circuit Creek Road–Risdon 110 kV transmission line was constructed in 1954 for a significantly smaller Hobart load than that existing today. By the early 2000s, the power flow through the Creek Road–Risdon 110 kV transmission line had reached a level at which the loss of one circuit would severely overload the other. Transend had an interim procedure in place for dealing with this contingency, which involved a network control scheme.

Transend's long-term solution was to replace the existing conductors with high temperature conductors. This solution was selected because the high temperature conductor that has the required current carrying capacity is only slightly larger in diameter, but much lighter, than the copper conductor it replaced. This meant that to achieve the required increase in transmission capability in an urban area, the transmission line towers did not have to be raised or rebuilt, and only reinforcing of some tower members was required.

Because there was limited precedent for this project, much of the design was unique. For instance, a new conductor is polished, so it does not emit as much heat as a dull conductor. Therefore Transend specified that the new conductor had to be shot-blasted in order to obtain the required heat emission from the outset.

The option of installing high temperature conductor was the least visually intrusive solution, other than the significantly higher cost option of installing underground cables. It was completed without requiring planning approval, and was undoubtedly the most cost-effective option for maximising the firm transmission capacity of the power corridor for customers connected to Risdon, Lindisfarne and associated substations east of the Derwent River.

4.5.3 Capital expenditure efficiency benefits

The benefits of the projects outlined above are attributable to innovations undertaken during the current regulatory control period. In particular, these initiatives have led to a deferral in capital expenditure.

4.6 Analysis of allowance and actual operating expenditure

This section presents an analysis of the operating expenditure allowance provided in the ACCC's 2003 revenue cap decision, and Transend's actual operating expenditure over the current regulatory control period.

During the 2003 revenue cap review and after the ACCC issued its decision, Transend wrote to the ACCC to outline concerns that the building block operating cost allowance in the ACCC's decision did not make adequate provision for Transend's efficient operating and maintenance expenditure over the 2004 to 2008–09 regulatory control period, particularly in the latter years of that period. Transend informed the ACCC that its concerns principally relate to:

- The allowance provided for less operating costs on average than those incurred to provide the system controller and TNSP functions that Transend was still required to provide after NEM entry.
- The allowance did not make provision for many of the scope and cost increases the business faced.
- A two per cent cumulative efficiency dividend was deducted from Transend's annual operating expenditure allowance. As the regulatory control period progressed, and the cumulative efficiency dividend increased, the divergence between the ACCC's operating expenditure allowance and Transend's efficient actual operating expenditure was expected to grow.

At the beginning of the current regulatory control period, Transend noted that to meet its obligations efficiently over the long-term, it may have to spend more than the operating and maintenance expenditure allowance provided by the ACCC in its 2003 revenue cap decision. This additional expenditure would be at the expense of Transend's shareholders.

Table 4.6 shows the operating expenditure allowance provided in the ACCC's 2003 decision, and Transend's actual operating expenditure for the current five-and-a-half year regulatory control period.

Table 4.6: Transend's operating expenditure compared to ACCC operating expenditure allowance ($m 2008–09)

	Jan–Jun 2004 (a)	2004–05 (a)	2005–06 (a)	2006–07 (a)	2007–08 (f)	2008–09 (f)	Total
Operating expenditure	15.2	33.1	39.5	39.8	44.7	47.4	**219.7**
ACCC decision	15.7	33.2	37.1	35.7	32.7	32.6	**187.1**
Difference	**-0.5**	**-0.1**	**2.4**	**4.1**	**12.0**	**14.7**	**32.7**

Note: (a) actual, (f) forecast.

For the first two-and-a-half years of the regulatory control period, prudent cost management together with the deferral of some decommissioning works, allowed Transend to maintain its total operating expenditure at levels close to the allowance provided in the ACCC's 2003 decision. However, the gap between the allowance and actual expenditure is growing and is expected to continue to grow for the remainder of the current regulatory control period.

The increase in the difference between actual operating expenditure and the ACCC decision in the latter years can be largely explained by:

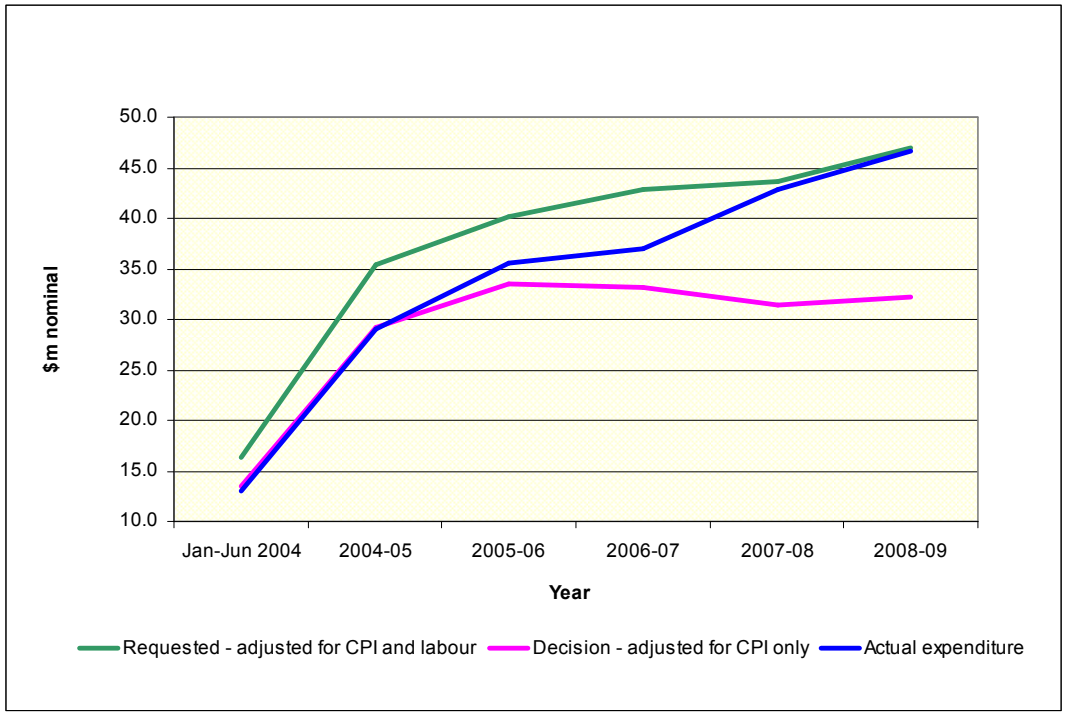
- timing of the dismantling program;
- scope change costs, including those identified by Transend in the last revenue proposal and new ones now facing the business (refer to chapter 6 for further detail); and
- wages growth impacts on internal and external costs.

Transend's view is that its forecast operating expenditure requested for the current regulatory control period was appropriate and reasonable to meet its regulatory obligation and business needs.

Notwithstanding Transend's best efforts to constrain its operating expenditure to within the ACCC's allowance, Transend has incurred additional prudent and efficient expenditure over the period because of the need to meet its regulatory obligations, customer and business needs.

Figure 4.2 shows the growing gap between prudent and efficient actual operating expenditure, and the ACCC's 2003 allowance.

Figure 4.2: Operating expenditure for the current regulatory control period ($m nominal)



4.7 Operating expenditure efficiency improvements

In the current regulatory control period, Transend has maintained an ongoing effort to improve the effectiveness and efficiency of its business processes with the aim of providing adequate service performance outcomes at the least cost.

As noted in chapter 3, asset management practices have been subject to ongoing review and improvement. Transend has kept pace with industry best practice in key areas such as the determination of optimum maintenance intervals, the efficient management of maintenance, and the evaluation of the condition and performance of transmission system assets.

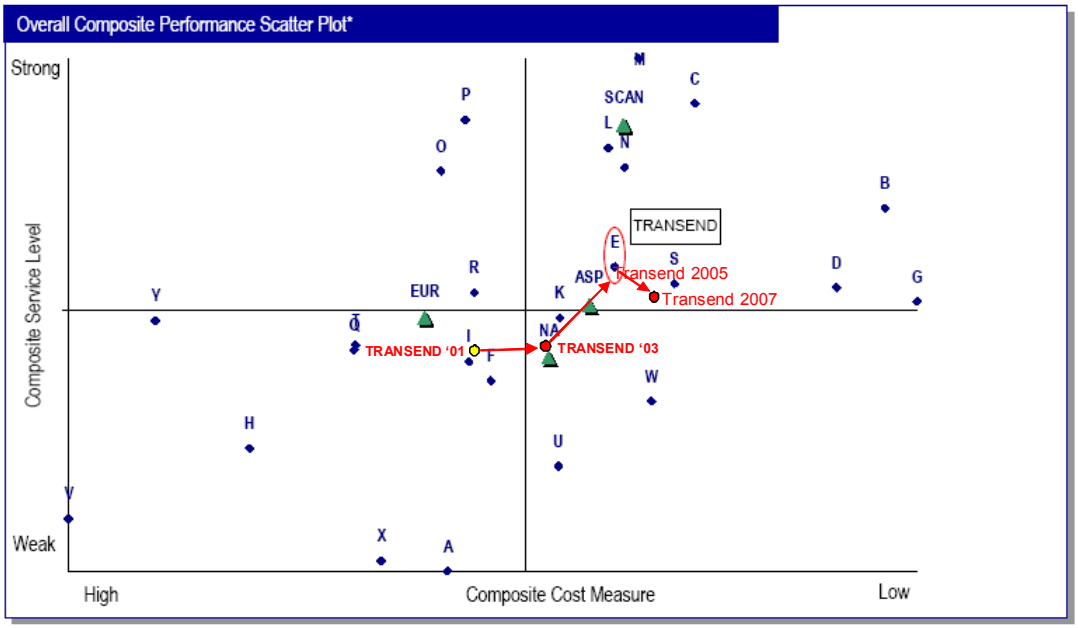
The major initiatives on which Transend's efficiency improvement efforts have been focussed are:

- the review and refinement of asset management strategies;
- investment in AMIS as identified in section 3.2 of this revenue proposal;
- proactive contingency analysis and risk assessment approach when planning transmission system outages in consultation with key stakeholders and customers;
- increased focus on customer management practices, including seven new directly contracted customers, introduction of account managers and a customer complaints management systems;

- close management of transmission system outages, minimising customer impacts and scheduling maintenance work to coincide with other outages needed for capital work;
- development and application of performance-based contracts and unit rates for operation and maintenance service providers;
- computerised processes for the writing and issuance of switching sheets for planned operations and equipment access. This function was previously performed manually by contracted field resources;
- introduction and utilisation of improved work practices and procedures learnt through the International Transmission Operations and Maintenance Study (ITOMS) benchmarking participation (Transend is currently a best performer in the circuit breaker maintenance and easement management categories);
- the use of live-line work and multiple work crews where practicable;
- application of transmission line dynamic ratings to support maintenance and construction activities that may have an impact on power system security;
- application of network control schemes to allow timely access for maintenance and construction activities;
- application of on-line condition monitoring techniques and the use of self-diagnostic protection equipment;
- rationalisation and improved management of alarms generated from transmission system assets;
- implementation of a quarterly performance review regime, providing a forum for asset managers and other staff to review performance trends and identify opportunities for performance improvement;
- development of an improved incident investigation and remedial action management framework that results in a cycle of continuous improvement and facilitates the close monitoring of remedial actions from registration to completion;
- development of an increased focus on analysis of the underlying causes of unplanned transmission system outages, and developing programs of work to address underlying causes as appropriate;
- improved emergency response arrangements for transmission system incidents;
- development and refinement of systems to facilitate the management of Transend's compliance obligations under Occupational Health and Safety and Workplace statutes, and the Rules; and
- targeted recruitment of key resources, and training and skills development.

The efficiency of Transend's operating expenditure is demonstrated by analysis of corporate and asset management costs undertaken by Parsons Brinkerhoff Australia Pty Ltd (PB) (refer to Appendix 23) and by its most recent ITOMS benchmarking results. Transend participates in the biennial ITOMS benchmarking exercise, which involves collection of operational asset, system and financial data. This data is subsequently collated, analysed and normalised to produce business level key performance indicators. Transend's performance can then be benchmarked against other ITOMS participants. Figure 4.3 shows Transend's overall benchmarked performance against all other ITOMS participants for the last four ITOMS reporting periods. It also shows that Transend has consistently improved its benchmarked cost performance over each reporting period while maintaining service levels above the benchmarked average.

Figure 4.3: Transend's ITOMS transmission composite performance trend



4.8 Service standard performance

Transend has been subject to a service standards performance incentive scheme (PI scheme) for each calendar year of the current regulatory control period. The ACCC stated that the purpose of the PI scheme is to influence the revenue cap to ensure that TNSPs:

- are rewarded when performance standards increase and penalised when performance standards decline, thus providing incentives for continued performance improvements; and

- consider how their operations are valued by the NEM[8].

The existing PI scheme for Transend has been developed in accordance with these objectives and is based on four measures:

- transmission circuit availability (transmission lines);
- transmission circuit availability (transformers);
- loss-of-supply event frequency index—number of events > 0.1 system minute; and
- loss-of-supply event frequency index—number of events > 2.0 system minutes.

In addition to these measures, the ACCC required Transend to report on average outage duration[9] whilst accepting that the average outage duration measure was not suitable for inclusion[10] in Transend's PI Scheme.

Transend has reported its annual performance for each calendar year since 2004 in accordance with the requirements of the Statement of Principles for the Regulation of Transmission Revenues—Service Standards Guidelines.

Transend's service standard scheme performance over the most recent five years is shown in Table 4.7.

Table 4.7: Historical annual service performance

Parameter	Annual target[11]		Annual performance				
	Lower DB	Upper DB	2003	2004	2005	2006	2007
Transmission circuit availability (transmission lines)	99.10%	99.20%	98.83%	99.34%	98.66%	99.21%	99.01%
Transmission circuit availability (transformers)	99.00%	99.55%	99.46%	99.31%	99.20%	98.80%	99.56%
Loss-of-supply > 0.1 system minute	16	13	17	18	13	16	10
Loss-of-supply > 2.0 system minutes	3	2	0	0	0	1	0
Average outage duration (minutes)	NA	NA	-	465	430	333	1,251

8 ACCC, Statement of principles for the regulation of transmission revenues service standards guidelines Decision, 12 November 2003, p1.
9 ACCC, *Tasmanian Transmission Network Revenue Cap 2004 to 2008–09*: Decision, 10 December 2003, section 8.5, pp 106
10 ibid, section 8.4, pp 105
11 All parameters include deadbands (DB)

As shown in Table 4.8, over the four years since the PI scheme has been in place, Transend has achieved modest positive results overall, with small incentive payments accruing under the PI scheme[12].

Table 4.8: Historical annual PI scheme performance

	Sub-parameter	Cap/collar % MAR[13]	S-factors (%MAR)				Total
			2004	2005	2006	2007	2004–07
1a	Transmission circuit availability (transmission lines)	±0.25	0.1750	(0.2500)	0.0125	(0.1125)	**(0.1750)**
1b	Transmission circuit availability (transformers)	±0.15	0.0788	0.0375	(0.1500)	0.1500	**0.1163**
2a	Loss-of-supply > 0.1 system minute	±0.20	(0.1000)	0.0000	0.0000	0.1500	**0.0500**
`2b	Loss-of-supply > 2.0 system minutes	±0.40	0.4000	0.4000	0.2000	0.4000	**1.4000**
Total		**±1.00**	**0.5538**	**0.1875**	**0.0625**	**0.5875**	**1.3913**

Sections 4.8.1 to 4.8.4 provide a more detailed description and analysis of Transend's service performance over the current regulatory control period.

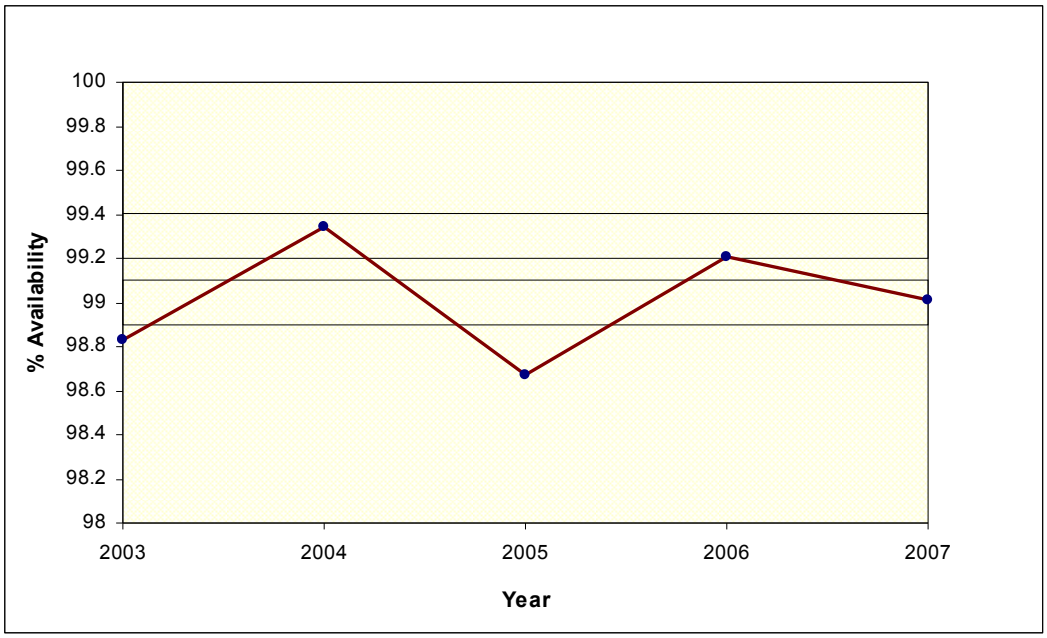
4.8.1 Transmission circuit availability (transmission lines)

Figure 4.4 shows Transend's performance in terms of transmission line circuit availability over the most recent five years from 2003 to 2007.

[12] *ACCC Decision Service Standards Guidelines* 12 November 2003

[13] For the current regulatory control period, the amount at risk was set at one percent of the Maximum Allowable Revenue for each calendar year

Figure 4.4: Transmission circuit availability (transmission lines)



Maintaining high levels of transmission line circuit availability has been particularly challenging during the current regulatory control period because of the relatively high level of capital works undertaken. The challenge was further exacerbated by the ACCC setting a target above the historical average for transmission line circuit availability in its 2003 revenue determination[14]. As a consequence, Transend has incurred a penalty for this parameter for two of the four years that this scheme has applied.

The implementation of Transend's capital investment program has accounted for over 50 per cent of outages contributing to transmission line circuit unavailability. In particular, the transmission line compliance program and a number of transmission line reconductoring projects have had a significant impact on transmission line circuit availability.

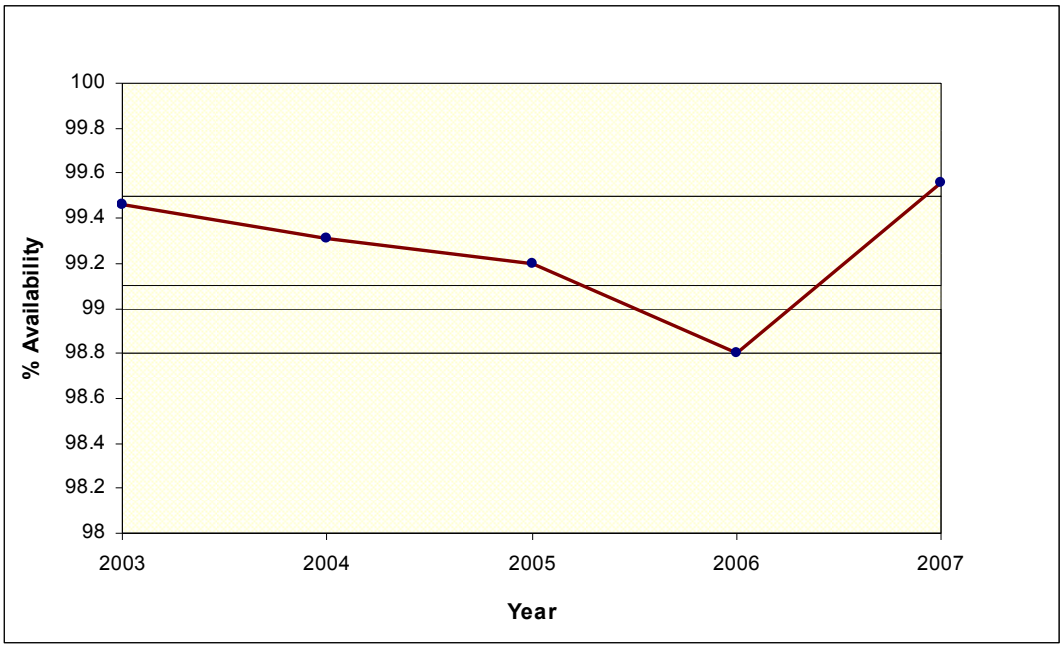
Transend anticipates that sustaining high levels of transmission line circuit availability will continue to present a significant challenge in the forthcoming regulatory control period.

4.8.2 Transmission circuit availability (transformers)

Figure 4.5 shows Transend's performance in terms of transformer circuit availability over the most recent five years from 2003 to 2007.

[14] ACCC, *Tasmanian Transmission Network Revenue Cap 2004 to 2008–09*: Decision, 10 December 2003, section 8.4.1, p 104

Figure 4.5: Transmission circuit availability (transformers)



Transend has generally achieved a positive result for transformer circuit availability over the regulatory control period, with the exception of 2006. Transformer replacements and planned outages to undertake capital works on transformer circuits in 2006 were the major factors that impacted adversely on transformer circuit availability. In particular, Transend replaced three network transformers at Chapel Street Substation and supply transformers at Palmerston, Risdon and Triabunna substations over the current regulatory control period.

Transend anticipates that sustaining high levels of transformer circuit availability will continue to present a significant challenge in the forthcoming regulatory control period.

4.8.3 Loss-of-supply events

Figure 4.6 and Figure 4.7 show Transend's performance in terms of loss-of-supply events over the most recent five years for >0.1 and >2.0 system minute events.

Figure 4.6: Loss-of-supply events (>0.1 system minute)

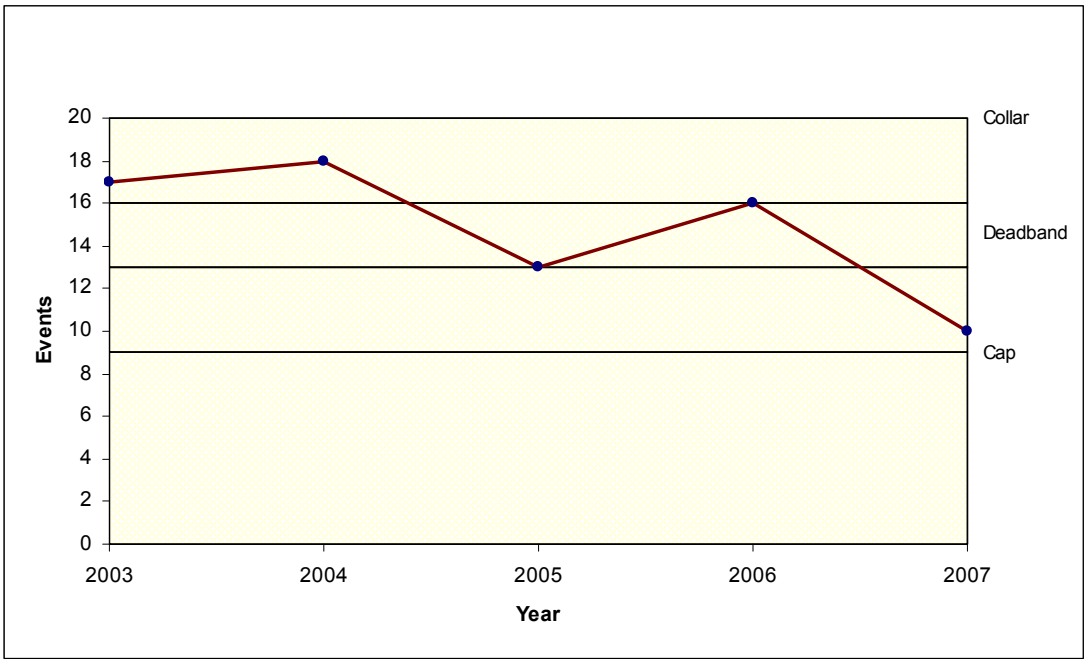
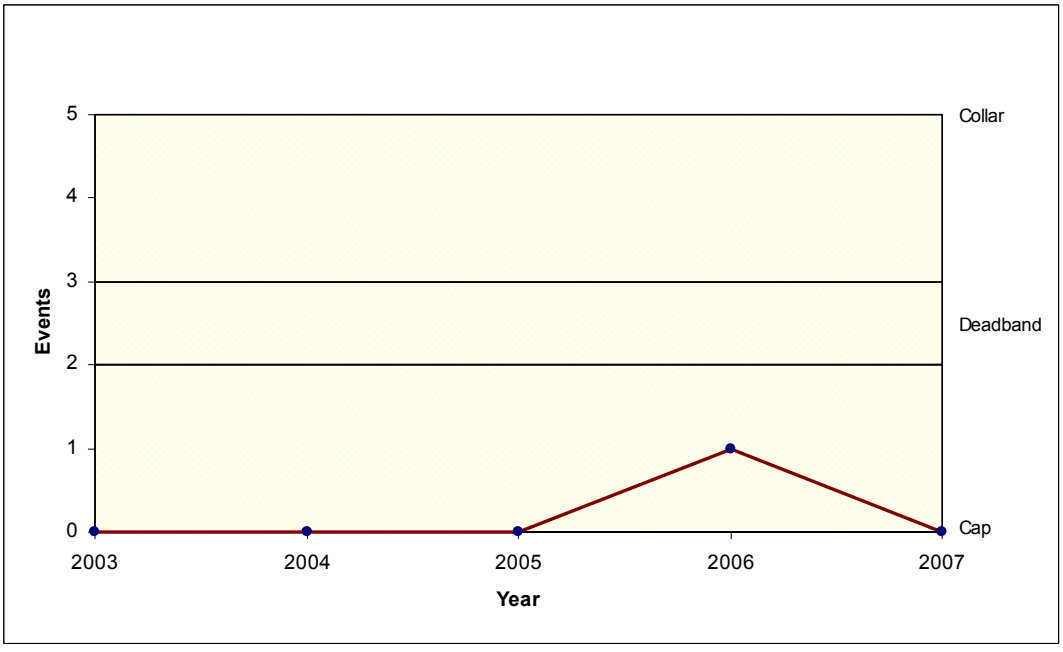


Figure 4.7: Loss-of-supply events (>2.0 system minutes)



The predominant causes of loss-of-supply events have been lightning, protection system mal–operation and human error. Over the current regulatory control period, Transend has reduced the occurrences of human error incidents by introducing more rigorous field switching processes and oversight, improving work processes and practices, and

designing out likely causes of human error. Implementation of the protection settings management strategy has significantly reduced the number of unplanned protection operations. The number of loss-of-supply events caused by lightning has remained relatively constant over the current regulatory control period.

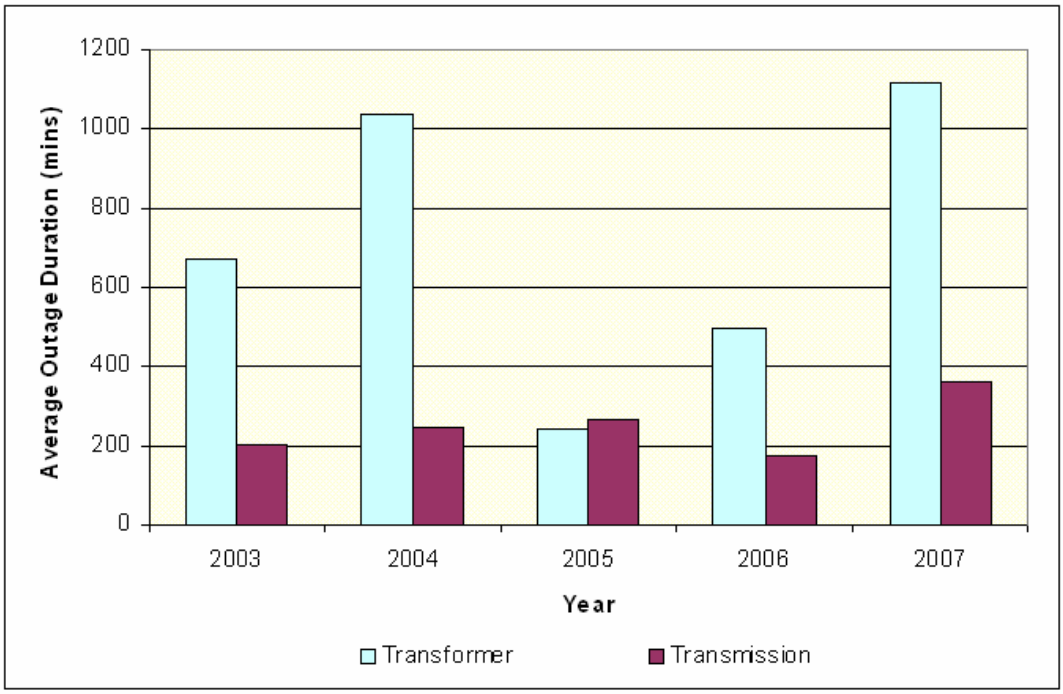
There was only one event greater than 2.0 system minutes. In January 2006, a conductor failure on the Burnie–Port Latta 110 kV transmission line resulted in the interruption of electricity supply to the north-western region of Tasmania.

Transend's asset replacement program has focused on assets that have the potential to cause larger impact events. Achieving a reduction in the impact of smaller events will remain a challenge in the forthcoming regulatory control period, particularly in light of the need to undertake a large capital works program over that period.

4.8.4 Average outage duration

Average outage duration is a measure of the duration of unplanned transmission system outages. Figure 4.8 shows Transend's performance in terms of average unplanned outage duration over the most recent five years from 2003 to 2007.

Figure 4.8: Average outage duration



Average outage duration for transformer circuits has been highly variable over the current regulatory control period. The unplanned outages with longest duration, including in 2007, are generally for the repair of faulty ancillary equipment associated with transformer circuits. Most unplanned outages of extended duration have had no impact on customer supply.

4.9 Concluding comments

Transend has delivered prescribed services to its customers that have efficiently met the required standards.

In relation to capital expenditure, Transend has delivered a prudent and efficient capital program over the current regulatory control period, which has:

- renewed assets that are in poor condition and unreliable, delivering improved asset performance and reduced maintenance requirements;
- enabled Transend to efficiently cater for electricity demand growth, and to connect new connection sites; and
- enabled Transend to address capacity constraints, and safety and environmental issues in accordance with all regulatory compliance requirements, and good electricity industry practice.

The capital works program delivered by Transend in the current regulatory control period is significantly larger than any program delivered in previous years. Transend has also made, and continues to make, significant investment in the support processes and tools to allow efficient planning, delivery and execution of the program.

Transend has been able to efficiently defer capital expenditure by the application of innovative technologies and approaches, including the adoption of dynamic transmission line ratings, application of network control schemes and installation of high temperature conductor.

Transend has faced significant upward pressures on its operating costs during the current regulatory control period. These cost pressures, which relate principally to the labour market, are largely beyond Transend's control. At the same time, the size and complexity of the Tasmanian transmission system has increased, and Transend has met increasing compliance requirements in areas such as financial reporting, emergency management, critical infrastructure protection, and safety and environmental management. These factors have also placed upward pressure on operating expenditure requirements.

The operating expenditure allowance provided by the ACCC's 2003 revenue cap decision has been shown to be substantially below the levels required by a prudent and efficient operator in the circumstances of Transend over the current regulatory control period. This deficit has heightened the pressure on Transend to achieve the highest possible levels of efficiency in operating and maintaining the transmission system over the current regulatory control period. The prudency and efficiency of Transend's operating expenditure is supported by ITOMS and PB's benchmarking.

5 FORECAST CAPITAL EXPENDITURE

5.1 Introduction

This chapter presents Transend's forecast capital expenditure for prescribed transmission services for the forthcoming regulatory control period. In developing its capital expenditure forecast in accordance with the Rules, Transend has carefully considered:

- the requirements of the Rules, including clause 6A.6.7 and schedule S6A.1.1 (which describes the accompanying information that must be provided to explain and justify the proposed capital expenditure);
- the requirements of the submission guidelines;
- the compliance obligations and regulatory objectives that Transend must satisfy;
- the expectations of Transend's customers, including the trade-off between price and service; and
- Transend's performance in delivering the capital works program for the current regulatory control period and its ability to deliver the forecast capital works program.

Transend is forecasting a significantly higher capital expenditure requirement in the forthcoming regulatory control period to achieve the capital expenditure objectives described in clause 6A.6.7 of the Rules. A large proportion of the increased expenditure is required to complete the Waddamana–Lindisfarne 220 kV transmission line project. The predominant investment drivers leading to the need for increased forecast capital expenditure over the forthcoming regulatory control period are:

- growth in demand creating the need for transmission system augmentations and seven new connection sites;
- the network performance requirements set out in the *Electricity Supply Industry (Network Performance Requirements) Regulations 2007*, which drive reliability augmentations; and
- continuation of the current asset renewal program to sustain transmission system performance and the reliability of electricity supply.

In preparing the capital expenditure forecast, Transend has carefully considered the need to prudently and efficiently achieve the capital expenditure objectives in a challenging environment where there is significant upward pressure on costs and strong demand for skilled and experienced resources.

A detailed explanation of Transend's capital expenditure forecast is provided in the following sections of this chapter:

- Section 5.2 summarises the key requirements of the Rules that relate to Transend's forecast capital expenditure.

- Section 5.3 briefly describes Transend's compliance obligations.
- Section 5.4 sets out Transend's capital expenditure categories.
- Section 5.5 describes Transend's capital expenditure forecasting methodology.
- Section 5.6 explains the key assumptions and variables applied in developing the capital expenditure forecast.
- Section 5.7 presents Transend's capital expenditure forecast regulatory control period.
- Section 5.8 compares Transend's historical and forecast capital expenditure.
- Section 5.9 sets out the contingent projects and associated trigger events.
- Section 5.10 demonstrates the deliverability of the capital expenditure program.
- Section 5.11 presents information on network support and non-network options.
- Section 5.12 presents concluding comments.

5.2 Rules requirements

Transend is required by clause 6A.6.7 of the Rules to present a capital expenditure forecast that satisfies the following capital expenditure objectives:

- meet the expected demand for prescribed transmission services over the relevant regulatory control period;
- comply with all applicable regulatory obligations associated with the provision of prescribed transmission services;
- maintain the quality, reliability and security of supply of prescribed transmission services; and
- maintain the reliability, safety and security of the transmission system through the supply of prescribed transmission services.

In addition, the forecast of capital expenditure must:

- comply with the requirements of the AER's submission guidelines; and
- relate to prescribed transmission services in accordance with the principles and policies set out in the cost allocation methodology for the TNSP.

Schedule S6A.1.1 of the Rules specifies other information that must be provided to explain and substantiate the capital expenditure forecast including, amongst other things:

- an appropriate categorisation of the capital expenditure forecast;
- the methodology used for developing the capital expenditure forecast;
- forecasts of demand growth relied upon to derive the capital expenditure forecast;

- key assumptions that underlie the capital expenditure forecast; and
- a certification of the reasonableness of the key assumptions by the directors of Transend.

The AER must accept the forecast of required capital expenditure that is included in the revenue proposal if the AER is satisfied that the total of the forecast capital expenditure for the regulatory control period reasonably reflects the following capital expenditure criteria:

- the efficient costs of achieving the capital expenditure objectives;
- the costs that a prudent operator in the circumstances of the relevant TNSP would require to achieve the capital expenditure objectives; and
- a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

The information presented in this chapter is intended to assist the AER in its assessment of Transend's capital expenditure forecast.

5.3 Compliance obligations

Compliance with regulatory obligations is an important driver of Transend's capital expenditure requirements. Transend is required by law to comply with and satisfy a suite of requirements and obligations contained in its licence, including Electricity Supply Industry legislation, codes, statutory instruments and regulatory guidelines.

In December 2007, new *Electricity Supply Industry (Network Performance Requirements) Regulations 2007* were legislated under the ESI Act. These network performance requirements were developed following an extensive public consultation process with key stakeholders, customers and interested parties.

The network performance requirements set out the minimum standards that Transend must meet in planning the transmission system. The object of these regulations is to specify, for the prescribed transmission service, the minimum network performance requirements that a planned power system of a TNSP must meet in order to satisfy the reliability limb of the regulatory test defined in the Rules.

An element of the requirements in the regulations is that Transend must apply to the Minister for approval of proposed reliability augmentations that are estimated to exceed $15 million,[15] with the Minister's approval taken to be an additional minimum network performance requirement. In effect, this provision introduces a requirement to consider additional direct and indirect costs and benefits so that the Minister may be satisfied that

[15] Section 6 of the *Electricity Supply Industry (Network Performance Requirements) Regulations 2007* provides that Ministerial approval is required where the present value of the cost of constructing, operating and maintaining the proposed augmentation is estimated to exceed $15 million.

the reliability-driven investment should proceed. The Reliability and Network Planning Panel (RNPP) noted that this requirement:

> improves the transparency of project assessments and provides an assurance to the jurisdiction that the regulated business is not over-investing in the network at the expense of energy users.[16]

Further details on the jurisdictional regulatory arrangements and network performance requirements are contained in Appendices 5 and 6 respectively.

In addition to the network performance requirements, Transend is required to satisfy applicable national and international standards, codes of practice, safety standards and guidelines generally accepted as appropriate by the Australian electricity supply industry. These standards and guidelines determine for example, how assets are to be designed and operated (eg AS 2374.7:1997–Loading Guide for Oil-Immersed Transformers, ESAA C(b)-1 Guideline for the Design and Maintenance of Overhead Distribution and Transmission Lines, and Energy Networks Association (ENA) Guideline for Prevention of Unauthorised Access to Electricity Infrastructure). Transend also faces compliance obligations common to all organisations of its nature and size, for example with respect to occupational health and safety, information management, and financial reporting.

In considering efficient solutions to meet its electricity supply industry compliance obligations, Transend properly considers all mandatory obligations including environmental, safety and planning approval processes. Transend also takes account of the trade-off between capital and operating expenditure, where opportunities for substitution and optimisation arise. Further information on Transend's approach to optimising its capital and operating expenditure plans is provided in section 6.2.2.

Transend's capital expenditure plans for the forthcoming regulatory period are focused on meeting its compliance obligations and, in turn, the capital expenditure objectives set out in the Rules.

5.4 Capital expenditure categories

Schedule S6A.1.1(1) of the Rules requires that Transend's forecast capital expenditure be presented with reference to well accepted categories of capital expenditure and the categories of transmission services to which the forecast capital expenditure relates. Table 5.1 provides the information relating to Transend's categories of capital expenditure as required by the Rules. All categories include the capital expenditure that is required to meet compliance obligations referred to in section 5.3. For example, the augmentation category contains projects that are necessary to meet a range of obligations in Transend's licence and in the network performance requirements.

[16] The RNPP identified the quoted statement as a stakeholder concern which it addressed in its final report by including the additional requirement to require jurisdictional oversight for larger projects. RNPP, *Transmission network security and planning criteria – Final Report*, July 2006, page 6.

Table 5.1: Categories of capital expenditure

Investment type	Category	Definition	Prescribed transmission services
Network			
Development	Augmentation	Works to enlarge the transmission system or to increase the capability of the transmission system to transmit or distribute active energy, as defined in the Rules	TUOS services
	Connection	Works to either establish new prescribed connections or to modify existing prescribed connections	Exit services
	Land and easements	Land and easement acquisitions for future prescribed transmission system augmentations or connections	TUOS services and exit services
Renewal	Asset renewal	Works to replace or refurbish prescribed transmission system assets to maintain reliability and quality of supply	TUOS, entry, exit and common transmission services
	Physical security/compliance	Works to improve the physical security of transmission system assets and/or compliance with technical, safety, environmental and other relevant obligations	TUOS, entry, exit and common transmission services
	Inventory/spares	Transmission system assets acquired to enable timely response to asset failures in accordance with the network performance requirements and good electricity industry practice	Common transmission services
	Operational support systems	Works required to create or replace operational IT support systems, required for efficient operation of the transmission system	Common transmission services
Non-network			
Support the business	Information technology (IT)	Works to develop and maintain corporate IT capacity and to improve the functionality of IT systems to support business needs in line with good electricity industry practice	Common transmission services
	Business support	Works to procure, replace or upgrade non-transmission system assets including land, buildings, vehicles and minor assets in line with business needs	Common transmission services

In the ACCC's 2003 revenue cap decision, Transend grouped its capital expenditure into the categories of development, renewal and non-network. However, under the previous classification, expenditure associated with operational support systems was assigned to the non-network category. The new structure more appropriately classifies capital expenditure directly associated with the transmission system.

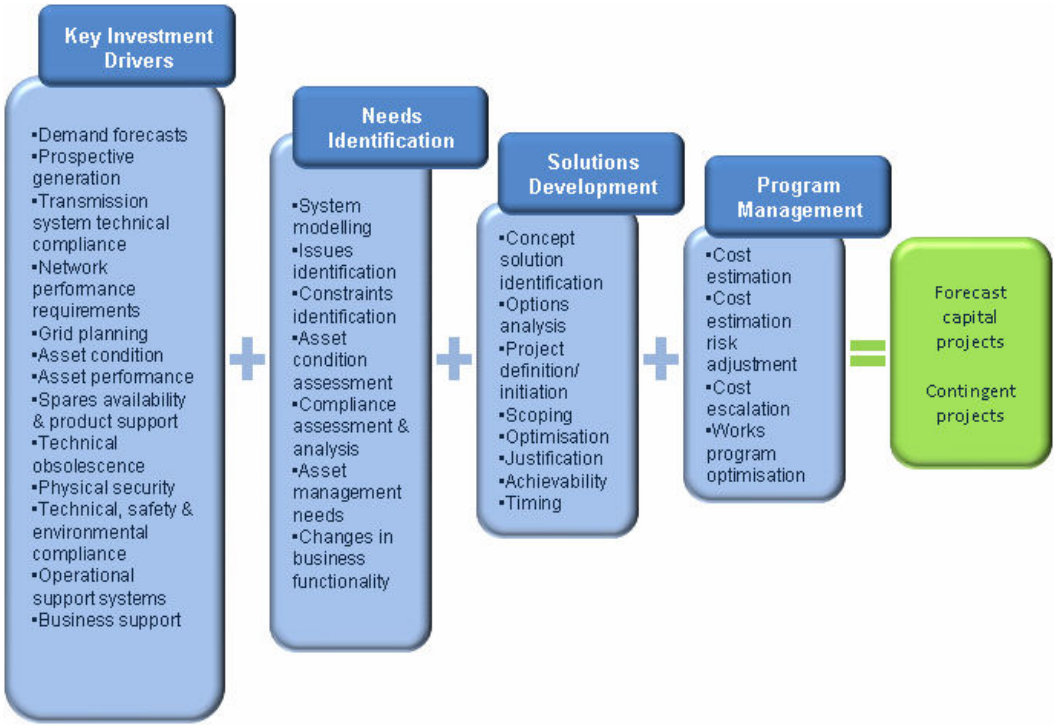
The capital expenditure for the first three years of the current regulatory control period and the expected capital expenditure for each of the last two years of the current

regulatory control period has been presented in Table 5.16 in section 5.8 of this proposal in line with the categories detailed in Table 5.1, consistent with the requirements of clause 4.3.3(6) of the submission guidelines.

5.5 Capital expenditure forecasting methodology

Transend recognises the importance of having an effective governance framework supported by robust business processes to ensure that capital investments are prudent and efficient. This section describes Transend's capital expenditure forecasting methodology as required by schedule S6A.1.1 of the Rules. Figure 5.1 provides key activities and considerations of the forecasting methodology.

Figure 5.1: Overview of Transend's capital expenditure forecasting methodology



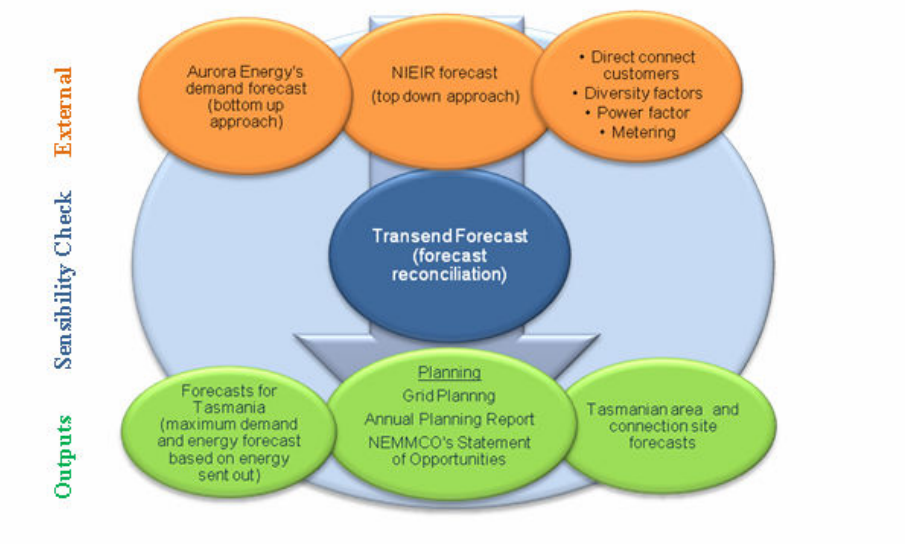
The remainder of this section briefly describes each of the four elements of the capital expenditure forecasting methodology in turn.

5.5.1 Key investment drivers

Demand forecasts

Growth in customer demand is a key driver for transmission network augmentation and prescribed connection site establishment or modification. Transend's forecast capital expenditure program must take into account the impact of demand growth on the transmission system. Figure 5.2 provides an overview of Transend's demand forecasting methodology.

Figure 5.2: Transend demand forecasting methodology



Transend has relied upon the following information to develop the demand forecasts for the forthcoming regulatory control period:

- *2007 Distribution Network Connection Ten–Year Consumption and Maximum Demand Forecast* prepared by the DNSP in Tasmania (Aurora);
- information provided to Transend by its direct connect customers; and
- the *Electricity sales and maximum demand forecasts for Tasmania to 2022* prepared by the National Institute of Economic and Industry Research (NIEIR).

Aurora's demand forecast is essentially a bottom-up approach that comprises individual demand forecasts for each connection site. The demand forecasts for each connection site are aggregated into 12 regional areas, based on the configuration of Aurora's distribution system.

Each year, Transend requests each of its direct connect customers to provide their demand forecast for the forthcoming ten years. Once received, the direct connect customer demand forecast information is added to Aurora's demand forecast to produce a consolidated bottom-up connection site and regional demand forecasts for Tasmania.

NIEIR produces an overall econometric top-down demand forecast for Tasmania. The NIEIR demand forecast includes scenarios for base, low and high demand growth. Aurora's demand forecast is compared against the NIEIR base scenario demand forecast to identify and resolve any discrepancies that may be related to different information or assumptions.

Transend uses the NIEIR demand forecast for modelling and planning the transmission system. The consolidated bottom-up demand forecast is used for modelling and planning prescribed connection sites.

Transend engaged PB to review Transend's demand forecasting methodology. PB found that Transend's demand forecasting processes and methods are sound and represent good industry practice.

Prospective generation developments

Future generation developments also drive forecast augmentation capital expenditure. Transend engaged ROAM Consulting to conduct an assessment of potential generation developments in Tasmania through the application of a probabilistic scenario analysis methodology.[17] The methodology is based on the identification and analysis of scenario themes that define potential directions for the energy sector.

Using different combinations of these themes, discrete scenarios that encompass a range of differing market development paths are constructed. Based on this scenario analysis and publicly available information, prospective generation projects are identified. The key inputs to Transend's capital expenditure forecasting methodology derived from the ROAM Consulting analysis are:

- the potential location of future generation to meet demand growth for the purpose of modelling future transmission network limitations; and
- modelling of the transmission network based on each scenario to identify the need for augmentations or other non-network solutions.

Further details of the analysis undertaken by ROAM Consulting is provided in section 5.6.2. and Appendix 11 of this revenue proposal.

Grid planning

Transend's Grid Vision project is an important input to developing the long-term planning requirements for the transmission system and ongoing review of the capital expenditure forecast. The Grid Vision project identifies the need for substantial augmentation of the Tasmanian transmission system over the next 30 years, even under the most conservative assumptions. Consideration of long-term requirements therefore influences the development of solutions to short-term network constraints, and also highlights future strategic land and easement requirements. The requirement for further assessment of the implications of the Grid Vision is recognised as an operating cost scope change in the forthcoming regulatory control period and is discussed further in chapter 6.

Renewal

Asset renewal investment drivers are targeted at sustaining the reliable, safe and secure provision of prescribed transmission services. Ensuring that transmission system assets comply with relevant technical, safety and environmental obligations is also an important

[17] ROAM Consulting, *Scenarios for Revenue Reset Application-2009–10 to 2013–14*, May 2008 (included as Appendix 11).

investment driver. The key asset renewal investment drivers that influence the performance of the transmission system are:

- asset condition;
- asset performance;
- spares availability and product support;
- technical obsolescence;
- physical security;
- technical, safety and environmental compliance; and
- operational support systems.

As outlined in the asset management plans, discussed in section 3.3, Transend has comprehensive condition assessment and performance monitoring regimes in place that provide a detailed understanding of the condition and performance of its assets. The availability of spare assets and parts, together with adequate product support from manufacturers has a significant impact on transmission system performance, particularly in the event of asset failure. Renewal driven by technical obsolescence is particularly relevant to secondary systems, due to issues encountered when interfacing new equipment with existing equipment.

The provision of adequate physical protection for critical infrastructure is vital to ensuring public safety, and providing a reliable and secure electricity supply. Where appropriate, Transend has modified its installations to comply with the ENA Guidelines for Prevention of Unauthorised Access to Electricity Infrastructure.

Compliance with technical, safety and environmental obligations is critical to meeting Transend's licence obligations as well as sustaining a reliable, safe and secure electricity supply. Projects in all categories of capital expenditure must meet these obligations.

Prudent investment in the development and continual improvement of operational support systems to ensure the satisfactory operation of the transmission system and to enhance asset management capability are important investment drivers. Prominent investment drivers in this category are associated with the Network Operation and Control System (NOCS) and the implementation of the AMIS program.

Business support

The business support investment drivers comprise the activities required to sustain efficient business operations. Investment drivers to support the business include the need to improve and further develop corporate IT systems, and to provide consolidated accommodation for employees.

5.5.2 Needs identification

The development capital expenditure forecast comprises the activities required to increase the capability or capacity of the transmission system and to establish or modify prescribed connections. To prepare this forecast, it is necessary to model the transmission system taking into account the key development investment drivers summarised in Figure 5.1. The purpose of the modelling is to assess whether or not the transmission system has sufficient capacity and capability to provide prescribed services in terms of meeting forecast demand, complying with the network performance requirements and catering for new generation.

Transend uses detailed models of the electrical power system including a detailed examination of the reliability and availability of equipment, number and nature of transmission system constraints to assess the ability of the transmission system to meet demand.

An overview of the modelling tools that Transend uses are as follows.

- Transend uses the Power System Simulator (PSS(E)) suite of power system analysis programs as the platform to identify both current and future transmission system constraints. Most other Australian TNSPs, DNSPs and NEMMCO use the same suite of analysis programs.
- Transend uses a modelling software tool called Plexos to determine long-term forecasts of energy availability from hydro storages, based on Monte Carlo style random water inflow sequence scenarios. The tool models the Tasmanian generation system (hydro, wind and thermal) and Basslink. It simulates market behaviour within the Tasmanian region by simulating the dispatch of generation to meet the Tasmanian demand. This form of scenario analysis is useful for analysing the future supply–demand balance and transmission system load flows.
- For connection site establishment or modification where an identified issue has an impact on reliability performance, reliability evaluation studies are undertaken using system reliability analysis software (TRANSREL). The impact of substation equipment-generated outages on reliability performance is analysed using substation reliability software (SUBREL). A combination of distribution reliability software (DISREL) and SUBREL has recently been used for projects that are driven by the need for distribution system reliability improvements.

Transend may use a combination of modelling tools to validate the preferred investment outcome.

For asset renewals, investment needs are identified by a detailed assessment of asset condition and performance. As outlined in section 3.2, a key objective of the AMIS program is to present asset related information in a way that enables potential issues to be readily identified and quantified. This information, together with feedback from product

suppliers regarding spare parts availability and obsolescence, forms the basis for developing the asset renewal component of the capital expenditure forecast.

Physical security needs are identified by monitoring the performance of existing security infrastructure and undertaking risk assessments where required. Technical, safety and environmental compliance needs are identified by measuring the level of compliance against new or existing acts, standards and industry guidelines.

Operational support system needs are identified by assessing the technical obsolescence of existing infrastructure, requirements for enhanced functionality and the continual improvement of asset management processes.

Business support needs are identified to ensure that the business continues to operate according to efficient and contemporary work practices. The need for new and modified facilities is identified as business functions and responsibilities increase.

5.5.3 Solutions development

To address a recognised need, potential solutions are identified, scoped and high level cost estimates prepared to enable the net cost of each viable alternative option to be analysed and assessed.

Where transmission system constraints are identified, both network and non-network prospective solutions are analysed. Typical solutions considered to address the identified needs include the application of network control schemes, transmission system reconfiguration, demand-side management, procurement of network support services, and distribution and transmission system augmentations. Transend works closely with Aurora to ensure that both transmission and distribution solutions are assessed in accordance with clause 5.6.2 of the Rules.

If the preferred solution to meet an identified need is to develop the transmission system, a project is initiated. The initiation process includes the preparation of a project definition and the registration of the project in the works planning and works prioritisation tools. As part of this process, the project is fully scoped, optimised and justified with key stakeholders consulted to ensure the optimum project definition is developed. The optimisation process includes an assessment of the works program to identify any other projects that could be cost-effectively undertaken concurrently. For transmission system augmentation projects, the option that minimises the cost of addressing an identified need is selected and fully supported in accordance with the requirements of the regulatory test.

The optimum timing of the project is also a key consideration, particularly for demand driven projects.

For the projects identified in Transend's forecast capital expenditure program, project definition forms, together with sufficient supporting information to allow each project to be estimated to the appropriate level are completed.

5.5.4 Program management

A cost estimate is prepared once a project is fully scoped and optimised. In 2006, to improve the accuracy of project estimates, Transend implemented a new cost estimating process that focuses on applying latest market cost data to well-defined project scopes.

To forecast cashflow, Transend has developed S-curves that model the cashflow of 16 generic project types that are representative of the projects typically undertaken. The generic project types vary in size, total duration, regulatory asset class composition, component cost breakdown and outage/activity duration. The S-curves reflect efficient project delivery for a well-planned generic project type and have been based on Transend's recent previous experience where possible.

Transend's forecasting methodology recognises cost estimation risk across the portfolio of projects. Cost estimation risk analysis is based on a statistical approach to evaluating the uncertainties associated with project cost estimates.

The capital works program comprises a large number of individual projects that must be undertaken to satisfy a broad range of needs. As Transend's assets range from 6.6 kV to 220 kV, including circuit breakers and transformers to distribution feeder level, implementing the capital program requires extensive consultation and coordination with customers to ensure that customer impacts are considered and minimised. Transend has recently developed a project prioritisation tool to assist with the effective management of the capital works program. Details of specific strategies to deliver the capital works program are provided in section 5.10 of this revenue proposal.

The capital expenditure forecasting methodology also identifies those projects where their scope, timing and cost are highly dependent on particular planning scenario triggers eventuating. For example, the trigger might be a substantial increase in forecast demand in a certain region, requiring a new connection site. Clause 6A.8.1 of the Rules provides for projects that are highly uncertain to be treated as contingent projects.

5.6 Key assumptions and variables for the forthcoming regulatory control period

This section details the key assumptions and variables used by Transend to produce its capital expenditure forecast for the forthcoming regulatory control period through the application of the capital expenditure forecasting methodology.

The key assumptions and variables relate to:

- forecast demand growth for Aurora and directly-connected customers;
- prospective generation developments;
- escalation rates for labour, non-labour and land;
- project scopes and cost estimates; and

- cost estimation risk analysis.

In accordance with schedule S6A.1.1(5) of the Rules, Transend's directors have provided a certification of the reasonableness of the key assumptions in Appendix 1.

5.6.1 Demand growth

This section details the demand growth forecast used to develop the capital expenditure forecast, consistent with the requirements of clause 4.3.3(a)(3) of the submission guidelines.

Unlike most Australian states, Tasmania experiences a winter peak in system demand, although the increasing penetration of reverse-cycle air conditioners is leading to an increase in summer demand growth. This is tending to reduce the difference between summer and winter maximum demand.

In 2003, the construction of a natural gas reticulation and distribution network commenced. NIEIR anticipates that the take-up of natural gas in Tasmania is likely to be slower than originally anticipated because of the cost of conversion. This has led to projected electricity sales being revised upwards compared to previous forecasts.

Demand growth in the Tasmanian transmission system is also heavily influenced by the activity of direct connected major industrial customers.

Electricity sales

The Tasmanian electricity sale projections for the base, low and high growth scenarios for the period 2009–14 prepared by NIEIR are shown in Table 5.2. Tasmanian electricity sale projections for the base, low and high scenarios to 2022 are shown in Figure 5.3. NIEIR predicts that total electricity sales growth is expected to average 1.9 per cent per annum to 2022. Residential, commercial and public lighting loads are expected to increase steadily. In addition to the new Gunns pulp mill negotiated connection, existing major industrial loads are expected to increase steadily over the demand forecast period.

Aurora forecasts that Tasmania's total annual electricity consumption (excluding direct connect customer demand) will increase by an average of 1.9 per cent per annum over the next 10 years.[18]

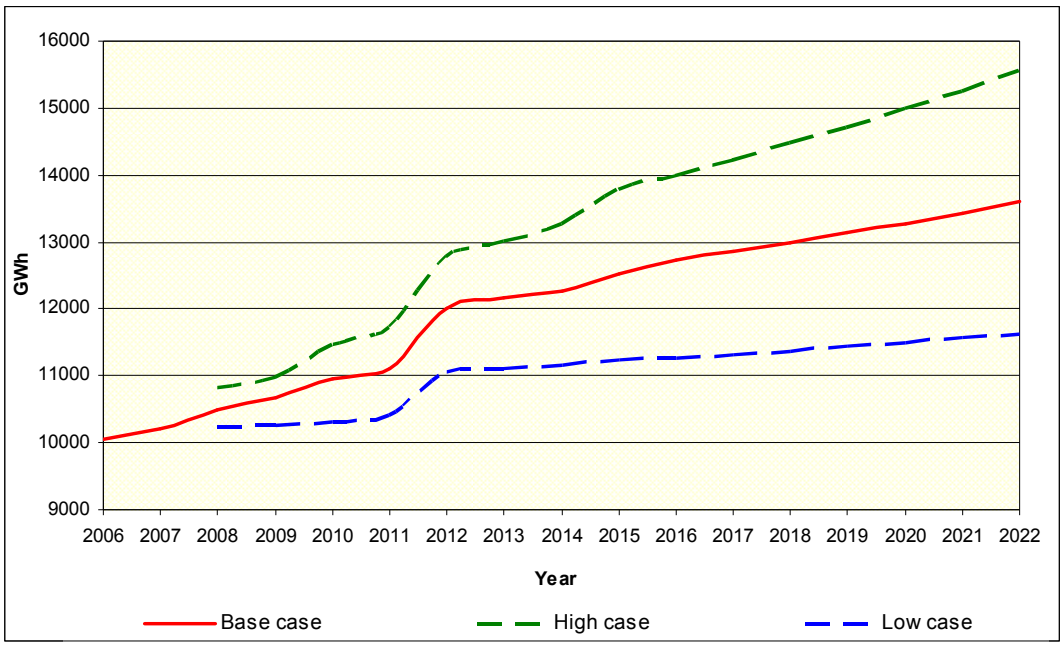
[18] *Utility Engineering Solutions 2007 Distribution Network Connection Ten-Year Consumption and Maximum Demand Forecast* p5

Table 5.2: Forecast total Tasmanian electricity sales: 2009–2014 (GWh)

Growth scenario	2009	2010	2011	2012	2013	2014
Base	10,663	10,943	11,117	12,000	12,153	12,269
High	10,978	11,466	11,728	12,776	13,019	13,263
Low	10,254	10,324	10,408	11,058	11,117	11,174

Note: data are for the financial year ending in June of the year specified.

Figure 5.3: Forecast total Tasmanian electricity sales: 2006–2022 (NIEIR) [19] (GWh)



Maximum demand

The Tasmanian winter maximum demand forecast for the base, low and high scenarios for the period 2009–14 prepared by NIEIR are shown in Table 5.3. Total winter maximum demand growth for the base, low and high scenarios to 2021 are shown in Figure 5.4. NIEIR predicts that the total winter maximum demand growth for the base scenario is expected to increase over this period by an average annual rate of 2.2 per cent.

Aurora forecasts that Tasmania's maximum demand (excluding direct connect customer demand) will increase by an average of 2.1 per cent per annum over the next 10 years.[20]

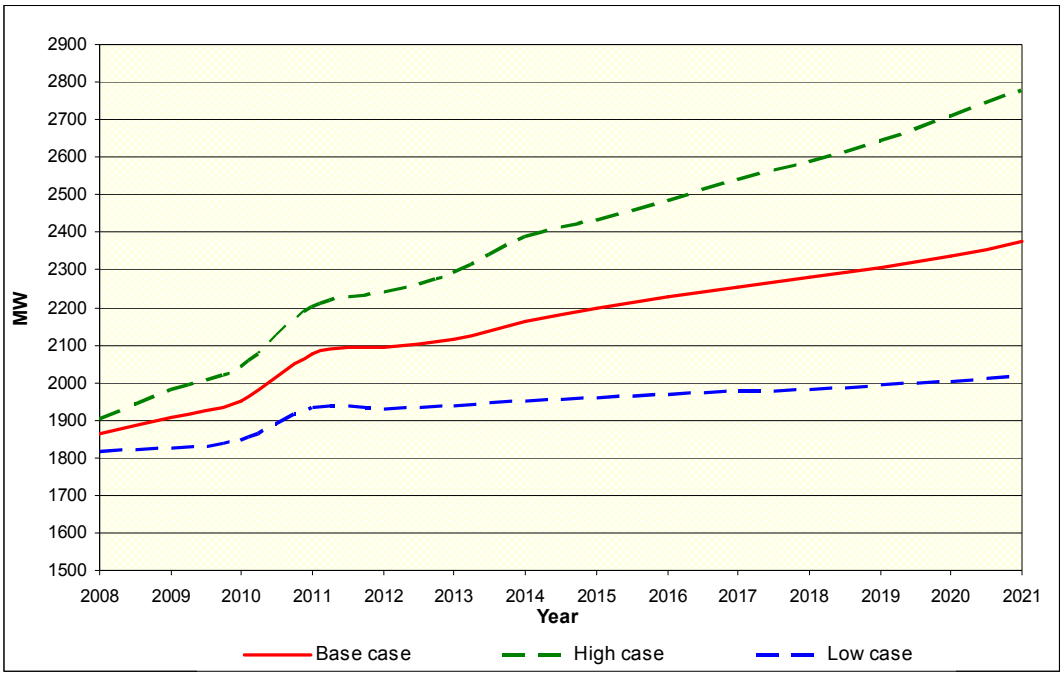
[19] *NIEIR Electricity sales and maximum demand forecasts for Tasmania to 2022* Figure 4.1 p44
[20] *Utility Engineering Solutions 2007 Distribution Network Connection Ten-Year Consumption and Maximum Demand Forecast* p5

Table 5.3: Forecast Tasmanian winter generated maximum demand (MW): 2009-2014

Growth scenario	2009	2010	2011	2012	2013	2014
Base	1,909	1,951	2,077	2,092	2,114	2,164
High	1,979	2,043	2,201	2,241	2,291	2,388
Low	1,827	1,847	1,934	1,930	1,939	1,952

Note: figures are on a calendar year basis.

Figure 5.4: Forecast total Tasmanian winter generated maximum demand forecast (MW): 2008–2021[21]



Maximum demand comparison

Table 5.4 compares the Tasmanian winter maximum projections for the base, low and high maximum demand growth scenarios to 2014 prepared by NIEIR with Transend's medium case winter maximum demand forecast for the period 2008–14. Figure 5.5 compares the Tasmanian winter maximum projections for the base, low and high maximum demand growth scenarios to 2018 prepared by NIEIR with Transend's medium case winter maximum demand forecast for the same period. The Transend medium case demand forecast has similar characteristics to the NIEIR forecast as can be seen in Figure 5.5.

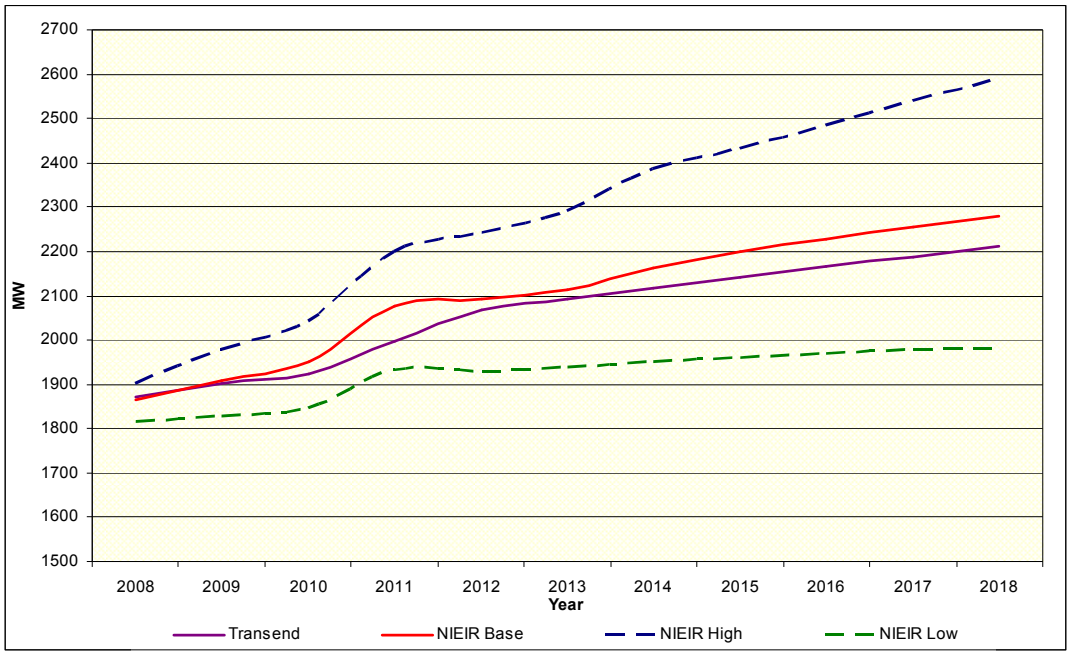
[21] *NIEIR Electricity sales and maximum demand forecasts for Tasmania to 2022*

Table 5.4: Forecast NEIR and Transend's winter maximum demand forecast

Growth scenario	2008	2009	2010	2011	2012	2013	2014
Base	1,866	1,909	1,951	2,077	2,092	2,114	2,164
High	1,901	1,979	2,043	2,201	2,241	2,291	2,388
Low	1,817	1,827	1,847	1,934	1,930	1,939	1,952
Transend (medium)	1,870	1,901	1,925	1,997	2,069	2,093	2,117

Note: figures are on a calendar year basis.

Figure 5.5: Forecast NIEIR and Transend's winter maximum demand forecast comparison 2008–2018

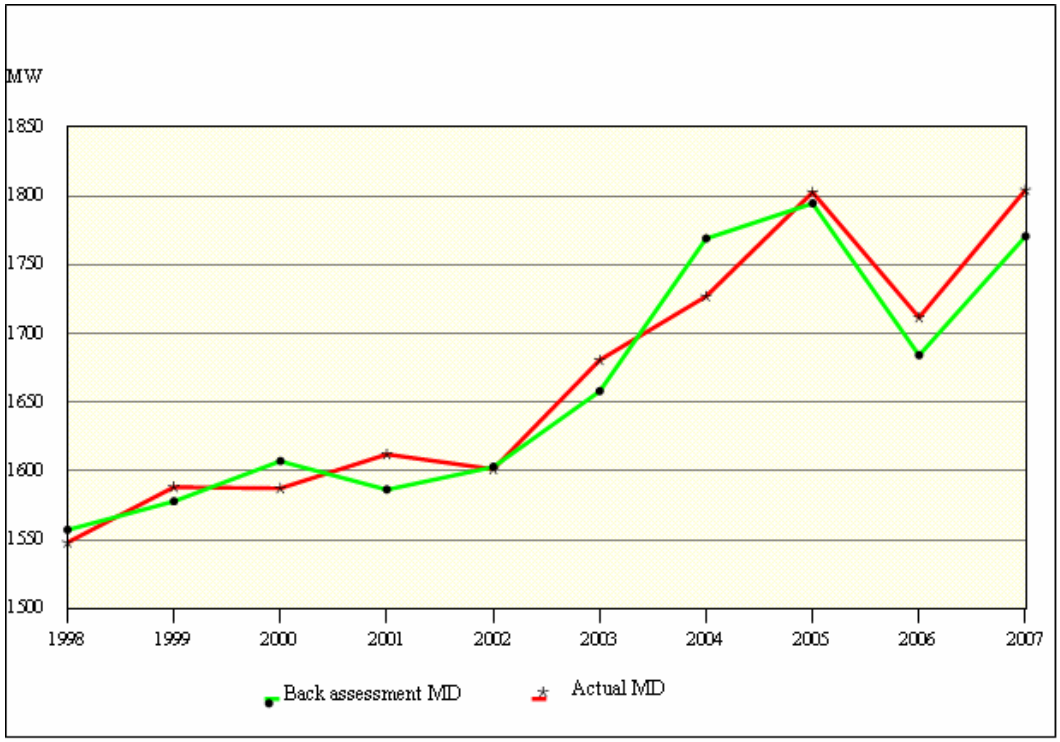


Back assessment

To assess the validity of the econometric model used for the maximum demand forecast, NIEIR has conducted a back assessment of actual maximum demand. This 10-year backward-looking demand forecast is based on actual data and economic conditions. The outcome of the back assessment is presented in Figure 5.6. In this backward-looking assessment, the Tasmanian actual maximum demands include direct connect customer loads. Variations in actual direct connect customer loads contributes to back-casting error, typically around 20 MW although occasionally up to 30 MW.

The back assessment indicates that, while the forecasting methodology is reasonably conservative (in that it understates demand), it has produced forecasts that are representative of likely maximum demand. Transend therefore considers that it is reasonable to use the NIEIR and Transend's demand forecasts for the forthcoming regulatory control period.

Figure 5.6: Back assessment of Tasmania maximum demand[22]



5.6.2 Prospective generation developments

This section details the assessment of potential generation developments for the Tasmanian region undertaken by ROAM Consulting, through the application of a probabilistic scenario analysis methodology. Table 5.5 summarises the scenario theme sets analysed by ROAM Consulting, which were developed with consideration of the Grid Vision project consultation recently undertaken by Transend.

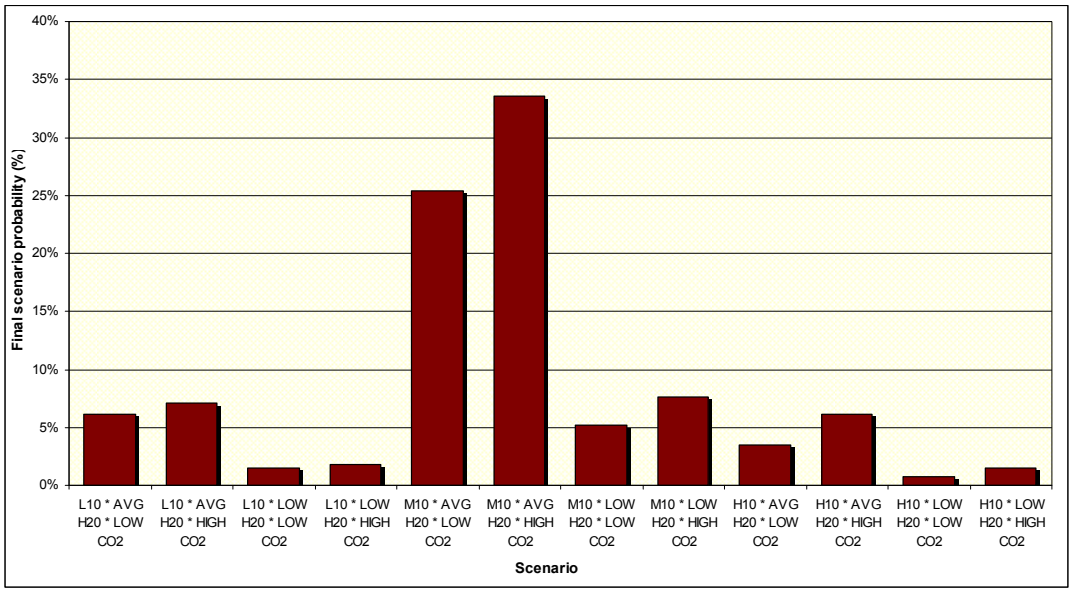
[22] *NIEIR Electricity sales and maximum demand forecasts for Tasmania to 2022* Figure B.1 p73

Table 5.5: Theme sets used for scenario analysis

Load Growth		Water Availability		Greenhouse Policy	
Low (L10)	Low economic growth, with 10% probability of exceedance demand	Business as usual (BAU)	Hydro inflows maintain long-term average levels, with yields at approximately 9,500 GWh per annum	Business as usual (low CO_2)	Current State and Federal greenhouse policies are maintained consistent with present arrangements. No significant incentives exist for large scale renewable developments
Medium (M10)	Medium economic growth, with 10% probability of exceedance of demand	Low inflows (Low H_2O)	Hydro inflows are lower than long-term averages, matching closer to drought levels. Yields vary but average approximately 8,500 GWh per annum	Increased carbon trade (high CO_2)	Significant change in greenhouse policy, with the introduction of a nominally $35/t equivalent CO_2 trading scheme. Additional gas supplies made available. Increased incentive for renewable technologies
High (H10)	High economic growth, with 10% probability of exceedance of demand				

Using different combinations of these themes, 12 discrete scenarios were constructed encompassing a range of differing market development paths. Each scenario was analysed and, based on that analysis, the probability of each scenario occurring identified. Likely generation projects were identified (where that information is publicly available) or assumed based on the need identified during the scenario analysis. The key output of this process is a set of scenarios with assigned probabilities and the generation developments necessary to meet each scenario. The probabilities for each scenario are shown in Figure 5.7.

Figure 5.7: Scenario probabilities



In undertaking its analysis, ROAM Consulting has recognised that unlike other regions in the NEM, Tasmania is more susceptible to energy constraints, rather than the usual capacity constraints, due to its reliance on hydro generators for much of its generation capacity. This means that even with sufficient installed capacity to meet peak demand, the Tasmanian power system may not be able to meet future energy needs due to water unavailability. ROAM Consulting considered both capacity levels to meet peak demands and anticipated energy levels to meet annual energy forecasts. ROAM Consulting's resulting scenario analysis assumes a reasonable mix of generation technologies in order to provide a reliable and secure supply.

Using the scenario analysis and further modelling of the implications of each scenario by Transend, a capital expenditure plan for each of the 12 scenarios has been developed. This analysis shows that across the scenarios a baseline of required capital projects remains constant. Further, the projects that vary from scenario to scenario meet the criteria for contingent projects, in that they are uncertain in timing, scope and/or cost. The scenario analysis has therefore assisted with confirmation of the ex-ante capital program and identification of contingent projects.

5.6.3 Strategic land and easement acquisitions

Given the complexity of achieving planning approval for transmission augmentation and connection projects, it is prudent to complete strategic investigations well in advance to determine the preferred route and location for transmission line easements and substation sites. The AER recognised the importance and worth of the early acquisition of land and easements in its Powerlink transmission determination and stated that:

> The AER accepts it is good industry practice to acquire some easements before they are required for augmentation if their acquisition is likely to result in lower costs for customers in the longer term.[23]

The AER, in its ElectraNet transmission determination, considered that providing ElectraNet with an ex-ante capital expenditure allowance on medium/high priority strategic land purchase projects within the 0 to 10-year demand outlook was reasonable, reflecting efficient costs that a prudent operator in the circumstances of ElectraNet would require to achieve the capital expenditure objectives.[24]

Transend's regional development plans outline likely future development requirements for each region within Tasmania. Transend has included funding provision in its capital expenditure forecast strategic land and easement acquisitions. Transend's estimated costs include land acquisition and easement compensation costs, labour and registration costs and are based on unit pricing consistent with recent acquisition experience for project types in transmission lines and substations augmentations relevant to geographical locations.

5.6.4 Labour cost escalation

Labour cost increases have a significant influence on Transend's capital expenditure forecast. Wages growth has been strong in the current regulatory control period, particularly in the latter years, and this is expected to continue well into the future.

Transend engaged Competition Economists Group (CEG)[25] to provide forecasts of real unit labour cost movements in the Australia-wide and Tasmanian electricity, gas and water (EGW) sectors and to identify labour market issues relevant to the electricity sector and Transend's operating environment in particular. Wages pressure in Tasmania for the period from June 2003 to June 2007 was high. CEG analysed the compound annual movements in Average Weekly Ordinary Time Earnings (AWOTE) and in the Labour Price Index (LPI) in its report and found that:

> …wage growth, as measured by AWOTE, in Tasmania has outstripped wages growth in Australia during this period—generally and specifically in the EGW sector. Similarly, wages growth, as measured by LPI for all industries, has been higher in Tasmania.[26]

For the period 2008 to 2014, CEG has compared forecasts in AWOTE growth in the EGW sector by two economic forecasters, Econtech and Macromonitor. In CEG's opinion, an average of the Econtech (Australia-wide) and Macromonitor (Tasmania) escalation factors provides an appropriate estimate of labour cost escalation in the Tasmanian EGW sector (refer Table 5.6). This may be a slightly conservative approach because the Econtech data is unlikely to be adjusted for productivity for the period.

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[23] *Powerlink Queensland transmission network revenue cap 2007-08 to 2011-2012 (Decision)* p.25.
[24] *ElectraNet South Australia transmission network revenue cap 2008-09 to 2012-13 (Decision)* p.29.
[25] CEG report *Escalation factors affecting expenditure forecasts,* April 2008.
[26] Section 2.1 in the CEG Report *Historic labour costs growth, a report for Transend,* May 2008, provided as Appendix 12.

Table 5.6: AWOTE growth in the EGW sector (per cent real)

	2006–07 (a)	2007–08 (e)	2008–09 (f)	2009–10 (f)	2010–11 (f)	2011–12 (f)	2012–13 (f)	2013–14 (f)
Econtech (Australia-wide)	–	2.0	2.8	5.6	5.0	3.9	3.4	3.1
Macromonitor (Tasmania)*	–	2.4	3.6	2.4	0.5	2.3	4.3	4.9
Tasmanian EGW labour growth	4.3	2.2	3.2	4.0	2.7	3.1	3.9	4.0

Note: *productivity adjusted, (a) actual, (e) estimated, (f) forecast

Transend has applied the Tasmanian EGW labour growth forecast to derive weighted average labour cost escalators following the processes as described in section 5.6.7. Details regarding the weighted average labour cost escalators are in Table 5.12. The CEG report[27] is included as Appendix 15.

5.6.5 Land value escalation

Land values in Tasmania are forecast to increase at a rate above the consumer price index (CPI). Transend has forecast land value escalation based on advice from an independent property valuer, Brothers & Newton, for the period from 1 July 2007 to 30 June 2014. The report is provided at Appendix 13.

Based on Brothers and Newton's regional forecasts, Transend derives the weighted average escalations using the proportion of proposed land and easement acquisitions for each region as a percentage of total land and easement acquisition for the period 2008-09 to 2013-14. Table 5.7 presents the weighted average land escalations that have been applied to Transend's land and easement acquisition cost components of its capital expenditure forecast.

Table 5.7: Land value escalation factors (per cent real)[28]

	2007–08 (f)	2008–09 (f)	2009–10 (f)	2010–11 (f)	2011–12 (f)	2012–13 (f)	2013–14 (f)
South	3.9	3.8	3.5	3.3	2.6	2.5	3.1
North	5.7	5.6	5.9	5.3	4.8	4.2	4.4
North–west	6.4	6.2	5.8	4.7	4.2	3.8	4.3
Weighted average	5.3	5.2	5.1	4.1	3.5	3.2	3.7

Note: (f) forecast.

[27] CEG, *Escalation factors affecting expenditure forecasts, A report for Transend*, April 2008.

[28] Source: Brothers & Newton, *Real land escalation by region*, April 2008. *Weighted average* derived by Transend's

5.6.6 Non-transmission system escalation

Transend has assumed that non-transmission system costs will increase by inflation. As explained in section 11.5, Transend engaged CEG to provide advice on the inflation forecast that would be most appropriate for Transend's revenue proposal. Full details of CEG's analysis and conclusions on forecast inflation are provided at Appendix 14.

5.6.7 Non-labour construction costs escalation

Transend also engaged CEG to investigate and research escalation trends from past infrastructure projects and forecasts of input costs movements as a basis for predicting future rates of escalation for project construction costs. CEG stated that due to tight supply conditions, and as a small customer, Transend's bargaining position is likely to worsen over time as the boom in demand for electrical equipment continues.[29]

Transend's proposed non-labour construction cost escalators were derived using the forecasting method outlined below. The process for estimating weighted escalators has been validated by CEG to ensure that it correctly derives labour and material cost escalators.

The forecasting method is summarised as follows:

- Step 1—Transend provides the breakdown of the capital expenditure program for transmission system capital projects by generic project estimate types and component costs, for example Transend has 16 estimate types such as transmission lines, substation, transformer, and protection and control. For each estimate type, there are three key component costs which are categorised as procurement, installation and land. Each key component cost is further broken down into detailed cost items such as raw materials, civil construction, and labour external and internal.
- Step 2—CEG defines inputs to the expenditure program. For example, in raw commodities, such as aluminium, copper, crude oil, in manufactured products, such as fabricated steel, and in general cost movements, such as general labour, producers' margins, construction services.
- Step 3—CEG sources or derives available forecasts for the input component costs identified in step 2.
- Step 4—Transend maps component costs by estimate types against input component costs advised by CEG. In so doing, Transend derives weights that can be applied to the forecasts from CEG in step 3.

The general approach adopted in Transend's capital expenditure forecast has been accepted by the AER in its recent decisions for SP AusNet and ElectraNet. Details associated with steps 1 to 4 and the resulting escalation factors for Transend are provided

[29] Section 3.8.3. *Producer margins faced by smaller customers* CEG report.

below. The CEG report is appended as Appendix 15.[30] Transend has applied the final weighted escalators in Table 5.12.

Transend's derived non-labour construction cost escalators

The following explains the derivation of non-labour construction cost escalators, following the steps outlined in section 5.6.7.

Step 1—breakdown of the transmission system capital projects by generic project estimate types and component costs:

Table 5.8 details Transend's capital expenditure program breakdown by estimate types and by component costs.

[30] CEG Report *Escalation factors affecting capital expenditure forecasts* by Dr. Tom Hird and Daniel Young dated April 2008 inserted as Appendix 15.

Table 5.8: Transend's capital expenditure forecast by estimate types and by component costs

		Procurement (per cent)									Installation (per cent)					Land (per cent)	
Project type	Estimate type	Aluminium	Steel	Copper	Concrete (foundation)	Buildings & demolition	Producers' labour	Producers' margin	Transport	Material—others	Plant Hire & establishment	Labour-External-civil & general	Labour-external-EGW	Labour-internal	Labour-other	Land	Total
TL-S	1	8	10	0	3	0	3	3	1	3	9	24	30	5	1	0	100
TL-M	2	9	11	0	3	0	3	3	1	5	8	25	27	4	1	0	100
TL-L-Br	3	9	11	0	3	0	3	3	1	5	8	27	25	4	1	0	100
TL-L-Gr	4	9	11	0	3	0	3	3	1	5	9	28	23	4	1	0	100
TC	5	0	4	28	2	0	5	10	1	9	9	24	5	2	1	0	100
TL-Refurb	6	6	5	0	8	0	3	1	1	9	14	12	21	19	1	0	100
SS-Gr	7	2	5	4	8	7	7	6	2	5	5	10	28	10	1	0	100
(GIS)	7a	1	8	6	1	15	10	6	4	12	6	8	17	5	1	0	100
SS-Br-Sgle	8	2	5	4	8	8	8	6	2	6	4	7	28	11	1	0	100
(GIS)	8a	1	7	5	1	12	10	6	4	4	4	6	28	11	1	0	100
SS-Br-Mult	9	1	4	3	5	4	6	6	1	4	7	7	35	16	1	0	100
Net-TF	10	0	11	9	6	0	27	19	8	4	1	10	3	1	1	0	100
Supp-TF	11	0	11	9	4	0	27	15	8	4	1	11	8	1	1	0	100
P&C-Sgle	12	0	2	6	0	2	10	6	0	12	1	6	40	14	1	0	100
P&C-Mult	13	0	2	6	0	2	10	6	0	12	1	6	35	19	1	0	100
Cap bank	14	6	5	7	10	4	5	6	2	15	4	7	20	8	1	0	100
Land/ easement	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100

Steps 2 and 3—input cost component breakdown and forecasts:

For raw materials, a change in commodity prices (such as aluminium, copper and crude oil) will not immediately feed through into higher equipment prices. The AER has recognised this in its SP AusNet draft decision where it states:

> On the balance of the available information SKM's assumption of a lag between movements in base metals prices and transmission equipment prices appears reasonable, however the AER considers that the lag is not likely to be greater than one year over the forthcoming regulatory control period.[31]

Transend considers that a one-year lag is appropriate and has applied this assumption when using the escalation factors for commodities. Table 5.9 shows that forecast input cost escalators, with a one-year lag applied to aluminium, copper and crude oil only as per steps 2 and 3 described above.

Table 5.9: Forecast input cost escalators (per cent real)

	2007–08 (e)	2008–09 (f)	2009–10 (f)	2010–11 (f)	2011–12 (f)	2012–13 (f)	2013–14 (f)
Tas EGW labour**	2.2	3.2	4.0	2.7	3.1	3.9	4.0
Aluminium*	11.6	-5.6	3.5	-0.5	-0.2	0.3	0.0
Copper*	30.5	-0.4	-3.7	-6.3	-4.2	-2.8	-3.1
Crude oil*	-2.6	24.5	12.4	-3.8	-1.3	-0.5	-2.0
Fabricated steel	0.2	0.1	0.3	0.2	0.2	0.2	0.2
General labour	1.8	1.6	2.4	1.9	1.8	2.0	2.0
Producer margin	9.5	5.4	6.1	7.6	0.0	0.0	0.0
Construction costs	2.3	2.1	0.9	0.7	1.1	1.9	2.6

Note: *one year lag included in raw material input cost escalators.

**TAS EGW labour is smoothed by adopting Macromonitor averages in productivity.

Step 4—map component costs by estimate types to input component costs and calculate weighted average escalations:

Table 5.10 provides the breakdown of Transend's network capital projects into component costs by estimate types and describes how these costs are mapped to input component costs (which is the first half of step 4).

[31] AER, *SP AusNet Transmission Determination: 2008-09 to 2013-14*, August 2007, p.90.

Table 5.10: Capex estimate types map to input component costs (per cent)

	Aluminium	Copper	Crude oil	Fabricated steel	General labour	Producers' margin	Construction costs	TAS EGW labour	Land & easements	Land & easements	Land & easements	CPI
Aluminium	100	-	-	-	-	-	-	-	-	-	-	-
Steel	-	-	-	100	-	-	-	-	-	-	-	-
Copper	-	100	-	-	-	-	-	-	-	-	-	-
Concrete (foundation)	-	-	20	-	-	-	80	-	-	-	-	-
Buildings & demolition	-	-	-	-	-	-	100	-	-	-	-	-
Producers' labour	-	-	-	-	100	-	-	-	-	-	-	-
Producers' margin	-	-	-	-	-	100	-	-	-	-	-	-
Transport	-	-	100	-	-	-	-	-	-	-	-	-
Material—others	-	-	20	-	80	-	-	-	-	-	-	-
Plant hire & establishment	-	-	-	-	-	-	100	-	-	-	-	-
Labour—external—civil & general	-	-	-	-	-	-	100	-	-	-	-	-
Labour—external—EGW	-	-	-	-	-	-	-	100	-	-	-	-
Labour—internal	-	-	-	-	-	-	-	100	-	-	-	-
Labour—other	-	-	-	-	100	-	-	-	-	-	-	-
Land (north-west)	-	-	-	-	-	-	-	-	100	-	-	-
Land (north)	-	-	-	-	-	-	-	-	-	100		
Land (south)	-	-	-	-	-	-	-	-	-	-	100	-
Non-network	-	-	-	-	-	-	-	-	-	-	-	100

Table 5.11 presents the weighted escalators as derived by the weights against the input component costs (which is the second half of step 4).

Table 5.11: Capital expenditure estimate types and input weights (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Aluminium	0.42	-0.18	0.16	-0.02	0.00	0.01	0.00
Steel	0.01	0.01	0.02	0.01	0.01	0.01	0.01
Copper	0.76	-0.01	-0.07	-0.28	-0.22	-0.07	-0.08
Concrete (foundation)	0.06	0.28	0.12	-0.01	0.03	0.08	0.07
Buildings & demolition	0.05	0.05	0.02	0.02	0.03	0.07	0.08
Producers' labour	0.11	0.08	0.11	0.10	0.11	0.10	0.11

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Producers' margin	0.49	0.26	0.25	0.36	0.00	0.00	0.00
Transport	-0.04	0.32	0.15	-0.05	-0.02	-0.01	-0.03
Material–others	0.04	0.29	0.21	0.04	0.06	0.07	0.06
Plant hire & establishment	0.14	0.12	0.05	0.04	0.07	0.10	0.13
Labour–external–civil & general	0.30	0.23	0.14	0.11	0.11	0.14	0.21
Labour–external–EGW	0.56	0.76	0.91	0.62	0.68	0.89	0.92
Labour–internal	0.20	0.29	0.27	0.20	0.31	0.41	0.39
Labour–other	0.02	0.01	0.02	0.02	0.02	0.02	0.02
Land (north-west)	0.00	0.00	0.00	0.00	0.00	0.05	0.05
Land (north)	0.00	0.00	0.00	0.00	0.00	0.09	0.09
Land (south)	0.00	0.00	0.00	0.00	0.00	0.12	0.13

Table 5.12 presents the final weighted escalators for labour, non-labour construction, land and non-network capital projects as derived from the forecasting method and applied to Transend's capital expenditure forecast.

Table 5.12: Final weighted escalators (per cent real)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Labour	2.2	2.8	2.7	1.9	2.4	3.3	3.6
Non-labour	5.2	3.2	2.9	0.5	0.0	0.8	0.7
Land	5.3	5.2	5.1	4.1	3.5	3.2	3.7

5.6.8 Project scopes and estimates

As noted in section 5.5.3, Transend has prepared project definitions and supporting information for each project included in the future capital expenditure program, to allow the estimation of future project costs. The project scopes and estimates are based on reasonable assumptions about future requirements, given the information presently available to Transend.

Transend engaged PB to conduct a benchmark assessment of the unit rates used to prepare the capital expenditure forecast. A comparison of cost estimates was made based on a sample of eight substation and two transmission line projects. These projects comprise 45 per cent of Transend's capital expenditure forecast and are representative of

the unit rates used for Transend's capital expenditure forecast. The PB report is included in Appendix 16.

The comparison shows that the variations between Transend's and PB's estimates are in each case within the acceptable range of accuracy expected from projects that are at the initiation stage. The total variation across the sample of projects was less than five per cent. Transend has also benchmarked its estimates against those prepared by other TNSPs, to ensure the reasonableness of its estimating process and resulting cost estimates.

5.6.9 Cost estimation risk analysis

Cost estimation risk analysis is based on a statistical approach to understanding the uncertainties and probabilities associated with project cost estimates. Cost estimation risk analysis recognises the inherent uncertainties in the cost estimating process and that there is generally a higher probability that costs will increase rather than decrease[32].

Transend engaged Evans & Peck to conduct a cost estimation risk analysis of Transend's portfolio of forecast capital projects. The analysis determines a number of risk factors that are applied to the estimated cost of projects to ensure that the overall capital expenditure forecast is unbiased. This is to ensure that the probability of actual cost outcomes exceeding the forecast is no higher than the probability of a cost underrun.

Traditionally, Transend has made best estimates of future project costs, and then applied a contingency to each project to allow for unforeseen cost increases. Applying a set contingency for each project invariably gives rise to an excessive contingency amount at an aggregated project level. To address the shortcomings of this approach, Transend has adopted a systematic risk-based evaluation developed by Evans & Peck. Such an approach is well recognised in industries with large project management experience.[33]

In summary, the approach adopted by Evans & Peck involves:

- including the range of potential cost outcomes for each item of known scope (inherent risk), based around the project cost estimates;
- including the probability of occurrence of each identified risk event outside of the known scope of work and the probable range of costs (contingent risks); and
- simulating potential combinations of the costs of all of these risks to develop a likely range of costs for the overall project portfolio.

The overall approach to cost estimation risk analysis is illustrated in Figure 5.8.

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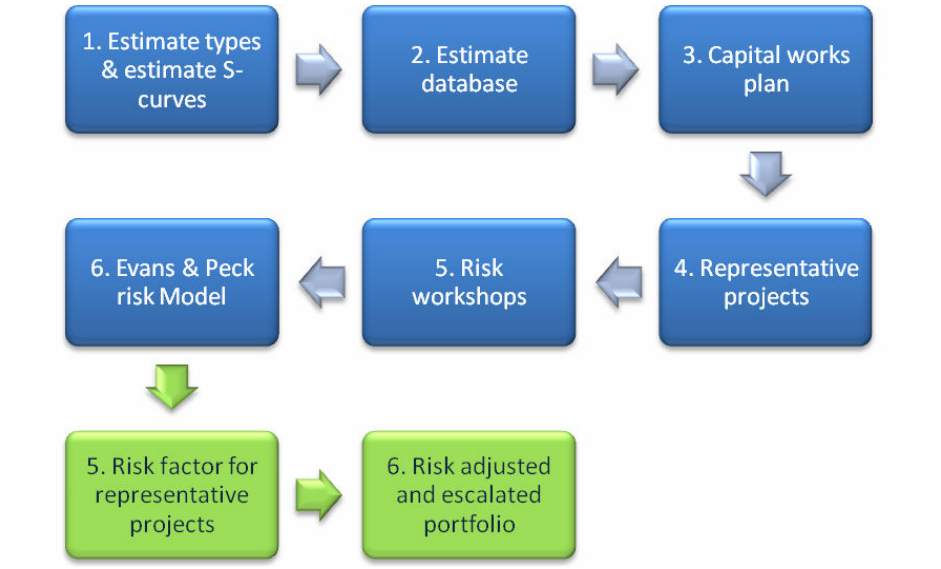
[32] Peter Trueman (Evans & Peck) *Capital works decision making using risk management techniques*, Risk Engineering Conference 2004.

[33] For a summary of risk management assignments undertaken by Evans & Peck refer to *Supplementary Report, Risk review of capital works program,* January 2008 inserted as Appendix A5 in ElectraNet's Revised Revenue Proposal 18 January 2008.

Figure 5.8: Portfolio cost estimation risk model



The results of Evans & Peck's cost estimation risk analysis is inclusion of a 3.13 per cent risk factor across Transend's forecast capital works portfolio. The Evans & Peck report is included in Appendix 25.

5.7 Forecast Capital Expenditure

This section presents Transend's forecast capital expenditure for the forthcoming regulatory control period. The expenditure forecast is the result of applying Transend's forecasting methodology and the key inputs and assumptions described above. In accordance with the requirements of clause 6A.6.7(b)(2) of the Rules, the forecast includes only capital expenditure that has been properly allocated to prescribed transmission services relating to the principles and policies set out in Transend's Cost Allocation Methodology as approved by the AER.

5.7.1 Summary of forecast capital expenditure

A summary of the capital expenditure forecast by category is shown in Table 5.13.

Table 5.13: Capital expenditure forecast by category ($m 2008–09).

Category	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Augmentation	70.8	82.7	29.4	16.1	28.6	**227.6**
Connection	31.5	35.0	37.0	16.5	1.7	**121.8**
Land and easements	0.0	0.0	0.0	10.5	10.3	**20.9**
Asset renewal	29.8	39.4	25.7	62.4	69.3	**226.6**
Physical security/compliance	5.1	2.0	2.4	0.8	0.4	**10.7**
Inventory/spares	9.6	0.4	0.5	0.2	1.0	**11.7**
Operational support systems	4.6	4.8	3.2	3.6	6.1	**22.3**
Total network	**151.4**	**164.2**	**98.3**	**110.2**	**117.5**	**641.6**
Information technology	2.7	5.1	3.6	4.0	5.9	**21.3**
Business support	3.9	4.1	4.5	4.3	1.0	**17.8**
Total non-network	**6.6**	**9.2**	**8.2**	**8.3**	**6.9**	**39.1**
Total	**158.0**	**173.4**	**106.5**	**118.5**	**124.3**	**680.7**

Details of the projects included in the capital expenditure forecast are contained in the templates that accompany this revenue proposal. The templates include the category driver, the location of the proposed asset (identified by project description), and the estimated cost of the proposed asset in accordance with schedule S6A.1.1(1) of the Rules. The categories of prescribed transmission services to which each project relates can be identified by reference to the capital expenditure categories provided in Table 5.1. Table 5.14 summarises the material assets (projects) included in the capital expenditure forecast. For this purpose, material assets (projects) have been taken to mean capital projects with an estimated cost greater than $10 million. It should be noted that a number of these projects commence in the current regulatory control period and that a number are not expected to be completed in the forthcoming regulatory control period. However, some expenditure relating to these projects will be incurred during the forthcoming regulatory control period and therefore must be included in the revenue proposal.

Table 5.14: Forecast capital projects greater than $10 million ($2008–09)

Project description	Estimated total project cost ($m)	Category	Description
Waddamana–Lindisfarne 220 kV transmission line project	153	Augmentation	Establishment of a second 220 kV supply to the southern region of Tasmania
Creek Road Substation redevelopment	33	Renewal	Redevelopment of the substation to sustain the reliability of supply to the greater Hobart area
Norwood–Mowbray 110 kV transmission line project	29	Augmentation	Establishment of a second 110 kV supply to Mowbray Substation to cater for demand growth and improve the security of supply to the Launceston area as requested by Aurora
Hobart eastern shore new 110/33 kV connection site	24	Connection	Establishment of a new 110/33 kV connection site on Hobart's eastern shore to cater for demand growth and improve the reliability of supply as requested by Aurora
Wynyard Substation new 110/22 kV connection site	23	Connection	Establishment of a new 110/22 kV connection site at Wynyard to improve the reliability of supply as requested by Aurora
Newstead Substation new 110/22 kV connection site	21	Connection	Establishment of a new 110/22 kV connection site at Newstead to cater for demand growth and improve the reliability of supply as requested by Aurora
Tungatinah Substation redevelopment	20	Renewal	Redevelopment of the existing substation to sustain the reliability of the transmission system
Penguin Substation new 110/22 kV connection site	19	Connection	Establishment of a new 110/22 kV connection site at Penguin to cater for demand growth and improve the reliability of supply as requested by Aurora
George Town Substation 220 kV security upgrade	18	Augmentation	Reconfiguration of George Town Substation 220 kV to comply with the network performance requirements
Kingston Substation new 110/33 kV connection site	18	Connection	Establishment of a new 110/33 kV connection site in the Kingston area to cater for demand growth and improve the reliability of supply as requested by Aurora
Bridgewater Substation new 110/33 kV connection site	17	Connection	Establishment of a new 110/33 kV connection site in the Bridgewater area to cater for demand growth and improve the reliability of supply as requested by Aurora
Wesley Vale Substation new 110/22 kV connection site	17	Connection	Establishment of a new 110/22 kV connection site at Wesley Vale Substation to cater for demand growth and improve the reliability of supply as requested by Aurora
Palmerston Substation 110 kV redevelopment	14	Renewal	Redevelopment of the existing 110 kV substation to sustain the reliability of the transmission system
Sheffield–Burnie 110 kV transmission line augmentation	14	Augmentation	Augmentation required to cater for demand growth in the north-western region of Tasmania

Project description	Estimated total project cost ($m)	Category	Description
Knights Road–Electrona transmission line replacement	13	Renewal	Replacement of the existing transmission line to sustain the reliability of the transmission system
Kingston–Huon area transmission line augmentation	12	Augmentation	Augmentation of the transmission system south of Hobart to cater for demand growth

Project summaries for augmentation, connection and replacement projects greater than $10 million are included in Appendix 17. This appendix provides a summary of each project, including information regarding the rationale for the project and the feasible alternative project options. The project summaries for each project also identify the capital expenditure objectives described in clause 6A.6.7(a) of the Rules that will be achieved by the implementation of each project.

For the purposes of clause 6A.6.7(b)(4) of the Rules, all augmentation projects included in the capital expenditure forecast are reliability augmentations, excepting the Waddamana–Lindisfarne 220 kV transmission line project which is a market benefit augmentation.

5.7.2 Characteristics of the capital expenditure forecast

Figure 5.9 shows the capital expenditure forecast expressed in terms of percentage capital expenditure by category.

Figure 5.9: Forecast capital expenditure by category

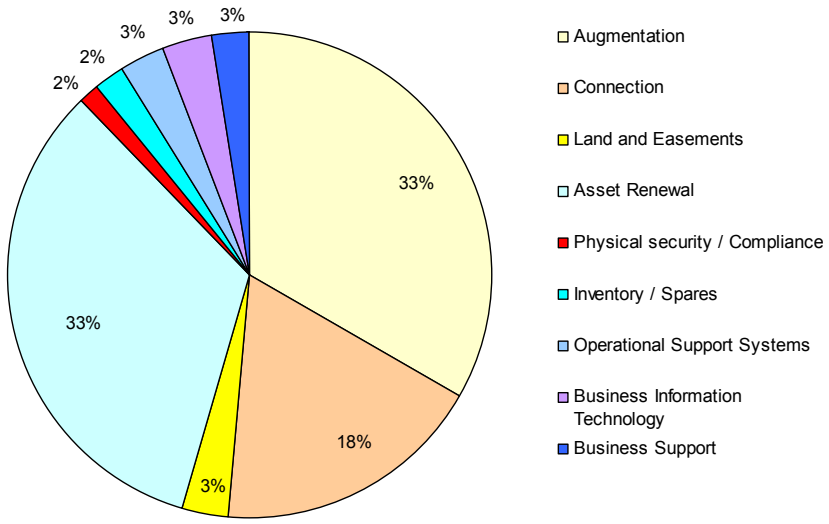


Figure 5.9 shows that the two largest expenditure areas by category are for augmentation and asset renewal projects. The Waddamana–Lindisfarne 220 kV transmission line project is the largest project included in the capital program and comprises approximately

52 per cent of the augmentation capital expenditure for the forthcoming regulatory control period and approximately 17 per cent of the planned total capital expenditure. This project has passed the market benefit limb of the regulatory test and is currently being implemented. It is planned to be completed in the 2010–11 financial year. Other augmentation projects are primarily driven by the need to cater for demand growth and to comply with the network performance requirements.

Analysis of the demand forecast and the joint planning process with Aurora has identified a number of key areas where connection site capacity and capability needs to be increased to meet customer demand. These include the Launceston/Tamar Valley area, Tasmania's south-eastern area, Hobart's southern urban area and the Devonport area. To meet this need, seven new connection sites and modifications to a number of existing connection sites in these areas are required over the forthcoming regulatory control period.

The asset renewal program is a long-term program that comprises a combination of targeted asset replacements and substation redevelopment projects that are critical to sustaining transmission system performance and the reliability of electricity supply to customers. This program is a continuation of the comprehensive asset renewal program that has progressed in the current regulatory control period. A number of asset renewal projects have been deferred from their optimal timing early in the forthcoming regulatory control period, primarily because of access constraints to the transmission system while the Waddamana–Lindisfarne 220 kV transmission line is being constructed.

As discussed in section 5.6.2, a key feature of Transend's capital expenditure forecast is that, once contingent projects are excluded, the augmentation and connection projects identified are independent of the varying generation development assumptions considered in the twelve scenarios modelled as part of the ROAM consulting analysis.

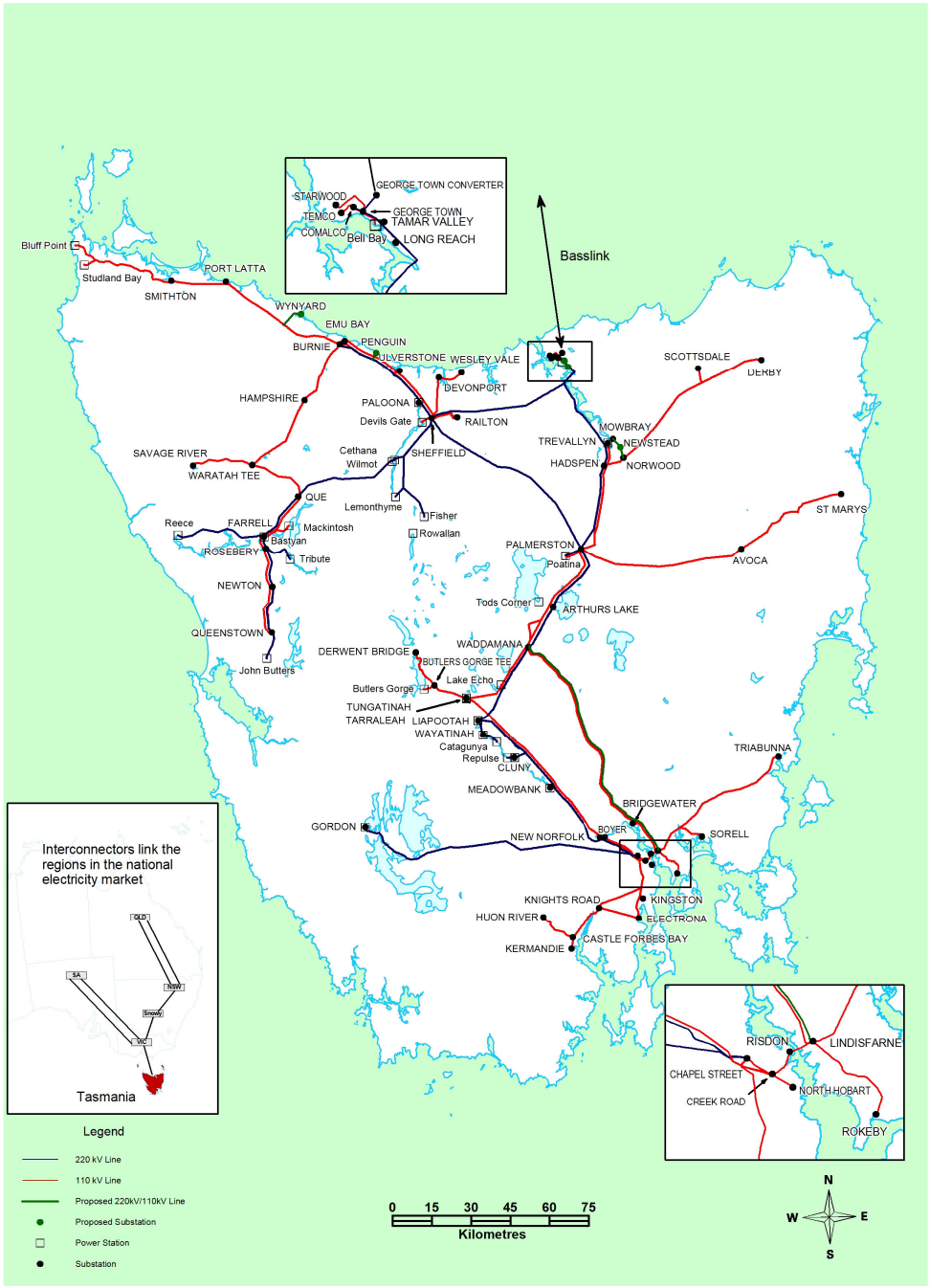
5.7.3 Forecast map of transmission system

Figure 5.10 shows a map of the transmission system for the forthcoming regulatory control period consistent with the requirements of clause 4.3.23 of the submission guidelines. It should be noted that the new major network assets planned for the forthcoming regulatory control period have been identified in Table 5.14, in section 5.7.1. Table 5.15 identifies the transmission lines that will have their ratings modified in the forthcoming regulatory control period, consistent with the requirements of clause 4.3.23(a) of the submission guidelines.

Table 5.15: Transmission line rating modifications for forthcoming regulatory control period

Project description	Existing nominal rating (winter/ summer)	New nominal rating (winter/ summer)	Category	Description
Waddamana–Lindisfarne 220 kV transmission line	104/68 MVA	500/420 MVA	Augmentation	Establishment of a second 220 kV supply point to southern Tasmania
Kingston–Huon area transmission line augmentation	122/104 MVA	177/157 MVA	Augmentation	Augmentation of the transmission system south of Hobart to cater for demand growth
Knights Road–Electrona transmission line replacement	48/41 MVA	101/87 MVA	Asset renewal	Replacement of the existing transmission line to sustain the reliability of the transmission system
Sheffield–Burnie 110 kV transmission line augmentation	86/55 MVA	122/104 MVA	Augmentation	Augmentation required to cater for demand growth in the north-west area

Figure 5.10: Tasmania's forecast electricity transmission system map for the period 2009–14



5.8 Comparison of 2004–09 capital expenditure with 2009–14 forecast

In accordance with schedules S6A1.1(6) and S6A1.1(7) of the Rules, this section presents:

- a comparison of the capital expenditure forecast with historical capital expenditure in the current regulatory control period by category; and
- an explanation of significant variations in the forecast capital expenditure from historical capital expenditure.

The comparison is shown in Table 5.16.

Table 5.16: Comparison of forecast and annual historical capital expenditure ($m 2008–09).

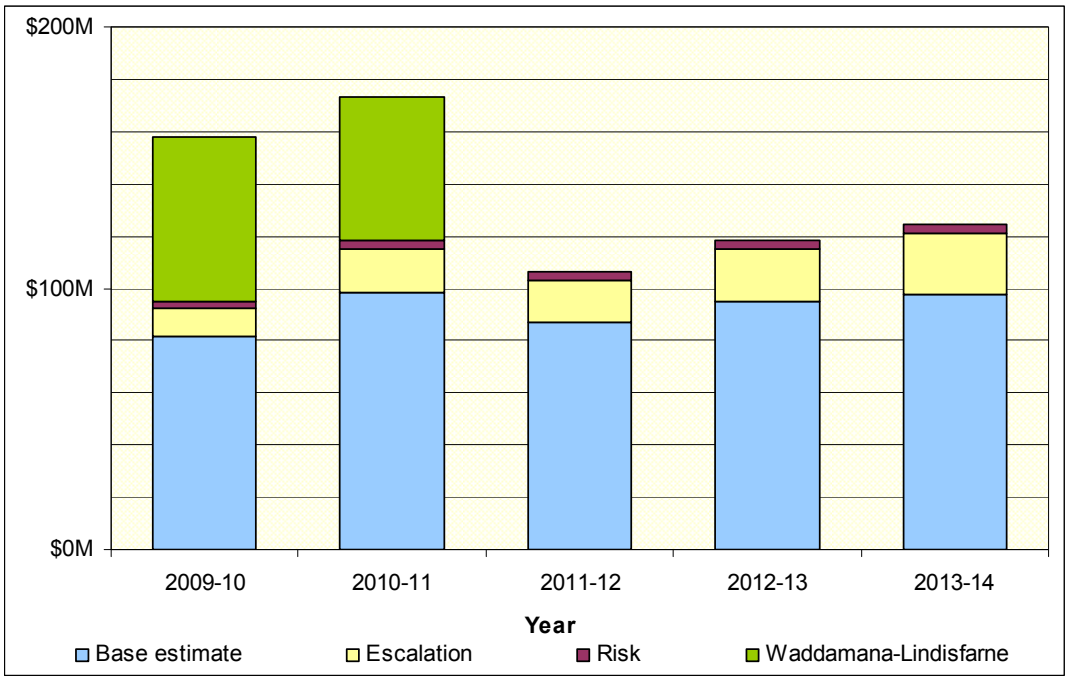
	Jan–Jun 2004	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Augmentation	2.6	15.7	28.4	27.3	16.6	41.3	70.8	82.7	29.4	16.1	28.6
Connection	1.0	3.4	11.3	2.9	1.6	11.2	31.5	35.0	37.0	16.5	1.7
Land and easements	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	10.3
Asset renewal	27.4	47.8	43.4	24.0	41.6	17.8	29.8	39.4	25.7	62.4	69.3
Physical security /compliance	1.8	5.8	7.2	0.8	3.6	21.0	5.1	2.0	2.4	0.8	0.4
Inventory/spares	0.8	-0.5	1.7	0.3	1.6	7.4	9.6	0.4	0.5	0.2	1.0
Operational support systems	2.0	2.7	3.2	1.8	0.0	2.0	4.6	4.8	3.2	3.6	6.1
Total network	**35.5**	**75.1**	**95.2**	**57.1**	**65.0**	**100.7**	**151.4**	**164.2**	**98.3**	**110.2**	**117.5**
Information technology	0.7	1.8	0.8	0.8	2.6	3.9	2.7	5.1	3.6	4.0	5.9
Business support	3.4	7.9	13.9	1.3	3.1	3.3	3.9	4.1	4.5	4.3	1.0
Total non-network	**4.1**	**9.7**	**14.7**	**2.1**	**5.7**	**7.2**	**6.6**	**9.2**	**8.2**	**8.3**	**6.9**
Total	**39.6**	**84.8**	**110.0**	**59.2**	**70.8**	**107.9**	**158.0**	**173.4**	**106.5**	**118.5**	**124.3**

Table 5.17 also compares the average annual forecast and historical capital expenditure by category including explanations of significant variations. As noted previously, the Waddamana–Lindisfarne 220 kV transmission line project is the most significant single reason for the higher capital expenditure requirement in the forecast period. Figure 5.11 indicates the price of work and cost estimation risk impacts on the capital program, with rising costs of labour and materials accounting for a $86.4 million increase in the capital expenditure forecast above $2008–09 levels.

Table 5.17: Comparison of forecast and historical average capital expenditure-as incurred ($m 2008–09)

Capex type	Historical expenditure	Forecast	Explanation of significant variations
Augmentation	24.0	45.5	The construction of the Waddamana–Lindisfarne 220 kV transmission line comprises a major proportion of the augmentation costs
Connections	5.7	24.4	The establishment of new connection sites is required over the forthcoming regulatory control period, leading to a significant increase in expenditure
Land and easements	0.0	4.2	Strategic provision needs to be made for future augmentation and connection developments
Asset renewal	36.7	45.3	Continuance of established asset renewal programs, but with increasing input costs
Physical security/compliance	7.3	2.1	The implementation of the asset security strategy has significantly progressed in the current period reducing the forecast expenditure requirements
Inventory/spares	2.1	2.3	Identified need for additional inventory/ spares holdings and a storage facility
Operational support systems	2.1	4.5	Systems upgrades and developments to meet operational and asset management needs
Total network	**77.9**	**128.3**	
Information technology (IT)	1.9	4.3	New IT systems and developments
Business support	6.0	3.6	Reduced need to establish new systems
Total non-network	**7.9**	**7.8**	
Total	**85.9**	**136.1**	

Figure 5.11: Impact of key cost drivers on the capital expenditure forecast ($m 2008-09)



Cost drivers contributing to higher levels of forecast capital expenditure are both volume of work related and price of work related. The cost drivers contributing to price of work related increases were described in section 5.6 and include wages growth, land value escalation and non-labour construction cost increases. The cost drivers contributing to volume of work related increases are summarised in Table 5.17, and include construction of the Waddamana–Lindisfarne 220 kV transmission line project and new connections for Aurora.

Transend is confident that its capital expenditure forecast is both efficient and prudent and that it meets the capital expenditure objectives set out in the Rules.

5.9 Contingent projects and associated trigger events

This section presents Transend's proposed contingent capital expenditure in accordance with clause 6A.8 of the Rules. All identified contingent projects relate to capital works that may be required to meet the capital expenditure objectives and the provision of prescribed transmission services only.

Based on modelling of Transend's maximum allowed revenue for the first year of the forthcoming regulatory control period, the $10 million threshold for contingent projects will apply for the purpose of this revenue proposal.

Transend has identified proposed contingent projects that:

- support future generation and load flow requirements, where the project is dependent on demonstrating a net market benefit;
- are required in future regulatory control periods (based on current demand forecasts), but would need to be advanced if a step increase in demand of sufficient magnitude occurs in the forthcoming regulatory control period; and
- may be required in the forthcoming regulatory control period, but the scope and cost of the project is uncertain.

The proposed contingent projects are summarised in Table 5.18 and are described in more detail in Appendix 18, including an explanation of how each project satisfies the requirements of clause 6A.8.1 of the Rules. The expected capital expenditure on contingent projects have been developed using similar methodology to Transend's capital expenditure forecast.

Transend has identified specific trigger events that are capable of objective verification as required by the Rules.

Transend notes that it is generally not possible to define accurately the scope of proposed contingent projects at this early stage. Therefore, the proposed contingent projects are described in general terms and the estimated cost of the projects is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER, should the specified trigger event for a proposed contingent project occur during the forthcoming regulatory control period.

Consistent with the requirements of clause 4.3.3(b) of the submission guidelines, the capital expenditure forecast does not include any funding for contingent projects.

Table 5.18: Proposed contingent projects ($m 2008-09)

Project name	Trigger	Indicative cost ($m)
Sheffield–George Town new transmission line	Generator and/or load flow changes in the north-western and/or western regions, leading to successful application of the regulatory test	147
Burnie–Smithton new transmission line	Generator and/or load flow changes in the north-western region, leading to successful application of the regulatory test	85
Sheffield–Farrell new transmission line	Generator and/or load flow changes in the western region, leading to successful application of the regulatory test	80
Sheffield–Burnie new transmission line	Generator and/or load flow changes in the north-western region, leading to successful application of the regulatory test	77
St Helens new 110/22 kV connection site	Load flow in the northern region leading to a DNSP application to connect and successful application of the regulatory test	43
Palmerston–Sheffield 220 kV transmission line augmentation	Generator and/or load flow changes in the north-western and/or western regions, leading to successful application of the regulatory test	22
Waddamana–Lindisfarne 220 kV transmission line second circuit	Demand growth in the southern region, leading to successful application of the regulatory test	22

Project name	Trigger	Indicative cost ($m)
Trevallyn Substation new 220/110 kV injection point	Demand growth in the northern region, leading to successful application of the regulatory test	21
Queenstown Substation security upgrade	Successful application of the regulatory test on the basis of a detail cost benefit assessment (including analysis and discussion with customers at Queenstown and Newton on the long-term plans)	12

5.10 Deliverability of capital expenditure

Transend recognises that the capital expenditure forecast represents a material increase compared to the capital expenditure allowance in the current regulatory control period. Section 5.8 discusses the impact of volume of work and price of work factors contributing to this increase. Transend understands that in assessing the reasonableness of the capital program, the AER will consider whether or not the larger program is deliverable.

Transend has considered how to deliver its future works program efficiently, taking into account market changes and the appropriateness of current resourcing strategies in this changing market. Following extensive consultation with key internal and external stakeholders, including service providers and representatives from national and international transmission companies, Transend has developed a revised resourcing strategy. A key aspect of the revised resourcing strategy is ensuring a sustainable market for service provision in Tasmania.

Transend has implemented or commenced implementation of a range of initiatives, including those arising from the revised resourcing strategies, to ensure that the capital program is delivered prudently and efficiently. As a result, Transend is confident that it can deliver the capital program in the forthcoming regulatory control period. Transend's delivery initiatives are discussed below.

Program management

Transend has recently reviewed its organisation structure. An outcome of this review is the establishment of a Works Planning and Coordination team focusing on capital program management, planning and reporting.

The ability to deliver the capital program is directly influenced by providing a structured program of similar projects to improve resource levels in tightly constrained construction and manufacturing markets. This enables contractors to plan and invest in the resources required for the forecast capital program.

Strengthening internal staffing

There is a need to support the delivery of the capital program by increasing resource levels for the provision of technical advice, contract account management and project support services.

Transend will also continue with its graduate and technical trainee programs to help proactively manage the workload commitments in recognition of the difficulty in recruiting and retaining skilled and experienced people.

Further discussion of these resource requirements is included in section 6.6.

Insourcing of protection and control field-based services

Transend's review of its resourcing model identified that appropriately skilled and experienced protection and control field-based resources are critical and fundamental to sustaining the satisfactory operation of the transmission system. The criticality of this function is further exacerbated over time due to the highly specialised nature and complexity of modern protection and control equipment.

Transend plans to insource this critical function. This will allow Transend to realise the benefits of having this specialist field-based technical capability in-house. Benefits include active participation in the implementation of projects that comprise the capital program.

Establishment of contractor panels

To ensure certainty and efficiency in the project delivery process, Transend is implementing a series of contractor panels. The composition and number of contractors for each panel will be commensurate with the nature, complexity, size and volume of the projects that comprise the capital works program. This approach will ensure the continuance of a sustainable service provision market in Tasmania as well as enabling the selected contractors to plan with certainty and to invest in the people, training and equipment required to undertake the work.

Design standardisation

Transend's designs for both new transmission lines and substations are now substantially standardised, especially in the area of protection and control, switchgear and transformers, towers and conductors. This delivers benefits in terms of outsourcing design work and reduced project durations, with the option for early procurement of long lead-time items.

Equipment and procurement

The lead time for critical transmission system equipment has increased substantially in recent times. It is anticipated that this trend will continue for the foreseeable future. This constraint has the potential to impact adversely on the delivery of the capital program. To mitigate this risk Transend plans to further strengthen its procurement arrangements with key suppliers of long lead time equipment, thereby providing improved certainty with regard to the timing of project delivery.

Transend also plans to upgrade its storage facilities. This will provide infrastructure to facilitate improvements in supply chain management and to house Transend's strategic spares.

5.11 Network support and non-network options

Network support is an alternative to transmission network augmentation. The Rules require the pass through of network support costs subject to the relevant factors set out in clause 6A.7.2.

In January 2005 Transend Networks submitted a pass-through application[34] for network support to the ACCC. The application explained that in the period prior to the commissioning of the new 220 kV supply point (and other associated augmentations) in southern Tasmania, there are two network constraints that need to be addressed through the provision of a network support arrangement. These are the:

- Liapootah–Chapel Street 220 kV transmission lines; and
- Chapel Street–Risdon 110 kV transmission lines.

Following public consultation and submissions, the ACCC wrote to Transend on 8 March 2005[35] concluding that:

> Following careful consideration of your application, the ACCC has decided to allow Transend to recover those costs which are directly related to the network support agreement for Liapootah–Chapel Street.

Transend subsequently extended the network support agreement with Hydro Tasmania, following unavoidable delays in the commissioning of the required augmentations in the southern region of Tasmania. Transend submitted a further pass-through application to the AER in March 2007, which the AER approved noting that Transend had acted prudently in procuring further network support services.[36]

The requirements for network support in the southern region of Tasmania remain fundamentally unchanged. Interim support is still required until the commissioning of the Waddamana–Lindisfarne 220 kV transmission line project, with a forecast network support operating cost included for the first two years of the forthcoming regulatory control period, as noted in section 6.9.1 of this revenue proposal.

5.12 Concluding comments

This chapter has presented Transend's capital expenditure forecast for the 1 July 2009 to 30 June 2014 regulatory control period.

The key cost drivers contributing to higher levels of forecast capital expenditure are both volume of work and price of work related:

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34 Transend's revenue application is available on the AER's website
35 Letter from Sebastian Roberts, ACCC to Stephen Clark, Transend
36 Letter from Chris Pattas, AER, to Michael Green, Transend, dated 27th April 2007

- The Waddamana–Lindisfarne 220 kV transmission line project is a significant investment to provide a secure supply to the southern region of Tasmania. This project has met the requirements of the regulatory test and is currently being implemented.
- Past and future growth in demand, together with the network performance requirements are driving the need for transmission investment to meet mandated reliability standards. For example, a number of new or modified prescribed connection sites are required in the forthcoming regulatory control period.
- Continued investment in renewing the asset base is required, to ensure that transmission system performance accords with mandatory standards and customer expectations.
- Further investment is required to meet requirements associated with the physical security of critical infrastructure.
- Tight supply conditions are driving upward pressure in wages, transmission equipment prices and unit cost of delivering capital projects.

The combined effect of these cost drivers is an increased capital expenditure requirement in the forecast period.

Despite increasing cost pressures, Transend has sought to manage the increase in required capital expenditure by carefully balancing the cost of increased network investment against the increased risk of reliability failures resulting from inadequate investment.

Transend has developed the requirements for network capital expenditure in consultation with Aurora, direct connect customers, generators and the Tasmanian jurisdiction. The capital expenditure forecast represents a continuation of the progress Transend has made in recent years to develop and maintain a reliable and secure transmission system in Tasmania. Transend has a demonstrated capability to manage the planning, development and implementation of the capital expenditure program effectively and efficiently. Transend is confident, therefore, that its capital expenditure forecast is both efficient and prudent and that it meets the required expenditure objectives set out in the Rules.

6 FORECAST OPERATING EXPENDITURE

6.1 Introduction

This chapter presents Transend's forecast operating expenditure for prescribed transmission services for the forthcoming regulatory control period.

As discussed in chapters 3 and 4 of this revenue proposal, Transend has continued to improve the effectiveness and efficiency of all business processes and practices to achieve better cost and performance outcomes. Although these changes will continue to deliver benefits over the forthcoming regulatory period and beyond, there are other drivers that will lead to upward pressure on Transend's operating expenditure requirements in the near to medium term.

In broad terms, the drivers of increased operating expenditure may be characterised as volume of work and cost of work factors. The volume of work is increasing as the asset base grows and the complexity in planning and operating the transmission system also increases. The key drivers in relation to the cost of work relate to labour costs, which are expected to continue to escalate more rapidly than the CPI.

In developing its operating expenditure forecast, Transend has carefully considered:

- the requirements of the Rules, including clause 6A.6.6 and schedule S6A.1.2;
- the requirements of the submission guidelines;
- the compliance obligations and regulatory objectives that Transend must satisfy;
- the operations and maintenance activities required to cost-effectively sustain asset performance; and
- the impact of asset growth on operating and maintenance expenditure requirements.

The remainder of this chapter provides a detailed explanation of Transend's operating expenditure forecasts, and is structured as follows:

- Section 6.2 provides an overview of the Rules relating to the operating expenditure forecast, the interaction between Transend's capital and operating expenditure programs, and Transend's compliance obligations;
- Section 6.3 describes Transend's operating expenditure categories, which are Controllable operating expenditure and Other operating expenditure;
- Section 6.4 explains Transend's operating expenditure forecasting methodology and provides an overview of the resulting expenditure forecast;
- Section 6.5 sets out the key variables and assumptions that affect the operating expenditure forecast;

- Section 6.6 explains the necessary scope changes that will affect Transend's forecast Controllable operating expenditure;
- Section 6.7 explains the zero-based expenditure forecasts that form part of Transend's Controllable operating expenditure;
- Section 6.8 summarises Transend's Controllable operating expenditure forecast;
- Section 6.9 presents Transend's Other operating expenditure forecast;
- Section 6.10 presents Transend's total operating expenditure forecast and compares this forecast with Transend's historical operating expenditure; and
- Section 6.11 provides concluding comments.

6.2 Rules requirements and other compliance obligations

6.2.1 Overview of Rules requirements

Transend is required by clause 6A.6.6 of the Rules to present an operating expenditure forecast for the forthcoming regulatory control period that will achieve each of the following objectives:

- meet the expected demand for prescribed transmission services over that period;
- comply with all applicable regulatory obligations associated with the provision of prescribed transmission services;
- maintain the quality, reliability and security of supply of prescribed transmission services; and
- maintain the reliability, safety and security of the transmission system through the supply of prescribed transmission services.

In addition the forecast of operating expenditure must:

- comply with the requirements of the AER's submission guidelines; and
- only include expenditure that is properly attributable to prescribed transmission services in accordance with the principles and policies set out in Transend's cost allocation methodology.

Schedule S6A.1.2 of the Rules specifies other information that must be provided to explain and substantiate the forecast of required operating expenditure including, amongst other things, an appropriate categorisation of the operating expenditure forecast, the methodology used for developing the forecast and a certification of the reasonableness of the key assumptions by the directors of Transend.

Transend's forecasting methodology for operating expenditure has been developed to ensure that the above objectives and requirements are satisfied in full.

Under clause 6A.6.6(c) of the Rules, the AER must accept the forecast of required operating expenditure that is included in the revenue proposal if it is satisfied that the total of the forecast operating expenditure for the regulatory control period reasonably reflects the following operating expenditure criteria:

- the efficient costs of achieving the operating expenditure objectives;
- the costs that a prudent operator in the circumstances of the relevant TNSP would require to achieve the operating expenditure objectives; and
- a realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.

The information presented in this chapter is intended to assist the AER in its assessment of Transend's operating expenditure forecasts.

6.2.2 Interaction between operating and capital expenditure

Schedule S6A.1.3(1) of the Rules requires the identification and explanation of any significant interactions between the forecast operating expenditure and forecast capital expenditure programs.

Operating and capital expenditure are intrinsically linked and it is essential that the right balance between operating expenditure and capital investment be maintained to prudently and efficiently achieve the operating and capital expenditure objectives. In view of these considerations, and in light of the requirements of schedule S6A.1.3(1) of the Rules, the following information is provided:

- Transend has developed an optimised works program that includes both capital and operating tasks. In particular, the optimisation of the timing and sequencing of asset renewal projects have been carefully considered taking into account a number of factors, including the costs and benefits of aligning the timing for proposed asset renewal with augmentation or connection projects.
- The timely delivery of the capital works program is essential to minimising the likelihood of additional operating expenditure being required to sustain assets beyond their useful service lives.
- New technology delivered through the capital works program, particularly with protection relays and other ancillary equipment that have self-diagnostic and remote monitoring capabilities, has a positive influence on operating expenditure in terms of reducing the need to remove assets from service for the purposes of undertaking planned maintenance.
- A number of projects included in the capital works program will reduce the number of assets to be maintained and provide for more flexible configurations. This will have a positive impact on operating expenditure because the volume of maintenance

will be reduced and the impact of accessing the assets will be simplified, when maintenance is required.

- The impact of asset growth on base-year operating expenditure requirements is discussed in section 6.5.2. The growth-related scaling factors set out in this section reflect the impact of scale economies and the resulting operating expenditure efficiencies.

6.2.3 Performance improvement maintenance programs

Clause 4.3.4(a)(4) of the submission guidelines require Transend to explain the methodology used for determining the cost associated with planned maintenance programs designed to improve the performance of the transmission system for the purposes of the service target performance incentive scheme (STPIS).

Transend has not included any planned maintenance programs specifically designed to improve the performance of the transmission system for the purposes of the STPIS in its operating expenditure forecast. However, Transend's operating expenditure forecast has been developed with appropriate consideration of the objectives of the STPIS.

6.2.4 Compliance obligations

Compliance with regulatory obligations is an important driver of Transend's operating expenditure requirements. In particular, Transend is subject to a wide range of general legislation and regulations, as well as industry-specific instruments that affect operating expenditure requirements. For example:

- general obligations arise from Corporations Law and other corporate governance obligations including the *Workplace Health and Safety Act 1995* and Workcover obligations;
- specific obligations arise from the *National Electricity Law*, the Rules, related regulations, and guidelines issued by the AER and NEMMCO;
- specific jurisdictional obligations arise from the ESI Act and other Tasmanian electricity industry specific acts and regulations including the *Electricity Companies Act 1997*, the *Energy Ombudsman Act 1998*, the *Electricity Wayleaves and Easements Act 2000*, the *Electricity Industry Safety and Administration Act 1997* and the *Tasmanian Electricity Code* (TEC); and
- specific obligations also arise from Transend's transmission licence, which is issued by the Regulator.

The Regulator licences Transend, under section 19 of the ESI Act, to operate as a TNSP in Tasmania.[37] The transmission licence requires Transend to fulfil a number of obligations including:

- preparing plans for asset management (including reliability and performance of the transmission system), vegetation management and emergency management;
- planning, proposing and procuring augmentations required to meet Transend's service obligations, including obligations imposed by network performance requirements;
- publishing an Annual Planning Statement (in addition to the Rules requirement for an APR); and
- retaining the capability to manage power system security for the entire Tasmanian power system.

Further details of the jurisdictional regulatory arrangements and network performance requirements are provided in Appendices 5 and 6. Transend's operating expenditure plans for the forthcoming regulatory period are focused on meeting its compliance obligations and, in turn, the operating expenditure objectives set out in the Rules.

6.3 Operating expenditure categories

6.3.1 Overview of approach

In accordance with schedule S6A.1.2(1) of the Rules, Transend has developed its forecast operating expenditure by reference to well accepted categories. In particular, total operating expenditure is first separated into Controllable operating expenditure and Other operating expenditure. Controllable operating expenditure includes:

- direct operating and maintenance expenditure—costs directly attributable to maintaining and operating the transmission system; and
- other controllable expenditure—cost of activities and services not directly related to maintaining or operating the system, but which provide necessary support functions.

Other operating expenditure comprises network support costs associated with the payment for non-system alternatives to system augmentations, self-insurance, and benchmark debt and equity raising cost allowances.

Figure 6.1 provides a pictorial overview of the expenditure categories.

[37] A copy of Transend's transmission licence can be obtained from the website of the Office of the Tasmanian Energy Regulator, at http://www.energyregulator.tas.gov.au/.

Figure 6.1: Transend's operating expenditure categories

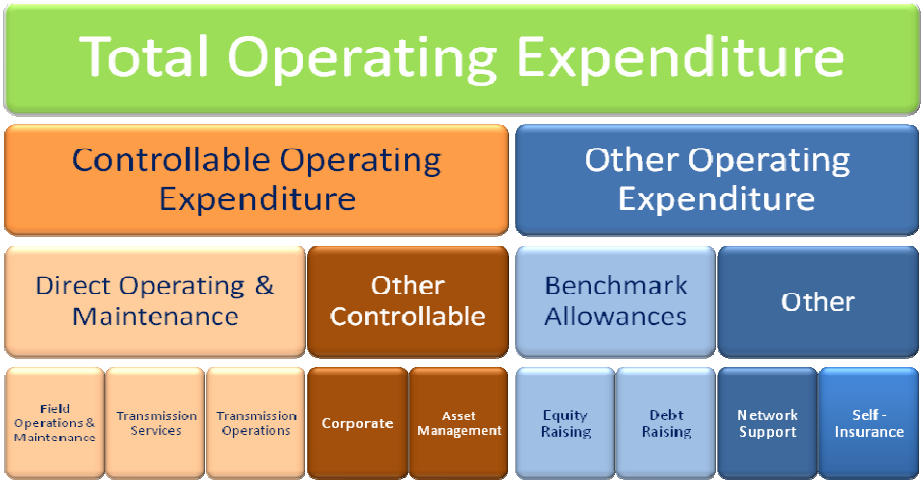


Table 6.1 defines the expenditure categories and the categories of prescribed transmission services to which they relate as required by schedule S6A.1.2(1) of the Rules. Further explanation of the Controllable operating expenditure categories is provided in section 6.3.2.

Table 6.1: Categories of operating expenditure

Expenditure type	Category	Definition	Prescribed transmission services to which this category relates
Controllable Operating Expenditure			
Direct operating and maintenance	Field operations and maintenance	Includes all field-based operations and maintenance functions (planned, condition assessment and corrective). The field maintenance category includes the following sub-categories—substations, protection and control, operational communications, transmission lines and easements.	Prescribed exit services, prescribed entry services, TUOS, common services
	Transmission services	Includes the functions associated with providing engineering and asset services, management of field operating and maintenance contracts, environment and safety management, asset condition monitoring and analysis, works planning and coordination.	Prescribed exit services, prescribed entry services, prescribed TUOS, common services
	Transmission operations	Includes the functions of managing the real-time operation of the Tasmanian power system. This includes planned outage security analysis, power system incident analysis, assessment of power system technical envelope, formation of limit equations for NEMMCO, preparation of switching sheets, coordination of field switching activities and technical support for the NOCS.	Prescribed exit services, prescribed entry services, prescribed TUOS, common services

Expenditure type	Category	Definition	Prescribed transmission services to which this category relates
Other controllable	Asset management	Includes the functions of operational activities that support the development and ongoing management of transmission system assets. This includes asset strategy, customer management, grid planning, project initiation, regulation and compliance, and system modelling and planning.	Prescribed exit services, prescribed entry services, prescribed TUOS, common services
	Corporate	Includes the functions of accounting, administration, audit, business planning, corporate governance, corporate IT, facilities management, finance, human resources, insurance, legal, office of managing director and company secretary, and public relations.	Prescribed common transmission services
Other			
Other operating expenditure	Network support	Payment for cost-effective alternatives to transmission system augmentation.	Prescribed TUOS
	Equity raising	Benchmark equity raising allowance.	Prescribed common transmission services
	Debt raising	Benchmark debt raising allowance.	Prescribed common transmission services
	Self-insurance	Self-insurance allowance	Prescribed common transmission services

In accordance with the requirements of clause 6A.6.6(b)(2) of the Rules, Transend's operating expenditure forecast includes only operating expenditure that has been properly allocated to prescribed transmission services in accordance with the principles and policies set out in Transend's Cost Allocation Methodology as approved by the AER.[38]

Transend's forecast of required operating expenditure does not include any amounts relating to a project that is included as a contingent project under clause 6A.8.1(b).

For the purposes of schedule S6A.1.2(1)(iii) of the Rules, the categories of operating expenditures are considered to be fixed other than network support payments and positive or negative change events that may occur during the forthcoming regulatory control period.

6.3.2 Controllable operating expenditure functions

Approximately 90 per cent of Transend's forecast operating expenditure falls within the Controllable operating expenditure category. As noted above, there are five functions within the Controllable operating expenditure category:

- field operations and maintenance;

[38] Transend, http://www.transend.com.au/Portals/0/costallocationmethodology.pdf , accessed 26 May 2008.

- transmission services;
- transmission operations;
- asset management; and
- corporate.

The remainder of this section provides further information in relation to each of these functions.

Field operations and maintenance

The field maintenance category includes the following sub-categories—substations, protection and control, operational communications, transmission lines and easements. Field operations and maintenance activities account for over one third of Controllable operating expenditure.

Field operations and maintenance activities are categorised as follows:

- planned maintenance is a scheduled activity that is completed to a predetermined scope to ensure the satisfactory on-going performance of the transmission system. Over the forthcoming regulatory control period, Transend's planned maintenance programs are predominantly driven by the objective of meeting the required levels of service and performance;
- field operations include all field switching activities to provide access for planned and corrective maintenance;
- condition assessment includes field inspection and testing of transmission system assets to ascertain their condition; and
- corrective maintenance includes field activities to restore a failed transmission system asset, or component, to a satisfactory operating state.

Transend has outsourced all field operations and maintenance activities since its establishment in 1998. Transend has contracts in place with service providers that have the necessary capability and capacity to perform the work. The majority of contracts are performance-based with some having financial incentives in place. These performance-based provisions have resulted in improved efficiencies.

Field operations and maintenance tasks for transmission system substation, transmission line and protection assets are costed principally using agreed unit rates. The time variable and work practices on which the unit rates are based are regularly reviewed to ensure that service providers maintain a continued focus on driving efficiencies in work processes and practices.

Transend has also undertaken independent benchmarking of certain service provider contracts to ensure that prices under these contracts are competitive and the level of service provided is consistent with industry best practice.

Transmission services

Transmission services comprise the following activities:

- engineering and asset services—compiling and prioritising maintenance work plans; emergency asset contingency plans, fault analysis and restoration processes, asset condition monitoring and analysis, project support and estimation, and contractor management;
- establishment and management of field operating and maintenance contracts—contract negotiation, contract administration, and contract account management;
- environment and safety management—compliance management, field operator accreditation, authorising contractor management plans to ensure safety and environmental systems are in place, and conducting safety and environmental audits of contractors to ensure compliance with their plans; and
- works planning and coordination—integrating the maintenance works plan with the capital program, managing access and outage requirements to undertake planned work, provision of a 13–month outage management plan for market participants, and consulting with customers regarding the timing for outages.

Transmission operations

Transmission operations comprise the following activities:

- real–time monitoring and control of the transmission system—provision of 7-day, 24-hour continuous operation. System operators provide the functions of system control, monitoring, coordination of field switching activities and switching sheet preparation for all plant outages;
- off–line system security support—power system security analysis, power system incident analysis, assessment of power system technical envelope, formation of limit equations for NEMMCO, and undertaking contingency planning; and
- technical support—for NOCS and Supervisory Communications and Data Acquisition (SCADA) systems, including NOCS configuration and maintenance.

Unlike most other TNSPs, this expenditure category includes control of sub-transmission system assets, which requires a high volume of activity including ongoing interface with Aurora. As the interconnected Tasmanian power system increases in size and complexity, the required amount of switching, contingency analysis, support and monitoring increases, driving higher levels of resource and capability requirements.

Asset management

Asset management comprises the following activities:

- grid planning for the transmission system (including system modelling and planning for both the medium and long-term horizons);

- maintenance of asset management strategies and plans, and technical standards;
- project initiation, options analysis, timing, justification and program management for Transend's capital works program;
- monitoring transmission system performance;
- refinement and administration of AMIS;
- customer and connections management; and
- regulation and compliance activities specific to the electricity supply industry.

Corporate

This category includes provision of corporate functions common to a business of Transend's size and complexity, including:

- business planning and governance—board and corporate governance, strategic planning and legal services; and
- business services—services associated with business planning, human resources, financial management, risk management, administration, corporate information technology, facilities management, and public relations.

6.4 Overview of methodology and operating expenditure forecasts

6.4.1 Overview of methodology

In accordance with schedule S6A.1.2(2) of the Rules, this section describes Transend's operating expenditure forecasting methodology. In broad terms, Transend's operating expenditure forecasting methodology follows the approach adopted by the AER in its recent revenue cap decisions. In particular, under the operating expenditure forecasting methodology:

- the audited 2006–07 total operating expenditure is used as a starting point for projecting future operating expenditure requirements; and
- Controllable operating expenditure and Other operating expenditure (network support, insurance, debt and equity raising costs) requirements are forecast separately.

The methodology comprises the following three steps.

Step 1. Derive the Controllable operating expenditure forecast as follows:

a. commence with actual Controllable operating costs for the 2006–07 base-year;

b. deduct non-recurrent operating expenditure items, which are not reflective of future expenditure requirements and should therefore be subject to a zero-based (bottom-up) forecast;

c. add cost of scope changes in the years that the scope change expenditure is forecast to be required;

d. scale up the sub-total annually by using applicable growth factors, which reflect the increase in operating expenditure requirements driven by growth of the business;

e. add to that scaled-up sub-total the forecast non-recurrent operating expenditure for the items deducted in step (b) (using zero-based cost estimates) for each year of the forthcoming period; and

f. scale up the total obtained in step (e) annually by using applicable labour and non-labour escalation factors to derive the forecast of Controllable operating expenditure for the forthcoming regulatory period.

Step 2. Derive the Other operating expenditure forecast as follows:

- Forecasts of each of the four elements (namely network support, self-insurance, debt and equity raising costs) are developed by adopting a separate, forecasting approach appropriate for each element.

Step 3. Derive the operating expenditure forecast as follows:

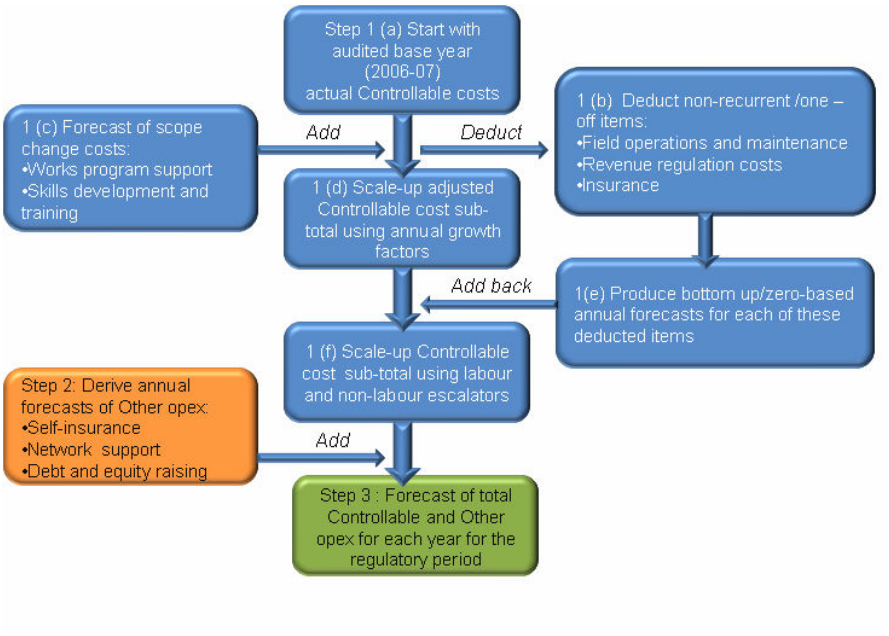
- Controllable operating expenditure and Other operating expenditure annual forecasts are summed to provide the total operating cost forecast for each year of the forthcoming regulatory period.

A pictorial overview of the development of Transend's forecast operating expenditure using the forecasting methodology is illustrated in Figure 6.2. Further detailed explanations of the assumptions, variables and analysis underpinning the forecasts are provided in sections 6.5, 6.6 and 6.7.

6.4.2 Overview of operating expenditure forecasts

Figure 6.2 illustrates Transend's application of the forecasting methodology steps described in section 6.4.1 for the forthcoming regulatory control period.

Figure 6.2: Transend's operating expenditure forecasting methodology



Tables 6.2 to 6.8 provide details of Transend's operating expenditure forecasts for the key steps in the forecasting methodology. This approach allows stakeholders to understand the application of the forecasting methodology and the derivation of Transend's actual forecasts.

Table 6.2 shows the audited base year Controllable operating expenditure for 2006–07, expressed in $2008–09.

Table 6.2: Step 1–Base year Controllable operating expenditure 2006–07 ($m 2008–09)

Category	2006–07
Field operations and maintenance	15.1
Transmission services	6.5
Transmission operations	4.7
Asset management	5.4
Corporate	8.1
Total Controllable	39.7

Table 6.3 shows the adjustments made to the Controllable operating expenditure in Table 6.2 by deducting non-recurrent operating expenditure items, which are either one-off costs or costs that should be subject to a zero-based (bottom-up) forecast. In particular, Table 6.3 shows that field operations and maintenance is subject to a zero-based forecasting approach. Regulatory and insurance costs are also subject to a separate forecasting approach.

In broad terms, the rationale for adopting a zero-based forecasting approach is that the base year cost does not reasonably reflect future recurrent expenditure requirements. For example, revenue regulation costs have been removed from the base-year because they are cyclical in nature and do not occur in all years of the regulatory control period. Insurance costs can also be cyclical in nature, reflecting changes in market conditions. The rationale for adopting a zero-based approach to estimate field operations and maintenance is more complex, and a detailed explanation for this approach is provided in section 6.7.

Table 6.3: Step 1(b) – Adjustments to base year operating expenditure derive recurrent Controllable operating expenditure 2006–07 ($m 2008–09)

Category	2006–07	Adjusted	Comments
Field operations and maintenance	15.1	0.0	Remove
Transmission services	6.5	6.5	no change
Transmission operations	4.7	4.7	no change
Asset management	5.4	4.4	Remove regulatory costs
Corporate	8.1	7.2	Remove insurance
Total expenditure	**39.7**	**22.8**	

Table 6.4 presents Transend's forecast scope changes for the forthcoming regulatory control period. This corresponds to step 1(c) in the flowchart of the forecasting methodology shown in Figure 6.2. These scope changes are allocated to the relevant Controllable operating expenditure categories in the years that the scope change expenditure is forecast to be required.

Table 6.4: Step 1(c) – Forecast cost of scope changes ($m 2008–09)

Item	2009–10	2010–11	2011–12	2012–13	2013–14
Works program support	3.1	2.9	2.6	2.5	2.5
Skills development and training	0.2	0.2	0.2	0.2	0.2
Total expenditure	**3.3**	**3.1**	**2.8**	**2.7**	**2.7**

Table 6.5 presents Transend's forecast of the non-recurrent Controllable operating expenditure items that were previously removed from the base year as shown in Table 6.5. This corresponds to step 1(e) in the flowchart shown in Figure 6.2 (to simplify the exposition, step 1(d) is not shown separately here).

Table 6.5: Step 1(e) – Non-recurrent Controllable operating expenditure forecast ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14
Field operations and maintenance	15.9	16.7	16.7	16.8	17.4
Insurance premiums	0.9	1.0	1.1	1.2	1.3
Revenue regulation	0.2	0.2	1.6	3.1	2.1
Total Operating expenditure	**17.0**	**17.9**	**19.4**	**21.2**	**20.8**

Table 6.6 summarises Transend's forecast total Controllable operating expenditure for the forthcoming regulatory control period. As explained in section 6.4.1 this forecast includes the expected cost impacts of asset growth (step 1(d) in the forecasting methodology), and labour and non-labour escalation rates (step 1(f) in the methodology). Further details on the estimation and application of these variables are provided in section 6.5 of this chapter.

Table 6.6: Conclusion of Step 1 – Total Controllable operating expenditure forecast ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14
Field operations and maintenance	16.4	17.5	17.9	18.3	19.3
Transmission services	7.8	8.1	8.4	8.7	9.0
Transmission operations	5.1	5.3	5.5	5.7	5.9
Asset management	6.6	6.9	8.5	10.5	9.7
Corporate	9.9	10.0	10.1	10.5	10.9
Total expenditure	**45.7**	**47.9**	**50.3**	**53.7**	**54.8**

Table 6.7 presents Transend's forecast of Other operating expenditure, which includes network support, self-insuance, debt and equity raising costs. This corresponds to step 2 in the operating expenditure forecasting methodology.

Table 6.7: Step 2 – Other operating expenditure forecasts ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14
Network support	3.9	2.6	0.0	0.0	0.0
Debt raising	0.9	1.0	1.1	1.2	1.2
Equity raising	2.4	2.4	2.4	2.4	2.4
Self-Insurance	0.8	0.8	0.8	0.8	0.8
Total Operating expenditure	**8.0**	**6.8**	**4.3**	**4.3**	**4.4**

Table 6.8 summarises Transend's total operating expenditure forecast for the forthcoming regulatory control period. This represents step 3 in the methodology, which sums the Controllable operating expenditure (derived in step 1) and Other operating expenditure forecasts (derived in step 2) presented in Table 6.6 and Table 6.7.

Table 6.8: Step 3 – Total operating expenditure forecasts ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14
Field operations and maintenance	16.4	17.5	17.9	18.3	19.3
Transmission services	7.8	8.1	8.4	8.7	9.0
Transmission operations	5.1	5.3	5.5	5.7	5.9
Asset management	6.6	6.9	8.5	10.5	9.7
Corporate	9.9	10.0	10.1	10.5	10.9
Total Controllable expenditure	**45.7**	**47.9**	**50.3**	**53.7**	**54.8**
Network support	3.9	2.6	0.0	0.0	0.0
Debt raising	0.9	1.0	1.1	1.2	1.2
Equity raising	2.4	2.4	2.4	2.4	2.4
Self-insuance	0.8	0.8	0.8	0.8	0.8
Total Operating expenditure	**53.7**	**54.7**	**54.6**	**58.0**	**59.2**

6.5 Key variables and assumptions for the forthcoming regulatory control period

This section describes the key variables and assumptions that underpin Transend's operating expenditure forecast for the forthcoming regulatory control period. Transend notes that it is a requirement of schedules S6A.1.2(3) and (5) of the Rules to provide this information in its revenue proposal.

The key assumptions and variables that underpin Transend's operating expenditure forecasts are:

- the assumption that 2006–07 base-year costs are efficient, and therefore provide a reasonable basis for projecting future operating expenditure requirements;
- Transend's assessment of the cost impact of asset growth on operating expenditure; and
- Transend's estimation of labour and non-labour operating expenditure input escalation rates for the forthcoming regulatory control period.

Each of these matters is discussed in turn below. It is also noted that further detailed information supporting Transend's operating expenditure forecast is provided in sections 6.6 and 6.7 of this chapter. In accordance with schedule S6A.1.2(6) of the Rules, Transend's directors have provided a certification of the reasonableness of the key assumptions in Appendix 1.

6.5.1 Efficient base year

Transend selected the 2006–07 financial year as the base-year for determining the recurrent expenditure component of the Controllable operating expenditure forecast because it is the most recent financial year for which audited financial accounts are available. This approach is consistent with recent AER decisions.

As noted in section 6.4.1, the forecasting methodology adopted by Transend is consistent with regulatory best practice and broadly reflects the approach adopted by the AER in recent decisions. An implicit assumption in this forecasting approach is that the 2006–07 expenditure represents an efficient level from which to project future costs. Transend's strongly held view is that the financial incentive to minimise operating expenditure provides reasonable assurances that the base year expenditure is efficient. This inferential approach to regulation has been adopted extensively by the Essential Services Commission in Victoria.

Notwithstanding the inferences that can reasonably be drawn from the regulatory framework, it is also possible to benchmark Transend's operating expenditure against its peers. The results of recent benchmarking studies support the view that Transend's 2006–07 financial year is an appropriate basis from which to forecast Controllable operating expenditure. Benchmarking from PB which is included as Appendix 23, and the 2007 ITOMS results support this conclusion.

6.5.2 Asset growth scaling factors

As noted earlier, it is appropriate for Transend's operating expenditure forecast to take into account the cost impact of a growing transmission system. In broad terms the increase in Transend's regulatory asset base creates a growing demand for operating services. Given the requirements of clause 6A.6.6(c)(3) of the Rules, it is important to take account of this increase in demand in developing Transend's operating expenditure forecast. The approach adopted by Transend for this purpose is consistent with that applied in recent AER decisions.

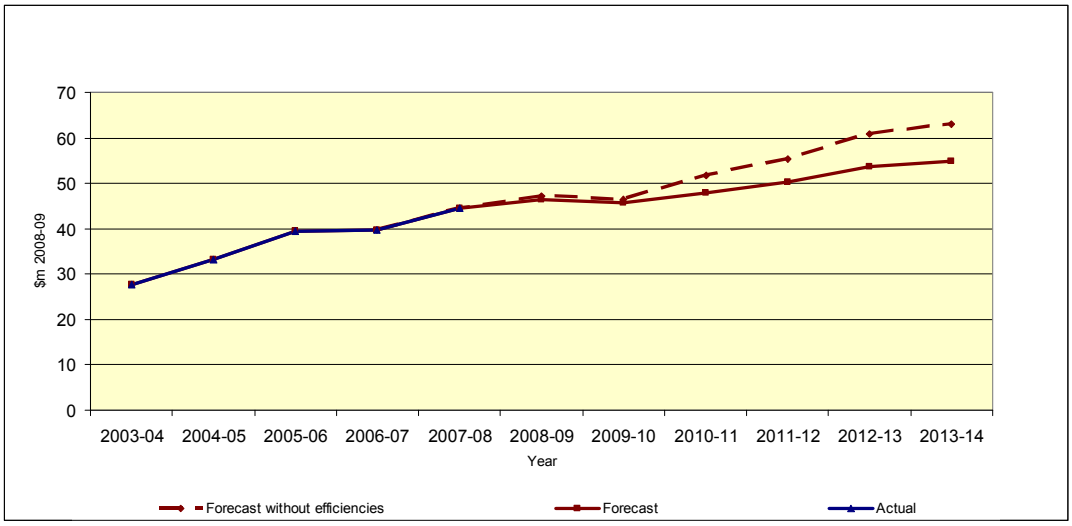
It is widely accepted that asset growth does not result in a one-for-one increase in operating expenditure. This is because transmission businesses are able to realise the benefits of economies of scale, where marginal costs are lower than average costs. The extent of scale economies differs across expenditure categories. Transend has exercised its experience and judgement in developing economies of scale factors for each of the expenditure categories, as shown in Table 6.9.

Table 6.9: Economy of scale factors for asset growth

Activity	Scale factor (%)	Rationale
Field operations and maintenance	N/A	This function is subject to zero-based forecasting, and therefore scale factors are not applied.
Transmission services, Transmission operations and Asset management	25	Economies of scale are possible for the existing scope of work through efficient management of this activity.
Corporate	10	Economies of scale are possible for the existing scope of work through efficient management of this activity.

The economies of scale factors described produce operating expenditure savings as illustrated in Figure 6.3.

Figure 6.3: Effect of efficiencies on Controllable operating expenditure ($m 2008–09)



6.5.3 Labour and non-labour escalation rates

Labour escalation

Labour cost increases have a significant influence on Transend's operating expenditure forecast. Wages growth has been strong in the current regulatory control period, particularly in the latter years, and this is expected to continue well into the future.

As noted in section 5.6, Transend engaged CEG[39] to provide forecasts of real unit labour cost movements for the purpose of preparing this revenue proposal.

CEG recommends that movements in AWOTE for EGW sector be used for the purposes of estimating wage increases in Transend's operating expenditure forecast. In CEG's opinion, an average of the Econtech and Macromonitor escalation factors for AWOTE provides an appropriate estimate of labour cost escalation in the Tasmanian EGW sector. The average labour cost escalation factors are provided in Table 6.10.

Table 6.10: Wages growth forecast for Tasmania EGW sector (per cent real, year ending December)

	2007 (a)	2008 (e)	2009 (f)	2010 (f)	2011 (f)	2012 (f)	2013 (f)
TAS EGW labour growth	3.2	2.7	3.6	3.3	2.9	3.5	3.9

Note: (a) actual (e) estimate (f) forecast

The wages growth forecast in Table 6.10 is applied to both internal and external labour components of Transend's operating expenditure forecast.

Non-labour escalation

Non labour operating components are assumed to increase in line with the CPI.

6.6 Controllable operating expenditure – scope changes

Transend has identified two areas where material scope changes from the adjusted base year activities are required in order to enable it to meet the operating expenditure objectives over the forthcoming regulatory control period, namely:

- works program support; and
- skills development and training.

Each of these scope changes is addressed in turn below.

6.6.1 Works program support

Section 5.10 discussed the need for Transend to implement strategies to deliver the works program efficiently, including improvements to medium and long-term system planning, with a particular emphasis on supporting the implementation and ongoing review of the Grid Vision project. The recently completed resourcing strategy also identified a need to improve certain aspects of strategic asset management functions.

Additional engineering, technical and commercial expertise, and resources are required to deliver the increased scope of work associated with a more complex works program that

[39] CEG report, *Escalation factors affecting expenditure forecasts,* April 2008.

appropriately considers the long–term needs of the transmission system. This scope change includes additional resources to undertake the following functions:

- strategic system planning, including economic analysis, to ensure the needs of transmission customers are met and that augmentation projects take into account the long-term needs of the transmission system;
- increased mid-term system planning activities and supporting documentation;
- project definition, detailed scoping and estimation for the increased volume of capital projects;
- establishment of dedicated contract account managers to oversee major operating and maintenance contracts, major equipment procurement and contractor panels associated with efficient delivery of the necessary works program;
- other costs associated with a more complex operational environment and increased volume of works including those for customer; and
- inventory and works program management, and works coordination and planning.

The additional forecast expenditure for the remainder of this regulatory control period and the forthcoming regulatory control period includes sufficient provision to ensure that Transend is able to prudently and efficiently meet its present obligations.

The efficiency of the proposed expenditure is supported by the comparative benchmarking study undertaken by PB for 2006–07. This study identified that Transend's 2006–07 Controllable operating expenditure on asset management and corporate costs is low relative to other TNSPs. This benchmarking outcome supports Transend's view that current resourcing levels in this area are not sustainable to support the works program efficiently in forthcoming regulatory control periods.

The operating expenditure forecast for the works program support scope change is provided in Table 6.11.

Table 6.11: Works program support operating expenditure forecast ($m 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Works program support	3.1	2.9	2.6	2.5	2.5	13.5

6.6.2 Skills development and training

The Australian Government through the Department of Employment and Workplace relations notes that skill shortages exist in all sectors of Australian industry, particularly within the engineering and electrical trades.[40] The skills shortage has been highly evident

[40] Department of Education, Employment and Workplace Relations, State and Territory Skills in Demand Lists –Tasmania http://www.workplace.gov.au/NR/rdonlyres/61794C3D-3BBA-4172-AFA4-EA953C7EA76B/0/TASskillshortagelist.pdf, May 2008, accessed 27 May 2008.

in Tasmania, as Transend has made national and international searches for suitably qualified and skilled staff.

Transend has implemented strategies to attract, develop and retain its staff through the establishment of specific development and training strategies that include graduate engineer development programs, technical traineeships and sponsorship of university graduates. Despite these initiatives, an increased focus in this area is required in the forthcoming regulatory control period to ensure that Transend has access to appropriately skilled staff both now and into the future.

The operating expenditure forecast for the skills development and training scope change is provided in Table 6.12.

Table 6.12: Skills development and training operating expenditure forecast ($m 2008–09)

	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Skills development and training	0.2	0.2	0.2	0.2	0.2	1.1

6.7 Controllable operating expenditure - zero-based forecasts

As explained in section 6.4.2, Transend has used a zero-based approach for forecasting operating expenditure associated with field operations and maintenance, insurance premiums and regulatory costs. This section details operating expenditure forecasts for each of these activities for the forthcoming regulatory control period.

6.7.1 Field operations and maintenance

In 2007, Transend implemented a consolidated works planning system that registers the long-term operating and capital works plans for transmission lines, substations, and protection and control assets. The works planning system delivers a single, integrated mechanism for registering every preventive and corrective work task. It also includes works associated with capital projects. The inclusion of forecast capital projects in the works planning system allows Transend to plan and optimise its works plan efficiently, taking into consideration asset replacements and additions, asset management strategies and practices and individual asset requirements.

The development of the works planning system included a detailed re-evaluation of the discrete work tasks performed on individual asset categories, and has led to considerable change to the nature and description of planned maintenance and condition assessment activities (work tasks) required to maintain asset performance. The new approach introduces significant efficiencies in administering the works planning process.

The detailed bottom-up approach to works planning using the new planning tool results in a field operations and maintenance expenditure profile that takes into account asset growth from a field operations and maintenance perspective and takes full advantage of efficiency gains through optimisation of work tasks. The resulting expenditure profile varies from year-to-year, based on forecast assets and optimal work timing. Expenditure forecasts also take account of changes to forecast decommissioning costs and operational telecommunications costs associated with existing and new assets.

Transend is presently in commercial negotiations with its operational telecommunications service provider, and will provide revised costs for this function if these negotiations result in materially different costs for the forthcoming regulatory control period.

The operating expenditure forecast for the field operations and maintenance activity is provided in Table 6.13.

Table 6.13: Field operations and maintenance forecast ($m 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Field operations and maintenance	16.4	17.5	17.9	18.3	19.3	89.5

6.7.2 Insurance premiums

Insurance cost estimates are provided to Transend through an insurance broking company. As insurance costs are highly dependent upon market conditions (and vary accordingly over time), Transend has sourced its forecast insurance premiums from a qualified insurance broker. The report is provided as Appendix 20.

The forecast insurance premiums have been calculated by taking into account Transend's claim history, risk profile and business growth. The forecast insurance premiums are set out in Table 6.14.

Table 6.14: Forecast insurance premiums ($m 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Insurance	0.9	1.0	1.1	1.2	1.3	5.7

6.7.3 Revenue regulation costs

The costs of Transend's revenue regulation and associated regulatory functions are cyclical, reflecting the timing and varying resource requirements to meet Rules obligations associated with the revenue regulation process. To ensure that the forecast operating expenditure properly reflects an appropriate estimate of revenue regulation costs, and the likely profile of operating expenditure, Transend has adopted a zero-based approach to forecasting this expenditure.

The forecast revenue regulation costs are set out in Table 6.15.

Table 6.15: Forecast revenue regulation costs ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Revenue regulation	0.2	0.2	1.7	3.6	2.4	8.2

6.8 Summary of Controllable operating expenditure forecast

Table 6.16 summarises the Controllable operating expenditure forecast for the forthcoming regulatory control period.

Table 6.16: Total Controllable operating expenditure forecast ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Field operations and maintenance	16.4	17.5	17.9	18.3	19.3	**89.5**
Transmission services	7.8	8.1	8.4	8.7	9.0	**42.0**
Transmission operations	5.1	5.3	5.5	5.7	5.9	**27.5**
Asset management	6.6	6.9	8.5	10.5	9.7	**42.2**
Corporate	9.9	10.0	10.1	10.5	10.9	**51.3**
Total Controllable	**45.7**	**47.9**	**50.3**	**53.7**	**54.8**	**252.3**

6.9 Other operating expenditure forecast

As explained in section 6.3, the Other operating expenditure cost category comprises costs for network support, debt and equity raising, and self-insurance. As noted in section 6.4, the forecast expenditure for all these inputs is zero-based. Transend's forecast for each of these elements is discussed in turn and summarised in Table 6.22 at the conclusion of this section.

6.9.1 Network support

Network support is an alternative to transmission network augmentation. The Rules require the pass through of network support costs subject to the relevant factors set out in clause 6A.7.2.

Transend requires network support services to manage two existing transmission system constraints:

- the Liapootah–Chapel Street 220 kV transmission lines; and
- the Chapel Street–Risdon 110 kV transmission lines.

Network support for these constraints is contracted through Hydro Tasmania, which provides both real and reactive power to support the reliability and security of the southern regional load.

As discussed in section 5.11, the ACCC and the AER have previously examined the proposed network support and found that the expenditure is prudent. Under the Rules framework, network support pass-through adjustments will be made for the difference between allowed and actual network support payments. Transend's network support requirement is shown in Table 6.17.

Table 6.17: Network support costs ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Network support costs	3.9	2.6	0	0	0	6.6

6.9.2 Debt raising costs

To raise debt, a company has to pay debt financing costs or transaction costs over and above the debt margin allowed in the cost of capital. Such costs tend to vary between each debt issue and depend on market conditions.

In its previous decision, the AER has allowed benchmark debt raising costs based on a methodology developed by the Allen Consulting Group (ACG).[41] Transend engaged CEG to review this methodology and to conduct a comprehensive survey of the empirical literature relating to the costs of raising capital. CEG concluded that the cost of raising debt should be at least equal to 15.5 basis points per annum of the amount of debt to be raised. CEG's report sets out full details of the evidence and analysis underpinning this conclusion. The report is attached as Appendix 19.

Transend has adopted CEG's advice to calculate its debt raising allowance which is shown in Table 6.18.

Table 6.18: Benchmark debt raising costs ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Debt raising costs	0.9	1.0	1.1	1.2	1.2	5.4

6.9.3 Equity raising costs

The AER's approach to estimating a benchmark allowance for equity raising costs distinguishes between two components:

- an allowance in respect of the initial asset base; and
- an allowance in respect of equity to be raised to finance the proposed capital expenditure program.

[41] AER Draft Decision, *Powerlink Queensland transmission revenue cap 2007–08 to 2011–12, 8 December 2006*, p104–105.

In relation to the first component, the AER and its predecessor, the ACCC, have made a number of different decisions since the draft Statement of Regulatory Principles was published in May 1999. In particular, the AER's approach to this issue has developed and changed in recent years, particularly in response to expert advice from Allen Consulting Group (ACG).

It is important to note that the ACCC's 2003 revenue cap decision for Transend stands apart from other ACCC decisions at that time by disallowing Transend's proposed equity raising costs. In its most recent revenue cap decisions for ElectraNet and SP AusNet, the AER has accepted further clarifying advice from ACG that equity raising costs should be allowed in respect of the initial asset base. It should be noted that Transend's circumstances prior to the ACCC's 2003 revenue cap decision were identical to those of ElectraNet and SP AusNet.

In light of these recent AER decisions, Transend's view is that it should now be treated on a comparable basis to SP AusNet and ElectraNet in relation to the recovery of equity raising costs. In particular, there is no reasonable basis for the AER continuing to disallow Transend's recovery of equity raising costs in respect of Transend's initial asset base.

As noted above, the second component of the benchmark equity raising cost allowance relates to the costs of financing the future capital expenditure program. In relation to this component, Transend has employed a methodology that is consistent with that applied by the AER in its recent revenue cap decisions to determine the amount of new equity that would be required to be raised by Transend (assuming the benchmark capital structure applies) to fund its proposed capital expenditure.

In relation to the estimated cost of raising equity, Transend engaged CEG to conduct a comprehensive survey of the empirical literature relating to the costs of raising capital.

CEG concluded that the cost of raising equity should be set at 7.6 per cent of the amount of equity to be raised. CEG's report sets out full details of the evidence and analysis underpinning this conclusion, as well as details of the calculation of Transend's proposed equity raising costs in relation to the forecast capital expenditure for the forthcoming regulatory control period. The CEG report is attached as Appendix 19.

Based on the analysis and calculations set out in the CEG report, Transend's equity raising allowance is shown in Table 6.19.

Table 6.19: Benchmark equity raising costs ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Equity raising costs	2.4	2.4	2.4	2.4	2.4	12.0

6.9.4 Self-insurance allowance

Clause 4.3.21 of the submission guidelines details the information that must be provided in relation to proposed self-insurance costs for the forthcoming regulatory control period. In accordance with these requirements, Transend's board has resolved to self-insure against the following specific risks:

- network related events greater than $20,000 as defined below:
  - losses for which insurance is commercially unavailable or excluded under a policy of insurance (for example damage to transmission lines);
  - loss events for insured risks below the existing liability and property insurance policy deductible;
  - costs incurred through emergency actions to mitigate losses; and
- non-network property risks such as vandalism, theft and damage (loss events for insured risks below existing insurance policy deductibles).

Transend engaged Marsh Risk Consulting Services to undertake an actuarial assessment to calculate the above risks and the corresponding self-insurance premium.

The total self-insurance premium is shown in Table 6.20. The Marsh Risk Consulting Services report attached as Appendix 21 to this revenue proposal includes full details of the amounts, values and other inputs used to calculate this proposed premium and an explanation of the calculations involved. The board resolution to self-insure is also attached as Appendix 22.

Table 6.20: Self-insurance allowance ($m 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Self-insurance allowance	0.8	0.8	0.8	0.8	0.8	3.9

6.9.5 Summary of other operating expenditure forecasts

Table 6.21 sets out a summarises Transend's forecast of Other operating expenditure.

Table 6.21: Transend's Other operating expenditure ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Network support	3.9	2.6	0.0	0.0	0.0	**6.6**
Debit raising allowance	0.9	1.0	1.1	1.2	1.2	**5.4**
Equity raising allowance	2.4	2.4	2.4	2.4	2.4	**12.0**
Self-insurance	0.8	0.8	0.8	0.8	0.8	**3.9**
Total	**8.0**	**6.8**	**4.3**	**4.3**	**4.4**	**27.9**

6.10 Total operating expenditure forecasts and historical analysis

6.10.1 Summary of total operating expenditure forecasts

Transend's total operating expenditure forecast is summarised in Table 6.22. The forecast reflects the assumptions, variables and analysis presented in the earlier sections of this chapter.

Table 6.22: Transend's operating expenditure forecast ($m 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Field operations and maintenance	16.4	17.5	17.9	18.3	19.3	89.5
Transmission services	7.8	8.1	8.4	8.7	9.0	42.0
Transmission operations	5.1	5.3	5.5	5.7	5.9	27.5
Asset management	6.6	6.9	8.5	10.5	9.7	42.2
Corporate	9.9	10.0	10.1	10.5	10.9	51.3
Total Controllable	**45.7**	**47.9**	**50.3**	**53.7**	**54.8**	**252.3**
Network support	3.9	2.6	0.0	0.0	0.0	6.6
Debt raising costs (Benchmarked allowance)	0.9	1.0	1.1	1.2	1.2	5.4
Equity raising costs (benchmarked allowance)	2.4	2.4	2.4	2.4	2.4	12.0
Self-insurance	0.8	0.8	0.8	0.8	0.8	3.9
Total	**53.7**	**54.7**	**54.6**	**58.0**	**59.2**	**280.2**

6.10.2 Comparison of forecast and historical expenditure

Transend is forecasting an increase in operating expenditure compared to historical levels. In broad terms, the forecast increase in operating expenditure reflects the combined effect of projected increases in both the volume and the price of the efficient and prudent operating activities over the forthcoming regulatory period.

In accordance with schedule S6A1.2 (8) of the Rules, this section presents:

- a comparison of the operating expenditure forecast with historical operating expenditure in the current regulatory control period by category; and
- an explanation of significant variations in the forecast operating expenditure from historical operating expenditure.

In the ACCC's 2003 revenue cap decision[42], Transend's operating expenditure allowance was categorised as a single line item, as recommended by the ACCC's consultant, plus allowances for energy metering[43] and debt raising costs. The operating expenditure categories for the forthcoming regulatory control period have been determined in accordance with the AER's submission guidelines. The operating expenditure for the current regulatory control period has also been presented in line with these new categories, consistent with the requirements of clause 4.3.3(6) of the submission guidelines.

A comparison between forecast and historical Controllable operating costs is shown in Table 6.23.

[42] ACCC Decision, *Tasmanian Transmission Revenue Cap 2004 – 2008/09*, 10 December 2003, p 72.

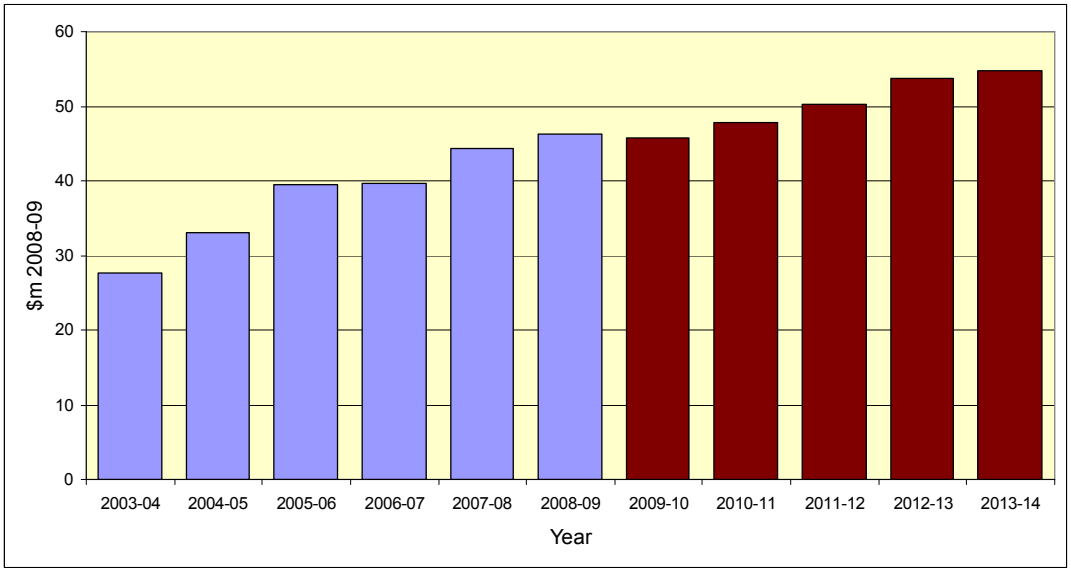
[43] Energy metering costs were considered separately because of uncertainty regarding the future NEM requirements at that time.

Table 6.23: Comparison of forecast and historical Controllable expenditure ($m 2008–09)

Category	Jan–Jun 2004	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Field operations and maintenance	7.1	14.6	13.7	15.1	16.4	16.3	16.4	17.5	17.9	18.3	19.3
Transmission services	2.1	5.2	6.8	6.5	6.6	7.3	7.8	8.1	8.4	8.7	9.0
Transmission operations	1.0	2.8	6.4	4.7	4.8	4.9	5.1	5.3	5.5	5.7	5.9
Asset management	1.8	4.1	4.3	5.4	8.3	8.2	6.6	6.9	8.5	10.5	9.7
Corporate	3.3	6.4	8.3	8.1	8.3	9.5	9.9	10.0	10.1	10.5	10.9
Total Controllable	**15.2**	**33.1**	**39.5**	**39.7**	**44.4**	**46.3**	**45.7**	**47.9**	**50.3**	**53.7**	**54.8**
Network support	0.0	0.3	1.4	0.7	3.0	3.6	3.9	2.6	0.0	0.0	0.0
Debt raising costs	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.0	1.1	1.2	1.2
Equity raising costs	0.0	0.0	0.0	0.0	0.0	0.0	2.4	2.4	2.4	2.4	2.4
Self-insurance	0.0	0.0	0.0	0.1	0.3	1.0	0.8	0.8	0.8	0.8	0.8
Total operating expenditure	**15.3**	**33.4**	**40.9**	**40.5**	**47.7**	**51.0**	**53.7**	**54.7**	**54.6**	**58.0**	**59.2**

Figure 6.4 compares the annual Controllable operating costs forecast with the annual historical operating expenditure in the current regulatory control period. Controllable costs are projected to fall in 2009–10 predominantly due to a reduction in the cyclical planning, documentation and liaison tasks associated with the revenue regulation process.

Figure 6.4: Controllable operating expenditure 2003–04 to 2013–14 ($m 2008–09)



A comparison of forecast and historical Controllable operating expenditure is shown in Table 6.24 by operating expenditure category. It should be noted that for comparative purposes, historical spend is expenditure over the last five years of current five and a half year regulatory control period. Explanations of significant variations between forecast and historical expenditure are also included in the table.

Approximately 50 per cent of the difference in total Controllable expenditure between the two regulatory periods can be attributed to real wage growth and asset growth.

Table 6.24: Comparison of forecast and historical Controllable expenditure ($m 2008-09)

Category	Historical	Forecast	Explanation of significant variations
Field operations and maintenance	75.5	89.5	Real wage growth and increased dismantling and operational communication expenditure
Transmission services	31.4	42.0	Real wage growth, asset growth and additional resource requirements to support the capital program
Transmission operations	22.3	27.5	System controller function and NEMMCO requirements for the full regulatory control period
Asset management	29.2	42.2	Real wage growth, asset growth, grid planning, higher levels of regulation and compliance activities for whole regulatory control period, works programming and asset management strategy formulation
Corporate	40.0	51.3	Real wage growth, asset growth, skills development and training, insurances and infrastructure requirements to support the capital program
Total Controllable	**198.5**	**252.3**	

6.11 Concluding comments

Transend's operating expenditure is based on a robust and accepted forecasting methodology, taking into account Transend's regulatory and customer obligations, and the requirements and expenditure objectives set out in the Rules. The information presented in this chapter and the supporting information in the relevant appendices demonstrates that Transend's forecast operating expenditure reasonably reflects:

- the efficient costs of achieving the operating expenditure objectives set out in clause 6A6.6(a) of the Rules; and
- the costs that a prudent operator in the circumstances of Transend would require to achieve the operating expenditure objectives.

7 SERVICE TARGET PERFORMANCE INCENTIVE SCHEME

7.1 Introduction

This chapter sets out Transend's proposal in relation to the Service Target Performance Incentive Scheme (STPIS), which is to apply over the forthcoming regulatory control period. This proposal is consistent with the requirements contained within the final version of the *Electricity transmission network service providers—Service target performance incentive scheme* released by the AER in March 2008.

This chapter is structured as follows:

- Section 7.2 provides an overview of the AER's STPIS compliance obligations and objectives.
- Section 7.3 provides an overview of the STPIS parameters.
- Section 7.4 sets out the methodology used for determining Transend's proposed values for the STPIS parameters for the forthcoming regulatory control period.
- Section 7.5 specifies the proposed values, weightings and other elements for the STPIS parameters for the forthcoming regulatory control period.
- Section 7.6 provides concluding comments.

7.2 Service target performance incentive scheme compliance obligations and objectives

In March 2008, the AER published the latest version of its STPIS that defines the principles of the scheme in accordance with the principles specified in clause 6A.7.4 of the Rules. These principles state (amongst other things) that the STPIS should provide incentives for each TNSP to:

- provide greater reliability of the transmission system that is owned, controlled or operated by it at all times when Transmission Network Users place greatest value on the reliability of the transmission system; and
- improve and maintain the reliability of those elements of the transmission system that are most important to determining spot prices.

The AER's objectives for the STPIS are that it:

(a) contribute to the achievement of the national electricity objective;
(b) is consistent with the principles in clause 6A.7.4(b) of the Rules; and
(c) promotes transparency in:
  (1) the information provided by a TNSP to the AER; and
  (2) the decisions made by the AER;

(d) assists in the setting of efficient capital and operating expenditure allowances in its transmission determinations by balancing the incentive to reduce actual expenditure with the need to maintain and improve reliability for customers;[44]

The STPIS defines the parameters and sub-parameters for the scheme, and provides information about how the values, weightings and other elements that will apply to the TNSP's parameters over the regulatory control period are to be determined.

The STPIS, as it applies to Transend, covers all prescribed transmission services except where customers have agreed higher or lower levels of connection service under their connection agreements.

7.2.1 Adjustments to maximum allowed revenue and timing

Section 3.4 of the STPIS states that the:

> maximum revenue increment or decrement that a TNSP may earn against its parameters and values under this service component is 1 per cent of the TNSP's maximum allowed revenue for the relevant calendar year.[45]

The STPIS for the forthcoming regulatory control period will commence operation on 1 July 2009 and run until 30 June 2014. The existing performance incentive (PI) scheme will remain in operation until 30 June 2009, in accordance with clause 2.4(b) of the STPIS.

7.3 Service target performance incentive scheme parameters

Unlike most other TNSPs, Transend's transmission system comprises a large number of sub-transmission assets operating at voltages at 6.6 kV, 11 kV, 22 kV, 33 kV and 44 kV. The inclusion of sub-transmission assets has a direct impact on the STPIS parameters and proposed values for the scheme.

In September 2007, Transend proposed changes to its parameters and sub-parameters for the STPIS for the forthcoming regulatory control period.

The proposal included an amendment to separate the transmission line circuit availability sub-parameter into critical and non-critical transmission circuit availability sub-parameters. Critical transmission line circuits are defined as those non-radial circuits under direct NEMMCO oversight. The critical circuits comprise approximately 45 per cent of the total length of the transmission system. Transend proposed that the transformer circuit availability parameter remain unaltered.

Transend also proposed that the loss-of-supply event frequency sub-parameter with a threshold of 0.1 system minute be retained unaltered and that the loss–of–supply event frequency index threshold for large events be amended from 2.0 system minutes to 1.0 system minute. This change reflects the improvements that Transend has made over the

[44] AER, *Electricity transmission network service providers—Service target performance incentive scheme*, March 2008, section 1.4, pp 1,2
[45] Ibid section 3.4 p8

past five years in transmission system performance, and provides appropriate incentives for future performance improvements.

The AER also required the average outage duration parameter, with transmission line and transformer circuit sub-parameters, to be included in the STPIS. Due to its volatility, the AER considered that it would not be suitable to attach a financial incentive to this parameter during the forthcoming regulatory control period. However, the AER requires Transend to report its performance against this parameter.

The AER accepted Transend's proposed parameters and sub-parameters in November 2007[46] and included the parameters and sub-parameters in the Final STPIS Guideline.[47] In summary, the following parameters and sub-parameters will apply to Transend for the forthcoming regulatory control period:

- transmission circuit availability:
  - transmission line circuit availability;
  - transformer circuit availability;
- loss-of-supply event frequency:
  - frequency of events where loss-of-supply events exceed 0.1 system minute;
  - frequency of events where loss-of-supply events exceed 1.0 system minute;
- average outage duration:
  - transmission line circuits; and
  - transformer circuits.

Details of the parameters, sub-parameters and elements for Transend's STPIS are provided in Appendix B of the STPIS.

7.4 Proposed values for the service target performance incentive scheme parameters

Transend engaged SKM to recommend appropriate values for each sub-parameter in the STPIS for Transend's forthcoming regulatory control period. SKM has developed the methodology to calculate the proposed values for each parameter consistent with the requirements of clause 3.3 of the STPIS. SKM's report is included as Appendix 10. The methodology used to calculate the performance targets, caps, collars and deadbands is discussed in this section.

[46] AER, *Service target performance incentive scheme* (incorporating incentives based on the market impact of transmission congestion), Explanatory Statement, 19 November 2007, section 1.4, pp 13–15

[47] AER, *Final—Service target performance incentive scheme*, March 2008

7.4.1 Methodology for setting proposed values

SKM has taken into account previously adopted approaches, recent AER determinations and its own extensive experience with service standards in developing the methodology for calculating the proposed performance targets, caps, collars and dead bands.

Targets

Consistent with the requirements of clause 3.3(g) of the STPIS, the proposed performance targets have been developed using the historical performance data over the most recent five years with consideration of the need to make reasonable adjustments to the performance targets based on the criteria specified in clause 3.3(k) of the STPIS. The data for the last four of the most recent five years has been audited on an annual basis by the AER and is considered to be accurate and reliable. Although the data for 2003 has not been audited by the AER, it has been reviewed in detail by Transend and SKM. Transend and SKM consider that the data from the most recent five years is sufficiently accurate and reliable to meet the requirements of clause 3.3(d) of the STPIS.

The target value has been determined as the average of the past five annual values for each sub-parameter.

Caps and collars

SKM assessed a number of different approaches to setting caps and collars and considered that setting the caps and collars at ±1.5 standard deviations either side of the target is the most appropriate methodology that is reasonably consistent with that previously accepted by the AER.

Deadbands

Within the STPIS, a performance deadband is defined as:

> …a performance target that is set over a range of values, within which a TNSP neither receives a financial penalty nor financial reward in the regulatory year.[48]

SKM considered that the inclusion of a performance deadband for each sub-parameter was appropriate because deadbands provide for:

- the normal range of measure variance that any prudent network operator would experience in the operation of a transmission system; and
- positive improvement in internal behaviours and performance to achieve a reward.

The performance deadband has been established using the statistical variance of the five year data set for each sub-parameter to allow for the natural variation in the annual result.

Transend is confident that the methodology used by SKM for setting the proposed values is robust and consistent with the requirements of clause 3.3 of the STPIS.

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[48] AER, *Electricity transmission network service providers—Service target performance incentive scheme*, March 2008, Glossary, p 14

7.4.2 Proposed weightings

Clause 3.5 of the STPIS defines the requirements for determining the proposed weightings for each of the parameters and sub-parameters included in the scheme. Importantly, the STPIS requires that Transend demonstrate how the proposed weightings are consistent with the objectives of the STPIS and, in particular, clause 6A.7.4(b)(1) of the Rules.

Extensive analysis has been undertaken, including the review of a number of market survey reports, to ensure that the distribution of weightings between the parameters and sub-parameters within the scheme accurately reflect the objectives of the STPIS. The following sections discuss each of the parameters of the scheme and how they relate to the objectives of the STPIS.

Transmission circuit availability

Transmission circuit availability measures the extent to which those prescribed assets are in service during the reporting period. Considering the STPIS and Rules requirements, and based on its analysis, Transend proposes that the transmission circuit availability parameter account for a total of 45 per cent of the maximum allowed revenue at risk.

The separation of transmission line circuit availability into critical and non-critical sub-parameters has introduced the opportunity to increase the emphasis on the availability of critical transmission line circuits, with the critical transmission line circuit availability sub-parameter attributed a higher weighting than the non-critical transmission line circuit availability sub-parameter. This approach is consistent with clause 6A.7.4(b)(1)(ii) of the Rules to:

> improve and maintain the reliability of those elements of the transmission system that are most important to determining spot prices.

The transformer circuit availability sub-parameter measures the availability of both network transformers and transformers that directly supply customers. Therefore, the transformer circuit availability sub-parameter is considered to satisfy the requirements of clause 6A.7.4(b)(1)(i) of the Rules to:

> provide greater reliability of the transmission system that is owned, controlled and operated by it at all times when Transmission Network Users place greatest value on the reliability of the transmission system.

Analysis has identified that transformer circuit availability does not have a material impact on spot prices within the NEM, but it does have the potential to impact on transmission system reliability. A proposed weighting has been assigned to this sub-parameter commensurate with this analysis. Table 7.1 summarises the proposed sub-parameter weightings.

Loss-of-supply event frequency

The loss-of-supply event frequency parameter is a measure of the impact on Transend's customers of the unplanned loss-of-supply to customers. The loss-of-supply frequency parameter is considered to satisfy the requirements of clause 6A.7.4(b)(1)(i) of the Rules to:

> provide greater reliability of the transmission system that is owned, controlled and operated by it at all times when Transmission Network Users place greatest value on the reliability of the transmission system.

Market surveys have confirmed that sustaining a reliable electricity supply is vitally important to customers[49]. Consistent with this view, and the Rules and STPIS requirements, Transend proposes that the loss-of-supply event frequency parameter account for a total of 55 per cent of the maximum allowed revenue at risk.

Of the two sub-parameters, a higher weighting has been attributed to the 1.0 system minute loss-of-supply frequency event sub-parameter, reflecting the greater ability of Transend to reduce the incidence of such events. Table 7.1 summarises the proposed sub-parameter weightings.

Average outage duration

The average outage duration parameter is a measure of the time taken to restore an asset to service following a forced interruption. Therefore, the average outage duration parameter is considered to satisfy the requirements of clause 6A.7.4(b)(1)(i) of the Rules to:

> provide greater reliability of the transmission system that is owned, controlled and operated by it at all times when Transmission Network Users place greatest value on the reliability of the transmission system.

As previously stated, the average outage duration parameter is highly variable and results vary significantly from year-to-year. For this reason, the AER considered that it would not be suitable to attach a financial incentive to this parameter during the forthcoming regulatory control period. Consequently, a weighting of zero per cent has been assigned to this parameter for the forthcoming regulatory control period.

The proposed weightings for each sub-parameter are provided in the following table.

[49] SKM, *Transend's Service Target Performance Incentive Scheme – Parameter Values and Weightings*, 11 April 2008, pp 31-34

Table 7.1: Proposed sub-parameter weightings

Sub-parameters	Proposed weighting (per cent)
Transmission line circuit availability (critical circuits)	20
Transmission line circuit availability (non-critical circuits)	10
Transformer circuit availability	15
Loss-of-supply event frequency >0.1 system minute	20
Loss-of-supply event frequency >1.0 system minute	35
Average outage duration (transmission line)	0
Average outage duration (transformers)	0
Total	**100**

This proposal results in a weighting of the transmission circuit availability parameter of 45 per cent of the maximum allowed revenue at risk and 55 per cent of the maximum allowed revenue at risk for the loss-of-supply event frequency parameter. Transend considers that the proposed weightings for its STPIS are consistent with the requirements of clause 3.5 of the STPIS.

7.5 Proposed values

The proposed values for each sub-parameter that will apply for the forthcoming regulatory control period are provided in Table 7.2. All of the values have been developed using the methodology summarised in section 7.4.1.

Table 7.2: Proposed STPIS values

Sub-parameter	Collar	Lower deadband	Target	Upper deadband	Cap
Transmission line circuit availability (critical)	98.36%	98.94%	99.13%	99.32%	99.89%
Transmission line circuit availability (non-critical)	98.54%	98.95%	98.99%	99.03%	99.43%
Transformer circuit availability	98.82%	99.23%	99.28%	99.33%	99.75%
Loss-of-supply > 0.1 system minute	20	16	15	14	10
Loss-of-supply > 1.0 system minute	5	3	2	2	0
Average outage duration (transmission lines)*	387	304	276	248	166
Average outage duration (transformers)*	1,085	595	541	487	118

Note: *Values to be used as basis for reporting only, as these parameters carry zero weighting in the STPIS.

Figures 7.1 to 7.7 graphically represent the parameters and proposed values.

Figure 7.1: Transmission line circuit availability (critical)

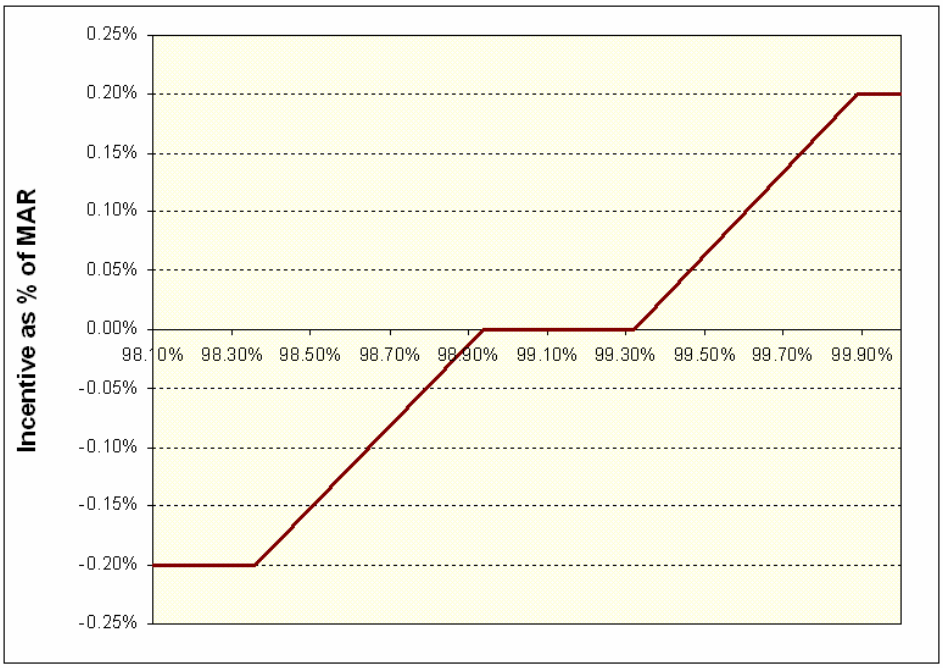


Figure 7.2: Transmission line circuit availability (non-critical)

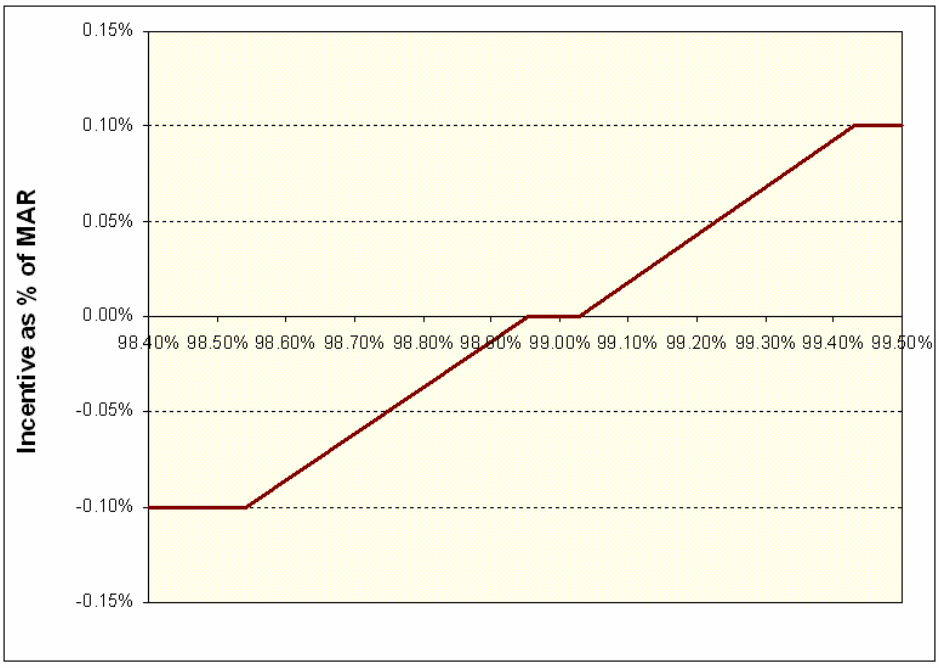


Figure 7.3: Transformer circuit availability

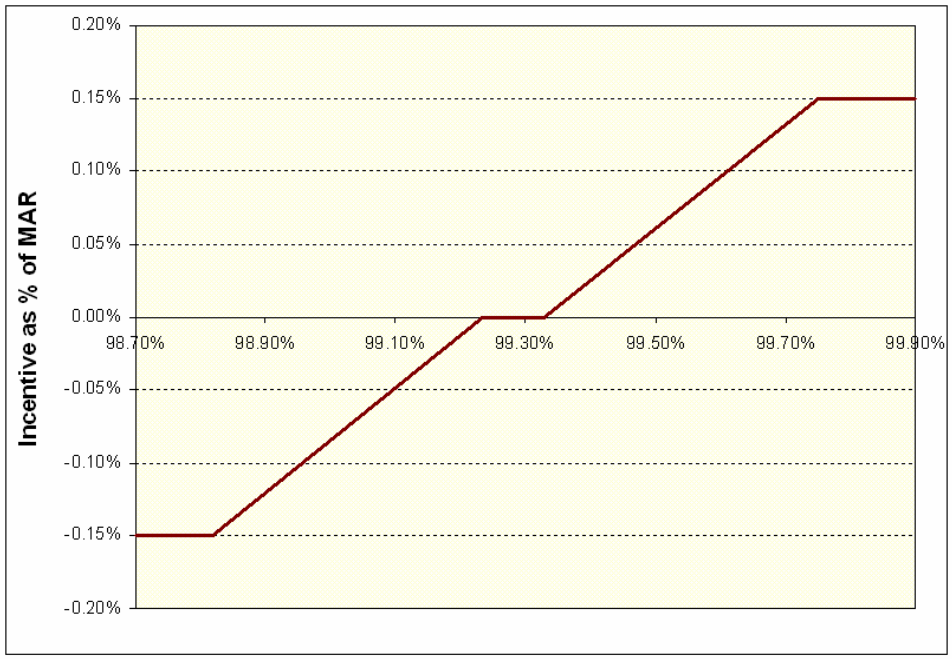


Figure 7.4: Loss-of-supply event frequency >0.1 system minute

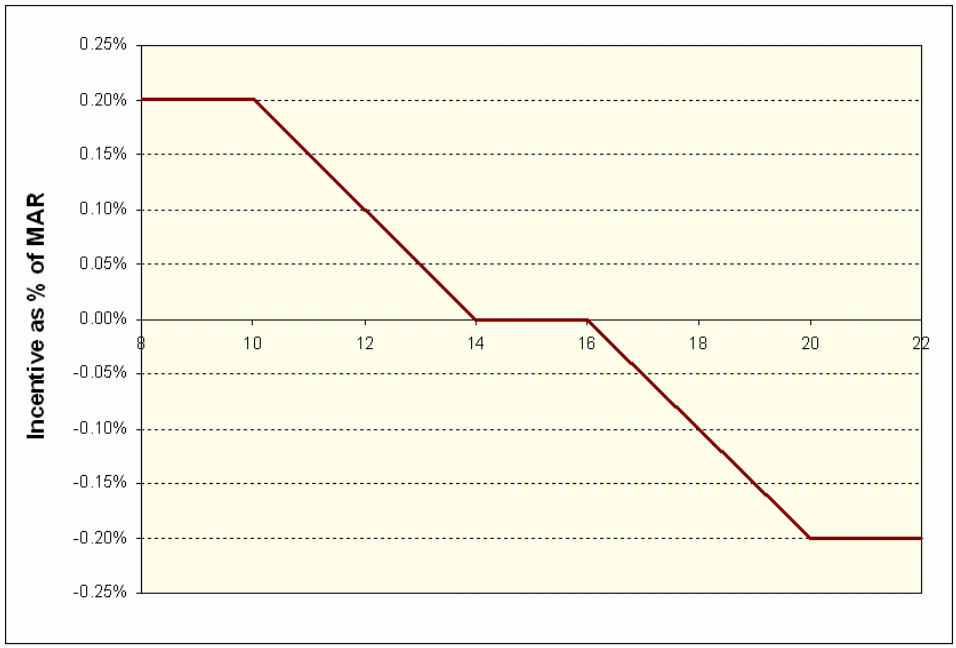


Figure 7.5: Loss-of-supply event frequency >1.0 system minute

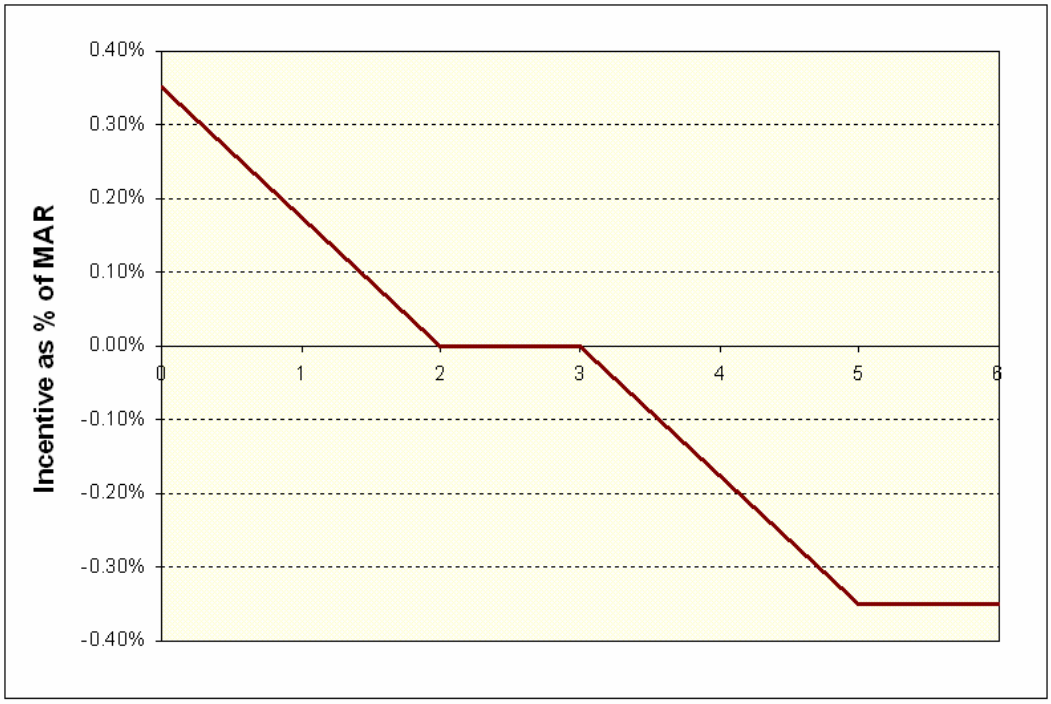


Figure 7.6: Average outage duration (transmission lines)

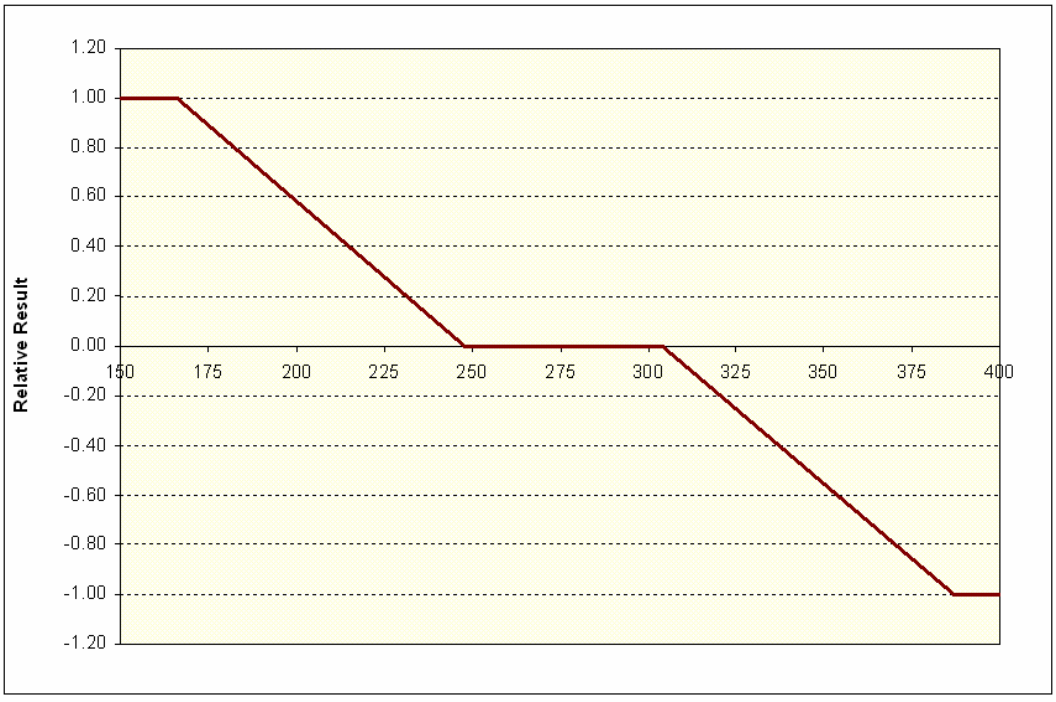
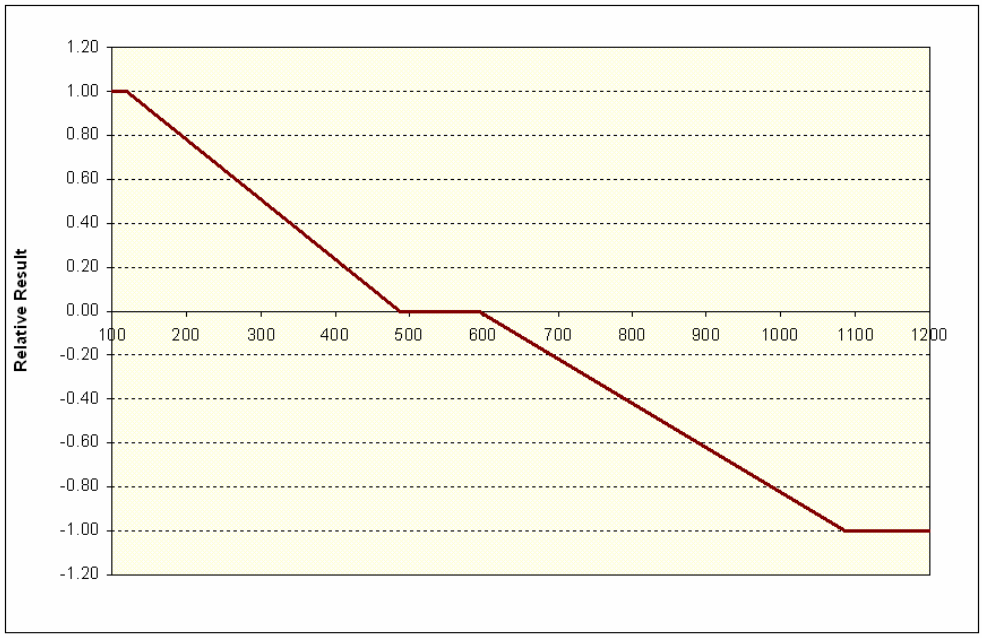


Figure 7.7: Average outage duration (transformers)



7.6 Concluding comments

Transend is of the view that the proposed STPIS values and weightings meet the objectives of the STPIS and the principles defined in the Rules. The proposed values and weightings have been established using a sound methodology, applied consistently and taking into account historical performance.

The resulting targets and weightings of the parameters ensure that Transend has incentive to make further improvements to the performance of the transmission system.

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8 EFFICIENCY BENEFIT SHARING SCHEME

8.1 Introduction

In designing CPI-X regulatory frameworks, the efficiency benefit sharing scheme (or carry-over mechanism) plays an important role in encouraging efficiency improvements. Broadly speaking, such schemes allow the regulated company to retain in the forthcoming regulatory control period a proportion of any cost efficiencies achieved in the current regulatory control period.

This chapter describes Transend's proposed efficiency benefit sharing scheme, which will apply during the forthcoming regulatory control period. This scheme must comply with the requirements of chapter 6A of the Rules. Any revenue impact from the application of this scheme will apply from 1 July 2014.

This chapter is structured as follows:

- Section 8.2 provides an outline of the requirements of the AER's efficiency benefit sharing scheme.
- Section 8.3 details Transend's proposed parameter values under the scheme.
- Section 8.4 sets out concluding comments.

8.2 Requirements of the AER's scheme

In September 2007, the AER published its final decision on the efficiency benefit sharing scheme in two parts:

- final decision—efficiency benefit sharing scheme (the AER's final decision); and
- Appendix 4—efficiency benefit sharing scheme (the AER's guidelines).

The following bullet points highlight the key features of the scheme:

- A five year carry-over period results in a benefit sharing ratio of approximately 30:70 between the TNSP and network users. A ten year carry-over results in a ratio of approximately 50:50 for the TNSP and users respectively. A five year period will apply unless there is a demonstrated need for an extended period.
- A continuous incentive to achieve efficiencies is provided by allowing the TNSP to retain, for a fixed period, the difference (negative or positive) between its actual and forecast operating expenditure.
- It is equally important to reward efficiency and penalise inefficiency. By penalising inefficiency and rewarding efficiency, the incentive regime encourages TNSPs to reveal their efficient or 'true' costs.

- The AER considers that adjustments to forecast and actual operating expenditure arising from changes in statutory responsibilities, pass-through events, changes in capitalisation policy and growth should be applied in calculating carry-over amounts.
- TNSPs will be able to propose, for consideration by the AER, other adjustments relating to events to be excluded from the operation of the scheme so that they are not unfairly penalised.
- TNSPs may have some scope to respond to incentives through their capitalisation policies and by substituting expenditures between operating and capital expenditure. To address this concern, the AER will require explanation where a TNSP's capitalisation policy has changed.
- The AER does not intend that the scheme will apply to capital expenditure.
- The AER will calculate the scheme in real terms (see attachment A of the AER's guidelines). This makes calculating the scheme simpler. All inflation adjustments and real values will be calculated in a manner that is consistent with the methodology used for adjusting for inflation in the corresponding determination.

The AER has decided to equate the fifth year actual and forecast amounts so that the efficiency gain in the fifth year is equal to zero. To ensure efficiency gains/losses made in the fifth year are not ignored, they will be incorporated in the calculation of the efficiency gain for the first year of the following period.

8.3 Transend's proposed parameter values

Transend's revenue proposal is required to specify the values that are to be attributed to the efficiency benefit sharing scheme parameters and to provide an explanation of how the values proposed to be attributed to those parameters comply with any relevant requirements set out in that scheme. Transend notes, however, that to a very large extent, the parameters of the scheme are defined by the AER's guidelines. There are two particular matters where Transend has some discretion in the operation of the scheme:

- treatment of uncontrollable costs, and
- treatment of growth.

Clause 2.4.2 of the submission guidelines provides the opportunity for Transend to propose, for consideration by the AER, other adjustments relating to uncontrollable costs to be excluded from the operation of the scheme. Transend proposes that the following categories of expenditure should be excluded from the calculation of its efficiency benefit:

- pass-through events;
- network support costs;
- debt raising costs;

- superannuation provisions;
- redundancy payments;
- equity raising costs; and
- insurance and self-insurance costs.

In accordance with the AER's guidelines, Transend proposes to apply adjustments to growth using the same relationship between growth and expenditure used in establishing the forecast operating expenditure. Transend understands that in this context, growth refers to growth in demand.

Transend's operating expenditure requirement is linked to the capital expenditure forecast, which in turn considers growth in demand. However, as discussed in section 5.6.2, Transend's ex-ante capital expenditure forecast for the forthcoming regulatory period is constant across the twelve scenarios considered in the capital expenditure forecasting methodology. In the forthcoming regulatory control period for the purpose of calculating carryover amounts in the efficiency benefit sharing scheme, no adjustment to Transend's actual expenditure should be made for growth unless actual demand is outside the range of scenarios considered in the proposal.

8.4 Concluding comments

This chapter confirms that Transend will adopt an efficiency benefit sharing scheme that meets the requirements set out in the AER's final decision and guidelines. Two matters that are worth noting relate to the treatment of uncontrollable costs and growth. However, even in relation to these potentially complex matters Transend considers that the AER's scheme provides sufficient clarity on how these issues should be addressed.

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9 REGULATORY ASSET BASE

9.1 Introduction

This chapter presents information relating to Transend's RAB in accordance with the Rules, specifically schedule S6A.1.3(5) of schedule 6A.1, and section 4.3.9(a)–(c) of the AER's submission guidelines. This chapter is structured as follows:

- Section 9.2 provides details of the calculation of the RAB value as at 31 December 2003 (the commencement of the current regulatory control period).
- Section 9.3 outlines the methodology for rolling forward of the asset base value to 1 July 2009.
- Section 9.4 provides an explanation of the derivation of the estimated RAB value for each year of the forthcoming regulatory control period.
- Section 9.5 provides concluding comments.

9.2 Regulatory asset base as at 31 December 2003

Schedule S6A.2.1(c)(1) of the Rules establishes Transend's RAB value as at 31 December 2003 to be $603.6 million, subject to adjustment in accordance with the provisions set out in schedule S6A.2.1(c)(2), which require this value to be adjusted for the difference between:

- any estimated capital expenditure that is included in those values for any part of a previous regulatory control period; and
- the actual capital expenditure for that part of the previous regulatory control period.

This adjustment must also remove any benefit or penalty associated with any difference between the estimated and actual capital expenditure.

These adjustments are included in the calculation of the RAB value as at 1 July 2009 as set out in the following section.

9.3 Regulatory asset base as at 1 July 2009

Transend's RAB as at 1 July 2009 (the commencement date of the forthcoming regulatory control period) has been calculated in accordance with the roll forward model provided by the AER and the requirements of schedules S6A.2.1 and S6A.2.4, and clause 11.6.9 of the Rules.

In summary, Transend's RAB as at 1 July 2009 is derived by:

- using the RAB value as at 31 December 2003 prescribed in schedule S6A.2.1(c)(1) of the Rules, adjusted for:

  - differences between forecast and actual capital expenditure in accordance with schedule S6A.2.1(c)(2) of the Rules, as described in section 9.2; and
  - removal of the benefit associated with the difference between forecast and actual capital expenditure;
- rolling forward the 31 December 2003 value for actual additions, disposals, revaluations and deductions of depreciation allowances contained in the ACCC's 2003 revenue cap decision for Transend using the AER's roll forward model; and
- adding a forecast of prudent assets under construction (WIP) as at 1 July 2009. The inclusion of $57.9 million in WIP, including accumulated finance during construction, is now required by the regulatory framework as a transition measure.

Table 9.1 shows the derivation of the RAB value as at 1 July 2009 (that is, the closing RAB as at 30 June 2009), in accordance with this methodology.

Table 9.1: Roll forward of regulatory asset base from 1 January 2004 to 30 June 2009 ($m nominal)

	Jan–Jun 2004	2004–05	2005–06	2006–07	2007–08[a]	2008–09[b]
Opening RAB with actual CPI	603.6	628.7	696.1	737.3	811.4	850.5
Forecast capex with actual CPI	28.6	84.4	56.0	95.1	46.0	40.0
Nominal economic depreciation with actual CPI	-3.5	-17.0	-14.8	-21.0	-6.9	-20.3
Add difference between actual and forecast capex						65.4
Add return on the difference[b]						-6.2
Add assets under construction						57.9
Closing RAB						987.3

Note: (a) forecasts, (b) this relates to the benefit associated with the difference between forecast and actual capex for 1 July 2003 to 31 December 2003

As shown in Table 9.1, the RAB value as at 1 July 2009 (in nominal dollars) is $987.3 million.

The roll forward model (including details of the amounts, values and other inputs used by Transend to calculate this RAB value) forms part of this revenue proposal.

9.4 Forecast of regulatory asset base

Table 9.2 presents a summary of the amounts, values and inputs used by Transend to derive its forecast of the regulatory asset base value for each year of the forthcoming

regulatory control period. In accordance with S6A.2.1(f)(4) of the Rules, only actual and estimated capital expenditure properly allocated to the provision of prescribed transmission services in accordance with Transend's Cost Allocation Methodology has been included in the RAB.

Table 9.2: Regulatory asset base roll forward 1 July 2009 to 30 June 2014 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
RAB (start period)	987.3	1,130.7	1,294.0	1,390.6	1,498.8
Inflation on opening RAB	25.1	28.7	32.9	35.3	38.1
Nominal capex as incurred	168.3	189.4	119.2	136.1	146.4
Nominal straight-line depreciation	-50.0	-54.8	-55.5	-63.3	-69.2
RAB (end period)	1,130.7	1,294.0	1,390.6	1,498.8	1,614.1

9.5 Concluding comments

Transend's actual and forecast RAB value (as appropriate) has been calculated in accordance with all applicable requirements set out in the Rules and guidelines (including the roll forward model and post-tax revenue model) issued by the AER.

Over the forthcoming regulatory control period, the RAB is expected to increase by more than 60 per cent in nominal terms, reflecting the renewal of, and forecast growth in, the asset base over the period and, to a lesser extent, the expected impact of inflation.

The completed post-tax revenue model setting out the supporting information is provided as part of this revenue proposal.

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10 DEPRECIATION

10.1 Introduction

This chapter sets out Transend's assessment of the allowable depreciation (for revenue determination purposes) on regulated assets during the forthcoming regulatory control period. The remainder of this chapter is structured as follows:

- Section 10.2 describes Transend's depreciation methodology.
- Section 10.3 sets out Transend's standard asset lives.
- Section 10.4 presents Transend's depreciation forecast for the forthcoming regulatory control period.
- Section 10.5 provides concluding comments.

10.2 Transend's depreciation methodology

Clause 6A.6.3(b)(1) of the Rules requires Transend to use a profile of depreciation that reflects the nature of the asset or category of assets over the economic life of that asset or category of assets.

Depreciation is defined in Accounting Standard AASB 116 (property, plant and equipment) as the systematic allocation of the depreciable amount of an asset over its useful life. The accounting standard requires depreciation to be charged on a systematic basis over the life of the asset.

Transend's depreciation methodology is consistent with AASB 116, and accords with the requirements of clause 6A.6.3 of the Rules. Transend uses economic depreciation, based on straight-line depreciation and standard asset lives, for each regulatory asset class. Straight-line depreciation is a well established method used to reflect the decline in the service potential of an asset over its economic life.

To determine the annual depreciation charge for the forthcoming regulatory control period, Transend has applied the post-tax revenue model (PTRM) using:

- the asset base value as at 30 June 2009 derived from the roll forward model;
- the capital expenditure forecasts set out in chapter 5; and
- the standard asset lives set out in section 10.3.

In order to calculate the annual depreciation charge for the forthcoming regulatory control period, the PTRM requires data on the remaining lives of assets in existence as at 30 June 2009. Transend derives an estimate of the remaining lives of these assets using the annual

depreciation charge in respect of those assets and their written down value as at 30 June 2009[50], as follows:

- For assets in existence as at 30 June 2003, the remaining asset lives and written down asset values as at 30 June 2003 (as recorded in the regulatory asset register) are used to determine the annual depreciation charge. It is noted that in real terms this charge is equal to the depreciation amount provided in respect of these assets in the ACCC's December 2003 decision on Transend's revenue cap.
- For assets added to the asset base in the current regulatory control period, a depreciation charge is calculated (for each asset class) based on the amount of new investment added, and the standard asset life for each asset class (as described in section 10.3).
- A total depreciation charge, and rolled forward RAB value for each year of the current regulatory control period are then determined (based on the summation of the annual depreciation charges on existing assets as at 30 June 2003, and the new assets added during the current regulatory control period).
- The weighted average remaining life of all assets as at 30 June 2009 is then derived as the written down value of all assets at that date divided by the annual depreciation charge for the forthcoming regulatory control period[51]. This value is used in the PTRM depreciation calculations for the regulatory control period commencing on 1 July 2009.

The calculations outlined above are included with the completed PTRM submitted with this revenue proposal.

10.3 Standard asset lives

Accounting standards recognise that a characteristic common to all physical assets held on a long-term basis (with the exception of land and easements) is that their useful lives are limited because their service potential declines over time to a point where it is either fully consumed or lost.

This decline can occur due to factors such as wear and tear, technical obsolescence and commercial obsolescence. The possibility of obsolescence, both technical and commercial, is a factor that exists regardless of the physical use of an asset.

[50] Note that this value differs slightly from the value in the roll forward model because the roll forward model deducts allowed depreciation in respect of the capital expenditure forecast for the current regulatory period, whereas Transend's calculations include the depreciation relating to actual rather than forecast capital expenditure for the current regulatory period.

[51] Note that for asset categories with remaining lives less than the duration of the forthcoming regulatory period, the remaining life is calculated as the next highest whole number, and the total depreciation charge over the forthcoming period for that asset category will not exceed the written down value of the asset category at the commencement of the period.

The useful life of an asset is the period over which an asset is expected to be available for use by an entity. In determining the useful life, the following factors need to be considered:

- the expected usage of the asset assessed by reference to the asset's expected capacity or physical output;
- expected physical wear and tear, which depends on operational factors such as the environmental conditions in which the asset is to be used, and repair and maintenance of the asset in accordance with good electricity industry practice;
- the anticipated technical life of the asset, that is, the period of time over which the asset can be expected to remain efficiently serviceable having regard to technical obsolescence;
- the expected commercial life of the asset, corresponding to the commercial life of its product or output; and
- in the case of certain rights and entitlements, the legal life of the asset, that is, the period of time during which the right or entitlement exists.

Transend's standard asset lives, set out in Table 10.1, reflect the considerations noted above to determine the economic life of each asset class. Transend's asset lives are generally consistent with asset lives used by other Australian transmission utilities as well as other international standards.

Transend capitalises assets at a less aggregated unit of plant than some other entities. Within Transend, these units of plant are referred to as units of property. Transend groups the units of property with common characteristics and expected lives into asset classes. Substation assets, for example, are grouped into components of substations that have a long life (60 years), medium life (45 years) and short life (15 years).

Table 10.1: Transend's standard asset lives

Asset class	Standard life (years)
Transmission line assets—long life (60)	60
Transmission line assets—medium life (45)	45
Transmission line assets—short life (10)	10
Substation assets—long life (60)	60
Substation assets—medium life (45)	45
Substation assets—short life (15)	15
Protection and control –short life (15)	15
Protection and control—short life (3)	3
Transmission operations—short life (10)	10
Transmission operations—short life (3)	3

Asset class	Standard life (years)
Other—medium life (40)	40
Other—short life (5)	5
Other—short life (3)	3
Land	does not depreciate

SKM has reviewed Transend's standard asset lives and provided advice that the resulting depreciation schedules meet the Rules requirements outlined in clause 6A.6.3(b) of the Rules, namely that they depreciate using a profile that reflects the nature of the assets or category of assets over the economic life of that asset or category of assets. SKM's report is included as Appendix 24.

10.4 Depreciation forecast

Transend has derived its forecast of depreciation for the forthcoming regulatory control period based on:

- the methodology and standard asset lives outlined above; and
- the opening asset base and forecast RAB values described in chapter 9 (which reflect Transend's forecasts of asset additions[52] and disposals).

The PTRM has been used to calculate the depreciation forecast on a straight-line basis.

Schedule S6A.1.3(7) of the Rules requires Transend to provide depreciation schedules, which categorise the relevant assets by reference to well accepted categories. Transend has provided depreciation schedules by asset class in the submission guidelines templates, information which have been provided under separate cover. For convenience, the total of the required regulatory accounting depreciation allowance is shown in Table 10.2.

Table 10.2: Total depreciation forecast from 1 July 2009 to 30 June 2014 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Depreciation	50.0	54.8	55.5	63.3	69.2
Indexation	-25.1	-28.7	-32.9	-35.3	-38.1
Economic depreciation	24.9	26.0	22.6	27.9	31.1

Schedule S6A.1.3(7) of the Rules also requires Transend to provide the depreciation schedules by location. Transend understands this requirement relates to clause 6A.6.3, which requires special treatment of assets dedicated to one user or a small group of users

[52] The capital expenditure forecast is set out in chapter 5.

(not being a DNSP) with value exceeding $20 million. Transend does not have any assets that fall within this category.

10.5 Concluding comments

Transend has prepared its forecast depreciation allowance at an asset category level using straight-line depreciation with all assets within a class assigned weighted average standard and remaining lives.

The AER's PTRM has been used to calculate the regulatory depreciation allowance. This approach is consistent with the requirements set out in clause 6A.6.3 and schedule S6A.1.3 of the Rules.

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11 COST OF CAPITAL AND TAXATION

11.1 Introduction

The assessment of an adequate rate of return is of critical importance to Transend and its customers. Failure to provide an adequate return will damage incentives for investment, and will ultimately deny customers the economic benefits that flow from transmission investment.

The importance of providing a stable return on investment has been recognised in formulating the provisions of the Rules relating to the cost of capital. In particular, the Rules provide greater certainty regarding the methodology and parameters that are to be applied in estimating the cost of capital. Having regard to the requirements set out in the Rules, the remainder of this chapter is structured as follows:

- Section 11.2 provides an overview of the cost of capital parameters set out in clause 6A.6.2 of the Rules.
- Sections 11.3 to 11.5 present Transend's assessment of the risk free rate, the debt risk premium and the inflation rate, respectively.
- Section 11.6 provides a summary of Transend's proposed cost of capital.
- Section 11.7 provides information on asset lives and depreciation for the purpose of calculating the allowance for tax.
- Section 11.8 sets out Transend's forecast allowance for corporate tax.

11.2 Estimation of the cost of capital

Clause 6A.6.2 specifies that the post-tax nominal vanilla Weighted Average Cost of Capital (WACC) is to be estimated in accordance with the following formula:

$$WACC = k_E \frac{E}{V} + k_D \frac{D}{V}$$

where:

- k_E is the nominal return-on-equity; (determined using the Capital Asset Pricing Model) and is calculated as:

  $r_f + \beta_e$ x MRP where:

- r_f is the nominal risk free rate for the regulatory control period;

  β_e is the equity beta; and

  MRP is the market risk premium;

- k_D is the nominal return on debt and is calculated as:

  r_f + DRP where:

- DRP is the debt risk premium for the regulatory control period;
- E/V is the equity share in total value (equal to 1–D/V);
- D/V is the debt share in total value.

Clause 6A.6.2 also specifies that the following parameter values must be applied:

- benchmark gearing (D/V) is set at 60 per cent;
- the market risk premium (MRP) is 6 per cent;
- the equity beta (β_e) is 1.0; and
- the benchmark credit rating used to estimate the debt risk premium is BBB+.

To calculate the relevant WACC, Transend is required to estimate the remaining WACC parameters:

- the nominal risk free rate;
- the debt risk premium; and
- forecast inflation.

Each of these parameters is addressed in turn below.

11.3 Risk free rate

The risk free rate represents the rate of return on an asset with zero default risk. In estimating the WACC, the risk free rate is a component of both the cost of equity and cost of debt.

In accordance with clause 6A.6.2(c) of the Rules, the annualised yield on the ten year government bond is used as the appropriate proxy for the risk free rate.

Transend proposes that the risk free rate be calculated by averaging the ten year government bond rate over a 10-day trading period. In accordance with the provisions set out in clause 6A.6.2(c)(2), Transend has nominated the start date and the end date of the proposed averaging period to the AER on a confidential basis. The Rules provide for the AER to update the calculation of the risk free rate, in accordance with the processes set out in clause 6A.6.2(c)(2), prior to its final decision.

For the purposes of this revenue proposal, however, Transend has used a nominal risk free rate of 6.37 per cent being the effective annual compounding rate[53] derived from the 10-day average of the ten year government bond rate for the period ending on 30 April 2008. Further details setting out the derivation of the nominal risk free rate are contained in the report prepared by CEG titled *Nominal risk free rate, debt risk premium and debt and equity raising costs for Transend*, which is attached as Appendix 19.

11.4 Debt risk premium

The cost of debt is determined by adding a debt risk premium (DRP) to the risk free rate of return. clause 6A.6.2(e) of the Rules states:

> The debt risk premium is the margin between the 10 year Commonwealth annualised bond rate and the observed annualised Australian benchmark corporate bond rate for corporate bonds which have a BBB+ credit rating from Standard and Poors and a maturity of 10 years.

It is noted that the AER used Bloomberg data in recent decisions made in relation to Powerlink, SP AusNet and ElectraNet to estimate the debt risk premium. For the purposes of this revenue proposal Transend has used a debt risk premium of 3.13 per cent based on the 10–day averaging period ending on 30 April 2008. Further details setting out the derivation of the debt risk premium are contained in the report prepared by CEG attached as Appendix 19.

It is recognised that the AER will calculate the actual debt risk premium from market data available at the date of its determination.

11.5 Forecast inflation

The expected inflation rate is not an explicit parameter in the return-on-equity calculation, but it is an inherent aspect of the risk free rate and is implicit in the nominal cost of debt. In addition, forecast inflation has several uses in the PTRM. Its primary use is to convert real inputs to nominal values, and to convert the nominal WACC to a real WACC.

Clause 6A.5.3(b) of the Rules states that the PTRM published by the AER must specify a methodology that the AER determines is likely to result in the best estimates of expected inflation.

In its most recent (April 2008) revenue cap determination on ElectraNet, the AER noted that its detailed considerations on inflation forecasting methodologies are set out in its

[53] An effective annual compounding rate is derived from the indicative mid-rates published by the Reserve Bank of Australia, which are quoted as semi-annual yields. (Refer to the RBA web site at: http://www.rba.gov.au/MarketOperations/Domestic/OperationalNotes/pricing_formulae.html for further details.) The derivation of an effective annual compounding rate is consistent with the approach applied by the AER in its *final decision in the ElectraNet transmission determination 2008-09 to 2012-13*, published on 11 April 2008.

January 2008 final decision on the SP AusNet transmission determination[54]. The AER proceeded to explain its approach as follows[55]:

> The AER determined that a methodology that is likely to result in the best estimate of inflation over a ten year period is to apply the RBA's short-term inflation forecasts—currently extending out to two years—and adopt the mid-point of its target inflation band beyond that period (i.e. 2.5 per cent) for the remaining eight years. An implied ten year forecast is derived by averaging these individual forecasts. This approach draws on publicly available RBA data, which is published on a regular basis. It also provides greater transparency in deriving an inflation forecast and allows the forecasts to be updated regularly.
>
> In the absence of an objective market-based approach, the AER considers that this methodology remains appropriate for the purposes of determining an inflation forecast in this final decision. The AER has updated the inflation forecast for the first two years of the regulatory control period using the latest published RBA inflation expectations.

Transend notes that the AER's final decision on ElectraNet (dated 11 April 2008) cited the RBA's February 2008 Statement on Monetary Policy as the source of inflation forecasts for the two years to June 2010.

It is also noteworthy however, that in a media release on monetary policy dated 6 May 2008, the Governor of the Reserve Bank stated:

> …considerable uncertainty remains about the outlook for demand and inflation.

In light of the present uncertainty in forecasting macroeconomic parameters, Transend engaged CEG to provide advice on the inflation forecast that would be most appropriate for Transend's revenue proposal. CEG concluded that an average inflation rate of 2.54 per cent per annum was appropriate, being the weighted average of forecasters' short and long-term expectations. Full details of CEG's analysis and conclusions on forecast inflation is provided at Appendix 14.

11.6 Summary of post-tax nominal WACC

Transend estimates that its post-tax nominal vanilla WACC is 10.65 per cent in accordance with the requirements of the Rules.

The key parameters and variables underlying the cost of capital calculation are summarised in Table 11.1.

[54] AER, *Final decision: ElectraNet transmission determination 2008–09 to 2012–13*, 11 April 2008 page 69.
[55] ibid.

Table 11.1: Proposed WACC parameters and variables

Parameter	Proposed
Risk free rate (nominal)	6.37%
Expected inflation	2.54%
Debt risk premium	3.13%
Market risk premium	6%
Gearing (D/V)	60%
Gamma	0.50
Equity beta	1.00
Corporate tax rate	30%
Vanilla WACC (nominal)	**10.65%**

11.7 Asset lives and depreciation for tax purposes

For the purpose of estimating the cost of corporate income tax pursuant to clause 6A.6.4 of the Rules, Transend has calculated tax depreciation in accordance with tax law on a straight-line basis, using the AER's tax asset base roll forward model. It is to be noted that the asset lives applying for taxation purposes are the same as those set out in section 10.3.

For convenience, Table 11.2 shows the asset lives applied for taxation purposes.

Table 11.2: Transend's standard asset lives

Asset Class	Standard Life (years)
Transmission line assets—long life (60)	60
Transmission line assets—medium life (45)	45
Transmission line assets—short life (10)	10
Substation assets—long life (60)	60
Substation assets—medium life (45)	45
Substation assets—short life (15)	15
Protection and control—short life (15)	15
Protection and control—short life (3)	3
Transmission operations—short life (10)	10
Transmission operations—short life (3)	3
Other—medium life (40)	40
Other—short life (5)	5

Asset Class	Standard Life (years)
Other—short life (3)	3
Land	does not depreciate

Based on the asset lives shown, the depreciation provisions set out in the tax statutes, Transend's forecast tax depreciation schedule for the forthcoming regulatory control period is set out in Table 11.3.

Table 11.3: Forecast tax depreciation schedule ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Tax Depreciation	43.2	46.4	48.2	52.6	56.8

11.8 Forecast allowance for corporate tax

Clause 6A.6.4 of the Rules sets out the methodology for calculating the allowance for corporate income tax in accordance with the following formula:

$$ETC_t = (ETI_t \times r_t)(1 - \gamma)$$

where:

- ETI_t is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of prescribed transmission services if such an entity, rather than the TNSP, operated the business of the TNSP, such estimate being determined in accordance with the post-tax revenue model;
- r_t is the expected statutory income tax rate for that regulatory year as determined by the AER; and
- γ is the assumed utilisation of imputation credits, which is deemed to be 0.5.

Based on Transend's estimated cost of debt and forecast of inflation (set out in sections 11.4 and 11.5), and the tax depreciation schedule shown in section 11.7, Transend's proposed net tax allowance for the forthcoming regulatory control period is set out in Table 11.4.

Table 11.4: Forecast tax allowance ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Income tax payable	10.8	12.5	13.6	15.6	17.1
Imputation credit	-5.4	-6.3	-6.8	-7.8	-8.6
Tax allowance	**5.4**	**6.3**	**6.8**	**7.8**	**8.6**

This tax allowance has been calculated using the AER's PTRM.

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12 TOTAL REVENUE AND X FACTOR

12.1 Introduction

This chapter provides a summary of the components that comprise Transend's proposed revenue requirements. The remainder of this chapter is structured as follows:

- Section 12.2 provides an overview of the building block revenue components and Transend's annual building block revenue requirement.
- Section 12.3 describes Transend's proposed total revenue cap, maximum allowed revenue and X factor.
- Section 12.4 shows the impact of Transend's proposed revenue in terms of average price levels.
- Section 12.5 describes the impact on customer prices.
- Section 12.6 describes the revenue adjustment for the forthcoming regulatory control period.

12.2 Annual building block revenue requirement

Transend's revenue proposal applies the post-tax building block approach, in accordance with the requirements outlined in chapter 6A of the Rules and the AER guidelines and post-tax revenue model (PTRM). Each of the building block components is described and substantiated in the preceding chapters.

The building block approach is outlined in clause 6A.5.4 of the Rules and it involves the determination of a regulated annual revenue allowance in accordance with the following formula:

$$ABBRR = (WACC \times RAB) + D + opex + tax$$

where:

- ABBRR is the annual building block revenue requirement (as defined in clause 6A.5.4 of the Rules);
- WACC is the post-tax nominal weighted average cost of capital;
- RAB is the regulatory asset base value;
- D is economic depreciation (nominal depreciation minus indexation of the RAB);
- opex is operating and maintenance expenditure and any efficiency glide-path payments; and
- tax is the corporate tax allowance.

A brief summary of each of the building blocks is provided below.

12.2.1 Regulatory asset base

The regulatory asset base value for each year of the forthcoming regulatory control period is set out in Table 12.1. These data reflect the capital expenditure forecast set out in chapter 5 and the expected depreciation over the period as set out in chapter 10.

Table 12.1: Regulatory asset base roll forward 1 July 2009 to 30 June 2014 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
RAB (start period)	987.3	1,130.7	1,294.0	1,390.6	1,498.8
Inflation on opening RAB	25.1	28.7	32.9	35.3	38.1
Nominal capex as incurred	168.3	189.4	119.2	136.1	146.4
Nominal straight-line depreciation	-50.0	-54.8	-55.5	-63.3	-69.2
RAB (end period)	1,130.7	1,294.0	1,390.6	1,498.8	1,614.1

12.2.2 Return on capital

Details of Transend's WACC calculation are set out in chapter 11 of this revenue proposal. The return on capital has been calculated by applying the post-tax nominal vanilla WACC to the opening regulatory asset base in each year consistent with the AER post-tax revenue model. This calculation is shown in Table 12.2.

Table 12.2: Return on capital from 1 July 2009 to 30 June 2014 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Opening RAB	987.3	1,130.7	1,294.0	1,390.6	1,498.8
Return on capital	105.1	120.4	137.8	148.1	159.6

12.2.3 Depreciation

The calculation of depreciation is detailed in chapter 10 of this revenue proposal. The AER's post-tax revenue model calculates economic depreciation by subtracting the indexation of the opening asset base from the depreciation for each regulatory year. A summary of this calculation is shown in Table 12.3.

Table 12.3: Total depreciation forecast from 1 July 2009 to 30 June 2014 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Straight-line depreciation	50.0	54.8	55.5	63.3	69.2
Indexation	-25.1	-28.7	-32.9	-35.3	-38.1
Economic depreciation	24.9	26.0	22.6	27.9	31.1

12.2.4 Operating expenditure

The calculation of operating and maintenance costs is detailed in chapter 6 of this revenue proposal. The total operating expenditure forecast is shown in Table 12.4.

Table 12.4: Total operating expenditure forecast from 1 July 2009 to 30 June 2014 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Operating expenditure	55.1	57.5	58.9	64.1	67.1

12.2.5 Corporate tax allowance

The calculation of the corporate tax allowance is detailed in chapter 11 of this revenue proposal. The corporate tax allowance is shown in Table 12.5.

Table 12.5: Forecast tax allowance ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Income tax payable	10.8	12.5	13.6	15.6	17.1
Imputation credit	-5.4	-6.3	-6.8	-7.8	-8.6
Tax allowance	**5.4**	**6.3**	**6.8**	**7.8**	**8.6**

12.2.6 Annual building block revenue requirement

The building block components that comprise Transend's annual building block revenue requirement for each year of the forthcoming regulatory control period are shown in Table 12.6 ($nominal) and Table 12.7 ($2008–09).

Table 12.6: Components of the annual building block revenue requirement, 2009–10 to 2013–14 ($m nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Return on capital	105.1	120.4	137.8	148.1	159.6
Return of capital (economic depreciation)	24.9	26.0	22.6	27.9	31.1
Operating expenditure	55.1	57.5	58.9	64.1	67.1
Net tax allowance	5.4	6.3	6.8	7.8	8.6
Annual building block revenue requirement—unsmoothed	**190.5**	**210.2**	**226.0**	**247.9**	**266.4**

Table 12.7 Components of the annual building block revenue requirement, 2009–10 to 2013–14 ($m 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14
Return on capital	102.5	114.5	127.8	133.9	140.8
Return of capital (economic depreciation)	24.3	24.8	21.0	25.3	27.5
Operating expenditure	53.7	54.7	54.6	58.0	59.2
Net tax allowance	5.3	6.0	6.3	7.0	7.6
Annual building block revenue requirement—unsmoothed	**185.8**	**199.9**	**209.7**	**224.3**	**235.0**

12.3 Total revenue cap, maximum allowed revenue and X factor

The annual building block revenue requirement is smoothed with an X factor to determine the maximum allowed revenue.

Matters relevant to the determination of the X factor are set out in clause 6A.6.8 and schedule S6A.1.3(8) of the Rules. In accordance with these requirements, Transend has determined its maximum allowed revenue (and the proposed X factor for each year of the regulatory control period) as shown in Table 12.8.

Transend has calculated the X factor for each regulatory year so that the expected maximum allowed revenue for the last regulatory year is as close as reasonably possible to the annual building block revenue requirement for that regulatory year, in accordance with clause 6A.6.8(c)(2) of the Rules. In interpreting and complying with the requirements of this particular clause, it is noted that:

- Transend has had regard to the desirability of limiting, as far as is practicable, the revenue increases in the first year of the forthcoming regulatory period; and
- Transend has also sought to limit the difference between the maximum allowed revenue and the annual building block revenue requirement for the last regulatory year to less than 1.5 per cent in nominal terms.

The total revenue cap (which is the sum of the maximum allowed revenue) for the regulatory control period is also shown. Table 12.9 shows this information in $2008–09.

Table 12.8: Annual building block revenue requirement, maximum allowed revenue, and X factors 2009–10 to 2013–14 ($m nominal)

	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Total revenue cap
Annual building block revenue requirement (unsmoothed)		190.5	210.2	226.0	247.9	266.4	
Maximum allowed revenue (smoothed)	144.6	190.5	207.8	226.7	247.2	269.7	1,141.9
X factor		-28.5%	-6.4%	-6.4%	-6.4%	-6.4%	

Note: includes network support forecast of $3.6 million for 2008–09

Table 12.9: Annual building block revenue requirement, maximum allowed revenue, and X factors 2009–10 to 2013–14 ($m 2008–09)

	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Total revenue cap
Annual building block revenue requirement (unsmoothed)		185.8	199.9	209.7	224.3	235.0	
Maximum allowed revenue (smoothed)	144.6	185.8	197.6	210.2	223.6	237.9	1,055.2
X factor		-28.5%	-6.4%	-6.4%	-6.4%	-6.4%	

Note: includes network support forecast of $3.6 million for 2008–09

Transend's proposed maximum allowed revenue represents an increase of approximately 28.5 per cent in 2009–10, relative to the maximum allowed revenue for 2008–09 under the current revenue determination, and 6.4 per cent per annum thereafter in real terms.

In this regard, the increase in the revenue requirement in the first year of the forthcoming regulatory control period of 28.5 per cent consists of the following three components.

- 5.5 per cent is due to Transend's proposed increase in activity levels in terms of operating expenditure and capital investment.
- 13.9 per cent is as result of technical changes to the regulatory framework relating to the treatment of work-in-progress (WIP) and financial market-driven changes to the cost of capital, both factors being beyond Transend's control.
- 9.1 per cent relates to an operating expenditure shortfall that arises because the ACCC's 2003 revenue cap decision provided an insufficient operating expenditure allowance for Transend to meet its TNSP obligations.

Figures 12.1 and 12.2 below show Transend's revenue requirements for the forthcoming regulatory control period and the impact of the increases in 2009–10 associated with the three components described above.

Figure 12.1: Increase in revenue requirement after adjusting the present revenue cap to reflect Transend's actual (efficient) operating expenditure over the current regulatory control period ($2008–09)

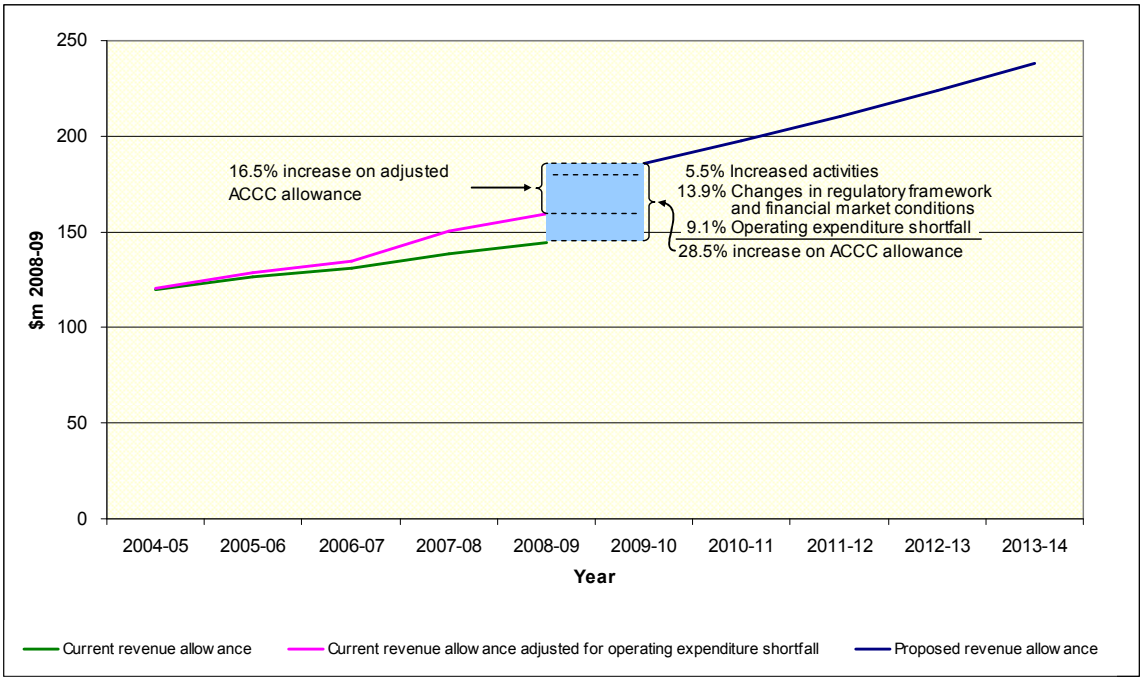


Figure 12.2: Simplified representation of increase in revenue for the first year of the forthcoming regulatory control period

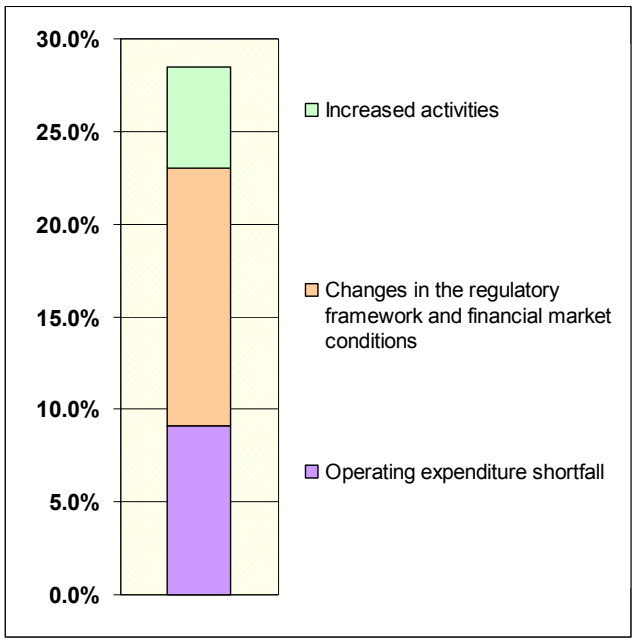
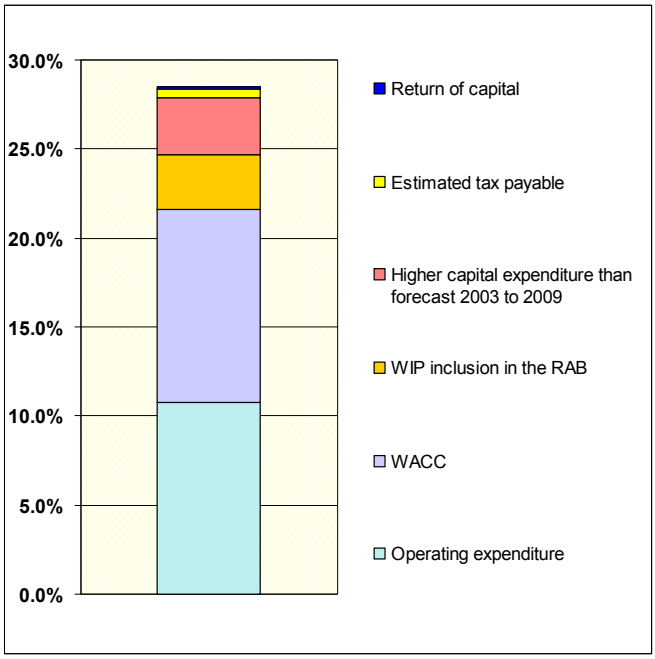


Figure 12.3 provides a more detailed breakdown of the 28.5 per cent increase in Transend's revenue requirements in the first year of the forthcoming regulatory control period. As noted previously, almost half of the required increase in Transend's revenue (that is, 13.9 per cent) results from:

- a change in the regulatory approach to capital expenditure, with WIP to be included in the opening regulatory asset base (RAB). This change results in the inclusion of $57.9 million of WIP, including accumulated finance during construction; and
- a change in financial market conditions that has led to an increase in the cost of capital.

These two changes do not directly relate to the operation or performance of the transmission system, even though they have a large impact on Transend's required revenue.

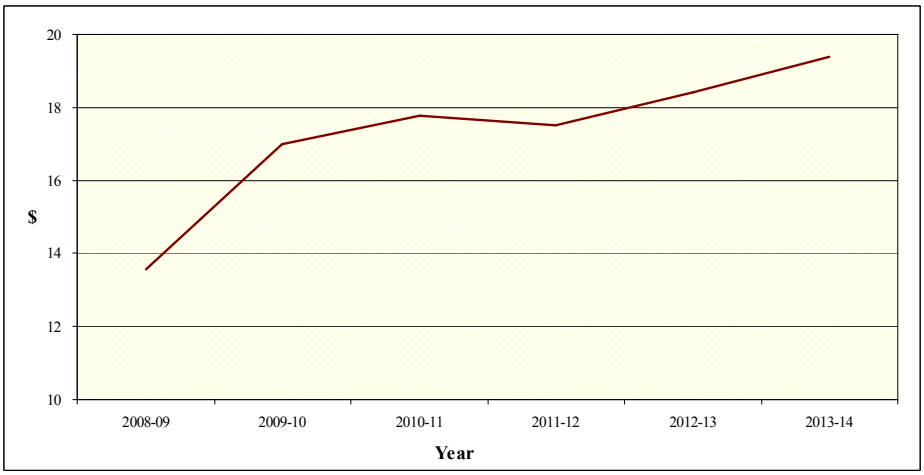
Figure 12.3: Composition of revenue increase for the first year of the forthcoming regulatory control period



12.4 Average price impact

Taking into account forecast demand, the proposed maximum allowed revenue equates to an increase in average prices of approximately 25.2 per cent in 2009–10, relative to the average price level for 2008–09, and 3.4 per cent per annum thereafter in real terms. This is shown in Figure 12.4.

Figure 12.4: Average price impact of revenue proposal ($/MWh 2008–09)



12.5 Cost to customers

Transmission costs in Tasmania represent approximately 12 per cent of the total delivered price for the typical residential customer.

The impact of Transend's revenue proposal on the total delivered price for a typical residential customer[56] is estimated to be an increase of 3.0 per cent or approximately $42 in 2009–10, and annual increases of less than $6 for the remainder of the forthcoming regulatory control period, in real terms.

It is recognised that for many commercial and energy intensive customers, transmission costs represent a greater percentage of the total delivered price.

While Transend recognises that the future price path for transmission services will increase over the forthcoming regulatory control period, Transend believes that its revenue proposal reflects a prudent and efficient expenditure program that is focused on the long term needs of the transmission system and Transend's customers.

12.6 Revenue Cap Adjustments

In accordance with the Rules, the revenue cap determined by the AER will be subject to adjustment during the regulatory control period as follows:

- The revenue cap will be calculated each year following the CPI–X methodology using actual CPI;
- Network support costs are treated as a pass through cost. As required by clause 6A.7.2 of the Rules, changes in network support costs will be subject to a pass through application. The application will seek to change the annual maximum allowed revenue allowance in each year based on the difference between forecast and actual network support expenditure;
- Clause 6A.7.3 of the Rules allows the pass through of other approved costs related to an insurance event, a regulatory change event, a service standard event, a tax change event or a terrorism event as defined in the Rules, and
- Contingent projects have been included in section 5.9 of this proposal. If a trigger event for a contingent project occurs then Transend will assess the projects using the regulatory test where applicable, and lodge an application to the AER requesting a revised maximum allowed revenue stream in accordance with clause 6A.8.2 of the Rules.

[56] As derived from data in OTTER report *Comparison of 2008 Australian Energy Prices*, January 2008 in section 4.1.1

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13 GLOSSARY

Acronym	Description
AASB	Australian Accounting Standards Board
ABARE	Australian Bureau of Agriculture and Resource Economics
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ACG	Allen Consulting Group
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AMD	Agreed maximum demand
AMIS	Asset management information system
APR	Annual Planning Report (Transend publication)
Aurora	Aurora Energy Pty Ltd
AWOTE	Average weekly ordinary time earning
B&N	Brothers & Newton Pty Ltd
Basslink	The DC interconnector between Loy Yang in Gippsland, Victoria across Bass Strait to Bell Bay in northern Tasmania
BPO	Base planning objects
C&AM	Connections and Asset Management (Group)
Capex	Capital expenditure
CAPM	Capital asset pricing model
CAP Bank	Capacitor banks (bay and capacitor bank)
CBD	Central business district
CCA	Current cost accounting
CCGT	Combined-cycle gas turbine
CEG	Competition Economists Group
COAG	Council of Australian Governments
Competition depreciation	An approach to depreciation which results in prices that are stable over time, and will not vary according to the age of an asset
CPI	Consumer price index
CPI-X	A regulatory approach intended to provide regulated companies with an incentive to increase efficiency
Customer	Has the same meaning as Transmission Customer in the National Electricity Rules.
DAC	Depreciated actual cost
DC	Direct current

Acronym	Description
Deprival value	The lower of DORC or economic value
DISREL	Distribution reliability software
DNSP	Distribution network service provider
DORC	Depreciated optimised replacement cost
Draft Regulatory Principles	ACCC's Draft Statement of Principles for the Regulation of Transmission revenues
DRP	Debt risk premium
Economic value	The value of an asset based on its future earnings
EMC	Electromagnetic compatibility
EMF	Electromagnetic fields
EPR	Earth potential rise
ESAA	Energy Supply Association of Australia
ESI	Electricity supply industry
ETI	Estimated taxable income
ENA	Energy Networks Association of Australia
EGW	Electricity, gas and water
EUA	Energy Users Association of Australia
Ex-ante	Based on forecast result rather than actual result
Ex-post	Based on actual result rather than forecast
GBE	Government business enterprise
Grid Vision	Transend's 30+ year network vision and associated Grid Vision project
GIS	Gas insulated system
GST	Goods and services tax
GWh	Gigawatt hour—one million kilowatt hours
HEC	Hydro-Electric Corporation, disaggregated in 1998 to form three entities: Aurora Energy Pty Ltd, Transend Networks Pty Ltd, and Hydro-Electric Corporation
HV	High voltage
Hydro Tasmania	Hydro-Electric Corporation, trading as Hydro Tasmania (see HEC)
IDC	Interest during construction
IIMM	International Infrastructure Management Manual
IRPC	Inter-Regional Planning Committee
IT	Information technology
ITOMS	International Transmission Operations and Maintenance Study
kV	Kilovolt—one thousand volts
kWh	Kilowatt hour—the basic unit of electrical energy

Acronym	Description
LPI	Labour price index
LGA	Local Government Association
LV	Low voltage
MD	Maximum demand
MAR	Maximum allowable revenue
MI	Major industrial (customer)
MRET	Mandatory renewable energy target
MRP	Market risk premium
MW	Megawatt—one million watts
NCC	National Competition Council
NCP	National competition policy
NEL	National Electricity Law
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NERA	NERA Economic Consulting
Network performance requirements	Electricity Supply Industry (Network Performance Requirements) Regulations 2007
NIEIR	National Institute of Economic and Industry Research
NOCS	Network operation and control system
NPV	Net present value
NSP	Network service provider
O&M	Operating and maintenance (expenditure)
ODRC	Optimised depreciated replacement cost
ODV	Optimised deprival value
Opex	Operating and maintenance expenditure
ORC	Optimised replacement cost
OTTER	Office of the Tasmanian Energy Regulator
PB	Parsons Brinkerhoff Australia Pty Ltd
PI	Performance Incentive scheme
PPI	Producer price index
PSS(E)	Power system simulator
PTRM	Post tax revenue model
RAB	Regulatory asset base
RBA	Reserve Bank of Australia
The Regulator	Tasmanian Energy Regulator (see OTTER)

Acronym	Description
RNPP	Tasmanian Reliability and Network Planning Panel
Rules	National Electricity Rules
SCADA	Supervisory Communications and Data Acquisition
SKM	Sinclair Knight Merz
SOO	Statement of Opportunities
SPS	System protection scheme
SRP	ACCC's Statement of Regulatory Principles
STPIS	Service target performance incentive scheme
SUBREL	Substation reliability software
TC	Transmission cable (new easement)—single or multiple projects
TEC	Tasmanian Electricity Code
TNSP	Transmission network service provider
TRANSREL	Transmission reliability software
TSMP	Transend's Transmission System Management Plan
TUOS	Transmission use of system
Unserved energy	The amount of energy (measured in megawatt hours, MWh) not delivered to transmission customers
VT	Voltage transformer
WACC	Weighted average cost of capital
WIP	Work–in–progress

14 APPENDICES

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Appendix 11	ROAM Consulting, *Scenarios for Revenue Reset Application—2009–10 to 2013–14*, May 2008
Appendix 12	Competition Economists Group, *Historic labour costs growth, a report for Transend*, May 2008
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Appendix 16	PB Associates, *Review of Transend's Project Cost Estimates,* May 2008
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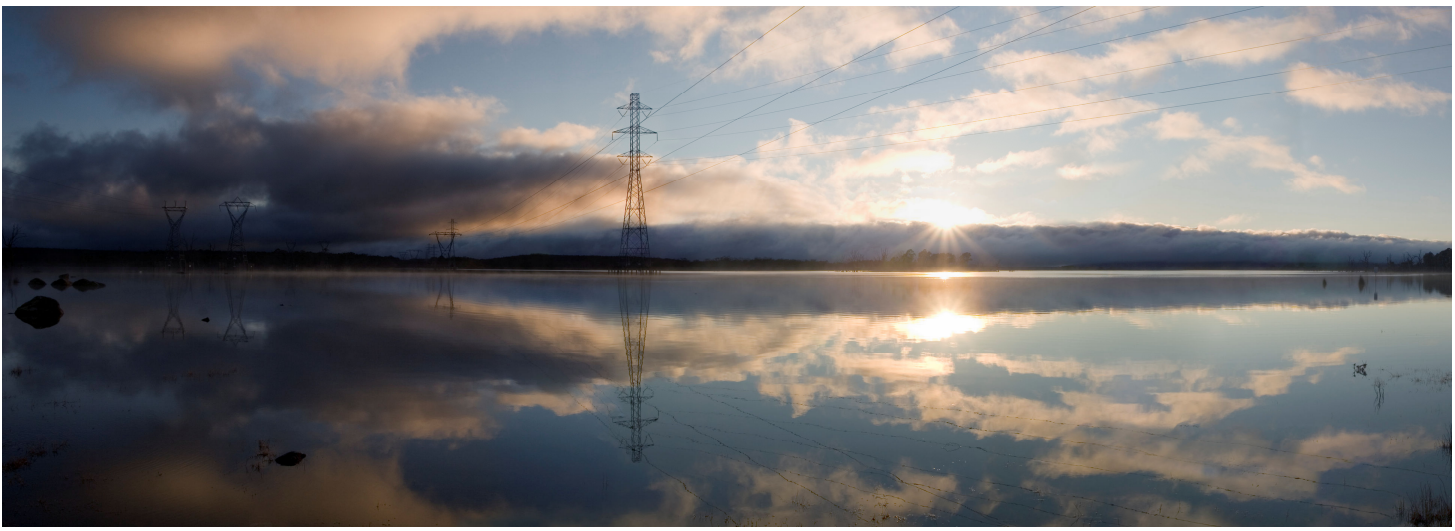
Appendix 20	Marsh, *Five Year Insurance Premium Trends – Indicative Forecasts*, May 2008

Appendix 21	Marsh, *Transend Self-Insurance Risk Quantification Report*, May 2008
Appendix 22	Board resolution to self-insure
Appendix 23	PB Associates, *Benchmark Comparison of Transend's Corporate Overhead and Shared Costs*, April 2008
Appendix 24	Sinclair Knight Merz, *Assessment of Economic Lives for Transend Regulatory Classes*, April 2008
Appendix 25	Evans & Peck, Risk Assessment of Transend Capital Works Program for 2009-14 Regulatory Reset Period, May 2008



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