Draft decision

Transend transmission determination 2009–10 to 2013–14

21 November 2008

AUSTRALIAN ENERGY REGULATOR

Request for submissions

This document sets out the Australian Energy Regulator's (AER) draft transmission determination for Transend during the period 1 July 2009 to 30 June 2014.

The AER will hold a pre-determination conference on this draft transmission determination on **10 December 2008** in Hobart for the purpose of explaining its draft decision and receiving oral submissions from interested parties. Interested parties can register to attend the pre-determination conference by calling the Network Regulation South Branch of the AER on (03) 9290 1430 or by emailing aerinquiry@aer.gov.au by 5 December 2008.

Interested parties are invited to make written submissions on issues regarding this draft transmission determination and the consultants' reports to the AER by 18 February 2009. The AER will deal with all information it receives in the transmission determination process, including submissions on the draft decision, in accordance with the ACCC/AER information policy. The policy is available at www.aer.gov.au.

Submissions can be sent electronically to aerinquiry@aer.gov.au

Alternatively, submissions can be mailed to:

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The AER prefers that all submissions be publicly available to facilitate an informed and transparent consultative process. Submissions will be treated as public documents unless otherwise requested. Parties wishing to submit confidential information are requested to:

- clearly identify the information that is the subject of the confidentiality claim
- provide a non-confidential version of the submission.

All non-confidential submissions will be placed on the AER website, www.aer.gov.au.

A copy of Transend's revenue proposal, proposed negotiating framework, proposed pricing methodology, consultancy reports and submissions from interested parties are available on the AER website.

Inquiries about the draft transmission determination or about lodging submissions should be directed to the Network Regulation South Branch on (03) 9290 1430.

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Shortened forms

ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AP	Australian Paper
AR	allowed revenue
APR	annual planning report
BPO	base planning object
capex	capital expenditure
CPI	consumer price index
DNSP	distribution network service provider
DRP	*Draft statement of principles for the regulation of transmission revenues*, 27 May 1999
EUAA	Energy Users Association of Australia
FDC	Finance During Construction
GWh	gigawatt hour
Hydro	Hydro Tasmania
kV	kilovolt, (one thousand volts)
MAR	maximum allowed revenue
MEG	Major Employers Group
MVA	megavolt ampere
MW	megawatt, (one thousand kilowatts)
MWh	megawatt hour
NEL	National Electricity Law
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NER	National Electricity Rules
NPV	net present value
opex	operating and maintenance expenditure
POE	probability of exceedance
PPI	producer price index
PTRM	post-tax revenue model
RAB	regulated asset base
RFM	roll forward model
RTA	Rio Tinto Alcan
SRP	*Statement of principles for the regulation of electricity transmission revenues*, 8 December 2004
the current regulatory control period	1 January 2004 to 30 June 2009
the next regulatory control period	1 July 2009 to 30 June 2014
TNSP	transmission network service provider
WACC	weighted average cost of capital
WorleyParsons Services Pty Ltd	WorleyParsons

Summary

Overview

The Australian Energy Regulator (AER) is responsible for the economic regulation of electricity transmission services provided by transmission network service providers (TNSPs) in the National Electricity Market (NEM). The AER has had this role since 1 July 2005 when these functions were conferred upon it by the National Electricity Law (NEL) and the National Electricity Rules (NER).

This is the AER's draft decision on Transend's transmission determination for the next regulatory control period (1 July 2009 to 30 June 2014).

This draft decision is based on an assessment of Transend's revenue proposal; the main components being its forecasts of capital expenditure (capex) and operating and maintenance expenditure (opex) for the next five years.

Transend has proposed capex of $681 million and opex of $280 million for the forthcoming regulatory period – an increase of 77 per cent and 60 per cent respectively, in real $2008-09 terms, over the 2003 ACCC Decision allowance. The AER is required to consider whether this proposed expenditure is reasonable when measured against the criteria set out in chapter 6A of the NER.

Transend has developed its capex and opex forecasts in consultation with Aurora Energy, Hydro Tasmania and direct connect customers. Transend submits this increased expenditure need is driven by new Tasmanian reliability standards, replacement of aging assets and the impact of higher input costs.

The ACCC's 2003 decision for the existing regulatory period (1 January 2004 to 30 June 2009) also requires the AER to assess whether Transend's capital expenditure over the current period has been prudent.

The AER estimates that, in nominal terms, Transend will overspend on its allowed capex for the 2004 to 2008-09 regulatory period by $64.4 million or 18.4 per cent.

The AER has undertaken an extensive review of Transend's past and future capital works programs as well as reviewing its governance procedures and cost-estimation processes. Two firms of engineering consultants assisted the AER in this review: WorleyParsons and Nuttall Consulting.

The AER's review has identified that Transend's past capital expenditure (capex) assessment and project governance processes—particularly in the early years of the current regulatory period—were not best practice and did not suit the rapidly evolving circumstances which faced Transend As set out in this decision, the AER accepts that the major reasons for over-expenditure in the current period can be attributed to underestimation of the extent of refurbishment required, Tasmania's entry to the National Electricity Market (NEM), unanticipated rises in labour, materials and construction costs and pre-existing deficiencies in Transend's cost estimation and governance practices. Although it has exceeded the approved level of expenditure by a significant margin (primarily in asset refurbishment), after an extensive review the

AER has assessed that Transend's expenditure over the current regulatory period was prudent.

Going forward, the AER is satisfied that Transend has recognised the past deficiencies and is making substantial improvements in its capital works cost estimation and governance processes and procedures.

New network reliability standards were incorporated in Tasmanian Government Regulations following a review by the jurisdictional regulator's Reliability and Network Planning Panel. These standards apply to Transend's transmission network from 1 January 2008 and will require a greater level of reliability in a significant portion of the Transend network.

Transend's revenue proposal for the next regulatory control period (1 July 2009 to 30 June 2014) has taken into account the increased capital works and operating expenditure (opex) that will be required to ensure the transmission network can meet the new standards and the long term needs of Tasmania for electricity transmission services. As a result, Transend proposes to continue its refurbishment program in the next regulatory control period.

The AER accepts that there are a number of drivers of higher capex and opex by Transend over the next 5 years:

- the need for increased capex associated with the new reliability standards specified in the Tasmanian regulations
- the urgent need to replace and maintain ageing assets
- high input costs such as construction materials and labour (as a consequence of the commodity/minerals boom and skills shortages respectively)
- increase in demand.

However, while Transend's estimation techniques and governance procedures are now considered to be of a higher standard, the AER was not satisfied the financial and economic analysis was sufficient to support Transend's entire ongoing refurbishment or renewal program.

In particular, the AER is not satisfied that Transend has demonstrated that it has adequately considered the optimal timing of its overall program of refurbishment and the scope for deferral of some elements in a much expanded works program. Accordingly, the AER has not accepted Transend's future capex proposal and has replaced this with an alternative estimate for future capex. The details of this are as set out later in this decision.

Outcome of regulatory process

The AER has approved a maximum allowed revenue (MAR) for Transend that increases from $176 million in 2009-10 to $244 million in 2013-14 ($nominal). The total revenue cap for Transend over the next regulatory control period is $1044 million. This is 8.6% ($97.9 million) less than that proposed by Transend.

The AER has reduced Transend's forecast capex proposal of $681 million ($2008-09) to $615 million ($2008-09). The reduction is primarily because of adjustments resulting from the detailed renewal projects review and the substitution of the AER's cost escalation rates.

The AER has reduced Transend's forecast opex proposal of $281 million ($2008–09) to $260 million. The reduction mainly results from:

- adjustments to labour and non-labour cost escalators
- adjustment to debt raising costs.

In addition to the ex ante capex allowance, the AER has approved an indicative contingent project allowance of $412 million.

The effect of the draft transmission determination on average transmission charges can be estimated by taking the annual MAR and dividing it by forecast annual energy delivered in Tasmania. Based on this approach, the AER estimates that this draft determination will result in an 8.1 per cent per annum (nominal) increase in average transmission charges over the next regulatory control period. In real terms ($2008–09), this equates to a 5.4 per cent per annum increase.

Transmission charges represent approximately 12 per cent[1] on average of end user electricity charges in Tasmania. In section 9.4 of this Decision, the AER has calculated the Transend proposal is equivalent to a nominal price increase of $48 (3.4 per cent) in 2009-2010 and $14 annually thereafter. The AER estimates, in nominal terms, the increase in average transmission charges for an average Tasmanian household, under this draft transmission determination, will be approximately $32 (or 2.2 per cent) in 2009-10 and approximately $12 for each subsequent year of the forthcoming regulatory period.

The higher than expected expenditure in the current period has provided customers with the benefits of increased network capabilities and reliability, without incurring the costs. Now that the AER has found this expenditure to be prudent, Transend will be allowed to earn a return on the excess expenditure from 1 July 2009.

In summary, the increase in average transmission charges is primarily because of:

- additions to Transend's asset base from over-expenditure on capex in the current regulatory period
- the need for increased capex associated with the new reliability standards specified in the Tasmanian regulations
- the urgent need to replace and maintain ageing assets

[1] Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 6

- high input costs such as construction materials and labour (as a consequence of the commodity/minerals boom and skills shortages respectively)

- increase in demand.

Transend proposed cost escalators for labour and materials including escalators for producer's margins and producer's labour costs. The AER has rejected Transend's escalators for labour and materials and has substituted its own estimates. The AER has also rejected the proposed producer's margins and producer's labour costs escalators. The AER considers that the Transend proposal goes beyond the reasonable recovery of efficient costs. The AER notes that such a movement would undermine the incentive framework for Transend and other TNSPs to operate efficiently and reduce costs. This issue is discussed in more detail in Appendix J.

The global financial crisis may also impact on the price of electricity through the estimated weighted average cost of capital used to determine Transend's allowed revenue. The cost of capital has fluctuated from around 9 per cent in early 2007, up to around 11 per cent in mid-2008. However, since then the cost of capital has fallen to around 9.64 per cent, as at 17 October 2008. The cost of capital used to determine Transend's future revenue will be determined closer to the time of the AER's final determination. If global financial conditions improve in the interim period and the commercial debt risk premium subsequently declines this will be reflected in a lower cost of capital for Transend and lower electricity prices for consumers.

Introduction

The AER must make transmission determinations for TNSPs according to chapter 6A[2] of the National Electricity Rules (NER) in respect of prescribed transmission services and negotiated transmission services.

The NER states that a transmission determination for a TNSP consists of: [3]

1. *[A] revenue determination for the provider in respect of the provision by the provider of prescribed transmission services.*

2. *[A] determination relating to the provider's negotiating framework.*

3. *[A] determination that specifies the negotiated transmission service criteria that apply to the provider.*

4. *[A] determination that specifies the pricing methodology that applies to the provider.*

On 31 May 2008 Transend submitted its revenue proposal, proposed negotiating framework and proposed pricing methodology[4].

The AER must make a draft decision relating to Transend's proposal.[5] The draft decision must comply and be in accordance with the relevant requirements of the NER.[6] This is the AER's draft decision on Transend's transmission determination for the next regulatory control period (1 July 2009 to 30 June 2014).

The Australian Competition and Consumer Commission (ACCC) determined Transend's revenue cap for a five-and a-half-year period from 1 January 2004 to 30 June 2009 (the current regulatory period). The AER assumed responsibility for regulating electricity transmission services provided by Transend from 1 July 2005.

The AER is required to provide Transend with sufficient revenues to meet the efficient costs of maintaining and developing the Tasmanian network, given the forecast growth in demand for electricity transmission services and the reliability standards required by the Tasmanian regulations.

The AER published Transend's revenue proposal, proposed negotiating framework and proposed pricing methodology on 27 June 2008. Interested parties were invited to

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[2] The new chapter 6A of the NER took effect on 16 November 2006.

[3] Clause 6A.2.2 of the NER

[4] In accordance with clause 6A.10.1 of the NER

[5] Under clause 6A.12 of the NER

[6] Under clause 6A.14 of the NER

make a submission on all documents. Five submissions were received. A public forum on Transend's revenue proposal was held in Hobart on 6 August 2008.

The AER engaged WorleyParsons as a technical expert to advise it on a number of key aspects of Transend's revenue proposal, including capex, opex and service standards. The AER engaged Nuttall Consulting to provide advice on replacement capex issues. Econtech Pty Ltd was commissioned to provide an independent assessment of Transend's proposed wage growth escalators for opex and capex.

This draft transmission determination should be read in conjunction with the consultants' reports.

The key components of this draft transmission determination are:

- The AER's draft revenue determination for Transend in respect of the provision by Transend of prescribed transmission services, including:
    - an assessment of the prudence of capex undertaken by Transend during the current regulatory period, under transitional and savings provisions in chapter 11 of the NER
    - the opening Regulatory Asset Base (RAB) value for Transend
    - an assessment of the forecast capex allowance for Transend over the next regulatory control period
    - an estimate of the efficient benchmark weighted average cost of capital (WACC) for Transend
    - an assessment of the forecast opex allowance for Transend over the next regulatory control period
    - an assessment of the Efficiency Benefits Sharing Scheme for Transend
    - the values to be attributed to the performance incentive scheme parameters for the purposes of the application to Transend of a service target performance incentive scheme
    - the amount of the estimated total revenue cap over the regulatory control period for Transend.
- the AER's draft determination relating to Transend's negotiating framework for negotiated transmission services.
- the AER's draft determination on the negotiated transmission service criteria that will apply to Transend.
- the AER's draft determination in relation to Transend's pricing methodology.

The AER's review process has considered the submissions made by interested parties, the independent advice of its consultants and the additional information provided by Transend. The AER has also undertaken its own analysis of major elements of the

capex and opex proposals, the pricing methodology, negotiated services framework and the escalators applied by Transend in formulating its forecast capex and opex amounts.

The process has included numerous meetings between Transend, the AER, WorleyParsons and Nuttall Consulting and detailed examination of Transend's supporting documentation. This included requesting further explanatory information from Transend and its consultants and evaluating the assumptions and methodologies behind the Transend responses.

The analysis of operating expenditure involved:

- desktop examination of the Transend proposal and supporting information, including the comparative benchmarking exercise by Parsons Brinkerhoff
- detailed analysis (and correction of) Transend's operating expenditure models and the under-lying assumptions
- scrutinising the proposed base year for one-off-costs
- examination of employee numbers and proposed scale and scope changes
- review of the drivers behind cost increases to Transend's operation, including reviews of labour, non-labour, materials, debt and equity costs
- review of Transend's contracts with external providers
- examination of internal processes, documentation of business practices and policies, internal budget papers and invoices.

The AER was particularly concerned with the level of over-expenditure for both opex and capex in the current regulatory period. Consequently, the AER undertook a comprehensive review of each over-expenditure category.

The assessment of Transend's past capex expenditure and proposed future expenditure examined:

- whether the governance framework, capex policies and procedures facilitate efficient investment outcomes
- if the methods used to develop the capex proposal, including probabilistic planning, demand forecasts and network planning criteria, are robust and appropriate
- the financial and economic analysis and documentation supporting capital projects
- whether there is a genuine need for the projects proposed in the revenue proposal and whether the scope, timing and costs are efficient
- if the cost accumulation process employed by Transend was reasonable
- whether Transend's contingent projects satisfy the NER requirements

- whether the future capex program is deliverable.

The AER's consideration of each of these components is summarised below. Further detail is provided in the relevant chapters and in the appendices attached to this draft transmission determination.

Past capital expenditure

Transend proposal

Transend stated that it anticipated actual capitalisation of investments to be $452 million ($2008–09) during the current regulatory period (on an as-commissioned basis). This is 20 percent more than the 2003 ACCC revenue cap decision allowance of $362 million (($2008–09 and adjusted for actual consumer price index (CPI)).[7] Of the $420 million of past capex that Transend proposed to roll into its RAB, $26 million relates to finance during construction (FDC).

Transend stated that as well as commissioned works, its assets under construction as at 30 June 2008 are estimated to be $57.9 million. This amount needs to be recognised in the RAB because of the transition to recognising capex on a partially as-incurred (hybrid) approach during the next regulatory control period. Figures 1 & 2 provide a graphical overview of Transend's current and projected capital expenditure.

AER conclusion

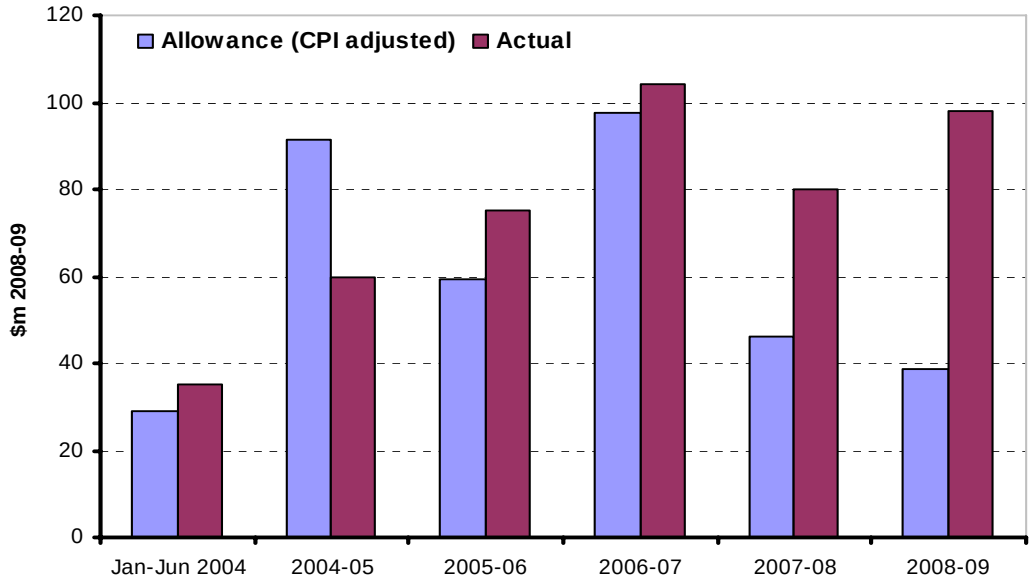
The AER has reviewed Transend's capex over the current regulatory period and has tested the prudence and efficiency of expenditure through detailed reviews of a targeted sample of projects. This analysis has been assisted by advice from WorleyParsons and Nuttall Consulting.

The AER's conclusion is that Transend's expenditure of $415 million (inclusive of FDC costs) on commissioned projects during the current regulatory period is prudent and that the projects were efficient and consistent with good industry practice.

Notwithstanding this, Transend's cost estimation processes—particularly in the early years of the current regulatory period—were not representative of best practice, which resulted in some projects' actual costs being considerably different to the original estimate. However, Transend has adopted a more sophisticated project cost estimating package that, going forward, should improve the accuracy of initial cost estimates.

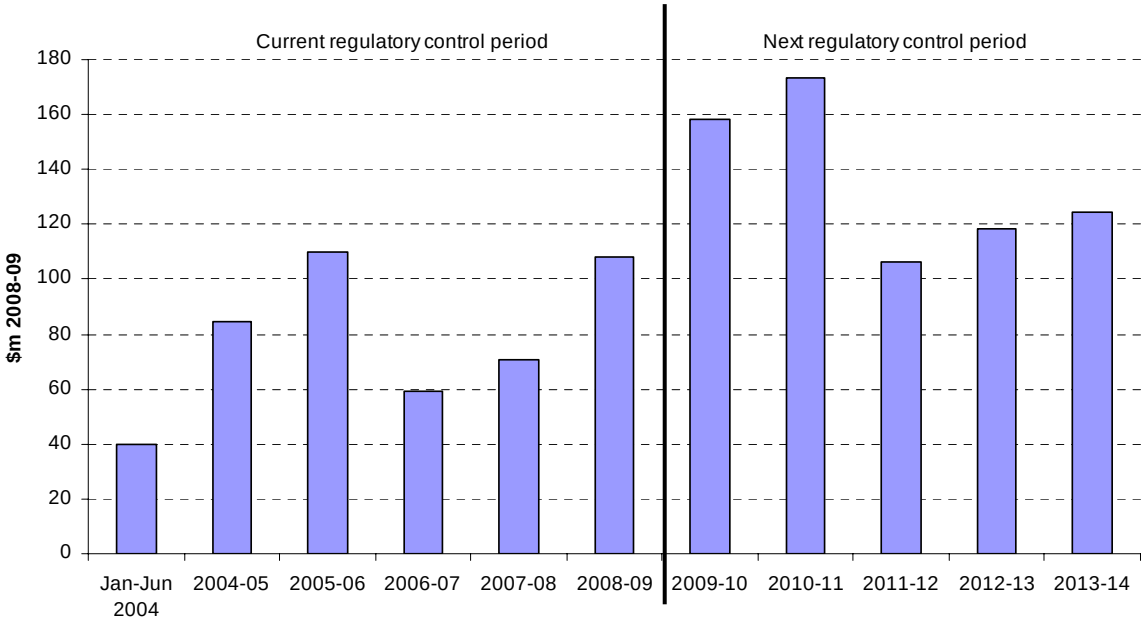
[7] Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 38.

Figure 1: Comparison of Transend's 2003 allowance and its actual commissioned capex profile ($m, 2008-09)



Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 38.

Figure 2: Comparison of annual forecast and historic capex ($m, 2008-09)



Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 93.

The AER further concludes that Transend's proposal of $55 million for assets under construction is also prudent.[8] This amount should be included in Transend's RAB to reflect the transition to a partially as-incurred approach to recognising capex during the next regulatory control period.

The AER also accepts Transend's proposal of $26 million relating to an FDC allowance for commissioned projects.

Opening regulated asset base

Transend proposal

Transend has proposed an opening RAB for the next regulatory control period of $987.3 million as at 1 July 2009. The proposed opening RAB includes a higher than forecast past capex amount of $419.8 million (including finance during construction (FDC) costs) and $57.9 million of assets under construction at the end of the current regulatory period[9]. The AER's consideration of these amounts is discussed in detail in chapter 2.

Transend has used the AER's asset base Roll-Forward-Model (RFM) to determine its proposed opening RAB. In performing the roll forward of its RAB, Transend has deducted the cash amount received for any disposal of its assets from the RAB. It has also adjusted the capex allowance and regulatory (economic) depreciation as determined in the ACCC's 2003 revenue cap decision for actual inflation using the consumer price index (CPI).[10]

In accordance with schedule 6A.2.1(c)(2) of the NER, Transend has sought to adjust its opening RAB value by $17.3 million to account for lower than estimated commissioned assets between July and December 2003. Further, it has proposed to roll out the return on this difference ($6.2 m) over the current regulatory period of to establish the opening RAB as at 1 July 2009.

AER conclusion

Consistent with the NER and the draft statement of regulatory principles (DRP), Transend has proposed to roll forward its RAB established in the ACCC's 2003 revenue cap decision to determine an opening RAB for the next regulatory control period. Applying the RFM, the AER has determined Transend's opening RAB to be $993.6 million for the next regulatory control period, as at 1 July 2009. This value is used as an input for the AER's post-tax revenue model for the purposes of determining Transend's MAR during the next regulatory control period.

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8 Transend, Response to information request no. 107, confidential, submitted 31 July 2008. Transend submitted revised models incorporating amendments for errors identified in the course of the review.

9 Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p 148.

10 As Transend's MAR for the current regulatory period was determined using forecast inflation, the MAR is adjusted annually to account for actual CPI.

The RAB roll forward calculations are set out in table 1. The AER will update the calculations with the most recent forecast of capex for 2008–09 and the latest CPI data, at the time of its final transmission determination.

Table 1: Transend's opening RAB for the next regulatory control period ($m, nominal)

	2004 (Jan to Jun)	2004–05	2005–06	2006–07	2007–08 [a]	2008–09 [a]
Opening RAB	603.6	628.7	696.1	737.3	811.4	850.5
Forecast capex (adjusted for actual CPI)[c]	28.6	84.4	56.0	95.1	46.0	40.0
Straight-line depreciation (adjusted for actual CPI)	–3.5	–17.0	–14.8	–21.0	–6.9	–6.0
Closing RAB	628.7	696.1	737.3	811.4	850.5	884.5
Add: prudent capex over 2003 decision[d]						59.9
Add: return on difference[e]						–6.2
Add: prudent assets under construction						55.4
Opening RAB at 1 July 2009						993.6

(a) Forecast updated for actual 2007-08 CPI data.
(b) Forecast.
(c) The capex values include a half WACC allowance to compensate for the average six-month period before capex is added to the RAB for revenue modelling purposes.
(d) Includes the difference between actual and forecast capex of the underspend of $17.3 million from 1 July to 31 December 2003 and an overspend of $77.2 million from 1 January 2004 to 30 June 2009. The cash values for disposal of assets have been deducted.
(e) This relates to the return on difference between actual and forecast capex of $17.3 million for 1 July 2003 to 31 December 2003.

Transend's opening RAB for the next regulatory control period is approximately 65 per cent higher (in nominal terms) than its opening RAB at the start of the current regulatory period. This increase largely results from:

- a higher than forecast amount of commissioned assets ($415.1 million, inclusive of FDC costs) compared with $350.1 million in the 2003 revenue cap decision.
- the inclusion of an assets under construction component ($55.4 million, inclusive of FDC costs) for the current regulatory period to allow for the transition to recognising capex on a partially as-incurred approach.

Forecast capital expenditure

Transend proposal

Transend has proposed an ex ante capex allowance totalling $681 million ($2008–09) for the next regulatory control period. [11] Table 2 set out the annual profile of Transend's capex proposal.

Table 2: Transend's proposed ex ante capex allowance ($m, 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Capex proposal	158.0	173.4	106.5	118.5	124.3	680.7

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 86.

Transend's revenue proposal includes 9 contingent projects. The indicative costs for these projects range from $12 million to $147 million, and total $509 million.

Transend's capex proposal is almost 65 per cent higher than the capex expected to be incurred during the current regulatory period. It noted that significantly higher capital investment is required due to the combined effect of 'volume of work' and 'price of work' cost drivers. Volume of work cost drivers include:

- the amended mandated reliability standards set out in the Tasmanian regulations.
- the age profile of Transend's network
- additional investment to address the physical security of critical infrastructure.

Price of work cost drivers include:

- rising wages growth, land escalation values and non-labour construction costs
- the rising price of electricity transmission equipment.

AER conclusion

The AER is not satisfied that the capex allowance proposed by Transend reasonably reflects the capex criteria. Because of this, the AER must not accept the forecast capex in Transend's revenue proposal.

On the basis of its analysis of Transend's proposed capex forecast and the advice of Nuttall Consulting, the AER has reduced Transend's ex ante capex allowance by $55 million ($2008–09). The AER has also revised the escalators that Transend has applied in its revenue proposal. On the basis of updated forecasts for CPI and the escalators detailed in appendix J, the forecast capex allowance for Transend is adjusted by $10.6 million. These adjustments mean that the forecast capex allowance for Transend will be $615 million for the next regulatory control period.

[11] Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 86.

This revised allowance represents the AER's estimate of the total capex that a prudent operator in the circumstances of Transend would require to achieve the capex objectives. The AER is satisfied that the revised forecast of $615 million over the next regulatory control period reasonably reflects the capex criteria, taking into account the capex factors. This is shown by capex category in table 3.

Table 3: AER's conclusion on Transend's ex ante capex allowance ($m, 2008–09)

	2008–09	2009–10	2010–11	2011–12	2012–13	Total
Transend's proposal	158.0	173.4	106.5	118.5	124.3	680.7
Adjustment resulting from detailed project reviews[a]	–1.4	–5.0	–3.7	–19.7	–25.2	–55.0
Application of annual escalators	–2.0	–1.8	–1.6	–2.0	3.1	–10.6
AER's total adjustments	–3.4	–6.8	–5.3	–21.8	–28.3	–65.6
AER's ex ante capex allowance	154.6	166.6	101.2	96.8	96.0	615.1

(a) These adjustments relate to augmentation, easement, replacement, and security and compliance projects.

Cost of capital

Transend proposal

In estimating the WACC for its revenue proposal, Transend has used the values for the WACC parameters set out in the NER. For the purposes of its revenue proposal Transend has calculated a nominal vanilla WACC of 10.65 per cent. The parameters underlying Transend's calculation of the WACC are presented in table 4.

Table 4: Transend's proposed WACC parameters

Parameter	Transend's proposal
Risk-free rate (nominal)	6.37%
Expected inflation rate	2.54%
Debt risk premium	3.13%
Market risk premium	6.00%
Corporate tax rate	30%
Value of imputation credits	50%
Proportion of equity funding	40%
Proportion of debt funding	60%

Equity beta	1.00
Nominal vanilla WACC	10.65%

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 161.

AER conclusion

For this draft transmission determination, the AER has determined a nominal vanilla WACC of 9.64 per cent for Transend. The WACC is less than that proposed by Transend due to a decline in annualised yields on Commonwealth Government Bonds since Transend submitted its revenue proposal.

The AER is guided by the Reserve Bank of Australia's stance on monetary policy and official target inflation range of 2 to 3 per cent when determining the appropriate forecast inflation rate. Based on this approach, the AER's estimate derived from the RBA's inflation forecast of 2.55 per cent per annum provides the best estimate at this time. The AER recognises that inflation forecasts will change in line with market sensitive data. Regulatory practice in Australia has been to update these parameter values at the time of making a final determination to take account of most recent information. Accordingly, the AER will update the inflation forecast to be used in the PTRM based on this methodology at the time of its final decision.

Table 5 outlines the WACC parameter values for this draft transmission determination. The AER will update the nominal risk-free rate and debt risk premium, based on the agreed averaging period, at the time of its final transmission determination.

Table 5: AER's conclusion on WACC parameters

Parameter	Transend's proposal
Risk-free rate (nominal)	5.27%
Expected inflation rate	2.55%
Debt risk premium	3.28%
Market risk premium	6.00%
Corporate tax rate	30%
Value of imputation credits	50%
Proportion of equity funding	40%
Proportion of debt funding	60%
Equity beta	1.00
Nominal vanilla WACC	9.64%

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 161.

Operating and maintenance expenditure

Transend proposal

Transend's forecast opex for the next regulatory control period is $281.4 million, $108.2 million greater than its expected opex in the current regulatory period. Transend identified the following significant cost drivers:

- asset growth
- an ageing asset base
- labour skills shortages and real wages growth

AER conclusion

As the AER is not satisfied that Transend's total forecast opex reasonably reflects the opex criteria, the AER must not accept the forecast opex in Transend's revenue proposal. Therefore, the AER is required to provide an estimate of the total opex that Transend will require over the next regulatory control period which the AER is satisfied reasonably reflects the opex criteria, taking into account the opex factors.

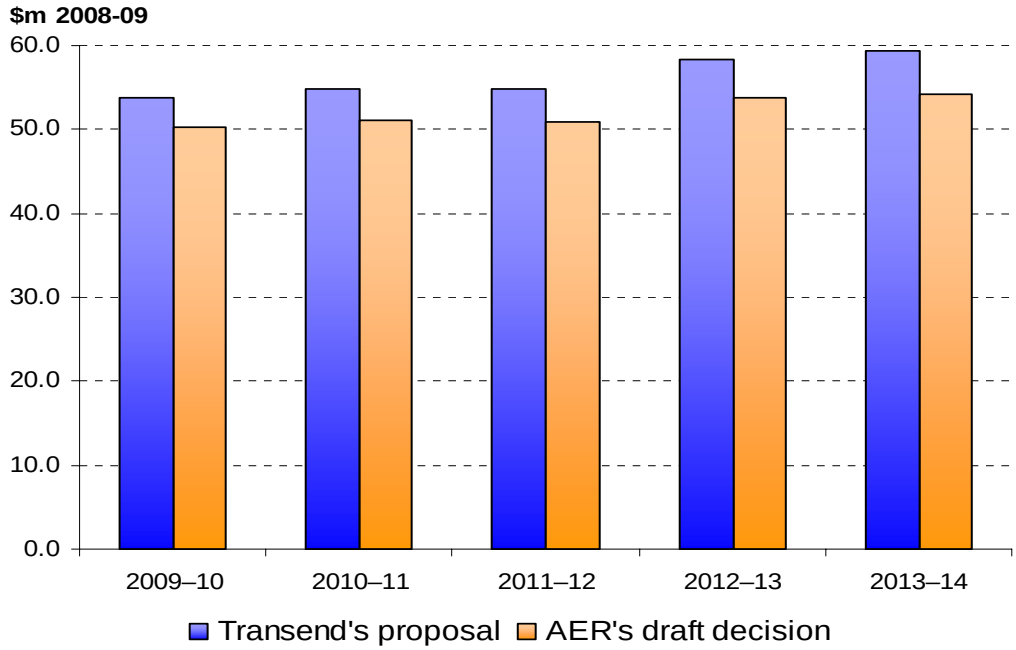
This revised estimate represents the AER's estimate of the total opex costs that a prudent operator would require to achieve the opex objectives. The AER is satisfied that the revised total forecast opex of $260.2 million over the next regulatory control period, reasonably reflects the opex criteria, taking into account the opex factors.

Table 6: AER conclusion on Transend opex forecast ($m, 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
Field operations and maintenance	16.4	17.5	17.8	18.2	19.0	88.9
Transmission services	7.6	7.9	8.1	8.4	8.5	40.6
Transmission operations	5.0	5.2	5.3	5.5	5.6	26.5
Asset management	6.5	6.7	8.3	10.2	9.2	40.9
Corporate	9.6	9.7	9.8	10.1	10.4	49.7
Total controllable expenditure	**45.1**	**47.0**	**49.4**	**52.3**	**52.7**	**246.6**
Network support	3.9	2.6	0.0	0.0	0.0	6.6
Debt raising	0.5	0.6	0.6	0.6	0.7	3.0
Equity raising	0.0	0.0	0.0	0.0	0.0	0.0
Self-insurance	0.8	0.8	0.8	0.8	0.8	4.0

Total Operating expenditure	**50.3**	**51.0**	**50.9**	**53.8**	**54.2**	**260.2**

Figure 3: Transend opex proposal vs AER allowance



Efficiency benefit sharing scheme

Transend proposal

The EBSS states that for the purposes of calculating carryover amounts, forecast opex should be adjusted for the cost consequences of the difference between forecast and actual demand growth over the regulatory control period. These adjustments should be made using the same relationship between growth and expenditure used in establishing the forecast opex. Transend did not discuss how it considered opex forecasts should be adjusted for actual demand growth at the end of the next regulatory control period when calculating carryover amounts.

The EBSS allows TNSPs to propose a range of additional cost categories to be excluded from the operation of the EBSS. The scheme requires that these cost categories must be proposed by a TNSP in its revenue proposal for the next regulatory control period. Transend proposed that pass through events, network support costs, debt raising costs, superannuation provisions, equity raising costs and insurance and self-insurance costs should be excluded from the calculation of its efficiency benefits.

AER conclusion

The AER will apply the EBSS to Transend for the next regulatory control period. In the event that actual demand growth is outside the range of scenarios modelled in the development of Transend's approved forecast capex and for the purposes of the EBSS, forecast opex should be adjusted based on the same models (opex and capex)

used to develop Transend's approved forecast opex to incorporate the impact of actual demand growth on the commissioning of new assets.

The following opex cost categories will be excluded from the operation of the EBSS for the next regulatory control period:

- debt and equity raising costs
- insurance and self-insurance costs
- superannuation costs
- non-network alternatives.

These are in addition to the costs of pass through events which are directly excluded by the EBSS.

The forecast controllable opex for Transend outlined in table 7 will be used to calculate efficiency gains and losses for the next regulatory control period, subject to adjustments required by the EBSS.[12]

Table 7: AER conclusion on forecast controllable opex for EBSS purposes

	2009–10	2010–11	2011–12	2012–13	2013–14
Total forecast opex	**45.1**	**47.0**	**49.4**	**52.3**	**52.7**
Debt and equity raising costs	0.5	0.6	0.6	0.6	0.7
Insurance and self-insurance costs	1.7	1.8	1.9	2.0	2.1
Superannuation costs	0	0	0	0	0
Non-network alternatives	3.9	2.6	0.0	0.0	0.0
Forecast opex for EBSS purposes	**39**	**42**	**46.9**	**49.7**	**49.9**

Service target performance incentive

Transend proposal

Transend's proposed performance targets, caps, collars, deadbands and weightings for each of the parameters to apply under the scheme are set out in table 8.

[12] AER, *Electricity transmission network service providers efficiency benefit sharing scheme*, September 2007, p. 7.

Table 8: Transend's proposed values and weightings

Parameter	Proposed values					
	Weight	Collar	Lower Deadband	Target	Upper Deadband	Cap
Transmission circuit availability (critical)	20%	98.36%	98.94%	99.13%	99.32%	99.89%
Transmission circuit availability (non-critical)	10%	98.54%	98.95%	98.99%	99.03%	99.43%
Transformer circuit availability	15%	98.82%	99.23%	99.28%	99.33%	99.75%
Loss of Supply > 0.1 system minutes	20%	20	16	15	14	10
Loss of Supply > 1.0 system minutes	35%	5	3	2	2	0
Average outage duration (transmission lines)	0%	387	304	276	248	166
Average outage duration (transformers)	0%	1085	595	541	487	118

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 137.

AER conclusion

The AER accepts the variations proposed by WorleyParsons to Transend's STPIS targets, caps and collars, with the exception of the collars for transmission line circuit availability (critical) and average outage duration (transformer). The AER has substituted its own value for these collar values. The AER also rejects the use of deadbands by Transend for the scheme. The AER accepts the weights Transend has proposed to apply to its parameters.

The definitions that apply to Transend for the next regulatory control period are set out in Appendix F of this draft determination. The performance incentive curves for each parameter are set out in Appendix G.

The caps, collars, performance targets and weightings to be applied to Transend during the next regulatory control period are set out in table 9.

Table 9: Caps, collars, targets and weightings to apply to Transend

Sub-Parameter	Weighting	Collar	Target	Cap
Transmission circuit availability (critical)	20%	97.90%	99.13%	99.75%
Transmission circuit availability (non-critical)	10%	98.48%	98.97%	99.47%
Transformer circuit availability	15%	98.67%	99.28%	99.90%
Loss of Supply > 0.1 system minutes	20%	21	15	8
Loss of Supply > 1.0 system minutes	35%	4	2	0
Average outage duration (transmission lines)	0%	529	326	124
Average outage duration (transformers)	0%	1428	712	354

Maximum allowed revenue

Transend proposal

Transend's MAR for the final year of its current regulatory period (2008–09) is $144.6 million. Transend has proposed a nominal MAR of $190.5 million in 2009-10, increasing to $269.7 million in 2013–14. The implied energy delivered unit cost of energy from this MAR is $13.56 per MWh in 2009–10 increasing at a nominal average annual rate of 10.1 per cent per annum to $21.98 per MWh in 2013–14. Transend stated that this average increase in transmission charges will increase the average residential customer bill by approximately $42 for the first year and by approximately $6 for each subsequent year of the regulatory period in real terms.

AER determination

Based on its assessment of the building block components and using the PTRM, the AER has determined an annual building block revenue requirement for Transend that increases from $176.4 million in 2009–10 to $239.8 million in 2013–14 ($nominal). Table 10 shows the annual building block calculations.

Table 10: AER's draft decision on annual building block revenue requirement ($m, nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Return on capital	95.8	109.2	124.3	132.9	141.1	603.2
Regulatory depreciation	24.4	25.0	23.1	26.2	29.9	128.6
Opex allowance	51.6	53.7	54.9	59.5	61.5	281.1
Opex efficiency glide path	0.0	0.0	0.0	0.0	0.0	0.0

Net tax allowance	4.6	5.4	6.1	6.7	7.3	30.2
Annual building block revenue requirement (unsmoothed)	176.4	193.3	208.4	225.4	239.8	1043.1

The NPV of the annual building block revenue requirement for the next regulatory control period has been calculated to be $787.1 million. Based on this NPV amount, the AER has determined a nominal expected MAR (smoothed) for Transend that increases from $176.4 million in 2009–10 to $244.0 million in 2013–14, as shown in table 11. Transend's MAR for the next regulatory control period is calculated using the formula described in section 9.3. The total revenue cap for Transend over the next regulatory control period is $1044.0 million.

To determine the expected MAR (smoothed) over the next regulatory control period the AER has applied an X factor of -18.9 per cent in the first year (based on setting the first year MAR equal to the annual building block revenue requirement for that year) and -5.8 per cent in subsequent years. The AER considers that this profile of X factors results in an expected MAR in the final year of the regulatory control period that is not unreasonably different to the annual building block revenue requirement for that year, and is therefore in accordance with clause 6A.6.8(c)(2) of the NER.

Table 11: AER's draft decision on the maximum allowed revenue ($m, nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
MAR (smoothed)	176.4	191.3	207.4	225.0	244.0	1044.0
X factor	-18.9	-5.8	-5.8	-5.8	-5.8	–

The revenue increase during the next regulatory control period consists of:

- An initial increase of 22.0 per cent (nominal) from 2008–09 to 2009–10.
- A subsequent average annual increase of 8.5 per cent (nominal) during the remainder of the next regulatory control period.

In real terms, the revenue increase during the next regulatory control period consists of an initial increase of 18.9 per cent from 2008–09 to 2009–10 and a subsequent annual average increase of 5.8 per cent per annum during the remainder of the next regulatory control period.

Transmission charges represent approximately 12 per cent[13] on average of end user electricity charges of $1400[14] in Tasmania. The AER estimates that in nominal terms the increase in average transmission charges under this draft transmission determination will add approximately $32 (or 2.2 per cent) in 2009-10 and

[13] The customer billing data is from the Office of the Tasmanian Energy Regulator. OTTER, *Comparison of 2008 Australian Standard Offer Prices Report*, February 2008, p. 5

[14] Interpolated from Transend revenue proposal, page 6, a 3 per cent price increase, in real terms, caused by a $42 rise in price under the Transend proposal means the average end user electricity charge is $1400.

approximately $12 for each year of the forthcoming regulatory period to the average residential customer's annual bill. Calculated on a nominal basis, Transend's proposed $42 real increase is equivalent to a $48 nominal increase in 2009-10 and the $6 real in each subsequent year is equivalent to $14 in nominal terms.

Negotiated framework for negotiated transmission services

Transend proposal

Transend stated that its proposed negotiating framework is in accordance with clause 6A.9.5(a) of the NER and sets outs the procedure to be followed when negotiating terms and conditions of access for a negotiated transmission service.

AER determination

AER approves Transend's negotiating framework for the next regulatory control period.

The AER has assessed Transend's negotiating framework and considers that the negotiating framework is compliant with clause 6A.9.5(c) of the NER.

Negotiated transmission service criteria

AER determination

As required by the NER, the determination by the AER at appendix H specifies the negotiated transmission service criteria for Transend for the regulatory control period 1 July 2009 to 30 June 2014.

Pricing methodology

Transend proposal

Transend stated that its proposed pricing methodology is a fulfilment of its obligation under the NER and the AER's pricing methodology guidelines to prepare a proposed pricing methodology for prescribed transmission services.

AER determination

The AER considers Transend's proposed pricing methodology for the forthcoming regulatory period is, in a number of respects, not compliant with the requirements of the NER. Chapter 12 of the AER's draft decision includes details of the changes required or matters to be addressed before the AER will approve the methodology.

Appendix K to this draft decision also sets out further changes of an editorial nature to be made by Transend to the proposed pricing methodology.

1 Introduction

1.1 Background

Under the National Electricity Law (NEL) and the National Electricity Rules (NER), the Australian Energy Regulator (AER) is responsible for the economic regulation of electricity transmission services provided by transmission network service providers (TNSPs) in the National Electricity Market (NEM).

The AER makes determinations according to chapter 6A of the NER in respect of certain services provided by transmission businesses. In performing these obligations, the AER is responsible for regulating:

- the revenues that TNSPs may earn from providing prescribed transmission services
- the terms and conditions of access and the access charges to be applied by TNSPs for providing negotiated transmission services.

The AER is required to provide Transend an opportunity to recover sufficient revenues to meet the efficient costs of maintaining its network.

On 31 May 2008 Transend submitted to the AER its revenue proposal, proposed negotiating framework and proposed pricing methodology for the next regulatory control period (1 July 2009 to 30 June 2014). On 27 June 2008 the AER published these and the proposed negotiated transmission service criteria for Transend.

The ACCC determined Transend's current revenue cap for a five-and-a-half-year period from 1 January 2004 to 30 June 2009 (the current regulatory period) under the National Electricity Code, which has been superseded by the NER.[15]

1.2 Regulatory requirements

1.2.1 National Electricity Law

The NEL sets out the functions and powers of the AER, including its role as the economic regulator of the NEM. Section 16 of the NEL states, the AER must in performing or exercising a regulatory function or power, do so in a manner that will or is likely to contribute to the achievement of the NEM objective. The NEM objective is:

> To promote efficient investment in, and efficient use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, reliability and security of supply of electricity and the reliability, safety and security of the national electricity system.[16]

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15 ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003.

16 National Electricity Law, section 7.

Further, the NEL specifies that the AER must, in performing or exercising its regulatory functions or powers ensure that the regulated transmission system operator that the determination applies to, and any affected registered participant be:

- informed of material issues under the AER's consideration
- given a reasonable opportunity to make submissions in respect of that determination before it is made.

The NEL also specifies that in making a transmission determination the AER must, in accordance with the NER:

- provide the regulated transmission system operator with a reasonable opportunity to recover the efficient costs of complying with a regulatory obligation
- provide the regulated transmission system operator with effective incentives to promote economic efficiency in providing the services that are subject to the determination
- make allowance for the value of regulated assets and the value of any proposed new assets.

In addition, the AER must have regard to any valuation of assets forming part of the transmission system owned, controlled or operated by the regulated transmission service operator applied in any relevant determination or decision.

1.2.2 National Electricity Rules

Chapter 6A of the NER sets out the provisions that the AER must apply in exercising its regulatory functions and powers for electricity transmission networks for prescribed transmission services and negotiated transmission services. In particular, the AER must make a transmission determination for a TNSP that includes a:

- revenue determination for the TNSP in respect of prescribed transmission services
- determination relating to the TNSP's negotiating framework
- determination specifying the negotiated transmission service criteria that apply to the TNSP
- determination specifying the pricing methodology to apply to the TNSP.

1.2.3 Revenue determination

Under clause 6A.4.2 of the NER the AER must use the building blocks approach to set a CPI – X revenue cap for a TNSP. A revenue determination for a TNSP is to specify, for a regulatory control period of not less than five years, the following matters:

- the amount of the estimated total revenue cap for the regulatory control period or the method of calculating that amount
- the annual building block revenue requirement for each year of the regulatory control period

- the amount of the maximum allowed revenue for each year of the regulatory control period or the method of calculating that amount
- appropriate methodologies for the indexation of the regulated asset base
- the values that are to be attributed to the performance incentive scheme parameters for the purposes of the application to the provider of any service target performance incentive scheme that applies in respect of the regulatory control period
- the values that are to be attributed to the efficiency benefit sharing scheme parameters for the purposes of the application to the provider of any efficiency benefit sharing scheme that applies in respect of the regulatory control period
- the commencement and length of the regulatory control period.

1.2.4 Negotiating framework for negotiated transmission services

Clause 6A.9 of the NER sets out the arrangements for negotiated transmission services. Each TNSP must prepare a negotiating framework, which sets out the procedures that are to be followed by the TNSP and service applicants when negotiating for the provision of negotiated transmission services.

The AER's determination on the negotiating framework must set out requirements that are to be complied with in respect of the preparation, replacement, application or operation of the TNSP's negotiating framework.

1.2.5 Negotiated transmission service criteria

The negotiated transmission service criteria must give effect to and be consistent with the negotiated transmission service principles set out in clause 6A.9.1 of the NER.

Under clause 6A.9.4 the AER's determination on the negotiated transmission service criteria must set out the criteria that the TNSP must apply in negotiating:

- the terms and conditions of access for negotiated transmission services, including the prices that are to be charged
- any access charges which are negotiated by the provider during that regulatory control period.

The negotiated transmission service criteria also must include criteria, which a commercial arbitrator will apply to resolve disputes, regarding:

- the terms and conditions of access for the negotiated transmission service, including the price that is to be charged for the provision of that service by the TNSP and
- any access charges that are to be paid to, or by, the TNSP.

1.2.6 Pricing methodology

Under clause 6.A.14.3(g) the AER is responsible for approving the pricing methodologies of TNSPs in accordance with the NER. A TNSP's pricing methodology sets out its approach to determining charges for prescribed transmission services in the next regulatory control period.

The NER requires a TNSP to submit a proposed pricing methodology for prescribed transmission services to the AER 13 months prior to the end of its current regulatory period. The AER will assess the proposed pricing methodology against the pricing principles for prescribed transmission services in clause 6A.23 and the AER's pricing methodology guidelines. The AER published its final pricing methodology guidelines in October 2007.

1.3 Review process

The AER has assessed Transend's revenue proposal, proposed negotiating framework and proposed pricing methodology in accordance with the review process outlined in Part E of Chapter 6A of the NER. To date, this process has involved:

- Proposal—Transend submitted its revenue proposal, proposed negotiating framework and proposed pricing methodology to the AER on 31 May 2008, 13 months prior to the end of its current regulatory period. The AER assessed Transend proposal against chapter 6A of the NER and the AER's transmission guidelines.[17]
- Public consultation—The AER published Transend's proposal and the AER's proposed negotiated transmission service criteria for Transend on 27 June 2008 and called for interested parties to make submissions. The AER held a public forum on Transend's proposal on 6 August 2008, where Transend and interested parties made presentations.
- Submissions—The AER received five submissions on Transend's proposal and the AER's proposed negotiated transmission service criteria for Transend. These included Australian Paper (AP), the Energy Users Association of Australia (EUAA), Hydro Tasmania (Hydro), the Major Employers Group (MEG) and Rio Tinto Alcan (RTA).
- Assessment by technical experts—The AER engaged WorleyParsons Services Pty Ltd (WorleyParsons) and Nuttall Consulting as technical experts to advise it on a number of key aspects of Transend's revenue proposal.
- Specifically, the AER asked WorleyParsons to provide its opinion on:
- whether the investment processes and procedures adopted by Transend for capital expenditure (capex) are likely to result in efficient outcomes
- the prudence of non-replacement capex undertaken by Transend during the current regulatory period
- the adequacy, efficiency and appropriateness of the non-replacement capex projects planned by Transend to meet its present and future service requirements
- the effectiveness of Transend's operating practices and procedures and asset management system
- the appropriateness of Transend's methodology to forecast its operating and maintenance expenditure (opex) requirements
- the efficiency of Transend's forecast opex

[17] AER, Electricity transmission guidelines: Guidelines, models and schemes, September 2007.

- the appropriate performance incentive scheme for service standards,

and the AER asked Nuttall Consulting to provide its opinion on:

- the prudence of replacement capex undertaken by Transend during the current regulatory period
- the adequacy, efficiency and appropriateness of the replacement capex projects planned by Transend to meet its present and future service requirements.

WorleyParsons and Nuttall Consulting have provided their opinion to the AER on these matters. The advice represents independent views based on their reviews. The AER has considered this advice in making its draft decision. The terms of reference guiding WorleyParsons' and Nuttall Consulting's reviews are set out in their reports.

- Additional technical/specialist advice— The AER engaged Nuttall Consulting to provide the AER with technical and engineering advice throughout the review process. Nuttall Consulting assisted the AER in reviewing the technical aspects of material contained in Transend's proposal, submissions and WorleyParsons' report. The AER also engaged Econtech to provide a forecast of Tasmanian labour costs.[18]

1.4 Structure of draft decision

The AER's consideration of Transend's revenue proposal, proposed negotiating framework and proposed pricing methodology, together with the negotiated transmission service criteria to apply to Transend are set out as follows:

- chapter 2 assesses the prudence of past capex
- chapter 3 determines the opening asset base
- chapter 4 assesses the efficient forecast capex allowance
- chapter 5 determines the benchmark weighted average cost of capital
- chapter 6 assesses the efficient forecast opex allowance
- chapter 7 assesses the efficiency benefit sharing scheme
- chapter 8 determines the performance values for each of the parameters applying under the service target performance incentive scheme
- chapter 9 determines the maximum allowed revenues for the next regulatory control period (1 July 2009 to 30 June 2014)
- chapter 10 assesses the negotiating framework for negotiated transmission services
- chapter 11 determines the negotiated transmission service criteria
- chapter 12 assesses the pricing methodology
- Appendix A sets out the AER guidelines applied in Transend determination

[18] Econtech Pty Ltd is an economic consulting firm that specializes in economic modelling, forecasting and policy analysis.

- Appendix B contains a summary of reliability standards in the Tasmanian electricity supply industry (network performance requirements) regulations.
- Appendix C contains a review of ex post projects
- Appendix D contains a review of ex ante capital expenditure
- Appendix E contains a review of contingent projects and their triggers
- Appendix F contains parameter definitions
- Appendix G contains information on performance incentive curves
- Appendix H contains the Transend negotiating framework for negotiated transmission services
- Appendix I contains a determination specifying the negotiated transmission service criteria that apply to Transend
- Appendix J contains information on cost escalators
- Appendix K contains information on the changes required to Transend's pricing methodolody

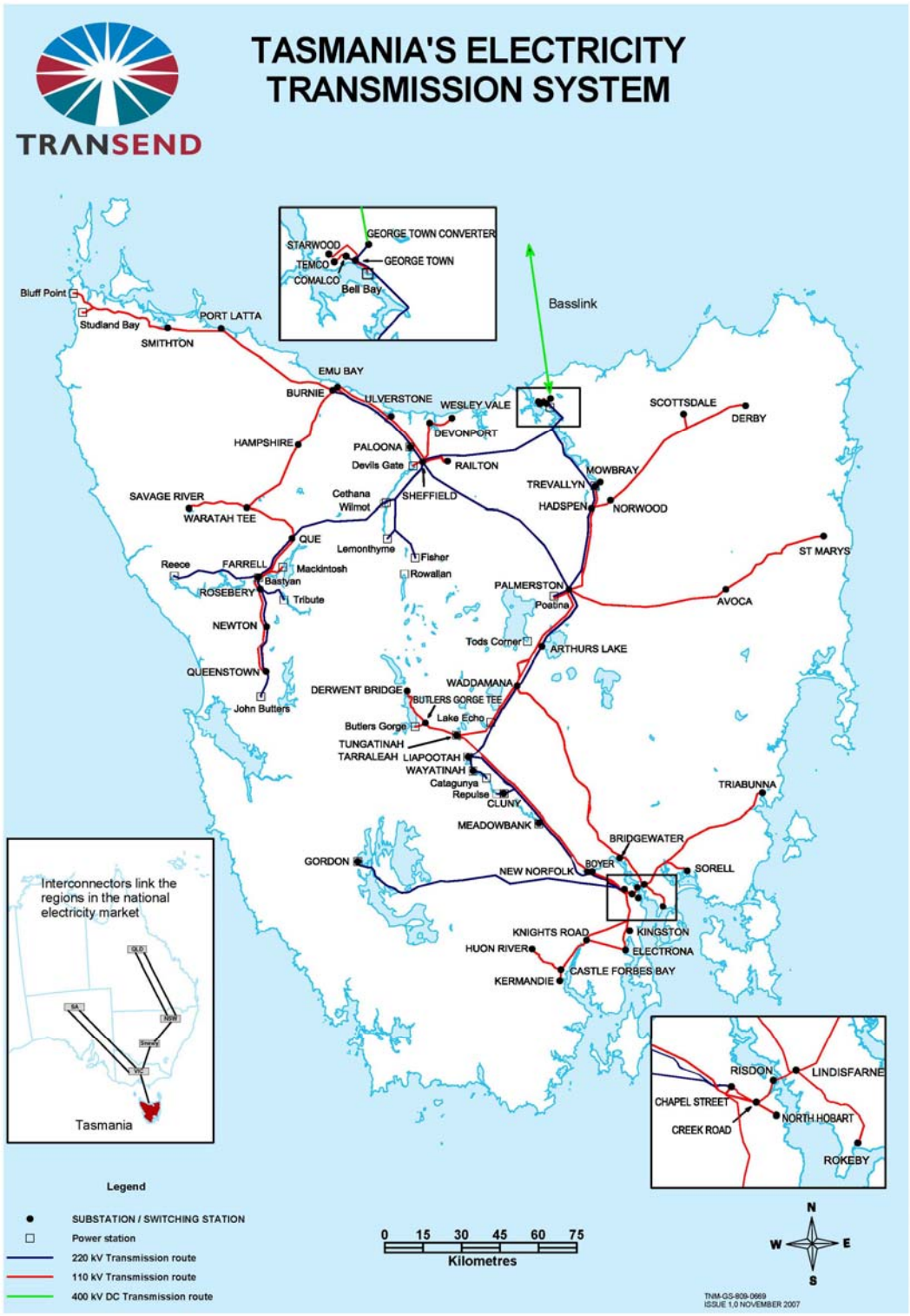
1.5 Transend network

Transend owns and operates the transmission network in Tasmania. It operates 3650 circuit kms of transmission lines predominantly at 110 kV and 220 kV. Transend also operates sub-transmission assets at voltages of 6.6 kV, 11 kV, 22 kV, 33 kV and 44 kV at substations connecting the Tasmanian transmission and distribution networks.

The Tasmanian transmission network is influenced by the connection of a large number of low capacity generators at geographically dispersed locations. As there is a small customer base compared to other states, demand growth on the transmission network is influenced by customers connected directly to the transmission network.

The Transend network and the mainland NEM states are connected via the privately owned Basslink interconnector. Figure 1.1 depicts Transend's network and highlights the major load centres and transmission lines in Tasmania.

Figure 1.1: Map of Transend's transmission network



Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 20.

2 Past capital expenditure

2.1 Introduction

This chapter presents the AER's ex post review of the prudence of Transend's commissioned projects and assets under construction, the allowance for finance during construction (FDC) costs and an analysis of the capital expenditure (capex) spending profile over the current regulatory control period (2004-2008/09).

When Transend's revenue cap was set in 2003, the regulatory arrangements provided that an ex post assessment of capex be undertaken in the current regulatory control period to determine if those expenditures were prudent. Only capex that is found to be prudent is included in Transend's regulated asset base (RAB) for the next regulatory control period.

2.2 Regulatory requirements

2.2.1 NER requirements

Rule 6A.6 and schedule 6A.2 of the NER outline how the RAB is determined. Rule S6A.2.1 provides that the RAB for the first year of the next regulatory control period must be determined by rolling forward the RAB value prescribed in the schedule. For Transend this value is $603.6 million (as at 31 December 2003). This value is then adjusted in accordance with clauses S6A.2.1(c)(2) and S6A.2.1(f) to calculate the RAB for the first regulatory year of the regulatory control period.[19]

Clause 11.6.9 of the NER provide that the value of the RAB for the first regulatory control period under the NER may also be adjusted to have regard for an existing revenue determination and any other arrangements agreed between the AER (or the ACCC) and the transmission network service provider (TNSP). The relevant arrangements in this instance are contained in the ACCC's 2003 revenue cap decision for Transend. The AER's ex post prudence assessment of the capex undertaken in the current regulatory control period accords with clause 11.6.9 and the ACCC's 2003 decision.[20]

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19 Transend's opening RAB for the 2009/10–2013/14 regulatory control period is discussed at Chapter 3 of this draft decision.

20 ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003.

2.2.2 Statement of regulatory principles

The process for reviewing past capex is set out in the *Statement of principles for the regulation of electricity transmission revenues* (SRP)[21] and as applied by the ACCC in its *NSW and ACT transmission network revenue cap decisions*.[22] This process was adopted by the AER in its recent determinations for Powerlink, SP AusNet and ElectraNet.[23]

The ACCC's 2003 revenue cap decision for Transend provides that capex undertaken during the 2004–2008/09 regulatory control period will be subject to an ex post prudence review. Only expenditure determined to be prudent is to be included in the RAB for the next regulatory control period. Appendix B of the SRP sets out the prudence test for revenue caps which were determined under the ACCC's *Draft statement of principles for the regulation of transmission revenues* (DRP).[24]

General principles for the assessment of prudence

Prudent investment can be defined in terms of a TNSP acting efficiently, in accordance with good industry practice, to achieve the lowest sustainable cost of delivering services. An assessment of whether a project undertaken by a TNSP accords with good industry practice necessarily requires the exercise of judgment, taking into account the specific engineering and economic facts, and the circumstances of the investment as known or expected at the time.

In undertaking this ex post prudence review, and considering the information available to the TNSP at the time it made the decisions to invest, the AER's task includes assessing whether a prudent TNSP would have made the same decisions. If the AER determines that a prudent TNSP would have made different decisions to those actually made, then the task is to quantify the difference in investment under each set of decisions. By implication, this difference represents the cost of inefficiency and is excluded from the RAB.

The application of the prudence test to investments

The prudence 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

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21 AER. *Compendium of electricity transmission regulatory guidelines: Statement of principles for the regulation of electricity transmission revenues*, 22 August 2005.

22 ACCC, *NSW and ACT transmission network revenue cap TransGrid 2004–05 to 2008–09: Final decision*, 27 April 2005.
ACCC, *NSW and ACT transmission network revenue cap EnergyAustralia 2004–05 to 2008–09: Decision*, 27 April 2005.

23 AER, *Powerlink Queensland transmission network revenue cap 2007–08 to 2011–12: Draft decision*, 8 December 2006.
AER, *SP AusNet transmission determination 2008–09 to 2013–14: Draft decision*, 31 August 2007.
AER, *ElectraNet transmission determination 2008–09 to 2012–13: Draft decision*, 9 November 2007.

24 ACCC, *Draft statement of principles for the regulation of transmission revenues*, 27 May 1999.

stages and is applicable to projects regardless of whether or not they have been subject to the regulatory test. The three stages are:

1. Assess whether there is a justifiable need for the investment. This stage examines whether the TNSP correctly assessed the need for investment against its statutory and obligations under the then National Electricity Code and the SRP. 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.

2. 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 TNSP objectively and competently analysed the investment to a standard that is consistent with good industry practice.

3. Assess whether, if the most efficient project was not developed, 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 how the TNSP responded to those factors relative to what could be expected of a prudent operator.

2.2.3 Transend proposal

Transend applied a probabilistic approach to derive its capex forecast for the current regulatory control period. Capital development plans and expenditure forecasts for 24 scenarios were developed. The scenarios were derived from variations in key drivers such as load growth and generation patterns. A forecast capex allowance of $307 million ($2002–03) was approved by the ACCC.[25]

In its revenue proposal, Transend stated that it anticipated actual capitalisation of investments to be $452 million ($2008–09) during the current regulatory control period (on an as-commissioned basis) in comparison with the 2003 revenue cap decision allowance of $362 million ($2008–09 and adjusted for CPI).[26] This is approximately 25 per cent more than the forecast capex allowance approved by the ACCC.

Table 2.1 and Figure 2.1 set out the 2003 forecast capex allowance and the actual (commissioned) outcomes for the current regulatory control period.

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25 ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003, p. 47.

26 Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, Transend revenue proposal, 31 May 2008, p. 38.

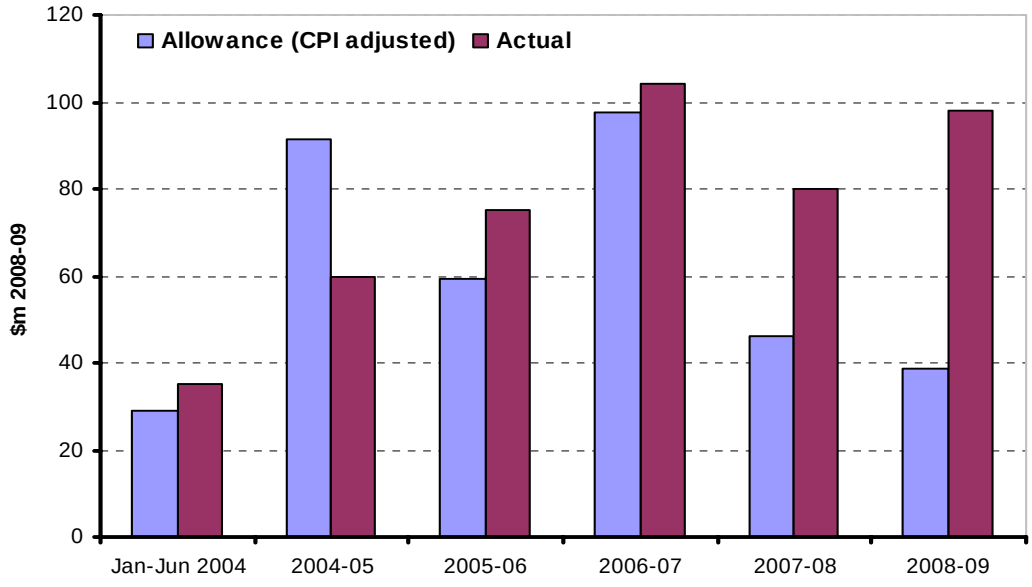
Table 2.1: 2003 capex allowance and actual outcomes ($m, 2008-09)[1]

	2004 (Jan to Jun)	2004–05	2005–06	2006–07	2007–08	2008–09	Total
2003 ACCC allowance[2 a]	24.4	77.5	50.2	82.9	39.1	32.7	306.8
2003 ACCC allowance (CPI adjusted)	28.8	91.5	59.3	97.8	46.2[b]	38.6[b]	362.1
Less: actual capex	35.0	59.6	75.0	104.0	80.0[c]	97.9[c]	451.5
Variation	6.2	–31.9	15.8	6.1	33.8	59.3	89.4

Source: 1. Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 38.
2. ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003, p. 47.

Note: All figures are inclusive of FDC.
(a) Figures are in 2002–03 dollar terms.
(b) Based on an estimated inflation rate of 2.90 per cent for Dec-2007 to Dec-2008 and 1.40 per cent for Dec-2008 to Jun-09.
(c) Forecast.

Figure 2.1: Comparison of Transend's 2003 allowance and its actual commissioned capex profile ($m, 2008-09)



Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 38.

Transend stated that in addition to commissioned works, its assets under construction as at 1 July 2009 are estimated to be $57.9 million. It proposed that this amount needs

to be recognised in the RAB because of the transition to recognising capex on a partially as-incurred (hybrid) approach during the next regulatory control period.[27]

2.3 Submissions

The AER received submissions commenting on Transend's capex during the current regulatory control period from the following interested parties:

- the Energy Users Association of Australia (EUAA)
- Major Employers Group (MEG)
- Rio Tinto Alcan (RTA)

The main issues raised in relation to Transend's capex for the current regulatory control period were:

- the brevity of Transend's explanation for its actual capex overspend
- the size of the overspend in the asset renewal capex category compared with the amount allowed in the ACCC's 2003 decision
- the apparent reliance on Transend's governance processes as sufficient demonstration that the investment decisions are prudent.

2.4 Consultant review

The AER notes that the ACCC's 2003 revenue decision had stated Transend should "demonstrate that its renewal expenditures are economically justified and that there are no, more cost effective, alternatives".[28] In view of this requirement expressed in the ACCC's 2003 decision, the AER engaged Nuttall Consulting to undertake a thorough review of asset renewal expenditure.

The AER separately engaged WorleyParsons to review the efficiency and prudence of Transend's past capex inclusive of network (excluding asset renewal), non-network and projects where some expenditure will be incurred at the end of the current regulatory control period (assets under construction).

Therefore, in conducting the reviews WorleyParsons focused on the development (augmentation and connection) and non-network projects whilst Nuttall Consulting focused on reviewing asset renewal projects. The AER required both WorleyParsons and Nuttall Consulting to:

- assess whether Transend had justified the need for its investments
- assuming the need for an investment is recognised, assess whether Transend had proposed the most efficient investment to meet that need

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27 ibid., p. 148.

28 ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision, 10 December 2003*, p. 42.

- assess whether the project option that was judged to be the most efficient was developed and, if not, whether the difference reflects decisions that were consistent with good industry practice.

Overall, WorleyParsons and Nuttall Consulting concluded that Transend's capex during the current regulatory control period was prudent and efficient and, with one minor exception, they found no evidence to suggest otherwise. The consultants have not identified any systematic issues or problems with the implementation of the projects. Accordingly, WorleyParsons and Nuttall Consulting recommended that Transend's past capex be accepted as reasonable, noting the recommended adjustments as shown in table 2.2.[29]

Table 2.2: WorleyParsons and Nuttall Consulting recommendations on past capex ($m, nominal)

	2004 (Jan to Jun)	2004–05	2005–06	2006–07	2007–08	2008–09	Total
Transend	29.9	52.3	67.6	96.8	76.7	96.5	419.8
Worley Parsons' adjustment for inefficient project costs (excluding renewal capex)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Worley Parsons' adjustment for errors identified during review (excluding renewal capex)	0.0	0.0	0.0	0.0	–4.6	–4.4	–9.0
Nuttall Consulting's adjustment for inefficient project costs (renewal capex)	0.0	0.0	0.0	0.0	0.0	–1.1	–1.1
Consultants' recommendation	29.9	52.3	67.6	96.8	72.1	91.0	409.7[a]

Source: WorleyParsons, *Review of the Transend Transmission Network Revenue Proposal 2009-2014 An independent review prepared for the Australian Energy Regulator*, October 2008, p. 59.
Nuttall Consulting, *Review of Transend Revenue Proposal Asset Renewal Capital Expenditure: A report to the Australian Energy Regulator*, October 2008, p. 76.
Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, Appendix 3—Table 3.1.
Transend, Transend capex model error corrections submitted 9 July 2008.

(a) Total may not add up due to rounding.

A summary of WorleyParsons and Nuttall Consulting's general findings from the project reviews are presented below.

[29] WorleyParsons, *Review of the Transend Transmission Network Revenue Proposal 2009-2014 An independent review prepared for the Australian Energy Regulator*, WorleyParsons report, October 2008, p. 59
Nuttall Consulting, *Review of Transend Revenue Proposal Asset Renewal Capital Expenditure: A report to the Australian Energy Regulator*, Nuttall Consulting report, October 2008, p. 76.

Project scope

Both WorleyParsons and Nuttall Consulting noted that Transend has documented procedures requiring, where practical, at least three project options be considered when developing a project business case and that the "do nothing" option must be considered. The range of options Transend considered was generally found to be appropriate.

WorleyParsons commented that the past non-renewal capex projects aligned with Transend's strategic plans and that overarching asset management plans or strategies were usually developed with stakeholders. Although capex-opex trade-offs typically were not explicitly considered in the project development, WorleyParsons found no evidence of engineering 'over-design'.[30]

Although the main components of the renewal projects are related to asset renewal, Nuttall Consulting found there were also elements of non-renewal project drivers. However, Nuttall Consulting found no evidence that the non-renewal elements of the renewal projects reviewed were not needed.[31]

Project governance

Transend's Investment Process Governance Framework was introduced in August 2007. WorleyParsons stated that Transend's governance framework was based on sound principles and the application of the framework was evidenced in the course of undertaking the capex review.[32] WorleyParsons considered Transend's documentation to be comprehensive and of a high standard and, although some of the documents had been prepared very recently, found there was evidence to support Transend's contention that the documents formalised practices that had been in place for some years. WorleyParsons considered that Transend's capital governance framework provided a reasonable level of assurance for capex projects undertaken in the current regulatory control period. As noted by Nuttall Consulting, WorleyParsons undertook the review of the business-wide aspects of Transend's proposal including the review of capital governance systems and/or processes. Nuttall Consulting commented that it had no reason to consider that WorleyParsons' findings on the governance issues surrounding efficient delivery of capital projects would not cover the asset renewal projects reviewed by Nuttall Consulting.[33]

Both WorleyParsons and Nuttall Consulting noted that all reviewed past capex projects were implemented in accordance with Transend's systems and process documentation. WorleyParsons considered the supporting economic/financial analysis for development and augmentation projects as adequate. However, Nuttall Consulting highlighted inadequacies in the level of supporting economic/financial analysis justifying the renewal capex projects.

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30 WorleyParsons, WorleyParsons report, op. cit., p. 63
31 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 49.
32 WorleyParsons, WorleyParsons report, op. cit., p. 45
33 Nuttall Consulting, Nuttall Consulting report, op. cit., p.5–6.

Efficiency gains

WorleyParsons commented that Transend had considered capex-opex trade-offs although it was typically not a primary consideration of the projects examined.[34] WorleyParsons noted that Transend has developed a dynamic rating system for its transmission lines and this initiative allows the transmission lines to carry additional loads for specified time periods, subject to environmental conditions, thereby deferring capex for building transmission lines. [35] WorleyParsons also noted that, since 2007/08, Transend has developed a works program that integrates capex and opex activities and customer and operational requirements.[36]

Project variations

WorleyParsons and Nuttall Consulting found no instances of systemic problems or issues with any of the past capex projects they reviewed, notwithstanding that a number of projects had cost/time overruns or scope variations. Where project scopes changed, WorleyParsons found that Transend acted in accordance with good industry practice and implemented a project WorleyParsons considered to be efficient, given the constraints and uncertainty that existed at the time.[37] Nuttall Consulting's review focused on whether there was evidence that projects were not developed as approved. It highlighted the difficulty in confirming the actual assets which have been installed in this form of review but noted that overall actual costs were broadly in line with approved costs and found no evidence that project variations did not reflect prudent decisions in accordance with approved business cases.[38]

Project costs

WorleyParsons and Nuttall Consulting noted that in several projects, the estimated cost of the project increased from the project costs proposed at the time of the ACCC's 2003 decision. The cause for these increases included inaccurate initial project estimates and changes of scope and delays in project implementation which caused projects to incur significant cost increases.

WorleyParsons noted that Transend's cost estimating systems at the beginning of the regulatory control period were often inaccurate. However, over the course of the current regulatory control period, Transend has developed improved project cost-estimating processes and systems. These processes and systems are integrated into its project planning and governance process and it is expected that this will significantly improve the accuracy of its future cost estimates.

While WorleyParsons found some deficiencies in the initial estimates of project costs, it was generally satisfied that Transend obtained the appropriate Board approvals for significant variations. Moreover, it noted that these variations were based on more refined cost estimates and were appropriately documented.

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34 WorleyParsons, WorleyParsons report, op. cit., p. 63
35 WorleyParsons, WorleyParsons report, op. cit., p. 224
36 WorleyParsons, WorleyParsons report, op. cit., p. 44
37 WorleyParsons, WorleyParsons report, op. cit., p. 63–64.
38 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 56

Based on the views formed of Transend's design, project management and implementation practices, WorleyParsons found no evidence of systemic cost inefficiencies. Moreover, WorleyParsons concluded that the final projects developed were efficient despite early cost estimation issues. Nuttall Consulting noted that overall actual costs were broadly in line with approved costs. It also found no evidence that project variations did not reflect prudent decisions in accordance with approved business cases.

2.5 Issues and AER considerations

The application of the prudence test to Transend's commissioned projects and assets under construction is necessary to determine the amount of past capex to be rolled into Transend's RAB.

2.5.1 Detailed review of selected commissioned and assets under construction projects

Consultant review

In consultation with the AER, WorleyParsons selected 10 past capex projects including network (excluding asset renewal) and non-network projects and projects under construction for review as shown in table 2.3 below. The 11 past capex projects selected by Nuttall Consulting to inform its review of Transend's renewal capex program are shown in table 2.4.

The projects reviewed included projects that were reported as being completed within budget and projects that appeared to have substantial cost overrun or scope changes. Projects were also selected that were completed at various times during the current regulatory control period.

Table 2.3: Past capex projects reviewed by WorleyParsons ($m, nominal)

Project ID	Project description	Project category	Project cost
ND0519	North East transmission line – Norwood-Scottsdale-Derby 110 kV transmission line	Augmentation	34.1
ND0036	Mowbray Substation	Augmentation	10.3
ND0573	Upgrade of Creek Road-Risdon 110 kV transmission line	Augmentation	0.3
ND0511	Establishment of a 33 kV Connection Point at Risdon Substation	Connection	6.8
ND0705	Wesley Vale Substation: Additional 11 kV circuit breaker installation	Connection	0.2
ND0614	Asset management information system Phase 2[a]	Operational support system	4.8
ND0765	Secondary equipment store (construction)	Inventory/spares	3.0
ND0437, ND0827	Substation security upgrade[a]	Physical security/compliance	30.3

Project ID	Project description	Project category	Project cost
ND0393	Strategic accommodation south	Business support	6.8
Various	IT and business applications	Information technology	2.6

Source: WorleyParsons, *Review of the Transend Transmission Network Revenue Proposal 2009-2014 An independent review prepared for the Australian Energy Regulator*, October 2008, p. 61.
(a) Assets under construction

Table 2.4: Past capex projects reviewed by Nuttall Consulting ($m, nominal)

Project ID	Project description	Project category	Project cost
ND0326	Burnie substation – 22 kV switchgear replacement	Renewal	3.3
ND0604	Burnie-Port Latta 110 kV transmission line re-conductor	Renewal	20.0
ND0552	Chapel Street substation: replacement of network transformers	Renewal	3.3
ND0590	George Town substation B bus replacement	Renewal	6.2
ND0603, ND0531	George Town substation network transformers T1, T2 and T3 replacement	Renewal	19.6
ND0514	Lindisfarne substation: 33 kV switchgear replacement	Renewal	3.4
ND0592	West Coast and Mersey Forth OPGW project	Renewal	6.9
ND0564	Palmerston substation HV switchgear and transformer replacement	Renewal	4.0
ND0640	Palmerston 220 kV substation: primary equipment upgrade	Renewal	5.7
ND0621	Sheffield substation 110 kV redevelopment	Renewal	6.9
ND0563	Triabunna substation HV switchgear and 110/22 kV transformer replacement	Renewal	4.3

Source: Nuttall Consulting, *Review of Transend Revenue Proposal Asset Renewal Capital Expenditure: A report to the Australian Energy Regulator*, October 2008, p. 45.

AER considerations

The selection of the projects to be reviewed by WorleyParsons and Nuttall Consulting was undertaken in consultation with the AER and designed to cover a broad range of projects across different capex categories, locations and timings. In selecting the projects for detailed review, the following factors were considered:

- Materiality—the cost associated with the project and the proportion of the total allowance it comprises. Both small- and large-value projects have been selected to assess whether Transend implements small projects with the same diligence as large projects.

- Project/asset category—a comprehensive selection of projects across each of the classifications adopted (by project type or capex category) ensures the detailed project reviews capture the key processes and systems employed by the business.

- Timing of the expenditure—ensures changes in processes and systems can be identified across the entire expenditure period. The drivers for any changes identified need to be understood to ensure prudent decision-making processes have been adopted.

- Variations in project costs and scope from original estimates—this provides further insight into the governance and business practices for undertaking capital projects and how cost-estimating processes incorporate feedback from specific experience.

Transend was notified of the selected projects for detailed review. In response, it prepared and provided 'project packs' collating detailed project information. The project packs were provided to the AER and its consultants, as relevant.

The AER notes that during the course of the review, frequent delays were encountered in the provision of timely responses to queries raised by the AER and its consultants. Whereas, in accordance with pre-agreed protocols, the AER expected that Transend would make existing documentation available in timely fashion to its consultants in relation to the projects subject to review, the consultants both reported that this expectation was frequently not met. The AER expected that relevant supporting information would be readily available and able to be provided in a timely manner.

In total, the projects sampled by WorleyParsons represent around 24 per cent of the value of Transend's total capex during the current regulatory control period (around 23 per cent of total network capex and 37 per cent of total non-network capex). The two projects under construction sampled represented around 13 per cent of the value of total assets under construction.

The projects sampled by Nuttall Consulting represent around 39 per cent of Transend's asset renewal capex during the current regulatory control period.

Appendix C provides further details on the AER's consideration of the projects selected for detailed review.

2.5.2 Prudence of network commissioned projects

Transend proposal

Transend's network past capex categories included augmentation, connection, land and easements, asset renewal, physical security/compliance, inventory/spares and

operational support systems.[39] It anticipated $394 million (inclusive of finance during construction (FDC) costs) in network capex to be commissioned during the current regulatory control period.[40]

Submissions

MEG and RTA were concerned that capex for renewal/replacement projects was larger than had been anticipated at the time of the ACCC's 2003 determination and stated that an ex post review of Transend's capex during the current regulatory control period is required.[41]

RTA considered that Transend has been aware since 2003 that the ACCC was concerned by the size of the renewal capex program. It considered that Transend had been 'put on notice' that the ACCC requires it to demonstrate that its renewal capex is economically justified and there are no more alternatives that are more cost effective. RTA stated that whether Transend has done this should be a focus of the AER's ex post review of Transend's capex in the current regulatory control period.[42]

RTA considered that the information provided by Transend in its revenue proposal was insufficient to allow it to make detailed comments as to whether Transend's capex in the current regulatory control period was prudent. RTA also noted that Transend's proposal has not provided information regarding its compliance with requirements of Chapter 5 of the NER,[43] including the timing of its capex. Therefore, RTA found it difficult to assess whether Transend had complied with relevant requirements of the NER including the regulatory test, where appropriate.[44]

Consultant review

WorleyParsons reviewed six past network capex projects which did not include a work-in-progress component. These projects included those categorised as augmentation, connection, operational support system and inventory/spares. WorleyParsons noted that Transend has considered a range of project options, their feasibility and timing and, in the few cases where only "do nothing" and Transend's preferred option were considered, WorleyParsons did not identify any other viable options. [45] WorleyParsons also reviewed the technical design for network (excluding asset renewal) capex projects and the unit costs applied and found no issues with the cost or timing of any of the projects reviewed.[46] It concluded that all of these reviewed projects met the prudence test and, accordingly, did not recommend any

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39 Transend, Transend revenue proposal, op. cit., Appendix 3—Table 3.1.

40 Transend, Transend revenue proposal, op. cit., Appendix 3—Table 3.3.

41 MEG, Major Employer Group (Tasmania) submission to AER on Transend Revenue Proposal, August 2008, p. 1.
RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 13–15.

42 RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 14–15.

43 Chapter 5 of the NER discusses the framework for connection to a transmission network and access to the national grid.

44 RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 14.

45 WorleyParsons, WorleyParsons report, op. cit., p. 63–64.

46 WorleyParsons, WorleyParsons report, op. cit., p. 64.

adjustments. However, WorleyParsons recommended a number of adjustments for errors relating to project cost and work-in-progress amounts which were identified in the course of their review.[47] As a result, the work-in-progress cost will be reduced by $2.7 million and this is discussed further in section 2.5.4.

WorleyParsons noted that projects had either scope/cost increases or implementation delays (ND0519 Norwood-Scottsdale-Derby 110 kV transmission line was the most notable). In all cases, WorleyParsons accepted Transend's justification for the scope/costs increases as reasonable.

Nuttall Consulting considered eleven past network capex projects which were categorised as asset renewals. It noted that the renewal need for the projects was supported by various condition and risk assessments and, in the case of 'non-renewal' elements of projects, Transend provided evidence of requests for additional HV switchbay work by Aurora Energy and the application of the regulatory test on the augmentation components of projects. [48] Nuttall Consulting concluded that all of these reviewed projects met the prudence test and, accordingly, did not recommend any adjustments. In discussing its asset renewal network past capex projects with Nuttall Consulting, Transend stated that its latest condition assessment had identified that the Burnie–Waratah wood pole replacement project expenditure is not required in 2008-09 as the relevant poles had not been condemned.

Nuttall Consulting also noted that, in some circumstances, Transend's asset arrangements do not meet modern standards (e.g. relating to safety) and therefore risk management considerations will affect the timing of any investment to address issues identified.[49] Nuttall Consulting noted cases where Transend considered the economic benefits of the renewal projects were self-evident due to asset condition and performance and safety risk to personnel.[50] However, although Nuttall Consulting did not consider Transend's economic analysis adequately supported its preferred project option, Nuttall Consulting found no evidence that the preferred project options selected and their timing were not prudent.

AER considerations

The AER notes RTA's submission relating to whether Transend has complied with relevant requirements of the NER, including the regulatory test where appropriate. In response, the AER notes that the NER does not apply to a portion of past capex as a number of early projects were undertaken under the earlier, but similar, requirements of the former National Electricity Code and the SRP. Further, the ACCC's 2003 decision required Transend to apply the regulatory test or abide by the planning requirements of the Office of the Tasmanian Energy Regulator (OTTER) for each project to justify its inclusion in the RAB.[51] The AER notes that Transend has provided evidence in support of its application of the regulatory test and its

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47 WorleyParsons, WorleyParsons report, op. cit., p. 59.
48 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 43, 49–50.
49 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 49
50 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 55–56.
51 ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003, p. 48.

compliance with OTTER's planning requirements in the course of the detailed project reviews.[52]

As set out in its 2003 decision, the ACCC stated an intention to closely examine Transend's asset renewal program. Transend provided business case documentation in support of its renewal projects and, for a number of the past projects reviewed, the project options adopted were found not to be supported by economic analysis or financial evaluation to a standard that Nuttall Consulting considered satisfactory in light of the ACCC's 2003 decision.

Transend has noted that its renewal decisions are based on a broad range of considerations that may include other matters such as compliance with technical, safety, and environmental conditions, business risk considerations, and age and condition assessments. While the AER recognises that business decisions are properly made on the basis of a wide range of considerations such as those identified by Transend, the AER expects that a sufficiently detailed financial or economic analysis would be available to support the chosen option, even where other considerations are the fundamental driver of the business decision.

The AER discussed with WorleyParsons and Nuttall Consulting jointly their views regarding the level of supporting project documentation and to identify reasons for the differences noted in their respective reports. Both firms agreed that Transend has developed an appropriate project governance framework and that, over the course of the current regulatory control period, Transend has dramatically improved its project governance and cost estimating procedures and the development of its supporting documentation. This improvement was most pronounced in relation to projects that include accountability to external parties such as directly connected customers and regulatory bodies.

The AER has considered WorleyParsons and Nuttall Consulting's findings and is of the view that the ex post assessment of Transend's network projects provides sufficient evidence to demonstrate that the network capex undertaken during the current regulatory control period is prudent given that:

- All projects had a justifiable need for investment. Transend correctly assessed the need for investment against its statutory obligations because, as per the ACCC's 2003 decision, Transend has demonstrated that it applied the regulatory test or abided by OTTER's planning requirements for each project to justify its inclusion in the RAB.

- Transend proposed the most efficient investment to meet the network requirements. Transend's project business cases demonstrate that it considered a range of viable options (including option timings) and other reasonable network and non-network solutions, as appropriate and the AER's consultants did not identify alternative options that Transend should have considered.

[52] WorleyParsons, WorleyParsons report, op. cit., p. 63–64.
Nuttall Consulting, Nuttall Consulting report, op. cit., p. 49–50.

- Transend's stated project evaluation and implementation procedures were followed, consistent with good industry practice. Both WorleyParsons and Nuttall Consulting considered Transend has well documented procedures.

- Final project costs appeared reasonable. Where there were significant variations in costs between the initial and final estimates, Transend sought Board approval for the variation. The AER notes that the detailed project reviews found no evidence of over-design of the network system.

- Transend has well-structured and systematic governance arrangements and is achieving reasonable efficiencies through its works planning process. The AER notes that the works planning process includes project prioritisation based on criteria including financial and environmental benefits.

- The project governance regime was adequate for the capex at the start of the current regulatory control period. The project governance regime developed a greater degree of sophistication as the level of capex increased during the current regulatory control period.

Notwithstanding this, Nuttall Consulting's review highlighted inadequate economic evaluation relating to asset renewal capex projects and this was inconsistent with Transend's own documented processes and procedures. The AER agrees with Nuttall Consulting that inadequate economic evaluation or analysis adversely affects the opportunities for Transend to make decisions to prudently defer projects where it may be efficient to do so.

The AER is concerned that Transend has not undertaken economic analysis at the level expected in relation to all asset renewal projects in the current regulatory control period. The AER considers economic analysis to be an important tool in determining the most appropriate option to implement, even in circumstances where the underlying need for a project may be principally driven by other considerations. The AER notes that Transend's internal procedures and policies incorporate an economic evaluation as a requirement. The AER expects that in future, all renewal projects will be supported by an economic evaluation of the most appropriate options.

The AER notes that some projects that were reviewed in detail had scope and cost increases from initial Transend Board approval to final completion. Transend reasons increased project costs from that proposed in 2003 were due to high level scopes of work and 'programs of work' for specific activities and project cost estimates based on unit costs developed for asset valuation purposes.[53] Additionally, it considered that market pressures increased input and construction costs during the current regulatory control period.

WorleyParsons noted that lack of confidence in the 2003 cost estimates and the estimating process used at that time led to an internal audit resulting in development of significantly improved estimating procedures. WorleyParsons found no evidence that the poor project estimates led to inefficient capital expenditure by Transend. The

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[53] Transend, *Capital expenditure profiles and variations for the period January 2004 to June 2014 (Issue 0.4, August 2008*), submitted 27 August 2008.

AER notes that WorleyParsons agreed that the cost increases were commensurate with the specified projected scope changes and unforeseen price increases.[54]

Overall, WorleyParsons concluded that the projects it reviewed, with scope and cost increases, were appropriately justified and passed the prudence test. Similarly, Nuttall Consulting concluded that overall, there was no evidence the asset renewal capex projects, with scope and cost variations, were not prudent. The AER is aware of the general increases in input and construction costs that have occurred over the current regulatory control period and it agrees that the scope/cost increases were justified.

Nuttall Consulting's review of Transend's asset renewal capex program considered eleven projects. The AER notes that Nuttall Consulting found that capex was not required during 2008-09 for the Burnie–Waratah wood pole replacement project. [55] Given this was discussed by Nuttall Consulting and Transend in the course of the detailed project review and Transend did not provide further evidence that refutes Nuttall Consulting's finding, the AER accepts Nuttall Consulting's finding. Transend's network capex to be commissioned during the current regulatory control period will be adjusted accordingly.

The Nuttall Consulting review considered that Transend's assets and associated strategies fell into the two broad categories of substations and lines. The sample of asset management plans provided to Nuttall Consulting by Transend indicated that Transend's renewal program was focused on substations, particularly the power transformer, EHV circuit breaker and HV switchgear asset classes. Although the main components of the renewal projects are related to asset renewal, there are also non-renewal project drivers.

The AER notes Nuttall Consulting's observation that project options costs or an economic appraisal of the options was typically not discussed or included in the business cases. Further, independent third party assessments of some of the projects reviewed incorporated an incomplete economic analysis of the various options considered. The AER also notes Nuttall Consulting's comments that, in the context of some asset renewal projects, the need for a full economic analysis in a business case is not always justified and it can be difficult to quantify and compare the factors considered in asset renewal projects.[56]

In the case of the six projects reviewed by Worley Parsons, variations were typically within the authority of the project manager, however, one project (ND0519 Norwood-Scottsdale-Derby 110 kV transmission line) required approval of additional expenditure by Transend's Board and this project is discussed below.

Project ND0519—Norwood-Scottsdale-Derby 110 kV transmission line

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

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54 WorleyParsons, WorleyParsons report, op. cit., p. 63–64 & Appendix 3.
55 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 48.
56 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 55

WorleyParsons noted that this project was the first transmission line replacement project that Transend had undertaken. The AER notes that Transend identified this project as being a necessary component of its broader strategy to improve the security of supply to north-east Tasmania. Further, WorleyParsons noted it was presented with evidence showing improved network reliability performance to customers following project commissioning.

Planning delays and other works identified during transmission line construction also contributed to the increased costs. The Board approved project budget was increased on receipt of contractor submissions to a competitive tendering process for the required transmission line works. However, WorleyParsons considered the final project costs to be reasonable based on its own estimates for similar projects. The AER considers that the cost increase highlighted the discrepancy between current market costs and project estimates based on costs developed for statutory asset valuations. The AER notes that the basis for scope increase arose from detailed investigation of the proposed transmission line route which identified necessary line route changes. The AER is also aware of the general increases in input and construction costs that have occurred over the current regulatory control period and this is discussed in Appendix J. Having considered the project information provided by Transend and WorleyParsons' advice, the AER agrees that the scope/cost increases were justified. The AER also notes that business cases were presented to the Transend Board to inform it of relevant new information likely to affect the project, including project costs.

The AER notes this project is part of Transend's broader strategy to improve the security of supply to northeast Tasmania. It also notes that Transend has applied the market benefits limb of the regulatory test in the development of this project and it has been presented to, and approved by, the Tasmanian Reliability and Network Planning Panel. The AER notes that a number of network and non-network solutions were considered and evaluated against a selection of scenarios and that the preferred option (double circuit 110 kV transmission line) provided the greatest market benefits across the scenarios.

The AER notes WorleyParsons' finding that the technical design arrangements are in line with standard industry practice and it accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $34.1 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Conclusion

The ACCC's 2003 revenue decision had stated Transend should "demonstrate that its renewal expenditures are economically justified and that there are no, more cost effective, alternatives".[57]

The AER agrees with observations made by Transend and Nuttall Consulting that economic appraisal is only one element of the overall project evaluation and approval

[57] ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003, p. 42.

process. Nevertheless, the AER considers economic appraisal to be a necessary element undertaken as a matter of course in project investment evaluations. Transend's business' investment processes and procedures highlight the importance of selecting the option with the highest NPV of benefits commensurate with acceptable levels of risk.[58] Where projects arise that involve matters with a pressing imperative such as safety as a key consideration, the AER still considers that it is appropriate to prefer projects which satisfy the imperative at the lowest net present cost.

The AER notes that Nuttall Consulting did not consider that Transend's economic analysis of its asset renewal capex projects was sufficient to demonstrate that no alternative project option or project timing could have been selected. Notwithstanding this, the AER accepts Nuttall Consulting advice that, based on its detailed project reviews, there was no evidence to suggest that Transend's actual project option selection and timing was not prudent.

The AER notes Transend had some issues early in the current regulatory control period relating to cost estimation processes and they appear to have been addressed by Transend through the establishment of project cost-estimating procedures which have improved the accuracy of initial cost estimates. Further, the fact that Transend has implemented improved governance and project management systems, including AMIS during the current regulatory control period, should assist the prudent development of capital projects in the next regulatory control period. Therefore, on balance, the AER considers Transend's overall network past capex is prudent and that the projects, as developed, were efficient and consistent with good industry practice.

Based on the information presented by Transend and the advice of WorleyParsons and Nuttall Consulting that no adjustment was recommended to the projects reviewed, the AER considers the total amount of $410 million for network past capex is prudent.

2.5.3 Prudence of non-network commissioned projects

Transend proposal

Transend's non-network past capex categories included business IT and building/facilities. It anticipates $26 million (inclusive of FDC costs) in non-network capex to be commissioned during the current regulatory control period.[59]

Consultant review

WorleyParsons reviewed a project in each of Transend's non-network past capex categories—Business Support (ND0393 Strategic accommodation south) and Information Technology (IT and business applications). WorleyParsons noted that the capex undertaken for both projects was prudent and, accordingly, did not recommend any adjustments.[60]

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58 Transend, *Investment Evaluation of Network Projects Guideline, Issue 1.0*, June 2008.
59 Transend, Transend revenue proposal, op. cit., Appendix 3—Table 3.4.
60 WorleyParsons, WorleyParsons report, op. cit., p. 63–64.

Project ND0393—Strategic accommodation south

WorleyParsons considered that Transend demonstrated a justifiable need for this project and the project appeared to have been prudently planned, scoped and executed. The project was tendered and WorleyParsons considered that no excess accommodation was provided. Although Transend recognised a need to maximise operational efficiencies and capitalise on a united workforce, Worley Parsons noted that accommodation shortage issues have returned and Transend staff are currently accommodated at the Maria Street and Moonah sites.

Various projects—IT and business applications

WorleyParsons considered that project drivers were relevant and Transend demonstrated a justifiable need in individual business cases for the project components. The project components were considered to be consistent with Transend's overarching asset management framework and WorleyParsons also noted that Transend's corporate IT spend per employee was favourable in two TNSP benchmarking studies; one benchmarking study was conducted by KPMG in 2006 and, in 2007, a second benchmarking study was conducted by PB Associates in the course of its review of corporate support functions operating expenditure for Transend.

AER considerations

The AER notes that WorleyParsons was satisfied with the prudence of the expenditure for the two non-network past capex projects because it found that Transend had analysed viable options to meet its business accommodation requirements and its IT expenditures benchmarked favourably against those of other TNSPs.

The AER notes that WorleyParsons considered the projects were prudently planned, scoped and executed and that appropriate levels of project governance were in place. Having considered the information provided by Transend and the advice of WorleyParsons, the AER considers that the Strategic accommodation south project is an efficient investment, however, it notes that Transend currently has accommodation shortage issues. The AER is of the view that this is not evidence of any systematic project management failings. Instead, the AER considers that Transend did not adequately anticipate its growth and associated business requirements following NEM entry.

On the basis that WorleyParsons has not identified any systemic problems with the past non-network capex, the AER considers that it is reasonable to accept the total amount of $26 million as prudent.

2.5.4 Prudence of assets under construction projects

Transend proposal

Transend stated that the transition to recognising capex on a partially as-incurred approach requires an amount for prudent expenditure on assets under construction at the end of the current regulatory control period to be rolled into the RAB. Transend's

forecast of prudent expenditure on assets under construction (as at 1 July 2009) is $58 million.[61]

Consultant review

WorleyParsons noted that a number of forecast capex projects have incurred some expenditure during the current regulatory control period. In the course of WorleyParsons' detailed project review, Transend identified an error in its calculation of work-in-progress costs for two substation security programs. As a result, the work-in-progress cost will be reduced by $2.7 million. Given that both the past and forecast capex are considered to be prudent and efficient, it recommended that the proposed amount of $56 million for assets under construction be accepted as prudent and efficient on the same basis. [62]

WorleyParsons also reviewed the application of the FDC rate to the individual projects within the works program and concluded the calculations were consistent and accurate.[63]

AER considerations

In the 2003 revenue cap decision, the ACCC determined the capex allowance on an as-commissioned basis. Under this approach, capex is rolled into the RAB when the asset is commissioned or placed into service.

In accordance with the NER, the AER's guidelines adopted the partially as-incurred (hybrid) approach to recognising capex. This requires modelling of the return on capital in the year that expenditure is incurred, while the return of capital is modelled on an as-commissioned basis.

Transend's revenue proposal has adopted the partially as-incurred approach to recognising capex for the next regulatory control period. To facilitate a smooth transition to this approach, a prudent amount of capex incurred in the current regulatory control period must be included in Transend's RAB to recognise assets that are under construction but will not be commissioned until the next regulatory control period.

The AER considers that the capex incurred in the current regulatory control period for assets under construction are largely costs associated with initial project development work. These project costs include up-front development requirements, initial design estimates, deposits on critical plant and equipment, and the establishment of construction contracts.

The AER accepts that these types of costs are generally reasonable during the early stages of project development. It also notes that WorleyParsons has accepted the prudence of these costs in relation to the two 'assets under construction' projects it

61 Transend, Transend revenue proposal, op. cit., p. 148.
62 WorleyParsons, WorleyParsons report, op. cit., p. 59.
63 ibid., p. 59.

reviewed. On this basis, the AER considers that the total amount of $56 million for assets under construction is prudent.[64]

2.5.5 Finance during construction

Transend proposal

Transend has proposed to roll in $420 million of past capex into its RAB. This includes a FDC allowance of $26 million. Transend calculated this FDC allowance based on the nominal vanilla WACC of 8.80 per cent determined for the current regulatory control period. Table 2.5 shows the FDC allowance proposed by Transend for each regulatory year of the current regulatory control period.

Table 2.5: Transend's proposed finance during construction costs ($m, nominal)

	2004 (Jan to Jun)	2004–05	2005–06	2006–07	2007–08	2008–09	Total
Transend	2.0	2.8	4.0	5.8	4.9	6.2	25.7

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, Transend revenue proposal, 31 May 2008, Appendix 3—historical cost information templates.

Consultant review

WorleyParsons reviewed Transend's proposed FDC allowance and methodology to apply to the completed capex projects. WorleyParsons noted that the FDC rate applied by Transend was a value of 7.54 per cent, which was based on the regulated WACC determined by the ACCC for the current regulatory control period. WorleyParsons identified that Transend had applied its proposed FDC rate to the amount of network capex projects commissioned during the current regulatory control period, regardless of the actual construction period for individual projects. WorleyParsons also noted that Transend's FDC rate was based on a nominal project cashflow expenditure 'S-curve' for a project occurring over an 18 month period. [65]

WorleyParsons' analysis and modelling of Transend's past capex to assess the reasonableness of the FDC proposal identified that FDC had been included for IT projects. In addition to the FDC proposed for completed capex projects, WorleyParsons confirmed Transend had applied FDC to its assets under construction with no FDC being applied in the 2008-09 year.

Based on the FDC rate of 7.54 per cent and adjustments including deduction of FDC applied for IT projects, application of actual June 2008 CPI and a change to the treatment of committed projects from 'as commissioned' to 'as incurred', WorleyParsons recommended that $55.9 million be added to Transend's proposed RAB value for assets under construction.[66]

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64 As indicated in section 2.5.5, the AER has removed an allowance for FDC for IT projects.
65 WorleyParsons, WorleyParsons report, op. cit., p. 59.
66 ibid., p. 58.

AER considerations

As discussed in section 2.5.4, the ACCC's 2003 revenue cap decision for Transend recognised capex on an as-commissioned basis. As such, the return-on and return-of capital were modelled at the time of the assets being commissioned. However, to provide for the efficient cost of financing projects when they are under construction but not earning revenues, the ACCC considered that it was appropriate to provide an allowance for FDC.[67] That is, the capitalised value of the project is increased by the FDC rate.

The AER notes that Transend derived the FDC rate based on a nominal project expenditure S-curve for a project occurring over an 18-month period and that Worley Parsons commented that the S-curve was consistent with S-curves developed for Transend's 16 generic project types. The S-curves show the profile of expenditure over the construction period of an asset and therefore are used to assess the costs required to compensate Transend for financing the project prior to its capitalisation. On this basis, the AER accepts Transend's proposed FDC allowance of $26 million to be included with its commissioned projects for rolling into the RAB.

The AER agrees that providing an FDC allowance for assets under construction is required in order for Transend's capex to satisfy the prudence test as it provides for the inclusion in the RAB of costs of financing projects from the start of construction to the end of the current regulatory control period.

The AER has reviewed Transend's FDC calculations and agrees that applying an FDC rate of 7.54 per cent to Transend's assets under construction would be appropriate and is consistent with the expenditure profiles of Transend's assets under construction.

The AER notes that no FDC allowance has been proposed by Transend for its forecast capex. This is consistent with the transition to the partially as-incurred approach for recognising capex over the next regulatory control period.

2.5.6 Past capital expenditure spending profile

Transend proposal

Transend stated that it was forecasting to commission a total of $452 million ($2008-09) worth of capital investment over the current regulatory control period, involving substantial renewal of the transmission system, as well as capacity augmentation to meet demand growth and to deliver market benefits.[68] This amount is $89 million ($2008-09) greater than the ACCC's allowance of $362 million ($2008-09) as set in the 2003 revenue cap decision. In addition, the timing of Transend's actual expenditure differs to the ACCC's forecast due to factors including:[69]

- difficulties in obtaining planning approvals, increased lead times for major plant and equipment (such as transformers) and changing regulatory requirements

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67 Also known as interest during construction.
68 Transend, Transend revenue proposal, op. cit., p. 24–25.
69 ibid., p. 38–39.

- deferral of projects for integration of development and renewal works with customer and generator requirements
- delay of the Waddamana-Lindisfarne 220 kV transmission line due to a requirement for further analysis arising from changes in regulatory and planning requirements.

Transend stated that it has achieved capital expenditure efficiency improvements in the current regulatory control period and highlighted two key initiatives:

- implementation of transmission line dynamic ratings to increase transmission network capacity
- replacement of existing conductors with high temperature conductors.

Transend stated that the capital works program delivered by it in the current regulatory control period is significantly larger than any program delivered in previous years.

Submissions

The EUAA, MEG and RTA were concerned by the size of Transend's overspend in the asset renewal capex category. They considered that the asset renewal capex category deserved particular attention by the AER to ensure that the projects were prudent and efficient.[70]

The EUAA noted concern about Transend's ability to forecast and control its capex in view of the significant increase in capex for 2004-2008/09 compared to the capex forecast in Transend's 2003 revenue application. [71]

The MEG noted that Transend's capital expenditure for the 2004-2008/09 regulatory control period was some 25 per cent in excess of the allowance approved by the AER in spite of delays in the large Waddamana-Lindisfarne transmission line project.[72]

Consultant review

WorleyParsons considered that, excepting the 2008-09 year, Transend's cumulative capex for the current regulatory control period was reasonably closely aligned with the ACCC allowance. It noted that the projects included in Transend's 2003 application were based on analysis by Sinclair Knight Merz (SKM) and the capex requested included expenditure for 'fixed' and 'variable' (less than 80 per cent probability of occurrence) projects. For the current regulatory control period,

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70 EUAA, *EUAA submission to the AER on Transend's 2009 to 2013 revenue proposal*, August 2008, p. 8.
MEG, *Major Employer Group (Tasmania) submission to AER on Transend Revenue Proposal*, August 2008, p. 1.
RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 13–15.

71 EUAA, *EUAA submission to the AER on Transend's 2009 to 2013 revenue proposal*, August 2008, p. 7.

72 MEG, *Major Employer Group (Tasmania) submission to AER on Transend Revenue Proposal*, August 2008, p. 1.

Transend's capex has been categorised as development, renewal and non-network capex and it appears that Transend's renewal capex is significantly higher than allowed in the ACCC's 2003 decision.

At WorleyParsons' and Nuttall Consulting's request, Transend developed a document attempting to reconcile the projects identified at the time of the ACCC's 2003 decision and the projects which will be implemented during the current regulatory control period.

Delay in the provision of the document meant that the WorleyParsons review considered the document as it was submitted in early August 2008 and not the revised and amended version provided at the end of August 2008. WorleyParsons noted that the actual profile of expenditure has changed, with significantly higher than forecast expenditure for asset renewals. It noted that despite being a high priority project for the current regulatory control period, the commissioning of the Waddamana–Lindisfarne 220 kV transmission line project has been deferred until the next regulatory control period.

WorleyParsons stated Transend has completed or made substantial progress with each of the proposed fixed development capex projects other than the Waddamana–Lindisfarne 220 kV transmission line and the George Town substation 220 kV security upgrade projects. Information technology, NEM entry projects, asset management information systems and business accommodation consolidation in southern Tasmania were the focus of the non-network capex.

WorleyParsons considered that real cost increases, Transend's estimating basis and changes to Transend's capital program are the key factors which caused the difference between the ACCC allowance and Transend's capex for the current regulatory control period.

Nuttall Consulting noted that the ACCC's 2003 decision stated that Transend should "demonstrate that its renewal expenditures are economically justified and that there are no other, more cost effective, alternatives". Although Transend has established systems and processes that are aligned with the ACCC's position, the majority of the project business case documents reviewed by Nuttall Consulting did not contain financial or economic analysis supporting the justification of the timing of the options selected.

In general, WorleyParsons and Nuttall Consulting agreed with Transend's capex timing during the current regulatory control period. Neither consultant made any finding that an alternative timing would alter their overall conclusion that there was no evidence that Transend's expenditure was not justified and prudent.

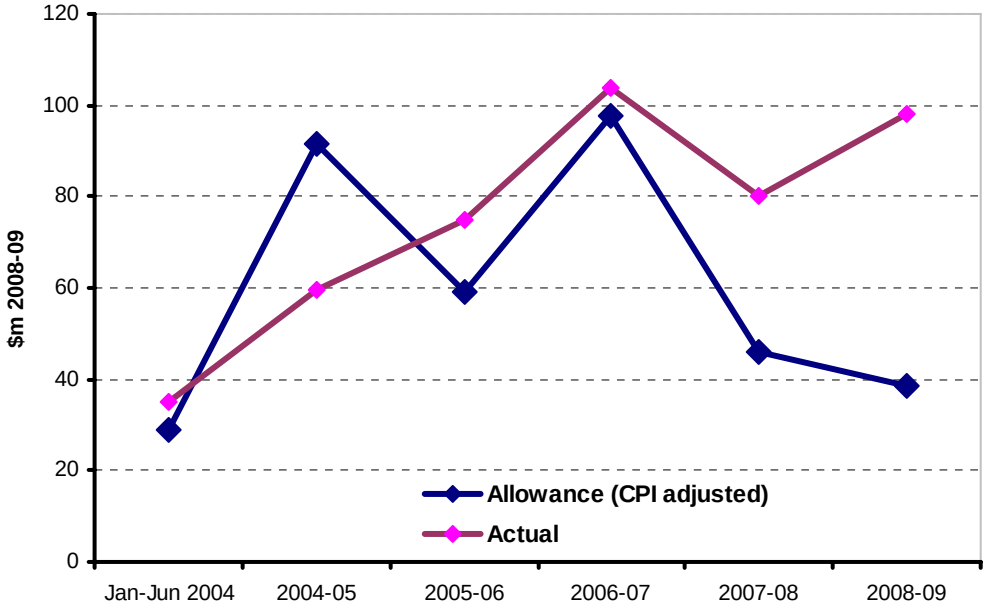
AER considerations

The AER notes that Transend's actual commissioned capex spending profile is different to that approved by the ACCC in its 2003 revenue cap decision (see figure 2.2). Expenditure for the Waddamana–Lindisfarne 220 kV transmission line was identified in Transend's 2003 revenue cap application as part of the Southern Augmentation project. The AER notes that delays in receiving necessary regulatory approvals and planning permission has contributed to delays in the project commencement until December 2007 and the project is now expected to be competed

in December 2010. The initial project cost estimate was $55 million and this has now been revised to $131 million on the basis of revised and updated project cost estimates. Transend has forecast $36 million will be spent on this project during the current regulatory control period.[73]

Further, Transend has stated that the Creek Road and Tungatinah substation redevelopment projects have been delayed until the next regulatory control period because of access issues associated with the Waddamana–Lindisfarne 220 kV line.[74]

Figure 2.2: Comparison of Transend's 2003 allowance and its actual commissioned capex profile ($m, 2008-09)



Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 38.

The AER notes the EUAA's concerns regarding Transend's ability to forecast and control its capex, however, the AER considers that, even though Transend did not follow its forecast spending profile, the explanations provided in its proposal and additional supporting information are reasonable.[75] The additional information provided by Transend sought to further explain the reasons for the overspend above the ACCC's 2003 allowance and, in doing so, Transend revised the allocation of capital projects between the development and renewal capex categories.[76] The AER notes that Transend stated that a number of project deferrals offset the need to

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73 Transend, Response to information request no. 75, submitted 2 July 2008.

74 Transend, *Capital expenditure profiles and variations for the period January 2004 to June 2014 (Issue 0.4, August 2008)*, submitted 27 August 2008.

75 Transend, Transend revenue proposal, op. cit., p. 39.
Transend, *Capital expenditure profiles and variations for the period January 2004 to June 2014 (Issue 0.4, August 2008)*, submitted 27 August 2008.

76 Transend, *Capital expenditure profiles and variations for the period January 2004 to June 2014 (Issue 0.4, August 2008),* submitted 27 August 2008.

undertake a number of substation redevelopment projects during the current regulatory control period. These issues are discussed below.

A number of submissions noted that Transend had overspent the renewal capex allowance set in the ACCC's 2003 decision. Transend stated it would commission an additional $78 million ($2008-09) over the current regulatory control period compared to the amount allowed by the ACCC.[77] Further, Transend noted that the cost estimates in its 2003 revenue proposal application were based on high level scopes of work or based on 'programs of work' and used unit rates which had been prepared for asset valuation purposes. Transend considered the estimates did not reflect cost escalations for wages and material during the current regulatory control period. The AER agrees that the cost escalators applied at the time of the ACCC's 2003 decision were lower than the actual escalation observed during the current regulatory control period.

The AER also notes that the Waddamana–Lindisfarne transmission line market benefits driven augmentation project, foreshadowed in the 2003 revenue cap decision for completion during the current regulatory control period as part of the Southern Augmentation project, has just commenced. The delayed commencement of this project has deferred expenditure on the Creek Road and Tungatinah substation redevelopment projects and this resulted in Transend not being required to spend amounts for these asset renewal projects in the current regulatory control period. The AER considers that the $78 million overspend by Transend compared with the allowed forecast can partly be attributed to real cost escalation of wages and materials during the current regulatory control period.

The AER is satisfied that the delay of the Waddamana–Lindisfarne transmission line project was outside Transend's control and does not reflect any systemic issues with its project development arrangements. In particular, it notes that proposed market benefits projects, by their very nature, are subject to the application of regulatory tests. However, Tasmania's entry into the NEM has not removed the market benefits, which justify the proposed transmission line.

Despite the underspends/deferrals associated with the Waddamana–Lindisfarne transmission line, the main reason for the change in the capex profile is that Transend had to prioritise its capital spend within the ACCC allowance when higher priority replacement work became necessary. Transend claimed this higher priority work resulted from the need to replace more of its ageing assets, which were starting to reach the end of their useful lives and were in poor condition. This resulted in a $102 million overspend in replacement expenditure compared to the 2003 revenue cap decision allowance.[78] However, the AER considers that the timing of the asset renewal projects during the current regulatory control period should have been better supported by economic analysis demonstrating the relationship between the project timing and the selected (efficient) investment option.

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77 Transend, *Capital expenditure profiles and variations for the period January 2004 to June 2014 (Issue 0.4, August 2008),* submitted 27 August 2008.

78 Transend, Transend revenue proposal, op. cit., p. 40.

The AER notes that, over the current regulatory control period, Transend has further developed its asset management regime to manage the risk and the costs of its ageing asset base in the forthcoming and subsequent regulatory control periods. The AER notes that there is a focus on condition monitoring in addition to defect identification. Transend stated that it has comprehensive condition assessment and performance monitoring regimes in place that provide a detailed understanding of the condition and performance of its assets. [79] The AER understands that this more detailed information influenced Transend's decision to commit to higher levels of replacement expenditure within the current regulatory control period. For this reason, it is likely and the AER is satisfied that the increase in replacement capex during the current regulatory control period includes a catch-up component for expenditure that would have been addressed earlier under a more rigorous asset management regime.

The AER is satisfied that the higher than forecast asset replacement expenditure is reasonable in the context of Transend's asset management regime for the reasons discussed above.

2.6 AER conclusion

The AER has reviewed the escalations that Transend has applied in its revenue proposal. On the basis of updated forecasts for CPI and the escalators as detailed in chapter 4 and appendix J, adjustments have been made to past capex, assets under construction and FDC.

Prudence of commissioned and assets under construction projects

The AER's conclusion is that Transend's expenditure of $415 million on commissioned projects during the current regulatory control period is prudent and should be included in its RAB.

To allow a smooth transition to the partially as-incurred approach, a prudent amount of expenditure incurred in the current regulatory control period must also be included in Transend's RAB to recognise assets that are under construction but will not be commissioned until the next regulatory control period. The AER's conclusion is that $55.4 million for Transend's assets under construction at the end of the current regulatory control period is also prudent and should be included in its RAB.

Table 2.6: AER conclusion on Transend's ex post allowance ($m, nominal)

	2004 (Jan to Jun)	2004–05	2005–06	2006–07	2007–08	2008–09	Total
2003 ACCC allowance (CPI adjusted)	28.6	84.4	56.0	95.1	46.0[b]	40.0[b]	350.1
Transend proposal	29.9	52.3	67.6	96.8	76.7	96.5	419.8
Consultants' recommendation	29.9	52.3	67.6	96.8	72.1	91.0	409.7[a]

[79] Transend, Transend revenue proposal, op. cit., p. 65.

AER escalation and CPI adjustment [c]	0.0	0.0	0.0	0.0	–0.6	5.4	4.8
AER Decision	29.9	52.3	67.6	96.8	71.5	96.4	414.5

Note: The AER will update the capex model with the latest CPI data at the time of its final transmission determination.
(a) These adjustments relate to augmentation, easement and replacement projects.
(b) Updated for latest CPI and AER CPI forecasts.
(c) This includes adjustments to escalation from 2006–07 to 2008–09 dollar, land (and easement) and materials escalators. These adjustments are detailed in section 4.6.6 and appendix J.
(d) Total may not add up due to rounding.

Finance during construction

The AER's conclusion on FDC is that an FDC allowance of $26 million be included with Transend's commissioned projects.

Table 2.7: AER conclusion on finance during construction costs ($m, nominal)

	2004 (Jan to Jun)	2004–05	2005–06	2006–07	2007–08	2008–09	Total
Transend Proposal	2.0	2.8	4.0	5.8	4.9	6.2	25.7
AER Decision	2.0	2.8	4.0	5.8	4.6 [a]	6.5 [a]	25.7

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, Transend revenue proposal, 31 May 2008, Appendix 3—historical cost information templates.
(a) Difference is due to change in capex allowance for these years.

3 Opening asset base

3.1 Introduction

This chapter sets out the methodology that has been used by the AER to determine Transend's closing regulated asset base (RAB)[80] for the current regulatory period. The closing RAB becomes the opening RAB for the next regulatory control period and is used to calculate Transend's maximum allowed revenue (MAR).

This chapter discusses the adoption of a roll forward methodology consistent with the regulatory principles operating when the ACCC determined Transend's current revenue cap.[81] It also sets out the AER's consideration of adjustments to the opening RAB for any difference between estimated capital expenditure (capex) and actual capex in the previous regulatory period.

3.2 Regulatory requirements

3.2.1 NER requirements

In determining an opening RAB for a transmission determination, the AER is bound by the relevant provisions of the NER. Clause 6A.6.1 and schedule 6A.2 of the NER outline the approach that is used to determine the opening RAB. The AER also uses its roll forward model to determine the roll forward of the RAB.

Schedule 6A.2.1(c) of the NER provides that the RAB for the first year of a regulatory control period must be determined by rolling forward the RAB value set out in the schedule. For Transend this value is $603.6 million (as at 31 December 2003). This value is then adjusted to allow for the difference between estimated capex and actual capex in the previous regulatory period. Schedule 6A.2.1(f) of the NER outlines how this value is further adjusted to roll forward and calculate the value of the RAB at the beginning of the first year of the regulatory control period.

Clause 11.6.9 of the transitional provisions of the NER provides that the value of the RAB for the first regulatory control period under the revised NER may be adjusted to have regard for an existing revenue determination and any other arrangements agreed between the AER and TNSP. The 2003 Transend revenue cap decision was made by the ACCC based on the framework contained in its *Draft statement of regulatory principles for the regulation of transmission revenues* (DRP).[82] Accordingly, the AER will roll forward Transend's RAB consistent with the DRP rather than the methodology outlined in schedule 6A.2.1(f) of the NER.[83]

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80 Pursuant to Transend's transmission licence, Transend's RAB includes a number of sub-transmission assets as set out in Appendix B of this draft decision.

81 ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003.

82 ACCC, *Draft statement of principles for the regulation of transmission revenues*, 27 May 1999

83 In the ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003, on page5, the ACCC states 'At the end of the regulatory period the ACCC will

3.2.2 Draft statement of regulatory principles

As noted previously in section 3.2.1 Transend's 2003 revenue cap decision was made in accordance with the DRP. The capex included in that revenue cap decision was a forecast that was based on an assessment of the likely investment required over the regulatory period. The closing RAB at the end of the current regulatory period must take account of actual capex.

The DRP requires the closing RAB to be determined following an ex post prudence assessment of actual capex. The AER's approach to the determination of what constitutes a prudent investment is discussed in chapter 2 of this decision.

Chapter 5 of the DRP, which discusses changes to the asset base over time, provides guidance on the treatment of excess return on capital associated with a lower than forecast capex. It states that the TNSP is entitled to retain the return on the difference between forecast and actual expenditure.[84]

Guidance on how excess return of capital (depreciation) associated with a lower than forecast capex should be treated is provided by proposed statement S5.3 in the DRP. It states that:

> At the start of the regulatory period only actual capital expenditure in the previous regulatory period will be included (retained in the case of previously forecast expenditures) in the asset base. At the commencement of the regulatory period this means that … any excess depreciation associated with forecast capital expenditures that did not eventuate [in the previous regulatory period] will be applied as a reduction in the value of the remaining items within the regulatory asset base at the start of the next regulatory period. [85]

The DRP requires forecast depreciation to be used in determining the value of the closing asset base. This means that excess depreciation associated with lower than forecast capex in the current regulatory period is treated as a bring-forward of depreciation, resulting in the establishment of a lower opening RAB at the start of the next regulatory control period.

The DRP does not explicitly indicate how a higher than forecast capex should be treated at the end of the regulatory period. The approach taken by the ACCC and the AER in previous regulatory decisions was to provide the TNSP with both returns on and of capital that exceeds the forecast amount if the capex was found to be prudent after an ex post assessment.[86] That is, the undepreciated value of the additional prudent capex and any foregone return on capital was added to the closing RAB.

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compare the actual capex with the allowance, both for amount and timing, and consider adjusting for any variance.'

84 ACCC, *Draft statement of principles for the regulation of transmission revenues*, 27 May 1999, p. 56.

85 ibid., p. 64.

86 ACCC, *NSW and ACT transmission network revenue cap–TransGrid 2004–05 to 2008–09: Final decision*, 27 April 2005.
ACCC, *NSW and ACT transmission network revenue cap–EnergyAustralia 2004–05 to 2008–09: Decision*, 27 April 2005.

3.3 Transend proposal

Transend has proposed an opening RAB for the next regulatory control period of $987.3 million as at 1 July 2009. The proposed opening RAB includes a higher than forecast past capex amount of $437.3 million (including finance during construction (FDC) costs) and $57.9 million of assets under construction at the end of the current regulatory period[87]. The AER's consideration of these amounts is discussed in detail in chapter 2.

Transend has used the AER's asset base RFM to determine its proposed opening RAB. In performing the roll forward of its RAB, Transend has deducted the cash amount received for any disposal of its assets from the RAB. It has also adjusted the capex allowance and regulatory (economic) depreciation as determined in the ACCC's 2003 revenue cap decision for actual inflation using the consumer price index (CPI).[88]

In accordance with schedule 6A.2.1(c)(2) of the NER, Transend has sought to adjust its opening RAB value by $17.3 million to account for lower than estimated commissioned assets between July and December 2003. Further, it has proposed to roll out the return on this difference over the current regulatory period of $6.2 million to establish the opening RAB as at 1 July 2009.

3.4 Submissions

No submissions were received by the AER on Transend's opening asset base. The submissions received concentrated on Transend's historical capex and are discussed in Chapter 2.

3.5 Issues and AER considerations

3.5.1 Opening RAB—1 January 2004

Schedule 6A.2.1(c) of the NER states that Transend's opening RAB as at 31 December 2003) must be rolled forward to determine the opening RAB as at 1 July 2009, subject to schedule 6A.2.1(c)(2) and any applicable transitional provisions.

The timing of a revenue cap decision requires that a revenue cap for a future regulatory control period must be set before the end of the current regulatory period. This means the actual capex for the final year of the current regulatory period cannot be known before the closing RAB is established. This, in turn, means that Transend's opening RAB value of $603.6 million prescribed in schedule 6A.2.1(c)(1)—which

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AER, *Powerlink Queensland transmission network revenue cap 2007–08 to 2011–12: Decision*, 14 June 2007.
AER, *SP AusNet transmission determination 2008–09 to 2013–14: Final Decision*, January 2008.
AER, *ElectraNet transmission determination 2008–09 to 2012–13 Final Decision*, 11 April 2008.

87 Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, Transend revenue proposal, 31 May 2008, p 148.

88 As Transend's MAR for the current regulatory control period was determined using forecast inflation, the MAR is adjusted annually to account for actual CPI.

was taken from the 2003 revenue cap decision—is based, to some extent at least, on estimates of capex in the later part of the preceding regulatory period.

Schedule 6A.2.1(c)(2) is designed to deal with this situation. It provides that, once the actual capex for the final part of the preceding regulatory period (in the case of Transend, this is the six month period from 1 July 2003 to 31 December 2003) is known, the opening RAB at 1 January 2004 must be adjusted for the difference between the forecast and actual expenditure.

The AER has developed an asset base RFM based on the capex incentive framework of the DRP. This model also provides for the adjustments to the opening RAB as required under schedule 6A.2.1(c)(2).

Transend proposal

Transend has used the AER's RFM and has adjusted the opening RAB for differences between actual and forecast expenditures during 1 July 2003 to 31 December 2003. In this period, Transend stated that actual expenditure was lower than forecast. The resulting foregone return on the difference between actual and forecast expenditures to be rolled into the RAB at 1 July 2009 is $6.2 million[89].

AER considerations

The AER notes that the NER requires that:

- the opening RAB for Transend is to be determined by rolling forward the value given to the RAB at a date specified in the table in schedule 6A.2.1(c)(1)
- the value of $603.6 million prescribed in the table is to be adjusted for the difference between actual and forecast capex for any part of a preceding period
- this adjustment must remove any benefit or penalty on the returns associated with any difference between actual and forecast capex.

The AER has reviewed the RFM for the inputs to the preceding regulatory period—1 July 2003 to 31 December 2003—and is satisfied with Transend's proposed adjustments to the opening RAB for the current regulatory period. Therefore, in accordance with schedule 6A2.1(c)(2), the AER accepts the adjustments to Transend's RAB of $17.3 million for the difference between actual and forecast expenditures for this period. The AER, under schedule 6A2.1(c)(2), also accepts $6.2 million for the foregone return on the difference between forecast and actual capex for the period 1 July 2003 to 31 December 2003.[90]

Table 3.1 shows the annual accumulated foregone return on capital associated with lower than forecast capex from 1 July to 31 December 2003.

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89 Transend, Transend revenue proposal, op. cit., p 148.
90 Updated for actual 2007-08 CPI data

Table 3.1: Return on capital associated with capex difference from July to December 2003 ($m, nominal)

Return on capex difference	2004 (Jan to Jun)	2004–05	2005–06	2006–07	2007–08	2008–09	Total
Capex in 2003 (Jul to Dec)	–0.42	–0.87	–0.98	–1.15	–1.18	–1.57	–6.17

Note: Total may not add up due to rounding.

3.5.2 Roll forward methodology

AER considerations

Under the AER's RFM, the closing RAB (nominal) for each year of the current regulatory period is calculated by:

1. Adjusting the opening RAB for the difference between actual CPI and forecast inflation.

2. Adjusting the forecast capex (allowed in the 2003 revenue cap decision) for the difference between actual CPI and forecast inflation.

3. Adjusting the forecast regulatory depreciation (allowed in the 2003 revenue cap decision) for the difference between actual CPI and forecast inflation.[91]

The AER has also reviewed the different asset classes adopted by Transend for the purpose of representing the values used in the RFM. The asset class spreadsheet provided by Transend demonstrates that it has appropriately mapped the opening RAB, capex and regulatory depreciation values categorised in the revised asset classes with those in the previously used asset classes. Therefore, the AER is satisfied that the input values in the roll forward model are consistent with the values forecast in the 2003 revenue cap decision.

During the current regulatory period Transend has undertaken more capex than was forecast in its 2003 revenue cap decision. However, as indicated in chapter 2, the AER has determined that $414.5 million of Transend's commissioned assets during the current regulatory period were prudent and should be included in its RAB.[92] Therefore, at the end of the current regulatory period, an adjustment to reflect the higher than forecast capex of $59.9 million[93] will be made to the closing RAB by adding the prudent additional expenditure. That is, the undepreciated value of the additional prudent capex is included in the RAB at the end of the current regulatory period.

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91 Regulatory (or economic) depreciation is calculated by determining the straight-line depreciation for the RAB less the CPI adjustment on the opening RAB.

92 An FDC allowance of $25.7 million for commissioned assets is also added to the RAB.

93 Includes the difference between actual and forecast capex of the underspend of $17.3 million from 1 July to 31 December 2003 and an overspend of $77.2 million from 1 January 2004 to 30 June 2009. The cash values for disposal of assets have been deducted.

In the case of a net prudent overspend, the DRP incentive framework requires that the return on the additional prudent capex also be added to the value of the closing RAB. However, over the current regulatory period Transend's actual capex was lower than forecast in 2004–05 and higher than forecast in 2005-06, 2006–07, and 2007–08.[94] The AER calculates that the accumulated return on capital associated with the lower than forecast expenditures in the earlier years more than offsets the foregone return on capital resulting in the latter years. Consequently, no adjustment to the closing RAB is required due to the excess returns that Transend has received over the current regulatory period.

Table 3.2 shows that there is an aggregate excess return on capital of $4.7 million received by Transend because of the profile of its actual capex during the current regulatory period. However, in accordance with the DRP's capex incentive framework, the aggregate excess return on capital is not deducted from a TNSP's closing RAB. Instead, Transend retains the excess return on capital within the current regulatory period.

Table 3.2: Accumulated return on capital associated with capex differences ($m, nominal)

Return on capex difference	2004 (Jan to Jun)	2004–05	2005–06	2006–07	2007–08	Total
Capex in 2004 (Jan to Jun)	0.16	0.18	0.21	0.22	0.29	1.06
Capex in 2004–05	–	–2.91	–3.40	–3.50	–4.63	–14.43
Capex in 2005–06	–	–	1.32	1.36	1.80	4.49
Capex in 2006–07	–	–	–	0.45	0.60	1.05
Capex in 2007–08	–	–	–		3.11	3.11
Capex in 2008–09	–	–	–	–	–	–
Total	0.16	–2.72	–1.86	–1.47	1.17	–4.72
AER Decision	0.0	0.0	0.0	0.0	0.0	0.0

Note: Total may not add up due to rounding. The negative sign refers to excess return associated with actual capex lower than forecast in the year.

The AER will also roll into Transend's RAB an amount for prudent expenditure on assets under construction at the end of the current regulatory period as a result of the transition to recognising capex on a partially as-incurred approach. As indicated in chapter 2, the AER has determined that $55.4 million of Transend's assets under construction were prudent and should be included in its RAB.[95]

[94] See Figure 2.1 for a comparison of Transend's annual forecast capex approved by the ACCC in 2003 and its actual capex for the current regulatory period.

[95] An FDC allowance of $1.3 million for assets under construction is also added to the RAB.

3.6 AER conclusion

Consistent with the NER and the DRP, Transend has proposed to roll forward its RAB established in the ACCC's 2003 revenue cap decision to determine an opening RAB for the next regulatory control period. Applying the roll forward methodology, the AER has determined Transend's opening RAB to be $993.6 million for the next regulatory control period, as at 1 July 2009. This value is used as an input for the AER's post-tax revenue model for the purposes of determining Transend's MAR during the next regulatory control period.

The RAB roll forward calculations are set out in table 3.3. The AER will update the roll forward of Transend's RAB with the most recent forecast of capex for 2008–09 and the latest CPI data, at the time of its final transmission determination.

Table 3.3: Transend's opening RAB for the next regulatory control period ($m, nominal)

	2004 (Jan to Jun)	2004–05	2005–06	2006–07	2007–08 [a]	2008–09 [b]
Opening RAB	603.6	628.7	696.1	737.3	811.4	850.5
Forecast capex (adjusted for actual CPI)[c]	28.6	84.4	56.0	95.1	46.0	40.0
Straight-line depreciation (adjusted for actual CPI)	–3.5	–17.0	–14.8	–21.0	–6.9	–6.0
Closing RAB	628.7	696.1	737.3	811.4	850.5	884.5
Add: prudent capex over 2003 decision[d]						59.9
Add: return on difference[e]						–6.2
Add: prudent assets under construction						55.4
Opening RAB at 1 July 2009						993.6

(a) Updated for actual 2007-08 CPI data.
(b) Forecast.
(c) The capex values include a half WACC allowance to compensate for the average six-month period before capex is added to the RAB for revenue modelling purposes.
(d) Includes the difference between actual and forecast capex of the underspend of $17.3 million from 1 July to 31 December 2003 and an overspend of $77.2 million from 1 January 2004 to 30 June 2009. The cash values for disposal of assets have been deducted.
(e) This relates to the return on difference between actual and forecast capex for the period 1 July 2003 to 31 December 2003.

Transend's opening RAB for the next regulatory control period is approximately 65 per cent higher (in nominal terms) than its opening RAB at the start of the current regulatory period. This increase largely results from:

- a higher than forecast amount of commissioned assets ($414.5 million, inclusive of FDC costs) compared with $350.1 million in the 2003 revenue cap decision.
- the inclusion of an assets under construction component ($55.4 million, inclusive of FDC costs) for the current regulatory period to allow for the transition to recognising capex on a partially as-incurred approach.

4 Forecast capital expenditure

4.1 Introduction

This chapter sets out the AER's consideration on Transend's forecast capital expenditure (capex) allowance for the next regulatory control period. The AER has assessed Transend's capex proposal by examining whether:

- its governance framework, capex policies and procedures facilitate efficient investment outcomes
- the methods used to develop the capex proposal, including probabilistic planning, demand forecasts and network planning criteria, are robust and appropriate
- there is a genuine need for the projects proposed in the revenue proposal and whether the scope, timing and costs are efficient
- the cost accumulation process employed by Transend was reasonable
- Transend's contingent projects satisfy the NER requirements and should be treated as contingent projects
- the capex program is deliverable.

The AER's conclusion, and the estimate of Transend's forecast capex allowance for the next regulatory control period it is satisfied reasonably reflects the capital expenditure criteria in clause 6A.6.7(c), is set out in section 4.7.

4.2 Regulatory requirements

4.2.1 Capex objectives

Clause 6A.6.7(a) of the NER provides that a transmission network service provider (TNSP) must include in its revenue proposal the total forecast capex for the regulatory control period in order to achieve the capex objectives, which are to:

> (1) meet the expected demand for prescribed transmission services over that period;
>
> (2) comply with all applicable regulatory obligations associated with the provision of prescribed transmission services;
>
> (3) maintain the quality, reliability and security of supply of prescribed transmission services; and
>
> (4) maintain the reliability, safety and security of the transmission system through the supply of prescribed transmission services.

4.2.2 Capex criteria and factors

Clause 6A.6.7(c) also provides that the AER must accept the capex forecast included in a revenue proposal if it is satisfied that the total of the forecast for the regulatory control period reasonably reflects the capex criteria, which are:

> (1) the efficient costs of achieving the capital expenditure objectives
>
> (2) the costs that a prudent operator in the circumstances of the relevant TNSP would require to achieve the capital expenditure objectives; and
>
> (3) a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

In making this assessment clause 6A.6.7(e) provides the AER must have regard to the following capex factors:

> (1) the information included in or accompanying the Revenue Proposal;
>
> (2) submissions received in the course of consulting on the Revenue Proposal;
>
> (3) such analysis as is undertaken by or for the AER and is published prior to or as part of the draft decision of the AER on the Revenue Proposal under rule 6A.12 or the final decision of the AER on the Revenue Proposal under rule 6A.13 (as the case may be);
>
> (4) benchmark capital expenditure that would be incurred by an efficient TNSP over the regulatory control period;
>
> (5) the actual and expected capital expenditure of the TNSP during any preceding regulatory control periods;
>
> (6) the relative prices of operating and capital inputs;
>
> (7) the substitution possibilities between operating and capital expenditure;
>
> (8) whether the total labour costs included in the capital and operating expenditure forecasts for the regulatory control period are consistent with the incentives provided by the applicable service target performance incentive scheme in respect of the regulatory control period;
>
> (9) the extent to which the forecast of required capital expenditure of the TNSP is referable to arrangements with a person other than the provider that, in the opinion of the AER, do not reflect arm's length terms; and
>
> (10) whether the forecast of required capital expenditure includes amounts relating to a project that should more appropriately be included as a contingent project under clause 6A.8.1(b).

Clause 6A.6.7(d) states that, if the AER is not satisfied that a TNSP's forecast capex reasonably reflects the capex criteria, then the AER must not accept the forecast capex in a revenue proposal. If the AER does not accept the total forecast capex proposed by a TNSP, clause 6A.14.1(2)(ii) of the NER requires the AER to include in its draft decision:

> …an estimate of the total of the Transmission Network Service Provider's required capital expenditure for the regulatory control period that the AER is satisfied reasonably reflects the capital expenditure criteria, taking into account the capital expenditure factors.

The AER is also required to assess contingent projects in accordance with clause 6A.8.1 of the NER.

4.3 Transend proposal

Transend has proposed an ex ante capex allowance totalling $681 million ($2008–09) for the next regulatory control period.[96] Table 4.1 sets out the annual profile of Transend's capex proposal.

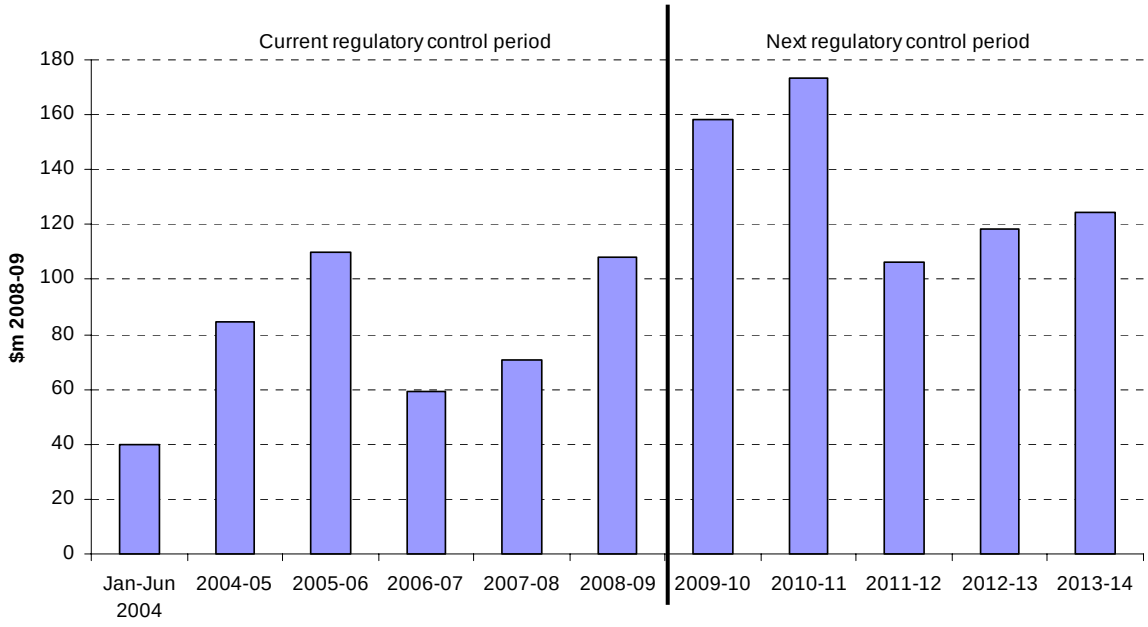
Table 4.1: Transend's proposed ex ante capex allowance ($m, 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Capex proposal	158.0	173.4	106.5	118.5	124.3	680.7

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 86.

Figure 4.1 shows the annual as-incurred profile of Transend's historic actual capex across the current regulatory control period and its proposal for the next regulatory control period.

Figure 4.1: Comparison of annual forecast and historic capex ($m, 2008-09)



Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 93.

[96] Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, Transend revenue proposal, 31 May 2008, p. 86.

Transend's capex proposal includes $58 million for expenditure on assets under construction to be included in its opening regulated asset base (RAB).[97] Work on these projects began in the current regulatory control period and they will be commissioned in the next regulatory control period. Transend's assets under construction were reviewed as part of the past capex assessment in section 2.5.4. Table 4.2 sets out Transend's proposal by capex categories.

Table 4.2: Transend's capex proposal by category ($m, 2008–09)

Type	Investment category	Forecast capex	Percentage of total capex (%)
Development	Augmentation	227.6	33.4
	Connection	121.8	17.9
	Land and easements	20.9	3.1
	Total development	*370.3*	*54.4*
Renewal	Asset renewal	226.6	33.3
	Physical security/compliance	10.7	1.6
	Inventory/spares	11.7	1.7
	Operational support systems	22.3	3.3
	Total renewal	*271.3*	*39.9*
	Total network	641.6	94.3
Support the business	Business IT	21.3	3.1
	Buildings/facilities	17.8	2.6
	Total non-network	39.1	5.7
Total capex		680.7	100.0

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 86.
Note: Total may not add up due to rounding.

Transend stated it uses the National Institute of Economic and Industry Research's (NIEIR) demand forecasts to model and plan its transmission system while a consolidated bottom-up demand forecast is used to model and plan prescribed connection sites.[98] Network development investment includes expenditure on augmentation, connection and strategic land and easements. Renewal driven network investment includes replacement expenditure on ageing assets, compliance with legal and regulatory obligations and ensuring the physical security of critical infrastructure. Transend applied a probabilistic approach to forecast its network development

[97] Transend, Transend revenue proposal, op. cit., p. 148.
[98] Transend, Transend revenue proposal, op. cit., p. 63.

investment requirements for the next regulatory control period. Transend highlighted that the primary drivers of its capex are the growth in demand, network performance requirements set out in the Tasmanian *Electricity Supply Industry (Network Performance Requirements) Regulations 2007*, and the continuation of the current asset renewal program.

Transend has undertaken a deterministic assessment of its network renewal and non-network expenditure for investments such as asset renewal, physical security/compliance, inventory/spares, operational support systems, information technology, and business support.

Transend's revenue proposal also includes 9 contingent projects. The indicative costs for these projects range from $12 million to $147 million and totals $509 million ($2008-09).

Transend's capex proposal states that its historical average capital expenditure expected to be incurred during the current regulatory control period is $86 million ($2008-09) while $136 million ($2008-09) is the forecast average annual capital expenditure proposed to be incurred in the next regulatory control period, an increase of 58 per cent. It noted that significantly higher forecast capital expenditure is required due to 'volume of work' and 'price of work' cost drivers. Volume of work cost drivers include construction of the Waddamana–Lindisfarne 220 kV transmission line project and new connections for Aurora. Price of work cost drivers include wages growth, land value escalation and non-labour construction cost increases.

4.4 Submissions

The AER received submissions commenting on Transend's capex proposal from the following interested parties:

- the Energy Users Association of Australia (EUAA)
- Hydro Tasmania (Hydro)
- Major Employers Group (MEG)
- Rio Tinto Alcan (RTA)

The main issues raised in relation to Transend's proposal were:

- the size and projected increase of Transend's demand forecasts
- the uncertainty associated with the introduction of an emissions trading scheme
- the proposed capex projects should be for prescribed transmission services
- the need to ensure the proposed contingent projects satisfy the NER requirements
- the costs that can be attributed to a specific project are funded by the proponent of that project rather than spread across all consumers

- Transend's ability to deliver the proposed capex program.

4.5 Consultant review

The AER engaged WorleyParsons and Nuttall Consulting to provide an independent assessment of the efficiency and appropriateness of Transend's capital governance framework and capex proposal. Specifically, WorleyParsons was required to:

- review the capital governance framework, including capex strategies, policies and procedures
- review the demand forecasts, methodology and information that underpin Transend's forecast capex program
- assess the adequacy and appropriateness of Transend's probabilistic forecasting
- review Transend's capex proposal (excluding network renewal capex) to ensure it is in accordance with the requirements under clause 6A.6.7 of the NER
- undertake a detailed review of a suite of network (excluding network renewal capex) and non-network projects
- determine whether the forecast capex program is deliverable
- assess whether each proposed contingent project is reasonably required in order to achieve the capex objectives outlined in clause 6A.6.7 of the NER.

Nuttall Consulting was required to:

- review the renewal capex strategies and associated policies and procedures
- review Transend's renewal capex proposal to ensure it is in accordance with the requirements under clause 6A.6.7 of the NER
- undertake a detailed review of a suite of network renewal projects

In the event that WorleyParsons or Nuttall Consulting disagreed with any element of Transend's capex proposal, WorleyParsons and Nuttall Consulting were required to:

- outline why the proposal was not in accordance with the NER
- provide an alternative efficient capex cost estimate and/or timing with the justification for the variance if it considered that Transend had over or underestimated its investment requirements.

As part of their assessment, WorleyParsons and Nuttall Consulting evaluated the documentation provided by Transend in its revenue proposal, sought additional information on specific projects and undertook follow-up discussions with Transend.

WorleyParsons found from its review of Transend's forecast capex (excluding asset renewal) proposal that:[99]

- the capital governance arrangements are well developed and documented and are being applied within the business. Inaccurate project estimates have been addressed by improving project cost estimation processes. Transend's documentation was comprehensive and and to a high standard, however, a number of processes relating to capital investment and governance were documented in June and July 2008 while other policy and process documents have been revised in 2008. On this basis, concern was noted in relation to consistent application of Transend's capital governance framework and its capex strategies, policies and procedures across the organisation

- the asset management documentation is comprehensive and, although many documents have been produced recently, they appear to be formalising Transend's existing processes

- the primary factors driving the capex program were the inclusion of the Waddamana–Lindisfarne 220 kV transmission line, connections requested by the Aurora Energy distribution business and the need to renew assets

- the process for preparing demand forecasts was sound but could be enhanced by improvement of documentation, communication, model maintenance, model variation and reporting. These improvements were identified in the PB Associates' report to Transend of its review of the load forecast methodology. Although Transend has not conducted statistical analysis to assess the accuracy of its maximum demand forecasts, its forecasts were consistently below those prepared by NIEIR. WorleyParsons noted that PB Associates' had concluded that Transend's load forecast methodology was robust and in line with good industry practice.

- the projects were prudent and efficient

- the base planning objects used for project costing for Transend's revenue proposal were developed using bottom-up estimating and historical data from similar projects

- the application of cost escalators and a cost estimation risk factor (developed with the assistance of Evans & Peck) is necessary to reasonably reflect the efficient costs that a prudent TNSP operating under the circumstances of Transend would require to achieve the NER capex objectives

- the cost estimation risk factor should be higher for Transend than for the mainland TNSPs because of its lower diversity and number of projects

- all of the proposed contingent projects meet the NER requirements

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[99] WorleyParsons, *Review of the Transend Transmission Network Revenue Proposal 2009-2014 An independent review prepared for the Australian Energy Regulator*, WorleyParsons report, October 2008, p.29, 45–46, 73–74, 94, 140–142, 250–252.

- the necessary external resources are likely to be available to deliver the forecast works program is deliverable.

Nuttall Consulting found from its review of Transend's forecast asset renewal capex proposal that:[100]

- the asset renewal strategies are broadly a continuation of established programs
- the 110 kV circuit breaker replacement program is a significant driver of the large number of proposed 110 kV substation redevelopments. The Reyrolle OS10 and Sprecher and Schuh HPF 110 kV circuit breaker types identified for replacement are being replaced, or have been replaced, by other TNSPs
- the economic analyses provided in support of asset renewal capex project proposals do not, in some cases, clearly demonstrate the need for the projects to be undertaken in the next regulatory control period.

Table 4.3 shows WorleyParsons and Nuttall Consulting's recommended adjustments to Transend's forecast capex proposal and its recommended forecast capex allowance for the next regulatory control period.

Table 4.3: WorleyParsons and Nuttall Consulting recommended forecast capex allowance ($m, 2008–09)

Category	Total
Transend's capex proposal (31 May 2008)	680.7
Adjustments as a result of WorleyParsons' detailed project reviews	–4.8[a]
Adjustments as a result of Nuttall Consulting's detailed project reviews	–50.1
Total recommended adjustments	–55.0
WorleyParsons and Nuttall Consulting recommended capex allowance	625.7

Source: WorleyParsons, *Review of the Transend Transmission Network Revenue Proposal 2009-2014 An independent review prepared for the Australian Energy Regulator*, October 2008, p. 123 & 153
Nuttall Consulting, *Review of Transend Revenue Proposal Asset Renewal Capital Expenditure: A report to the Australian Energy Regulator*, October 2008, p.79.

Note:
(a) This has not been adjusted for actual June 2008 CPI. WorleyParsons' report notes an actual CPI adjusted figure of $4.6 million.

WorleyParsons considered that Transend's ex ante capex (excluding renewal capex) allowance was likely to be prudent and efficient subject to its recommended reduction of $4.6 million. Based on its assessment, WorleyParsons recommended a provision for contingent projects of $412 million based on indicative costs. Based on its

[100] Nuttall Consulting, *Review of Transend Revenue Proposal Asset Renewal Capital Expenditure: A report to the Australian Energy Regulator*, Nuttall Consulting report, October 2008, pp .77–82.

assessment, Nuttall Consulting recommended a forecast renewal capex allowance of $177 million (around a 22 per cent reduction to Transend's renewal capex proposal).

Table 4.4 compares Transend's capex proposal with WorleyParsons and Nuttall Consulting's recommended ex ante capex allowance for each regulatory year of the next regulatory control period.

Table 4.4: Comparison of ex ante capex allowance ($m, 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Transend's proposal (31 May 2008)	158.0	173.4	106.5	118.5	124.3	680.7
WorleyParsons recommendation (non-renewal capex)	128.0	133.9	80.6	54.5	52.2	449.3
Nuttall Consulting recommendation (renewal capex)	28.6	34.5	22.1	44.3	46.9	176.5
Consultants' recommendation	156.6	168.4	102.8	99.8	99.1	625.7

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 86.
WorleyParsons, *Review of the Transend Transmission Network Revenue Proposal 2009-2014 An independent review prepared for the Australian Energy Regulator*, October 2008, p. 123 & 153.
Nuttall Consulting, *Review of Transend Revenue Proposal Asset Renewal Capital Expenditure: A report to the Australian Energy Regulator*, October 2008, p.81.

4.6 Issues and AER considerations

4.6.1 Transend governance framework, capex polices and procedures

This section examines whether Transend's capital governance arrangements and capex policies and procedures are appropriate, and provide a framework that is likely to result in prudent and efficient investment decisions. The AER considers this is necessary as it informs its determination of whether Transend's proposed forecast capex proposal reasonably reflects the capital expenditure criteria, and in in its consideration of the capital expenditure factors noted in clause 6A.6.7(e)(4) and (e)(5).

Transend proposal

Transend has developed detailed policies and procedures that govern its investment decision-making process. Key aspects of some of the policies and procedures are as follows:

1. The governance framework is supported by a number of strategic and asset management plans from which projects are initiated and prioritised. These include Transend's:

- corporate strategic plan
- *Grid Vision* project
- Transmission System Management Plan
- regional development plans
- asset management plans

2. Transend's Cost Allocation Methodology, as approved by the AER, was applied to allocate its forecast capital expenditure to prescribed transmission services in accordance with the requirements of clause 6A.6.7(b)(2) of the NER. This clause requires a TNSP to properly allocate capex into prescribed and negotiated transmission services.[101]

3. Transend developed project scopes and cost estimates for the projects in its forecast capital expenditure program. Separate cost estimation risk factors developed by Evans & Peck was applied to the individual projects to ensure the probability of actual costs exceeding the forecast is no higher than the probability of a cost underrun.[102]

4. Transend's board approves the organisation structure, delegations, strategic policies and plans. Board approval is required for major capital programs, projects and transactions involving the acquisition or disposal of major assets. The board audit and risk committee oversees an internal audit program to ensure compliance obligations are met and business risks are appropriately managed.[103]

5. 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 project progress
   - give direction as required.[104]

6. Monthly financial and project management reporting is undertaken at the project steering committee, management and board levels until completion and finalisation of the project or works program.[105]

Consultant review

WorleyParsons was required to assess whether Transend's capital governance framework was consistent with achieving efficient investment outcomes.

WorleyParsons found that:[106]

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101 Transend, Transend revenue proposal, op. cit., p. 85.
102 ibit., p. 83–85.
103 ibid., p. 32–33.
104 ibid., p. 33.
105 ibid., p. 33.

- Transend has reasonably considered likely solutions to address investment needs and that optimal projects are selected.

- Transend's governance processes are in line with good industry practice and the policies and procedures are well documented. Although some of the documents have been produced recently, there is evidence they are actively used.

- Transend's overall asset management approach is sophisticated and in line with good industry practice. Detailed condition assessment of all plant has provided a robust approach to assessing system risk and allocating project priorities. There is evidence of integration of policies, procedures and systems (including a works prioritisation system) which is a good framework for ensuring good management and decision making.

- Costs estimates reviewed by WorleyParsons were in line with its view of reasonable estimates. It noted that Transend had implemented a new cost estimating process which was considered to be sophisticated and robust. Change control and approval mechanisms are in place to manage any scope or cost changes.

- Based on WorleyParsons' detailed review of a sample of projects, Transend has appropriately assigned project capex classifications and the capex was required to provide prescribed transmission services.[107]

- Transend's capital governance framework is well developed and provides a high level of assurance for future capex. Based on WorleyParsons' detailed review of projects, there is evidence that the governance framework is being used, with management reporting and compliance auditing being undertaken.

- a formal post implementation review process should improve future project management.

Nuttall Consulting was required to assess whether Transend's asset renewal capex strategies and associated policies and procedures were consistent with achieving efficient investment outcomes.

Nuttall Consulting found that:[108]

- Transend's asset renewal strategies are broadly a continuation of established programs. However, the focus on the specific asset types within an asset class is changing as the poorest performing assets have been replaced in the current and previous regulatory control periods.

- Transend's asset renewal strategies are reasonable, in principle, and asset issues are identified for specific asset types and the commercial impact is considered in order to assess asset maintenance and renewal requirements.

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106 WorleyParsons, WorleyParsons report, op. cit., p. 45–46.
107 ibid., p. 141–142.
108 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 51–53, 77–82.

- Transend's systems and process documentation confirms that economic justifications are a critical element of the approval process for asset renewal and other capital projects.

Overall, WorleyParsons and Nuttall Consulting were satisfied that Transend's governance framework was in line with good industry practice.

AER considerations

The AER has reviewed Transend's capital governance framework and agrees that it contains appropriate controls, checks, accountability, reviews and approval gateways, and is consistent with good industry practice. However, the AER is concerned by Nuttall Consulting's finding, based in its detailed project review, that Transend's economic analysis of its asset renewal projects and strategies did not clearly support its preferred project option and/or the option timing. The AER notes that Transend's procedures highlight the usefulness of economic analysis in assessing the prudence and efficiency of capital investments and, therefore, the AER considers that Transend should ensure that its economic analysis documentation appropriately reflects its consideration of alternative project options and clearly demonstrates the selection of the preferred project option and the option timing as per its systems and process documentation.

The AER notes that Transend's *Business Case Manual* comprehensively documents the business case approval process supporting Transend's internal funding allocation processes. The AER notes that the document was prepared in July 2008 and, based on the project information provided by Transend and WorleyParsons' advice following its detailed review of a sample of projects, accepts that Transend's *Business Case Manual* documents practices which have been applied for some years.

The AER notes that Transend's *Business Case Manual* (and its *Strategic Plan 2008)* also refer to capital projects as being either 'revenue cap' or 'non revenue cap' capital projects and that a different investment evaluation framework (and rate of return) is applied to 'non revenue cap' capital projects. The AER considers this supports WorleyParsons findings that Transend has appropriately separated the capex required to provide prescribed transmission services from non-prescribed services (including negotiated transmission services).

The AER also notes that the consultants have not recommended changes to Transend's forecast capex based on their findings in relation to Transend's capital governance framework. However, WorleyParsons has identified that a formal post implementation project review should improve future project management. The AER considers that incorporation of WorleyParsons' suggested post implementation project review in Transend's capital governance framework could result in better implementation of Transend's projects and thereby enhance the efficiency of its investment decisions.

The AER recognises that Transend has made considerable progress in improving internal policies and procedures governing capital expenditure and, generally speaking, these are now of a high standard. The AER is satisfied that Transend's capital governance framework is likely to result in efficient and prudent investment decisions. This conclusion is, in turn, an important consideration in determining

whether the AER is satisfied Transend's proposed forecast capex allowance on the whole reasonably reflects the capital expenditure criteria.

4.6.2 Probabilistic planning approach

This section discusses whether Transend's probabilistic planning approach, which it used to develop its forecast annual network development capex profile, is a robust methodology and is likely to result in an outcome consistent with achieving the capital expenditure objectives in clause 6A.6.7(a). The AER considers an assessment of Transend's probabilistic planning approach is necessary as it informs its determination of whether Transend's proposed forecast capex proposal reasonably reflects the capital expenditure criteria.

Transend proposal

Transend applied a probabilistic approach to develop its capex forecast to account for the uncertainty surrounding generation and load developments in Tasmania during the next regulatory control period.[109] Transend engaged ROAM Consulting (ROAM) to produce probabilistic generation planning scenarios consistent with Transend's demand forecasts, under a range of other assumptions. The assumptions, in addition to demand forecasts, related to water availability (for hydro generation) and greenhouse gas abatement policy changes. Seven elements made up ROAM's probabilistic planning approach:[110]

1. The identification of scenario theme sets that will impact on the development of Transend's network including load growth, water availability and greenhouse policy to curb emissions. In consultation with Transend, the development of each theme set was allocated a probability of proceeding.
2. The development of 12 scenarios as set out in table 4.5. Each possible combination of the three theme sets (3 × 2 × 2) forms a scenario and determines the top down probability of that scenario eventuating.[111]
3. The identification of the scenario dependent generation developments (e.g. technology type, location, size and fuel type).
4. Analysis was undertaken to derive the weighting applicable to each generation project assumed to proceed within the given scenario. This was to account for the uncertainty relating to which of the various prospective generation developments will be developed under each particular theme. This was not captured in the top down probabilities.
5. The initial scenario probabilities were calculated from a combination of the top down and bottom up probabilities.
6. The initial scenario probabilities were moderated to account for the total amount by which Tasmanian annual energy generation (irrespective of the import or

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109 Transend, Transend revenue proposal, op. cit., p. 64, 73–75.

110 Transend, Transend revenue proposal, op. cit., Appendix 11—ROAM Consulting, *Scenarios for revenue reset application—2009–10 to 2013–14*, May 2008.

111 Scenario probability = (load growth probability) × (water availability probability) × (greenhouse policy probability).

export across Basslink) exceeds or falls short of the annual energy demand of the region.

7. For completeness, the final project probabilities included a number of generation projects that were not utilised in any of the scenarios because they were deemed unsuitable for the bottom up scenario undertaken in element four. ROAM considered some projects, which typically involved wind farms or sub-critical baseload power stations, were unlikely to proceed under the studied market conditions.

Table 4.5: ROAM's scenario theme sets for probabilistic scenario analysis

Load growth		**Water availability**		**Greenhouse policy**	
Low (15 %)	Low economic growth, with 10% probability of exceedance demand	Business as usual (80 %)	Hydro inflows maintain long-term average levels, with yields at approximately 9,500 GWh per annum	Low (40 %)	Current State and Federal greenhouse policies are maintained consistent with present arrangements. No significant incentives exist for large scale renewable developments
Medium (70 %)	Medium economic growth, with 10% probability of exceedance demand	Low inflows (25 %)	Hydro inflows are lower than long-term averages, matching closer to drought levels. Yields vary but average approximately 8,500 GWh per annum	High (60 %)	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 (15 %)	High economic growth, with 10% probability of exceedance demand	n/a	n/a	n/a	n/a

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 74 & Appendix 11, p.3.

Transend derived its network development capex forecasts from a combination of the capex requirements determined under each of the 12 scenarios. It noted there is little variation, in the capex requirements across the 12 scenarios because the majority of projects are required irrespective of the level of demand growth and where generation is located to meet this demand. The capex project list has been driven by the need to

remove existing network constraints and exceedance of substation firm capacity and to provide connection points for Aurora Energy.[112]

Transend stated that the augmentation and connection projects identified in its network capital expenditure forecast are independent of where new generation sources locate to meet the growth in demand.[113] It considered that the ROAM scenario analysis assisted in confirming its ex ante capital program and the identification of contingent projects.

Network renewal driven and non-network capex projects were prepared deterministically as the requirements for these projects were not dependent on demand forecasts or the location of future generation. For example, asset renewal projects were determined based on condition assessment and asset replacement recommendation reports and IT projects were determined based on forecast business requirements following separation of its IT systems from Hydro Tasmania. As a result, the same network renewal driven and non-network capex appears in each scenario.

Consultant review

WorleyParsons reviewed the probabilistic planning approach and found that:[114]

- The scenario analysis is a key input into Transend's identification of contingent projects associated with likely generation developments.
- Transend has used the scenario analysis to identify likely areas requiring transmission network development in the next regulatory control period.
- The two highest probability scenarios assumed medium load growth and average water availability. Final scenario probabilities are sensitive to the probabilities assigned to the scenario theme sets.

AER considerations

WorleyParsons has reviewed ROAM's methodology used in the development of the 12 scenarios for Transend's forecast capex and noted that ROAM's scenario analysis has minimal impact on Transend's capex program because:

- the two dominant scenarios assume medium load growth and average water availability. The highest probability scenario featured significant wind and hydro generation development related to a high CO2 cost scenario theme.
- at this time, no augmentation projects are proposed which would be sensitive to likely generation development.

WorleyParsons concluded that Transend's contingent projects (which are not included in the ex ante capital requirement) are driven by generation development and,

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112 Transend, Transend revenue proposal, op. cit., p. 89.
113 Transend, *Transend 2008 Annual Planning Report*, p. 66–67, 90. This document is available at www.transend.com.au .
114 WorleyParsons, WorleyParsons report, op. cit., p. 111–115.

therefore, the ex ante capital requirement under each of the 12 scenarios is very similar.

The AER considers that WorleyParsons' observations provide an insight into the drivers and composition of Transend's capex proposal. Transend's analysis based on ROAM's generation scenarios show that the underlying factors driving Transend's forecast capex are not influenced by the location of future generation or the introduction of greenhouse policies curbing emissions. Overall, it appears to the AER that Transend's forecast capex program, while based on a probabilistic approach, is consistent with a deterministic approach given the variance in ex ante capex projects between the modelled scenarios serves only to identify Transend's proposed contingent projects. The AER notes that ROAM's probabilistic scenario planning methodology is consistent with that applied by ROAM in support of other TNSPs' revenue proposal submissions.

Whilst the AER acknowledges this suggests Transend's probabilistic planning approach lends itself to reaching a result consistent with achieving the capital expenditure objectives, this is by no means definitive. A definitive view on Transend's capex program with respect to achieving the capital expenditure objectives, and satisfying the capital expenditure criteria, involves examining the need, timing, scope and cost estimates of the projects that make up the overall capex program. The AER has reviewed a sample of projects, indicative of the total capex proposal and the cost estimation process against the capital expenditure criteria having regard to the capital expenditure factors in sections 4.6.5 and 4.6.6 respectively below.

4.6.3 Demand forecasts

The expected growth in electricity demand is an important factor driving the need to augment electricity networks. Demand forecasts are used in conjunction with network planning to determine the amount and timing of load driven expenditure. Transend publishes an Annual Planning Report including 10-year demand/load forecasts for Tasmania.

This section discusses whether Transend's demand forecasts can reasonably be relied upon for the purposes of developing its load driven capex requirements over the next regulatory control period. In particular the AER recognises demand forecasts are crucial to its assessment which is specifically referred to in the capital expenditure objective in clause 6A.6.7(a)(1) and the capital expenditure criterion in clause 6A.6.7(c)(3).

Transend proposal

Transend's demand forecast is based on information provided by Aurora Energy, direct connect customers and NIEIR. Transend uses a top-down forecast prepared by NIEIR and reconciles it with Aurora Energy's bottom-up demand forecast to determine demand at connection points. The resulting demand forecast is used to plan capital works for the next five years in consultation with Aurora Energy and direct connect customers.

Transend explained its demand forecast as follows:[115]

> Transend's demand forecast is prepared by using the connection point forecasts provided to Transend by Aurora and direct connect customers. Aurora and direct connect customers provide only a medium (summer and winter) forecast for each of the connection points, which is used as the 50% POE medium demand forecast for each connection point. The data provided by customers are not modified for the 50% POE medium demand forecast. They do not produce high or low nor a 90% or 10% POE forecast for connection points.
>
> For producing the Transend forecast for the high and low (10% 50% 90% POE) and medium (only 10% and 90% POE), Transend uses the NIEIR State forecast. The NIEIR forecast is based on generation sent out data (not demand). This (NIEIR) forecast includes high, medium and low, 10% 50% and 90% POEs based on generation sent out value.
>
> The Transend forecast spreadsheet then calculates the forecast for high, medium and low (10%, 50% and 90% POE) based on generation sent out data. A further calculation is done on the NIEIR generation sent out forecast to determine the loads at the connection points (taking into account transmission losses). This in-turn produces the demand forecast for the high and low (10%, 50% and 90% POE) and medium (only 10% and 90% POE).
>
> Transend uses the Aurora and direct connect customer medium forecast, which is the 50% POE medium forecast for planning connection points (which includes transmission lines or substation equipment needed to supply the customer demand at the connection point). In conducting inter-area studies for Tasmania (ie impact of flows from Northern area to the Southern area) Transend uses the 10% POE medium forecast. This is the same approach as that of other TNSPs.

Aurora Energy's and NIEIR's demand forecasts are econometric models. Each differs markedly in its approach to both data and methodology as summarised below:

- NIEIR collects data on key macro-economic variable such as GSP, interest rates, population, employment growth, exchange rates and Tasmanian power output, etc. These are combined in the NIEIR model to produce a Tasmanian regional forecast of energy generation.

- Aurora Energy collects data on metered energy and demand for individual or connection points and produces forecasts for individual connection points. Its approach is based on 12 geographic areas of Tasmania and a distribution loss factor adjusted summation is employed to produce overall results.

In preparing its revenue proposal, Transend engaged PB Associates (PBA) to review its demand forecast methodology. This review was finalised in June 2008 and PBA concluded that, overall, the methods and processes adopted by Transend are appropriate and reasonable.[116]

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[115] Transend, Response to information request No. 232, submitted 8 September 2008.

[116] Transend, Response to information request No. 10, confidential, submitted 18 June 2008— PB Associates, *Review of Transend load forecast methodology: An independent review*, June 2008.

Submissions

MEG stated the assumptions behind Transend's maximum demand forecast should be carefully reviewed to ensure that the forecasts reflect a carbon constrained environment. MEG further considered that little weight should be given to backcasting as providing veracity for future forecasting.[117]

RTA considers that it is a 'direct connect customer' to Transend's network. RTA stated that Transend has not sought RTA's input into its demand forecasts for the purposes of its revenue proposal.[118]

Hydro Tasmania considered that Transend has given little consideration to an economic downturn scenario and its potential impact on an economically efficient level of transmission investment in specific locations.[119]

Consultant review

WorleyParsons reviewed Transend's demand forecasting methodology. At WorleyParsons' request, Transend provided a copy of PBA's report on its review of Transend's demand forecasting methodology.[120]

From its review of Transend's demand forecasts, WorleyParsons considered that:[121]

- neither Transend nor Aurora Energy have conducted statistical analysis to enable an assessment of the accuracy of Transend's maximum demand forecasts
- Transend's process for preparing its demand forecasts is sound, but could be enhanced by implementation of recommendations made by PB Associates
- it saw no evidence that Transend's maximum demand forecasts had been inappropriately inflated
- Transend's demand forecasts formed an appropriate input to the development of Transend's capex program
- NIEIR's forecasts have assumed the 2010-11 introduction of a carbon levy, in the form of an emissions trading scheme.

AER considerations

The AER has reviewed Transend's maximum demand forecasts and forecasting methodologies. Transend projected growth for the winter maximum demand over the next regulatory control period to be 2.2 per cent per annum including taking into

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117 MEG, *Major Employer Group (Tasmania) submission to AER on Transend Revenue Proposal*, August 2008, p. 3–5.

118 RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 5.

119 Hydro Tasmania, *Transend Revenue Proposal*, August 2008, p. 1–2.

120 Transend, Response to information request No. 10, confidential, submitted 18 June 2008— PB Associates, *Review of Transend load forecast methodology: An independent review*, June 2008.

121 WorleyParsons, WorleyParsons report, op. cit., p. 73–74.

account the Gunns paper mill. [122] As the AER considered that there was insufficient material relating to demand forecasts in the revenue proposal, further explanation and documentation of forecasting methodologies was requested from both Transend and Aurora Energy.

Transend stated that for many augmentation projects the drivers are closely linked and cannot easily be separated from each other.[123] Therefore, at the AER's request, Transend summarised its primary drivers for its capex program. In Transend's capex program, demand is one of the primary drivers for 23.2 per cent ($158.8 million) of all capex expenditure. Further, Transend noted: [124]

- 13.9 per cent ($95.6 million) of all capex is driven by customer requests and demand and are therefore required under rule 5.3.2(d) of the NER.
- 9.2 per cent ($49.2 million) of all capex is required as the forecast demand will lead to violation of the TEC minimum regulatory reliability requirements.
- 2 per cent ($14 million) of all capex is for the Sheffield-Burnie Transmission line augmentation, which is driven solely by Transend's demand forecast.

This suggests that Transend's demand forecast has minimal impact on its capex program and is being driven more by the need to meet minimum network requirements under the Tasmanian regulatory framework, customer requirements and compliance with the NER rather than the demand forecast. It follows that Transend's demand forecast is not the primary driver of the majority of its forecast capex program.

In its submission, MEG noted that the demand forecasts should reflect a carbon constrained environment. The AER notes NIEIR has assumed the introduction in 2010-11 of a carbon levy (in the form of an emissions trading scheme) in preparing the demand forecasts used by Transend.[125] The AER also notes that the inputs to the demand forecasting models are based on inputs determined at the start of the 2008. The macroeconomic environment has changed dramatically over the course of 2008 and this may result in a reduced growth rate.

Further, Hydro Tasmania submitted that Transend has not taken account of the effect of an economic downturn on the efficient level of investment at specific locations. However, the AER notes that the PBA review of Transend's demand forecast methodology did recommend a number of improvements to Aurora Energy's and Transend's methodologies including that the forecasts should be temperature

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122 Transend, Transend revenue proposal, op. cit., p. 70.
Despite its significant size the paper mill is expected to be largely self-sufficient and therefore has little direct impact on the forecast capex program. In addition, following discussions with Aurora, much of the forecast augmentation that superficially appears related to Gunns' pulp mill in the Launceston area is actually required for reliability reasons.

123 Transend, Response to information request No. 233, *Investment Drivers – Development Capex (AER query).pdf*, 17 September 2008.

124 Ibid

125 Transend, Response to information request No. 3, confidential, submitted 16 June 2008— NIEIR, *Electricity sales and maximum demand forecasts for Tasmania to 2022: A report for the Transend Networks Pty Ltd*, February 2008, p. 23.

normalised to remove the variance in demand due to temperature effects and the provision of information concerning the error in the forecast estimate and discussion of variance drivers including impacts of unusual major loads.[126]

The AER acknowledges the impact the step change in 2011 representing the new Gunns Longreach pulp mill in the Launceston area will have on the demand forecasts. The AER has confirmed with Transend that this is a result of the need to account for all of the demand in Tasmania that may exist in the next regulatory control period even though Gunns will have its own co-generation facility on site. Transend has stated that the Gunns Longreach pulp mill development will not require Transend to initiate any network augmentations. That said, the AER also notes that due to problems arising from the current state of financial markets, the Gunns project appears less likely to proceed than indicated at the start of the 2008.

The AER notes that its discussions with Aurora Energy have confirmed the forecast augmentation in the Launceston area is required for reliability reasons and are required irrespective whether the Gunns project proceeds. Therefore, the AER considers there will be minimal impact on Transend's capex program of a change in the demand forecast due to Gunns not proceeding.

The AER also recognises that only limited statistical analysis has been performed by Transend and NIEIR on its demand forecast. In particular, NIEIR when performing its analysis of the back-cast of its own forecast, found an adjusted R^2 of 0.74. This means that the model fits 74 per cent of the historic data. This is a fairly good result. This can be seen in Figure 4.2. However, when it performs a similar analysis of summer maximum demand the adjusted R^2 is only 0.29 or fit only 29 per cent historical data. NIEIR explains this as being due to the fact that Tasmania experiences it highest summer peaks on its coldest summer days as opposed to elsewhere in Australia. This makes the summer maximum demand harder to predict for Tasmania. Transend has also stated that Tasmania experiences its highest maximum demand during winter. The AER notes that NIEIR is a widely respected and independent demand forecasting body, engaged by NEMMCO in producing demand forecasts for the NEM. However, McLennan Maganasik Associates (MMA), as noted in the AER's 2008 NSW draft distribution determinations, has previously noted the difficulty of analysing NIEIR's forecasting methodologies due to a lack of transparency of NIEIR's models.

The AER notes PBA's comments that Transend's models would benefit from further statistical analysis. The AER also notes that Transend does not have access to the econometric demand forecast data produced by NIEIR's models and is therefore unable to perform statistical analysis on the data.[127] The AER is of the view is that in-depth statistical analysis of the model would enable users to establish the credibility of the model, by ensuring that the model had undergone rigorous assessment and analysis. This would also offer third parties a higher degree of confidence in the model's results.

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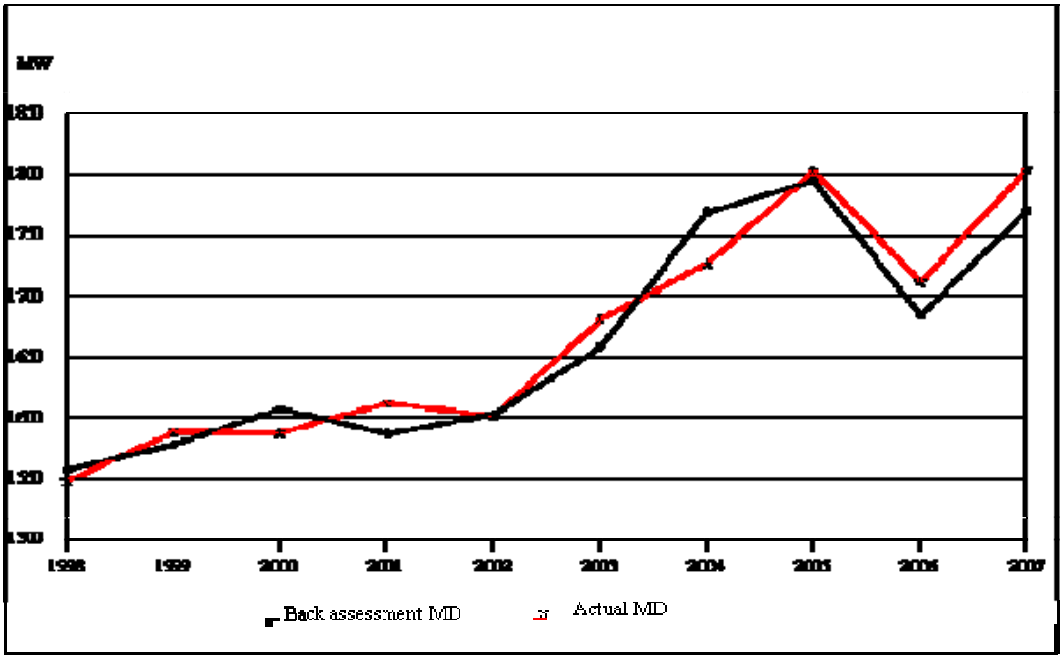
[126] Transend, submitted 18 June 2008— PB Associates, *Review of Transend load forecast methodology: An independent review*, confidential, June 2008, p. 1–2.

[127] Transend, Response to information request no. 232, submitted 8 September 2008.

Figure 4.2: NIEIR back-cast of maximum demand



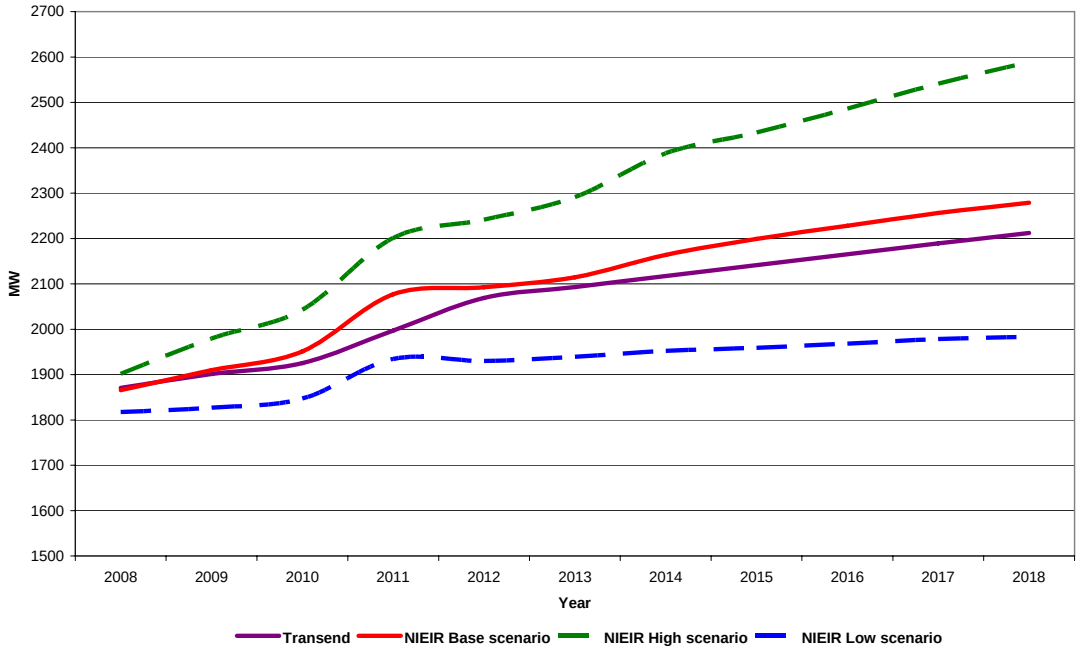
Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 73.

In its submission, MEG considered that little weight should be given to backcasting as providing veracity for future forecasting. The AER notes that NIEIR's analysis of the back-cast of its own forecast, found an adjusted R^2 of 0.74 which means that the model fits 74 per cent of the historic data. The back-cast of NIEIR's demand forecast against actual demand forecast for the last 10 years is shown in figure 4.2 and it suggests that NIEIR's demand forecasting methodology is rather robust. However, the AER notes that Transend did not adequately explain the divergence in the demand forecast in the last two years of the period. The AER considers that statistical analysis may assist in further analysing the factors behind this divergence, such as whether this is due to natural variation, the effects of the drought, or the model needing to be reassessed.

The AER notes that NIEIR's back-cast represents NIEIR's demand forecast measured against actual demand. While Transend does base its forecast on NIEIR's results, they are anchored by Aurora Energy's bottom-up results. A comparison of the NIEIR and Transend's deterministic forecasts is shown in Figure 4.3.

In its submission, RTA noted that it is Tasmania's largest electricity consumer and that the Bell Bay smelter consumes more than 25 per cent of the Tasmanian state electricity demand. Following discussion with Transend, the AER understands that some large Tasmanian customers are 'direct connect customers' of Aurora Energy and, as such, would not have been directly contacted by Transend in the course of developing its demand forecasts. However, these customers' demands have been incorporated in the forecasts Aurora Energy provided to Transend. The AER notes that RTA is currently Aurora Energy's customer. Therefore, RTA would not have been directly contacted by Transend.

Figure 4.3: Transend forecast vs. NIEIR forecast



Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 73.

This chart shows Transend has consistently produced a forecast of maximum demand below NIEIR's forecast maximum demand. Transend has not offered an explanation for the differences between the two models. The AER notes that there are likely to be many reasons for this including the fact that NIEIR is based on generation sent out while Aurora Energy's is based on consumer metered demand. This means that network loss factors would need to be accounted for and may help to account for the different demand results.

Conclusion

The AER notes Transend's reliance on NIEIR's demand forecasting models in developing its own demand forecasts and, notwithstanding the absence of detailed statistical analysis supporting NIEIR's demand forecasts, the AER acknowledges that the back-cast of NIEIR's demand forecast against actual demand forecast for the last 10 years suggests that NIEIR's demand forecasting methodology for Tasmania is robust. The AER notes that Transend's demand forecast is not the primary driver of the majority of the capital expenditure that Transend is proposing for the next regulatory period. Transend's capex program is primarily motivated by customer (i.e. Aurora) connection requirements, renewal capex and reliability augmentations.

The AER accepts Transend's demand forecast noting that the forecast has little effect on Transend's capex program for the next regulatory control period. In particular, the AER is satisfied Transend's demand forecasts reasonably reflect a realistic expectation of that which is required to meet the expected demand for prescribed transmission services over the next regulatory control period, consistent with the capital expenditure criterion in clause 6A.6.7(c)(3).

The AER also notes PBA's recommendation for greater statistical analysis. The AER supports PBA's recommendation in this area noting that it would allow the AER to

undertake a more in-depth analysis of the results and offer greater confidence in future assessments of the demand forecast.

4.6.4 Network planning criteria

This section examines whether Transend's planning criteria is consistent with the NER and its relevant legislative obligations. The effect that reliability standards have on Transend's network planning criteria and forecast capex requirements over the next regulatory control period are also discussed. The AER notes one of the capital expenditure objectives Transend's forecast capex proposal is required to achieve is to comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services (clause 6A.6.7(a)(2)).

Network planning criteria form the basis for assessing the requirement for and design of network development driven capex. A key element of Transend's planning criteria is the Tasmanian Electricity Code (TEC) and the jurisdictional network performance requirements. The Tasmanian Reliability and Network Planning Panel (TRNPP) reviewed the jurisdictional network performance requirements and made recommendations to the Tasmanian Regulator on the transmission planning and security criteria to apply in Tasmania which are contained in the *Electricity Supply Industry (Network Performance Requirements) Regulations 2007*which were approved by the Tasmanian Minister for Energy.

Transend proposal

Network planning

Transend noted that compliance with regulatory obligations is an important driver of its capex requirements. It considers that the Tasmanian network performance requirements regulations set out the minimum standards that must be met in planning the transmission system and, in particular, these regulations drive reliability augmentations.

Transend has also undertaken a *Grid Vision* project to identify strategic actions responding to emerging trends and a range of 30-year scenarios associated with the Tasmanian electricity network. Further, *Grid Vision* forms the basis for its more detailed regional development plans and the Transmission System Management Plan. Transend's Annual Planning Report publishes relevant information from the regional development plans.[128]

Network Performance Requirements

The Tasmanian Regulator administers Transend's licence for operating the Tasmanian electricity transmission network. As a condition of this licence, Transend must comply with all relevant regulatory obligations, which includes the *Electricity Supply Industry (Network Performance Requirements) Regulations 2007* enacted in December 2007.

[128] Transend, *Transend 2008 Annual Planning Report*. This document is available at www.transend.com.au .

Transend considers meeting the network performance requirements in the regulations provides the justification for reliability driven transmission network augmentation under the reliability limb of the AER's regulatory test. The regulations apply to the shared transmission network and those parts of the network supplying the distribution system but not to energy intensive customers directly connected to the transmission system. Transend stated that the regulations specify it must apply to the Minister for approval of proposed augmentations exceeding $15 million which it has factored into its future capex plans.[129]

Transend states that compliance with regulatory obligations, including those set out in the regulations, is an important driver of its capex requirements for the next regulatory control period. [130]

Consultant review

From its review of Transend's network planning, WorleyParsons found that: [131]

- the NOUS report to Transend (Appendix 8 of Transend's 2008 revenue proposal) was a practical document for determining the focus of Transend's long-term planning
- the 30 year network vision, Grid Vision, for the Tasmanian electricity transmission network was developed following investigation of possible long-term network development challenges
- a high level of integrated planning is undertaken with Aurora Energy and both the distribution and transmission networks are considered when designing transmission projects
- a need has been identified for the development of four key network development strategies identified as the transmission network backbone, major northern and southern load centre, north-west and west coast, and the east coast.
- a decision on the transmission network backbone voltage has not yet been made. Subject to the timing of the decision, some contingent transmission line projects may be constructed with insulation to the new backbone voltage but energised at a lower level for an extended period of time
- a number of identified transmission network constraints have resulted in breach or expected breach of the NER system standards and stability requirements and the network performance requirements (as enacted in December 2007)
- in its presentation at the 6 August 2008 public forum, the Tasmanian Department of Infrastructure Energy and Resources, Office of Energy Planning and Conservation articulated the view that the minimum network performance requirements (as described in the regulations enacted in December 2007) are not

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129 Transend, Transend revenue proposal, op. cit., Appendix 6—Jurisdictional network performance requirements, p. 2.

130 Transend, Transend revenue proposal, op. cit., p. 59.

131 WorleyParsons, WorleyParsons report, op. cit., p. 96–97, 101, 110.

directly related to the current operational status of the system, however, Transend must plan to meet the requirements.[132] Therefore, WorleyParsons considered that a reasonable approach to address Transend's identified cases of breach of these requirements would be to address them within the 2009/10-2013/14 regulatory control period.

AER considerations

No submissions were received on Transend's network planning criteria. The AER's consideration of Transend's network planning criteria is set out below.

Network planning

Transend's *Grid Vision* project outlines its long-term network planning strategy and stakeholders were provided an opportunity to participate in the development of this vision. The project identified four key areas relating to long term network development strategies — transmission network backbone strategy, major northern and southern load centre strategy, north-west and west coast strategy and east cost strategy. Transend's guiding principles and strategies to achieve these strategies are described in its Transmission System Management Plan (TSMP).[133] This document is produced annually and considers the following five-year period. It sets out Transend's approach to its asset management processes and its transmission network development. The AER notes the TSMP is also consistent with Transend's asset management plans and the information provided in its Annual Planning Report.

The AER considers that Transend's *Grid Vision* provides a context for Transend's proposed capex program and that stakeholder consultation in the development of the 30 year vision is a constructive step for providing effective ongoing and long-term network planning. The AER notes that Transend's regional development plans are based on the strategies identified by the 30-year *Grid Vision* project, technical/engineering network studies and regular consultations between Transend and Aurora Energy. The regional development plans outline:

- regional demand forecasts
- location of existing and emerging system performance issues
- options for addressing system performance issues
- regional development plan with all options and costs estimates.

The outputs of the regional development plans are used in Transend's Annual Planning Report and the Tasmanian Annual Planning Statement.

WorleyParsons noted that planning is a continuous process and that network constraints are identified as part of work for the Annual Planning Report and

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132 Tasmanian Department of Infrastructure Energy and Resources, Office of Energy Planning and Conservation, 6 August 2008. All presentations made at the public forum are available at www.aer.gov.au.

133 Transend, Transend revenue proposal, op. cit., Appendix 9—Transend, *Transend Networks Transmission System Management Plan*: *2007–2012*.

individual projects as well as during monthly meetings with Aurora Energy network planning staff.

The AER notes the *Grid Vision* project, Annual Planning Report and the regional development plans have been developed to support the asset and planning strategies that feed into Transend's capital and maintenance works programs. The AER notes these documents have been developed to address long-term load growth, ageing assets, regulatory requirements and customer expectations. The AER also acknowledges that Transend and Aurora Energy jointly consider both transmission and distribution network solutions to address emerging network constraints and that Transend has actively consulted with stakeholders in developing its long-term network planning vision. The AER considers these activities taken collectively to be indicative of a well run company applying planning techniques appropriate to its circumstances.

Having considered Transend's network planning framework and WorleyParsons' advice, AER considers that Transend's network planning is sound and consistent with good industry practice for the reasons discussed above.

Network Performance Requirements

Clause 5.2.3(f) of the NER requires Transend to comply with all relevant regulatory obligations, which include the TEC and the Tasmanian *Electricity Supply Industry (Network Performance Requirements) Regulations 2007*. Further, the Office of the Tasmanian Energy Regulator (OTTER) administers Transend's licence for operating the Tasmanian electricity transmission network. As a condition of this licence, Transend must comply with all relevant laws, rules, codes and guidelines, including the Tasmanian Electricity Code.[134] Transend is required to plan and develop its network based on these requirements.[135] The AER notes that the TRNPP undertook extensive public consultation to review Tasmania's network security and planning criteria.[136] In May 2006, the AEMC reliability panel adopted the Tasmanian reliability standards that were previously set by the Tasmanian Reliability and Network Planning Panel.[137]

The AER considers that two features of the Tasmanian network performance requirements regulations are of particular importance to its consideration of Transend's capex proposal: first, the assigned timeframe that Transend has to correct any existing identified breach of the network performance standards and, second, the

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134 Office of the Tasmanian Energy Regulator, *Transend Supply Industry Transmission Licence*, 18 December 1998, as amended 9 May 2007, clause 3.1.

135 *Tasmanian Electricity Supply Industry (Network Performance Requirements) Regulations 2007* Tasmanian Electricity Code, as amended 1 January 2008 This document is available at http://www.energyregulator.tas.gov.au .

136 In November 2005, the TRNPP released a consultation paper on the review of Tasmania's network security and planning criteria. The TRNPP's consultation paper, report to the Tasmanian Regulator and all submissions are available at http://www.energyregulator.tas.gov.au.

137 AEMC Reliability Panel, *Tasmanian reliability and frequency standards determination*, 28 May 2006, p. 9.

requirements set out in section 6 relating to seeking the (Tasmanian) Minister's approval of proposed augmentations which exceed an NPV of $15 million. [138]

At the AER's 6 August 2008 public forum presenting Transend's revenue proposal submission, the presentation by the Tasmanian Office of Energy Planning and Conservation noted that Transend must plan its network so as to rectify identified breaches, however, there is no requirement for Transend to correct all existing identified breaches in the next regulatory control period. The AER notes that the Tasmanian network performance requirements regulations simply state the minimum network performance requirements and do not specify a time period within which Transend is obligated Transend to correct existing identified breaches.[139]

Further, section 6 of the Tasmanian network performance requirements regulations state that Ministerial approval is required for transmission system augmentations to meet the minimum network performance requirements which cost more than $15 million. This requirement is intended to allow the (Tasmanian) Minister an opportunity to review reliability driven augmentation to ensure that not only are technical standards being met, but that the augmentation's direct and indirect economic, social and environmental benefits outweigh its direct and indirect economic, social and environmental costs.[140]

The AER notes that the 6 August 2008 presentation by the Tasmanian Office of Energy sought to clarify the implications of this requirement. It appears to the AER that (Tasmanian) Ministerial approval would not be unreasonably withheld. Therefore, the AER does not expect this jurisdictional requirement to lead to project development and implementation delays which are beyond Transend's control. A summary of the jurisdictional network performance requirements regulations, as relevant to Transend's network planning activities, is set out in Appendix B.

Joint network planning

The AER notes that Transend liaises with Aurora Energy, generators and other interested stakeholders in Tasmania, and works to encourage efficient outcomes in developing its transmission network. Transend also undertakes a significant amount of joint planning with Aurora Energy for new connections and, in its submission, Transend indicated it worked closely with Aurora Energy to ensure both transmission and distribution solutions are assessed in accordance with clause 5.6.2 of the NER. This included identifying efficient solutions to network constraints that formed a number of projects in the forecast capex program and a number of Transend's proposed contingent projects. This was confirmed by Aurora Energy at a separate meeting with the AER.

While joint planning provides some assurance that the most efficient project options are identified for addressing emerging network constraints, the AER has sought

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138 Transend, Transend revenue proposal, op. cit., Appendix 6—Jurisdictional network performance requirements, p. 2.

139 Tasmanian Government, *Electricity Supply Industry (Network Performance Requirements) Regulations 2007* is available at www.thelaw.tas.gov.au.

140 Tasmanian Government, *Electricity Supply Industry (Network Performance Requirements) Regulations 2007*, section 6.

greater assurance on the efficiency of the proposed projects by undertaking a detailed review of some projects in the forecast capex program. The AER's detailed review of projects is set out in section 4.6.5 and Appendix D.

Conclusion

In summary, the AER considers that:

- Transend's network planning framework is sound and consistent with good industry practice
- the Tasmanian minimum network performance requirements regulations enacted in December 2007 impose additional planning requirements on Transend, which drives a significant portion of its proposed augmentation and connection capex.
- Transend's joint planning with Aurora Energy, and engagement with other stakeholders provides some assurance that the most efficient project options have been identified.

The AER also notes the Tasmanian Office of Energy Planning and Conservation has stated that:

- the network performance requirements regulations do not relate to the current operational status of the system and,
- while Transend should be planning to meet the requirements, a licence compliance obligation to meet the requirements in the next regulatory control period is not currently in effect.

The AER notes that Transend has addressed this situation by proposing that a number of projects where it is not certain the network performance requirements may be breached in the forthcoming period be classified as contingent projects.

Having reviewed Transend's network planning framework and processes, the AER is satisfied they are consistent with good industry practice and reasonably reflects the practices a prudent operator in the circumstances of Transend would implement to achieve the capex objectives as required by clause 6A.6.7(c).

4.6.5 Detailed review of selected forecast capex projects

This section discusses the AER's review of Transend's main capex categories and issues identified during the detailed project reviews. WorleyParsons undertook a detailed review of a sample of projects from Transend's network (excluding asset renewal) and non-network capex categories. Nuttall Consulting undertook a detailed review of a sample of projects from Transend's asset renewal capex categories.

It is noted that although Transend has prepared its forecast capex proposal on a detailed project-by-project basis, and the AER has for the most part assessed expenditure in this way, the AER's conclusions relate to a total forecast capex allowance. Therefore the AER's project-specific conclusions should not be taken to bind Transend to a particular set of project-specific capex budgets — Transend has the ultimate discretion in how it spends its capex allowance.

Transend proposal

Transend stated that its forecast capex program is largely driven by the growth in demand, network performance requirements and asset renewal requirements.[141] It noted that its asset base requires the current asset renewal program to continue in order to sustain transmission system performance and the reliability of electricity supply.

Transend's forecast capex program consists of a possible 103 projects that may take place during the next regulatory control period. This includes 17 augmentation projects, 18 connection projects, 1 land and easements project, 48 asset renewal projects, 2 inventory/spares projects, 12 operational support systems projects, 5 physical security/compliance projects, and 18 non-network projects.[142]

Submissions

RTA stated that the AER should ensure that the allowance sought by Transend should be properly allocated to prescribed transmission services and not include negotiated transmission services. In particular, RTA noted that an augmentation or extension to the transmission network as a result of new generation should not be allocated to a prescribed transmission service. RTA also stated that the AER should carefully review the cost and timing of the forecast capex program.[143]

MEG urged the AER to confirm that exports are excluded in any augmentation assessment and to ensure that land is not purchased for asset construction in future regulatory control periods.[144]

Consultant review

The purpose of the detailed project review is twofold—to assess the prudence and efficiency of each project, and to test whether Transend has complied with its stated capex policies and procedures. The sample of projects selected, in consultation with the AER, was targeted to cover a wide range of factors that underpin and are representative of Transend's forecast capex allowance. These factors included the costs, project drivers, timing, geographic location and probability of proceeding, and potential issues identified from project descriptions. WorleyParsons reviewed 10 projects with a total value of $205 million (30 per cent of Transend's proposed ex ante capex excluding asset renewals).[145] Nuttall Consulting reviewed 13 projects with a total value of $141 million (62 per cent of Transend's proposed ex ante asset renewal capex).[146]

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141 Transend, Transend revenue proposal, op. cit., p. 57.

142 Transend, Transend revenue proposal, op. cit., Appendix 3—forecast capex cost information templates.

143 RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 3–5.

144 MEG, *Major Employer Group (Tasmania) submission to AER on Transend Revenue Proposal*, August 2008, p. 3–5, 8.

145 WorleyParsons, WorleyParsons report, op. cit., p. 137–139.

146 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 57.

In assessing the prudence and efficiency of each project in the sample, the consultants were specifically required to provide their independent opinion on the following matters:

- whether or not there was genuine need for the project
- whether Transend had considered the complete range of feasible alternatives
- whether the scope, cost and timing of the proposed project was efficient. If the consultants found the scope, cost and timing of the proposed project was not efficient they were required to recommend an alternative scope, cost and timing
- whether the project aligns with Transend's strategic plans, governance arrangements, and capex policies and procedures.

Based on its detailed review of a sample of projects, WorleyParsons did not recommend any adjustment to Transend's proposed ex ante capex allowance. However, it noted that adjustments were required for errors identified in the course of the detailed project review and escalators. Nuttall Consulting's detailed review of a sample of projects led it to recommend a reduction of $50 million ($2008–09) from Transend's proposed ex ante asset renewal capex allowance.[147] It recommended the following adjustments:[148]

- Transend's proposed 110 kV substation redevelopment asset renewal allowance be reduced by $37 million.
- Transend's proposed secondary system asset renewal capex allowance be reduced by $9 million.
- Transend's proposed transmission line asset renewal capex allowance be reduced by $4 million.

Overall, WorleyParsons' detailed reviews did not identify any issues or problems that they considered to be serious or systemic, and found that the projects reviewed were prudent and efficient. WorleyParsons did not report any evidence of inappropriate costs being included in project estimates. Nuttall Consulting's detailed reviews confirmed that the range of issues to be addressed by the asset renewal projects was reasonable and aligned with Transend's strategies. However, it also noted there was inadequate discussion and quantification of the project risk costs identified by Transend. Further, economic analyses provided in support of the asset renewal projects did not clearly demonstrate the need to undertake all of the proposed projects in the next regulatory control period. Therefore, it was not evident to Nuttall Consulting that Transend had followed its own procedures relating to the preparation and consideration of economic evaluations for proposed projects.

147 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 81.
148 ibid., p. 81.

AER considerations

The objective of the AER's assessment of specific proposed projects is to test the efficiency and prudence of Transend's policies, procedures, replacement strategies and cost estimates, as they relate to the entire forecast capex proposal. The AER considers these to be relevant considerations in determining whether it satisfied Transend's forecast capex proposal reasonably reflects the capex criteria.

The AER notes that WorleyParsons found that the sample of projects reviewed in detail were justified, prudent and efficient subject to the following:

- in many cases, a business case had not yet been prepared as the project was at an early stage of development. Where business cases did exist, they were prepared in accordance with Transend's Business Case Manual
- minor adjustments to correct identified errors.

Error adjustments

In the course of WorleyParsons' detailed project review, Transend identified a number of errors and re-submitted its models to the AER and WorleyParsons.[149] The AER considers that it is appropriate to correct the errors. The errors identified are as follows:

- Corporate IT-custom applications—reduction of $4.6 million
- Substation security (2 programs)—reduction of $2.7 million to work-in-progress amount

Further, the AER notes that Nuttall Consulting found that the sample of projects reviewed in detail were justified, prudent and efficient subject to the following:

- the project costs for the 110 kV substation redevelopment projects associated with Reyrolle OS10 circuit breaker replacement being reduced by 40 per cent to take account of the likelihood of prudent deferral by 1 to 3 years of some projects on the basis of more detailed analysis yet to be undertaken by Transend
- the project costs for the Farrell and New Norfolk secondary system replacement being reduced by 50 per cent to take account of the likelihood of prudent deferral beyond the next regulatory control period on the basis of more detailed analysis yet to be undertaken by Transend
- the project cost for the Burnie–Waratah wood pole replacement project being reduced by 50 per cent in 2011-12 and 100 per cent in 2013-14 to take account of recent pole inspection results.

Based on their reviews, WorleyParsons and Nuttall Consulting noted they had not identified issues or problems they considered were serious or likely to be systematic within Transend's proposed ex ante capex allowance. However, the AER notes that

[149] Transend, Response to information request no. 107, confidential, submitted 31 July 2008.

Nuttall Consulting was concerned whether optimal project timings had been selected for some asset renewal capex projects.

The AER considers that the issues identified during Nuttall Consulting's detailed sample project review may be indicative of the issues likely to be encountered across other elements of Transend's forecast asset renewal capex proposal. The AER has reviewed the economic analyses which Transend provided to Nuttall Consulting. The AER is of the view that assessment of the efficiency and prudence of capex projects would be enhanced by a more thorough and consistent approach to economic analysis and the documentation of the options considered. It notes that Transend has adopted a least cost approach to economic analysis and has not attempted to quantify all economic costs and benefits associated with its investment decisions.

The AER's considerations of the consultants' recommendations on specific projects and issues identified by the AER are set out below. Appendix D provides further details on the AER's consideration of the specific projects reviewed.

Development driven capex—Augmentation

Transend's proposed augmentation capex totals $228 million ($2008–09) over the next regulatory control period.[150] This compares with a total of $132 million incurred during the current regulatory control period.[151] Augmentation capex represents 33 per cent of the total forecast capex proposal. MEG submitted that exports should not be considered in assessing augmentations and the AER notes that Transend has stated that all the augmentation projects included in its forecast capex are reliability augmentations excepting the Waddamana-Lindisfarne 220 kV transmission line project which is a market benefit augmentation.[152]

The value of the augmentation projects reviewed by WorleyParsons is $140 million (61 per cent of Transend's augmentation capex).

Project ND0575—Waddamana–Lindisfarne 220 kV transmission line and substation

Transend's cost information templates indicate that this project has an estimated cost of $118 million ($2008–09) in the next regulatory control period. This is the single largest project identified in Transend's capital works program and it amounts to about 17 per cent of Transend's proposed ex ante capex allowance.

This project includes the construction of a new double-circuit 220 kV transmission line (strung initially on one side only) between Waddamana and Lindisfarne and an extension of the Lindisfarne substation. Transend has stated the project has passed the market benefit limb of the regulatory test and is currently being implemented.[153] The project is expected to be commissioned by 2011.

The AER notes that the Waddamana–Lindisfarne 220 kV transmission line and substation project is an element of Transend's Southern Augmentation project

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150 Transend, Transend revenue proposal, op. cit., Appendix 3—forecast capex cost information templates.
151 Transend, Transend revenue proposal, op. cit., p. 93.
152 ibid., p. 88.
153 ibid., p. 8.

included in the development capex category for the current regulatory control period and approved by the ACCC in its 2003 decision.[154]

However, the AER has reviewed the project information provided by Transend and notes the project has twice been subjected to the regulatory test process. The regulatory test has required extensive project justification and the AER notes the recent studies by MMA showing net market benefits are achievable from 2010 under most scenarios.[155] The AER considers that this analysis has been conducted consistent with the requirements of the regulatory test.

The AER accepts WorleyParsons advice that the technical design selected by Transend is appropriate for the circumstances and in accordance with good industry practice. Although the estimated project cost is significantly higher than initially proposed, the AER agrees with WorleyParsons that there is no evidence that Transend has over-estimated the likely actual project cost. The AER notes WorleyParsons' observation that there is less than 1 per cent NPV difference between a staged double circuit augmentation and a double circuit augmentation under the majority of network development scenarios.

The AER considers that a secure and reliable transmission system is vital to an efficient electricity market. The AER considers this project is required to improve the security of supply to the southern region of Tasmania and accepts WorleyParsons' advice that the Waddamana–Lindisfarne 220 kV transmission line project achieves the capex objectives.

Having reviewed the project information provided by Transend (including the economic analysis by MMA) and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, consistent with the capex criteria.

Development driven capex—Connection

Transend's proposed capex for connection totals $122 million ($2008–09) over the next regulatory control period.[156] This compares with a total of $31 million incurred during the current regulatory control period.[157] Connection capex represents 18 per cent of the total forecast capex proposal.

The value of the connection driven projects reviewed by WorleyParsons is $22 million (18 per cent of Transend's connection driven capex).

Project ND0931—Newstead substation new 110/22 kV connection point

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154 ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003, p. 30.

155 McLennan Magasanik Associates, *Report to Transend: Assessment of market benefits from grid reinforcement in Southern Tasmania*, 15 June 2007. This report can be found at www.transend.com.au.

156 Transend, Transend revenue proposal, op. cit., Appendix 3—forecast capex cost information templates.

157 Transend, Transend revenue proposal, op. cit., p. 93.

Transend's cost information templates indicate that this project has an estimated cost of $21 million ($2008–09). This is the third largest project identified in Transend's connection network capex category. The two largest projects in the same category have an estimated cost of $23 million ($2008–09) each.

This project includes a new 110/22 kV substation in the Newstead area of Launceston. The AER notes that the Newstead area is currently supplied from Mowbray and Norwood substations and the 22 kV feeders are heavily loaded. Further, Aurora Energy submitted connection applications to Transend for firm 50 MVA supply at Mowbray substation by winter 2009 and the establishment of a new 22 kV connection site at Newstead.

The AER also notes that Transend and Aurora Energy have jointly identified existing constraints in the electricity transmission and distribution systems supplying the Launceston area and joint planning between Transend and Aurora Energy identified the combination of the Norwood-Mowbray 110 kV transmission line and a new connection point at Newstead has been identified as the preferred option. The AER notes that Transend has indicated the new 22 kV connection site at Newstead will be implemented with the Norwood-Mowbray 110 kV transmission line project to demonstrate efficiency in works delivery.

The AER notes that Transend and Aurora Energy have jointly determined that the establishment of the Newstead substation will ensure reliability and security of supply to the Newstead area and that there are physical restrictions to expanding the distribution system without the establishment of the substation. Therefore, the AER accepts WorleyParsons' advice that Transend has demonstrated the project is required to improve security and reliability of supply in the Launceston area and to cater for forecast demand growth.

The AER notes that this project is classified as a 'large network asset' and will be subject to consultation under clause 5.6.6 of the NER and, therefore, it is possible that an alternative solution may be identified in the course of the public consultation process.[158] The AER also notes that Transend has not yet submitted a business case for internal approval, however, it is proposing to apply the reliability limb of the regulatory test to select the project option which maximises the net economic benefit. The AER accepts WorleyParsons advice that the technical design for this project is appropriate and that the estimated project cost is reasonable for the work proposed.

Further, the AER notes that this project is a 'connection' project and that Transend is required to prepare an 'offer to connect' in accordance with the requirements set out in Chapter 5 of the NER on receipt of an application to connect to its network.[159]

Having reviewed the project information provided by Transend, including the intention to conduct a public consultation process in accordance with the NER, and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed forecast capex reasonably reflects the efficient costs that a prudent operator in the

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[158] Clause 5.6.6 of the NER discusses the consultation processes required for establishment of new large transmission network assets.

[159] National Electricity Rules, clauses 5.3.5 and 5.3.6(d).

circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Development driven capex—Land and Easements

Transend's proposed capex for land and easements over the next regulatory control period is $21 million ($2008–09). This is a significant increase compared to the $0 million incurred during the current regulatory control period. The AER has reviewed this capex category to determine whether Transend's proposed allowance reasonably reflects the efficient costs that a prudent TNSP in Transend's circumstances would require to achieve the capex objectives.[160]

The land and easements capex category comprises one specific strategic easement purchase project (ND1001 Strategic easement acquisition). The project sets out Transend's easement acquisition strategy for the next regulatory control period. In summary, easement acquisition is proposed for the Sheffield–Burnie 220 kV capacity upgrade and easement investigation is proposed for 3 transmission lines and 3 substation development projects. [161]

The AER recognises that Transend is concerned with potential development delays and notes that Transend considers that acquiring easements 'well in advance' of a project has a strategic value. The AER has reviewed the strategic easement acquisition project and notes that the underlying network augmentation project that drives the project (the Sheffield–Burnie 220 kV transmission line) is listed as a contingent project in the next regulatory control period. Although the Sheffield–Burnie 220 kV transmission line has been identified as a contingent project, one of the trigger events is related to high load growth in that area and the AER notes, subject to the load growth rate, it is possible this project (and, therefore, the associated easement) may be required sooner than currently proposed by Transend.

The AER notes the sensitivity of Transend's NPV analysis to the timing of the easement acquisition for the Sheffield–Burnie 220 kV transmission line. It also notes that WorleyParsons tested the sensitivity of Transend's NPV economic analysis by deferring the easement acquisition for one and two years respectively in the case of the medium demand growth scenario. WorleyParsons found that the net present cost of the acquisition was increased by $0.9 million and $1.3 million respectively and, therefore, was satisfied with Transend's proposed timing of the easement land acquisition. The AER has reviewed the NPV economic analysis and is satisfied, in this instance, it is reasonable to provide Transend an allowance for the Sheffield–Burnie 220 kV transmission line easement because the need and timing have been sufficiently demonstrated and supported by the economic analysis.

Given the defined timing and cost of the specific easement acquisition project related to the Sheffield–Burnie 220 kV transmission line, the AER considers that it is reasonably likely that these costs will be incurred during the next regulatory control period.

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[160] National Electricity Rules, clause 6A.6.7(c).

[161] Transend, Response to information request no.114, submitted 30 July 2008.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Renewal driven capex—Asset renewal

Transend's proposed replacement capex totals $227 million ($2008–09) over the next regulatory control period. This compares with a total of $202 million incurred during the current regulatory control period. Asset renewal capex represents 33 per cent of the total forecast capex proposal.

As part of its detailed review, Nuttall Consulting reviewed thirteen replacement projects with a total value of $141 million, which is 62 per cent of Transend's replacement capex.

Nuttall Consulting noted that Transend has assessed its management and replacement of ageing assets using a risk assessment methodology. Based on its review, Nuttall Consulting considered the various asset renewal strategies were reasonable in principle.[162] Nuttall Consulting noted that Transend has established its corporate governance framework during the current regulatory control period and has comprehensively documented associated policies and procedures. However, Nuttall Consulting noted concerns relating to the standard of economic analysis supporting the projects in the proposed asset renewal capex.

Based on the findings of its detailed project review, Nuttall Consulting recommended adjustments to the following:

- 110 kV substation redevelopment projects associated with replacement of Reyrolle OS10 circuit breakers
- the Farrell and New Norfolk secondary system replacement projects
- the Burnie–Waratah wood pole replacement project.

Transend has noted that its renewal decisions are based on a broader range of considerations that may include other matters such as compliance with technical, safety, and environmental conditions, business risk considerations, and age and condition assessments. While the AER recognises that business decisions are properly made on the basis of a wide range of considerations such as those identified by Transend, the AER expects sufficiently detailed financial or economic analysis would be available to support the chosen option, even where other considerations are the fundamental driver of the business decision.

The AER's consideration on the recommendations is set out below.

[162] Nuttall Consulting, Nuttall Consulting report, op. cit., p.78.

110 kV substation redevelopment projects

Transend's cost information templates indicate that thirteen 110 kV substation redevelopment projects with an estimated cost of $113 million ($2008–09) have been proposed. The projects are linked to Reyrolle OS10 and Sprecher and Schuh HPF 110 kV circuit breaker replacement strategies.

Nuttall Consulting identified that 110 kV substation redevelopments which are linked to the replacement of Reyrolle and Sprecher and Schuh 110 kV circuit breakers account for a large portion of Transend's asset renewal capex. While the 110 kV circuit breaker replacement strategies are in line with those of other TNSPs, the significant number of replacements proposed for the next regulatory control period would reduce the average age of the circuit breakers from 23 years to 15 years by the end of the next regulatory control period. This reduction in the average age of the circuit breakers is significant and is not adequately supported by information that this replacement activity is prudent and efficient.

Nuttall Consulting concluded that it was satisfied that the issues associated with identified 110 kV circuit breakers were reasonable and warranted consideration of their replacement. However, it did not consider that the economic analysis of the options for projects relating to replacement of the Reyrolle OS10 circuit breakers sufficiently supported the proposed timing of the projects in the next regulatory control period.

Nuttall Consulting identified that the Creek Road and Tungatinah substation redevelopment projects were the largest projects involving replacement of the Reyrolle OS10 circuit breakers. These two projects account for $53 million of the substation redevelopment projects as Transend is proposing a complete redevelopment of these substations and has received independent reports on various aspects of these projects. Nuttall Consulting commented that safety appeared to be a factor in the need for some of the redevelopment projects but information to appraise the significance of the risks was not provided in all cases. Nuttall Consulting noted that, in all cases other than the Tungatinah redevelopment, Transend provided an economic analysis of the options considered and the analyses indicated that Transend's preferred option had the least (net) present cost value.

In the particular case of the Tungatinah redevelopment, Nuttall Consulting noted that the substation equipment arrangements do not comply with current standards for clearances and Transend considers this imposes a significant safety risk. In this case, Nuttall Consulting considered that the safety issue may be a primary driver for the overall redevelopment of substation, given that existing equipment clearances do not meet current standards.

The AER agrees with Nuttall Consulting's opinion that the significant decrease in the age profile of Transend's 110 kV circuit breakers suggests that the 110 kV circuit breaker replacement plans are overly aggressive. The AER considers that, on balance, the number of substation developments proposed for the last two to three years of the next regulatory control period is unlikely to be completed within the next regulatory control period as proposed.

The AER notes, however, that Transend has typically not provided detailed economic assessments supporting the timing of renewal capex projects proposed for the next

regulatory control period. The AER accepts Nuttall Consulting's advice that the proposed costs for the 110 kV substation redevelopments associated with the Reyrolle OS10 circuit breakers is not reasonable because the individual project analyses do not demonstrate that there is a clear need to undertake *all* of the proposed projects in the next regulatory control period. In particular, the AER notes that the timing of the two largest proposed substation redevelopment (Creek Road and Tungatinah) are not well supported by the economic analysis and appear to have other uncertainties relating to the timing and cost of the redevelopments. That is, project delays may result from necessary consultation with customers affected by the proposed projects and from scope and cost changes relating to alternative innovative solutions tendered for the project work by third party contractors. That said, the AER notes that safety issues appear to be the primary driver of the Tungatinah substation redevelopment.

Having reviewed the project information provided by Transend and having regard to the advice of Nuttall Consulting, the AER is not satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c). The AER accepts Nuttall Consulting's recommendation to reduce Transend's proposed allowance for the 110 kV substation redevelopment projects related to replacement of Reyrolle OS10 circuit breakers.

The AER notes that there was potential for this project to have included some cost elements not properly attributable to the provision of prescribed services but, in light of the AER's decision, this possibility was not further investigated.

Secondary system replacement projects

Nuttall Consulting reviewed two projects relating to replacement of secondary system assets. Transend's cost information templates indicate that the two projects (ND0914 Farrell substation secondary asset replacements and ND0961 New Norfolk substation 110 kV protection replacements) have an estimated cost of $18 million ($2008–09). Nuttall Consulting noted that Transend rejected the 'maintain and defer' option which its economic analyses indicated would provide the lowest net present cost value for each project.

Nuttall Consulting noted that Transend's economic analysis considered maintenance costs and risk costs were not included. Nuttall Consulting considered that certain elements (such as busbar protection schemes) would have higher risks and there may be diminishing returns in terms of the costs and the reduction in risk.
Nuttall Consulting found that Transend's project economic analyses did not sufficiently demonstrate that there would be a positive net benefit in undertaking the projects as proposed.

The AER accepts Nuttall Consulting's advice that the individual project analyses for the Farrell and New Norfolk secondary system replacement projects do not demonstrate that there is a clear need to undertake the proposed projects in the next regulatory control period.

Having reviewed the project information provided by Transend and having regard to the advice of Nuttall Consulting, the AER is not satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause

6A.6.7(c). The AER accepts Nuttall Consulting's recommendation to reduce Transend's proposed allowance for the Farrell and New Norfolk secondary system replacement projects.

Project ND0966—Burnie-Waratah 110 kV transmission line wood pole replacements

Transend's cost information templates indicated that this project has an estimated cost of $5.8 million ($2008–09). It involves the replacement of 30 existing wood pole structures with new steel poles. The transmission line was commissioned in 1967 and Transend's 3-yearly pole inspection program is the basis for identification of the wood pole structures to be replaced

Nuttall Consulting reviewed the project and noted that recent pole inspections have indicated that the poles may be in better condition than the average for their age. Based on the recent pole inspection results and the timing of the 3-yearly inspections, Nuttall Consulting considered it reasonable to estimate that only 15 poles will be replaced in the next regulatory control period.

The AER accepts Nuttall Consulting's advice that it is reasonable to consider the proposed costs for the Burnie–Waratah 110 kV transmission line wood pole replacements project is not reasonable because recent pole inspections indicate that the poles are in a better condition than the average for their age and, based on Transend's historical works programming actions, it is unlikely that any poles identified for replacement during the 2013-14 inspection will be replaced in that same year.

Having reviewed the project information provided by Transend and having regard to the advice of Nuttall Consulting, the AER is not satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c). The AER accepts Nuttall Consulting's recommendation to reduce Transend's proposed allowance for the Burnie–Waratah 110 kV transmission line wood pole replacements project.

Renewal driven capex—Physical security/compliance

Transend's proposed physical security/compliance capex totals $11 million ($2008–09) over the next regulatory control period. This compares with a total of $40 million incurred during the current regulatory control period. Physical security /compliance capex represents 2 per cent of the total forecast capex proposal.

As part of its detailed review, WorleyParsons reviewed the largest project from this capex category—ND1002 Substation asset condition monitoring enhancement program—with a total value of $4.5 million (42 per cent of Transend's physical security /compliance capex by value).

Project ND1002—Substation asset condition monitoring enhancement program

Transend's cost information templates indicated that this project has an estimated cost of $4.5 million ($2008–09). The AER notes the project involves the implementation of asset condition monitoring initiatives that will enable realisation of business benefits including early detection and possible prevention of asset failure, improved maintenance practices and collection of data relating to equipment performance.

The AER notes Transend's *Substation Asset Condition Monitoring Enhancement Program* documents the various initiatives developed following Transend's comprehensive review of its asset management strategies and condition monitoring techniques. The AER also notes that the initiatives will facilitate the maintenance practices discussed in Transend's asset management plans and that, in the case of transformer moisture removal systems, Transend has been able to trial equipment to assess effectiveness prior to purchase.

WorleyParsons stated that it supports the implementation of the asset condition monitoring initiatives in the next regulatory control period in order to realise the benefits of improved asset management and enhanced productivity. Further, WorleyParsons has noted that expected savings in opex due to these initiatives have been quantified and included in Transend's opex forecasts for the next regulatory control period.

The AER notes that opex savings will result from reduced reliance on third parties to undertake the monitoring and testing of electrical plant and from reduced reliance on electrical testing of equipment because of on-line/remote monitoring. The AER also notes that Transend has estimated project costs based on its recent procurement costs of similar equipment and the timing of the installation of the equipment will be coordinated with planned maintenance work wherever possible.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Renewal driven capex—Inventory/spares

Transend's proposed inventory/spares capex for the next regulatory control period is $12 million ($2008–09). The proposed expenditure for the next regulatory control period is significantly higher than the $3 million expenditure in the current regulatory control period, which was focussed on the establishment of Transend's secondary system equipment store (ND0765 Secondary system equipment store).[163] The AER has reviewed this capex category to determine whether Transend's proposed allowance reasonably reflects the efficient costs that a prudent TNSP in Transend's circumstances would require to achieve the capex objectives.[164]

Transend has proposed two distinct projects in its inventory/spares capex category in the next regulatory control period —Primary equipment stores and General Inventory/spares. The AER notes that inventory/spares purchase is influenced by the ongoing need for replacement of parts. Transend has set out its inventory/spares strategy in its *System Spares Policy* and the AER notes that Transend will need to purchase a new spare 200 MVA network transformer to replace the spare unit which has been placed into permanent service at George Town substation.[165] Further, the AER notes that, as is the case for the secondary equipment store (construction) project

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163 Transend, Transend revenue proposal, op. cit., Appendix 3—capex cost information templates.
164 National Electricity Rules, clause 6A.6.7(c).
165 Transend, Capital expenditure profiles and variations for the period January 2004 to June 2014 (Issue 0.4, August 2008), submitted 27 August 2008.

commenced in the current regulatory control period, the primary equipment store has been proposed because the lease for the current store will not be renewed by Aurora Energy on expiry in 2010 and the proposed primary equipment store project cost is in line with the forecast cost set out in Transend's Facilities Management Plan strategy plan developed in 2006.[166]

The AER notes that Transend's proposed inventory/spares strategy has been addressed in its *System Spares Policy* and the policy and the asset management plans together provide the basis for development of the spares/inventory forecast expenditure forecast.[167] The AER also notes that Transend has considered its experience, manufacturers' recommendations and its contractual arrangements with its customers in assessing its spares holdings and the AER also notes that Transend is cognisant of the requirements set out in this policy in undertaking network projects.[168]

Having reviewed the information provided by Transend, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Renewal driven capex—Operational support systems

Transend's proposed operational support systems capex for the next regulatory control period is $22 million ($2008–09). This is double the total amount incurred during the current regulatory control period. As part of its detailed review, WorleyParsons reviewed the largest project from this capex category—ND1043-1 Asset management information systems—with a total value of $7.1 million (32 per cent of Transend's operational support systems capex by value).

Project ND1043-1—Asset Management Information System

Transend's cost information templates indicate that this project has an estimated cost of $7.1 million ($2008–09). The asset management information systems (AMIS) project consolidates primary asset management functions and information on the Works assets scheduling and programming system. The AER notes the AMIS implementation commenced in 2003 and continuing development and enhancement is an organisational initiative included in Transend's *Strategic Plan 2008*.[169] The AER also notes the key investment driver of this project is the facilitation of the development of an asset management system to support improved asset management and the asset life cycle management process and, therefore, continuing AMIS development is preferred to the 'do nothing' option.

The AER notes the project includes a number of individual sub-projects which will each be subject to a business evaluation and that recent (AMIS) project costs have

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166 Transend, *Facilities Management Plan Transend Strategy Paper* (Issue 1.0, August 2006), submitted 8 July 2008, p. 16.

167 ibid., p. 7–8.

168 Transend, Investment Evaluation Summary: Burnie network transformer replacement, submitted 23 September 2008.

169 Transend, *Strategic Plan 2008: Planning period: 2008-09 to 2013-14*, confidential, submitted 2 July 2008, p. 33.

informed Transend's proposed project cost estimates. The AER also notes that, as a result of this project, Transend is proposing to increase its opex by increasing the number of support staff and the proposed project cost estimates have been developed using historical costs. WorleyParsons considered the project appears to be prudently planned, scoped and executed because, although the project is at a very early stage, it has been developed in accordance with Transend's policies and procedures. The AER notes that, based on its ex post prudency review of the AMIS project in the current regulatory period, WorleyParsons considered that Transend had demonstrated a 'successful track record' for the development and implementation of AMIS to date.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Non-network capex

Transend's proposed non-network capex for the next regulatory control period totals $39 million ($2008–09). This compares with a total of $44 million incurred during the current regulatory control period. This capex category represents 6 per cent of Transend's forecast capex proposal. Transend categorises its non-network capex into information technology and business support capex. The information technology category consists of 12 projects with a total value of $21 million and the facilities category consists of 6 projects with a total value of $18 million.

WorleyParsons undertook a detailed review of one of Transend's information technology projects—Corporate IT- package systems—and one of Transend's business support projects—control centre backup.

Project ND1011—Corporate IT-package systems

Transend's cost information templates indicate that this project has a total cost estimate of $4.2 million over the next regulatory control period. This is the single largest information technology project with $3.5 million (84 per cent of the project costs) proposed in the first year of the next regulatory control period.

WorleyParsons noted that IT systems need ongoing review and enhancement to support efficient and effective business operations. The AER notes that Transend considered 3 broad options including 'do nothing', 'replace software as it fails or becomes unsupportable' and 'manage software replacement cycles' and that further options analysis will be undertaken when preparing project business cases. The AER agrees with WorleyParsons' finding that the proposed project manages software replacement cycles for IT package systems and this is a better option for Transend than reacting to software support and maintenance issues as they arise. The AER also notes that the proposed systems are a mixture of third party products and custom developed software applications. The AER considers the systems proposed by Transend are the result of a detailed identification process rather than based on a general solution. The AER notes that Transend has forecast the project costs using suppliers' indicative costs and historical costs for licence fees and systems maintenance and it accepts WorleyParsons' assessment that the estimated costs are reasonable.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Project—Control centre backup

Transend's cost information templates indicate that this project has a total cost estimate of $6.2 million over the next regulatory control period. This is the single largest business support project and the project is proposed to be completed by the end of the third year of the next regulatory control period. The relevant substation site is currently used by network operations and corporate IT groups to back-up control centre and co-primary infrastructure. The project proposes to upgrade the current back-up facilities either by developing the existing site or relocating to an alternative site.

The AER notes WorleyParsons considered there is a need for the project to be completed during the next regulatory control period as effective back-up facilities for network operations and corporate IT functions are essential for an electricity transmission business. The AER agrees there is a need to mitigate business risk associated with loss of key systems.

The AER notes that Transend's project cost estimates are based on preliminary estimates provided by third party engineers and planners for the development of the relevant site. Although the third party's preliminary cost estimates were drawn from recent relevant project experience and knowledge of the existing site substation services, the AER notes the project cost estimates are based on preliminary estimates by third-party contractors which have been prepared on the basis of their relevant experience and current industry standard costing rates. It also notes that an initial review will be conducted to determine the most cost effective approach for upgrading the current back-up facilities. The AER notes that Transend is considering 5 options including redeveloping the existing control centre site and relocating to an alternative site. The AER accepts WorleyParsons' advice that it found no evidence the forecast costs were not reasonable for the work proposed.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Conclusion

As discussed in Chapter 2, the AER considers that Transend has improved its project governance and cost estimating procedures during the current regulatory control period. The AER considers that supporting documentation is well developed, particularly in relation to projects (such as augmentation and connection capex projects) that require accountability to external parties such as directly connected customers and regulatory bodies. However, the AER notes that Nuttall Consulting's detailed review of asset renewal capex projects for the current regulatory control period found that the project options and option timings adopted by Transend were not adequately supported by economic analysis or financial evaluation.

The AER has considered the size of the adjustments proposed by its consultants, which total $55 million for identified errors and prudent deferral of projects. The AER has noted that Transend's asset management plans span a period that extends beyond the end of the next regulatory control period. The AER also notes its consultants have not found these plans to be inappropriate. The AER considers that Transend's renewal projects should be undertaken in accordance with timings more reflective of the planning horizon contemplated in the relevant asset management plans. Transend has proposed capital expenditure of $681 million, of which $271 million was slated for renewal projects. The AER considers that, having regard to the period relevant to this decision relative to the longer periods detailed in Transend's asset management plans, the size of the adjustment proposed will result in an allowance that is 92 per cent of the amount sought by Transend. As Transend has not satisfied the AER that the timings of its proposed renewal expenditure are justified, the AER considers the size of the adjustment proposed is appropriate, having regard to the capex objectives.

Overall, having considered the information provided by Transend and the advice of its consultants, the AER considers that all the amounts sought by Transend in its ex ante capex allowance should not be approved. The total adjustments of $55 million outlined by the AER in this chapter will result in an ex ante capex allowance that reflects the efficient costs that a prudent TNSP in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

4.6.6 Cost accumulation process

The AER notes that under the ex ante framework set out in the NER, a TNSP is able to retain the excess return on and return of capital where actual capex is less than the allowance provided. To this end, if Transend is not able to implement all the capex projects, as per its proposed capex profile, within the proposed timeframe over the next regulatory control period it will retain the associated benefit of the excess return on and return of capital relating to the lower than forecast capex. This section examines the AER's consideration of whether Transend's cost accumulation process provides a reasonable basis for estimating the cost and profile of its capex over the next regulatory control period which is relevant in determining whether Transend's proposed forecast capex reasonably reflects the capex criteria.

It discusses the process Transend has employed to develop its base project cost estimates and then converting them into a capex profile for the next regulatory control period. Specifically, it reviews the base planning objects (BPOs) used to develop the project costs, input escalators for land and easements, labour and non-labour (materials) construction costs, and the application of a cost estimation risk factor.

Transend has undertaken the following cost accumulation process in developing the annual capex profile for its network projects over the next regulatory control period:[170]

1. Transend estimated the capital costs for each project in 2006–07 dollar terms.

[170] Transend's non-network projects follow the cost accumulation process up to step 4 and is only escalated by CPI.

2. It then allocated each project's estimated cost into annual expenditure based on its historical S-curves which vary according to the project type.[171]

3. To present the project cost estimates in 2008–09 dollar terms, CPI, and real labour, non-labour (materials) and land escalators were applied.

4. Annual expenditure profiles over the next regulatory control period were escalated by real labour, non-labour (materials) and land escalators.

5. Based on advice from Evans & Peck (E&P), Transend added a cost estimation risk factor to each of the network projects.

Base planning objects

Transend proposal

Transend developed project scopes and cost estimates for each project proposed for the next regulatory control period. They have been based on the available information and assumptions about future requirements. Transend has developed project cost estimates based on unit rates.[172] Transend's project cost estimates are by necessity high-level estimates.

Transend also engaged PB Associates (PBA) to conduct a benchmark assessment of its unit rates.[173] The total variation across a sample of projects was less than 5 per cent.

Consultant review

WorleyParsons noted that Transend's unit rates comprise 'base planning objects' and 'base planning rates'. The base planning objects are unit costs for an installed asset assembly and/or functional element (such as a 110 kV feeder bay or a lattice tower) and the base planning rates are unit cost rates for installed assets such as 110 kV transmission line or 110 kV conductor type stringing).

The base planning objects are applied to individual segments of a project and Transend has developed its base planning objects from bottom-up estimation and from historical data for similar projects. Base planning objects and base planning rates are adjusted for project specific requirements by applying factors to the cost estimates. For example, adjustment factors are applied for the cost impact of contract strategy, number of project stages, strain/suspension ratio, soil type, vegetation type and terrain.

WorleyParsons noted that Transend had engaged PBA to review Transend's cost estimation process. PBA generated independent costs for ten project scopes and established individual costs for selected equipment items. PBA found that its cost estimates were lower than Transend's cost estimates, although typically within 5 per

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171 Transend's S-curves range up to two years depending on the project type. They exclude the concept phase of each project and include the development, implementation and finalisation project phases.

172 Transend, Transend revenue proposal, op. cit., p. 83.

173 Transend, Transend revenue proposal, op. cit., Appendix 16—PB Associates, *Review of Transend's project cost estimates*, May 2008.

cent of Transend's cost estimates. In PBA's view, Transend's cost estimates were reasonable. WorleyParsons indicated Transend attributed PBA's lower cost estimates to PBA's use of outdated costing data.

AER considerations

The base planning objects used by Transend to underpin the majority of its network project cost estimates are essentially unit rates for different components used in the construction of switchyard bays, substations and transmission lines. WorleyParsons noted that Transend's base planning objects are based on typical transmission objects which comprise individual segments of a project. The base planning objects can be added together and built upon to generate the project cost estimate, and this process is a commonly accepted practice within the industry.

WorleyParsons reviewed the base planning objects and was satisfied that the process used by Transend to determine project costs is reasonable. It also noted that PBA had reviewed Transend's cost estimating process and generated costs for a number of projects to determine their accuracy. PBA concluded that the cost estimating process used by Transend generated reasonable costs for the described objects.

The AER notes that Transend used recent project costs and suppliers' indicative costs to establish its base planning objects and unit rates and accepts WorleyParsons advice that Transend's base planning objects and base planning rates are reasonable and provide an appropriate basis to estimate the cost of its forecast capex program. The AER is satisfied that Transend's proposed base planning objects and base planning rates reasonably reflect the efficient costs that a prudent TNSP would require to achieve the capex objectives.

S-curves

Transend proposal

Transend stated that it has developed S-curves that model the cash flow of 16 generic project types that are representative of the projects typically undertaken. The S-curves have been based on Transend's recent previous experience where possible.[174]

Consultant review

WorleyParsons reviewed Transend's development of S-curves for the 16 generic project types and was satisfied that the generic S-curves were reasonable.

AER considerations

The AER notes that Transend has used generic S-curves to estimate the expenditure profile associated with different types of projects. The S-curves show the profile of expenditure over the construction period of an asset. The AER notes that Transend's S-curves are based on historical project expenditure profiles and their application reflects the fact that most of the capex is incurred well in advance of a project's commissioning date.

WorleyParsons considered that Transend's S-curves were reasonable for the purposes of developing the capex profile of different projects. The AER notes that the S-curves

[174] Transend, Transend revenue proposal, op. cit., p. 68.

are used in Transend's *Project Estimating Manual* to estimate project costs and it accepts WorleyParsons' advice and it agrees that Transend's S-curves, which are based on its historical expenditure profiles for projects, provide a reasonable basis to estimate the capex profile over the next regulatory control period for a prudent TNSP.

Land and easements costs

Transend proposal

Transend stated that land values in Tasmania are forecast to increase at a rate above CPI. It based its land escalators on regional forecasts by an independent property valuer, Brothers & Newton.[175] Transend's proposed weighted average land escalation is based on the proportion of proposed land acquired in each region as a percentage of the total land acquisition for the period 2008-09 to 2013-14.

Consultant review

WorleyParsons noted that Transend had engaged the services of a property valuer, Brothers & Newton to advise on movements in real land prices for the period 1 July 2007 to 30 June 2014. Further, the Brothers & Newton report highlighted a lack of statistical data for property markets, and so, the forecast movements in property values were based on general economic trends and Brothers & Newton's experience.

WorleyParsons was concerned by the lack of historical data in the Brothers & Newton report, however, they felt they had no basis to suggest that the regional land value escalation forecasts provided by Brothers & Newton were not reasonable.

AER considerations

In view of the reservations expressed by WorleyParsons on its ability to comment on the regional land value escalation forecasts proposed by Transend, the AER undertook its own analysis of this issue. In previous transmission determinations, the AER utilised ABS long-term historical land data to develop forecast proxies for land and easement escalation rates.[176] The AER considers the use of a long-term historical average as a reasonable forecast due to long-term data being less exposed to business cycle fluctuations.

The AER has used the Tasmanian land value data published by the ABS to calculate the historical growth rate. Brothers & Newton's land forecasts relied upon by Transend are based on geographical regions and therefore, are not directly comparable with the ABS data which are based on the rural, residential and commercial land types. As such, the AER has attempted to reconcile the information contained in Transend's capex proposal.

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[175] Transend, Transend revenue proposal, op. cit., Appendix 13—Brothers & Newton, *Escalation forecasts for land values in Tasmania*, April 2008.

[176] AER, *Powerlink Queensland transmission network revenue cap 2007–08 to 2011–12: Draft decision*, 8 December 2006, p. 76.
AER, *SP AusNet transmission determination 2008–09 to 2013–14: Draft decision*, 31 August 2007, p. 189–190.
AER, *ElectraNet transmission determination 2008–09 to 2012–13 Final Decision*, 11 April 2008, p. 34.

The AER notes that Transend's Sheffield–Burnie transmission line project accounts for approximately 94 per cent of its forecast land/easement capex. The AER therefore used this project as a proxy to reconcile Transend's real land escalators with the real average historical growth land value data as published by the ABS. The AER found the ABS data to be broadly consistent with Transend's average forecast growth rate for its land/easement escalator, for the next regulatory control period. Accordingly, the AER accepts Transend's proposed land/easement escalator. The AER's conclusions on the real land escalators for Tasmania are set out in table 4.6.

Table 4.6: AER conclusion on land and easement escalator (per cent, real, year ended June)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Tasmania	5.3	5.2	5.1	4.6	4.0	3.6	4.1

Appendix J provides further details on the AER's consideration of the land and easement escalators.

Labour costs

This section discusses the real labour cost escalations proposed by Transend to apply to its forecast capex and opex allowances over the next regulatory control period. The proposed labour cost escalators fall into two categories:

- electricity, gas and water (EGW) or utility sector-specific labour cost forecasts
- general labour cost forecasts.

Transend proposal

Transend engaged CEG to provide expert opinion regarding the outlook for labour costs and labour market issues relevant to the electricity sector in Tasmania.[177] CEG compared forecasts by two economic forecasters, Econtech and Macromonitor, and, in its opinion, an average of the Econtech (Australia-wide) and Macromonitor (Tasmania) escalation factors provided an appropriate estimate of labour cost escalation in the Tasmanian EGW sector.

Transend applied CEG's recommended Tasmanian EGW forecast labour rates, as set out in table 4.7, to derive weighted average labour cost escalators applied to its proposed projects.

Table 4.7: Average Weekly Ordinary Time Earnings growth in the EGW sector (per cent, real)

	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14

[177] Transend, Transend revenue proposal, op. cit., Appendix 12—Competition Economists Group, *Historic labour costs growth*, May 2008.
Transend, Transend revenue proposal, op. cit., Appendix 15—Competition Economists Group, *Escalation factors affecting expenditure forecasts*, April 2008.

Tasmanian EGW labour growth	4.3	2.2	3.2	4.0	2.7	3.1	3.9	4.0

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 77.

CEG also recommended that Transend apply Econtech's forecast for wages across the Australian economy as an appropriate estimate of general labour costs. The general labour cost forecast recommended by CEG is taken from Econtech's Australian National State and Industry Outlook (ANSIO) December 2007 report and is outlined in table 4.8.

Table 4.8: CEG general wage growth (per cent, real year ended June)

	2007–08	**2008–09**	**2009–10**	**2010–11**	**2011–12**	**2012–13**	**2013–14**
General wage growth	1.8	1.6	2.4	1.9	1.8	2.0	2.0

Source: Competition Economists Group, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 31.

CEG also recommended that Transend apply the Econtech general wage cost to escalate equipment cost inputs (incurred by equipment manufacturers) for the next regulatory control period.[178] CEG stated that network service providers could face higher equipment costs due to increased producers' wage costs, and that these costs should be recoverable under the AER's regulatory framework.

CEG produced its estimates for producer labour costs using the Australian Bureau of Statistics (ABS) input-output tables.[179] CEG calculated the proportion of labour used to produce each relevant ABS output category to be 27 per cent. The categories examined were:

- primary plant and materials supply
- secondary systems and materials supply
- transformers
- aluminium conductor
- copper cable/conductor.

CEG recommended the application of Econtech's Australian general wage cost forecasts to escalate the 'labour component' of the above equipment categories over the next regulatory control period.

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[178] Transend, Transend revenue proposal, op. cit., Appendix 15—Competition Economists Group, *Escalation factors affecting expenditure forecasts*, April 2008.

[179] ABS, Australian National Accounts: Input-Output Tables 2001/02, Catalogue Number 5209.0.55.001, Table 2.

Submissions

RTA noted that Transend has anticipated significant labour cost increases and strong growth in land values and non-labour construction costs in capex and opex forecasts. RTA considered these views on increasing cost pressures were doubtful in a slowing economy.[180]

Consultant review

WorleyParsons reviewed Transend's proposed escalators (excluding labour escalators) and associated methodology for their application to Transend's capex forecasts and found them reasonable. The AER queried the basis of WorleyParsons assessment of Transend's proposed escalators. The AER was advised the assessment was based on WorleyParsons observation of recent trends in engineering and other cost increases but not on a detailed economic assessment. Given recent dramatic changes in the macroeconomic environment, the AER considered the WorleyParsons assessment insufficient and undertook its own separate investigation to determine appropriate escalators to be used to determine Transend's capex and opex allowance for the next regulatory control period.

The AER engaged Econtech to provide advice on wage forecasts for the EGW sectors in Tasmania.[181] Econtech's labour cost growth rates for these sectors in Tasmania and nationally are shown in table 4.9.

Table 4.9: Econtech labour escalation rates— Electricity, gas and water sector (per cent, real, year ended June)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
TAS growth	–3.0	2.0	2.9	2.8	2.5	2.4	1.9
Australia growth	–0.8	2.2	3.3	3.1	2.8	2.6	2.1

Source: Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, Attachment D, 19 September 2008, p. 10 – 12 & p. 25

Econtech has provided these forecasts using an updated version of the model it developed for its report to the AER in August 2007. In particular, the forecasts provided by Econtech incorporate:

- a simplified, but enhanced approach to labour cost forecasting
- national accounts data from December 2007 (which was published by the Australian Bureau of Statistics (ABS) in March 2008)
- average weekly earnings data obtained by request from the ABS in August 2008

[180] RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 5, 9.

[181] KPMG-Econtech is an economic consulting firm that specialises in economic modelling, forecasting and policy analysis. Econtech, *Labour cost growth forecast2007/08 to 2016/17*, 19 September 2008.

- policy measures introduced in the 2008–09 federal budget
- an extension of the forecast period from 2015–16 to 2016–17.[182]

These forecasts are broadly consistent with Econtech's national forecasts.

Econtech reviewed the methodology used by CEG to forecast labour cost growth rates in the EGW sectors in NSW and Tasmania.[183] Econtech stated that CEG's approach of averaging the Macromonitor and Econtech labour cost forecasts was misguided because these forecasts were not comparable.

AER considerations

Electricity, gas and water (EGW) labour cost forecast

The AER has examined the EGW wage growth forecasts put forward by CEG for Tasmania. Based on Econtech's advice the AER does not consider that the averaging methodology employed by CEG to forecast wages growth in the utility sectors for Tasmania is sufficiently robust. In particular, the AER notes Econtech's advice that the Macromonitor and Econtech forecasts are not comparable and that averaging the two forecasts is likely to provide inaccurate forecasts of labour cost escalation.

In addition to the inappropriateness of averaging data from Econtech and Macromonitor, the AER does not consider that the CEG proposed labour cost growth rates are a reasonable reflection of the likely future labour costs as they are not based on the most recent information. The AER notes Econtech's advice that since it provided forecasts of labour cost growth rates to the AER in August 2007 (which were used by CEG), the economic climate has changed considerably, resulting in some pressure being taken off wages growth.[184] The AER also does not consider it appropriate to rely on the forecasts presented by Macromonitor because there is no description of the methodology used to forecast wages growth or productivity. For these reasons the AER does not accept CEG's proposed labour cost growth rates for Tasmania.

Given that actual wage data is available for 2007–08, the AER will apply the actual wage increase provided for under Transend's Enterprise Bargaining Agreement (EBA) or Award. From 2008–09 onwards the AER proposes to apply Econtech's Tasmania labour cost forecasts to the Transend opex and capex proposals.

The AER's conclusions on EGW growth rates for Tasmania are provided in table 4.10. On average, the Econtech labour cost forecasts are lower than the CEG forecasts for Tasmania during the next regulatory control period. This is largely because the economic climate has changed considerably since the last Econtech forecasts provided to the AER in 2007, resulting in some pressure being taken of wages growth.

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182 Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 4.
183 ibid., p. 38 – 42.
184 ibid., p. 24.

Table 4.10: AER conclusion—Tasmania EGW growth rates (per cent, real year ended June)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Average
CEG	2.2	3.2	4.0	2.7	3.1	3.9	4.0	3.5
Econtech/ Transend EBA	-3.0	2.0	2.9	2.8	2.5	2.4	1.9	2.5

Source: Competition Economists Group, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 8
Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, Attachment D, 19 September 2008, p. 11.
Note: The average is calculated for 2009–10 to 2013–14 (the next regulatory control period)

The AER considers that the application of the Econtech forecasts for wages growth in the EGW sectors for Tasmania reflect the efficient costs that a prudent operator in the circumstances of Transend would require to achieve their capex objectives as required by clause 6A.6.7(c).

General labour cost forecast

Direct Labour Costs

The AER accepts that a general labour cost forecast is appropriate to escalate direct labour costs (i.e. other than EGW) incurred by network service providers.

As part of its report to the AER, Econtech also provided advice on wages forecasts for all industries across Australia. A comparison of Econtech's general wages forecast with the forecasts recommend by CEG is shown in table 4.11.

Table 4.11: CEG and Econtech labour escalation rates— general wages (per cent, real year ended June)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Average
CEG	1.8	1.6	2.4	1.9	1.8	2.0	2.0	2.02
Econtech	0.6	1.0	1.1	0.7	0.7	0.8	0.6	0.78

Source: Competition Economists Group, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 31

Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 25.

Note: The average is calculated for 2009–10 to 2013–14 (the next regulatory control period)

As can be seen from table 4.11 there is a material difference between CEG and Econtech's respective general wages forecasts.

The AER notes that the general wage forecasts used by CEG were taken from Econtech reports published in 2007. Econtech stated that, since it provided forecasts of labour cost growth rates to the AER in August 2007, the economic climate has

changed considerably.[185] The AER notes that Econtech's latest ANSIO for June 2008 also predicts a decline in average earnings.

Given the change in economic conditions since 2007, the AER does not consider that the general wages forecasts proposed by CEG are reasonable for the purposes of forecasting labour market wage trends for the next regulatory control period.

Accordingly, where applicable, the AER will apply Econtech's latest general wage forecasts to Transend's opex and capex proposals.

The AER's conclusion on a general labour cost escalator is set out in table 4.12.

Table 4.12: AER conclusion—general wages (per cent, real year ended June)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Average
AER	0.6	1.0	1.1	0.7	0.7	0.8	0.6	0.78

Source: Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 25.

Indirect Labour Costs

The AER notes that Transend has applied the Econtech labour cost escalator to equipment cost inputs. This is intended to represent the labour costs incurred by the producers of manufactured equipment that is purchased by network service providers (NSPs).

The AER notes CEG's proposal to weight general labour costs at 27 per cent of the total costs of various electrical equipment. The AER considers that the introduction of a new labour component in equipment costs is inappropriate as it:

- represents a movement beyond the AER's obligation to provide regulated businesses a reasonable opportunity to recover efficient costs towards providing compensation for changes in input costs ata a very fine level of detail. The AER considers it sufficient to monitor whether the cost of finished goods, as opposed to the component parts, need to be escalated above or below CPI.
- is not supported by robust data.

The AER notes that some amount of producers' labour costs will already be embedded in the NSPs' base cost estimates of equipment (i.e. as at 30 June 2007). However, what is questionable is the extent to which the existing producers' labour costs embedded in base costs are expected to change in real terms over the next regulatory control period, and if a real change is expected, how to reliably measure it.

The data used by CEG assumes that Australian manufacturing conditions (as measured in the ABS input-output tables) and wage growth rates are the same as in those countries where equipment is purchased. It also assumes that labour and other factor productivity is held constant. These issues have not been addressed by CEG to substantiate its recommended position.

[185] Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 5.

The AER does not accept the producer wage cost escalator proposed by CEG as it does not meet the underlying objective for inclusion in forecast costs under clause 6A.6.7(c) of the NER. On the basis of the information presented, the AER is not satisfied that expenditure associated with a real escalation of indirect labour costs is required to meet the capex and opex objectives.

Appendix J provides further details on the AER's consideration of the labour escalators.

Further discussion on the AER's consideration of labour escalators over the next regulatory control period is set out in section 6.5.4.

Non-labour construction costs—materials

This section discusses the real materials cost escalators proposed by Transend to apply to their forecast capex and/or opex allowances over the next regulatory control period. The proposed materials cost escalators are as follows:

- copper and aluminium
- steel
- crude oil
- exchange rates (used to develop the materials cost escalators)
- producer margins
- construction costs (includes labour and materials costs).

These cost escalators are discussed separately below.

Transend proposal

Transend engaged CEG to investigate escalation trends from past infrastructure projects and forecasts of input costs movements as a basis of predicting future rates of escalation for project construction costs.[186] Recognising the AER's comments in its decision for SP AusNet, Transend has developed its recommended materials cost escalators based on a one-year lag. [187] CEG recommended Transend proposed forecast input cost escalators, as shown in table 4.13.

Table 4.13: Transend forecast input cost escalators (per cent, real)

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
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

[186] Transend, Transend revenue proposal, op. cit., Appendix 15—Competition Economists Group, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008

[187] Transend, Transend revenue proposal, op. cit., p. 81.

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

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 81.

AER considerations

Copper and aluminium forecast

Transend engaged CEG to develop aluminium and copper cost escalators. CEG used two data sources to develop its aluminium and copper price forecasts:

- London Metal Exchange (LME) actual prices to March 2008, then forward contracts (3, 15 and 27 months) for short-term price forecasts out to June 2010
- Consensus Economics long-term price forecasts from July 2010 to 2017.

The AER considers that a linear interpolation between the LME forecasts and the Consensus Economics' long-term forecast appears to be the most reasonable approach to merge the short-term LME data with Consensus Economics long-term forecasts. The AER does not, however, consider that an upward adjustment (21 per cent and 30 per cent for aluminium and copper respectively) to Consensus Economics' data prior to interpolation is appropriate. Interpolation between these two data sources, without adjustment of Consensus Economics' data, is the same same methodology approved by the AER in its determination for ElectraNet.[188]

The AER has therefore developed its own projections using LME futures prices up to 2010 and Consensus Economics' long-term (7.5 years) forecast, then interpolating between the two data sources. The AER also assumes the mid-point (7.5 years) for Consensus Economics' long-term forecast, rather than the end point (10 years) as proposed by CEG.

Since all aluminium and copper prices from LME, ABARE and Consensus Economics were in nominal US dollar (USD) terms, all the projections were converted into nominal Australian dollars (AUD) using the following steps:

[188] AER, *ElectraNet transmission determination 2008–09 to 2012–13: Final decision*, 11 April 2008, p. 42–44.

- convert nominal USD to nominal AUD using the RBS's latest actual and Econtech's forecast exchange rates[189] (see discussion of exchange rate in appendix J)
- convert nominal AUD to real AUD June 2009 using actual and forecast CPI based on the AER's methodology[190]
- convert into a real cost escalation index (with a base year 30 June 2007).

The AER considers it is appropriate to forecast copper and aluminium prices by using LME futures prices up to 2010 and the long-term Consensus Economics forecast (7.5 years), then interpolate between the two data sources.

The AER, however, determined that adjusting the long-term price of copper and aluminium by the difference between the LME 27-month forward contract contract price and the corresponding Consensus Economics long-term forecast is inappropriate and unnecessary.

In accordance with its preference to use updated data where possible, the AER will incorporate updated LME and Consensus Economics data when the final determination is published in 2009.

Using the September/October 2008 data published at the time of this draft decision, the AER's conclusions on real copper and aluminium escalations for the period 2007–14 are presented in table 4.14 below.

Table 4.14: AER conclusions – copper and aluminium (real $AUD, June 2009)

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Copper	–6.3	–13.5	0.3	1.4	–5.6	–6.3	–7.0
Aluminium	–6.3	–7.0	7.5	9.3	–0.8	–1.3	–1.6

Steel forecast

The AER has concerns with the derivation of CEG's fabricated steel escalators and considers the approach should be modified to be consistent with developing escalators for other base metals escalators, such as copper and aluminium. The AER's reasoning and subsequent amendments to the CEG methodology and resulting steel escalators are set out below.

Hot rolled coil (HRC) steel component

The Consensus Economics estimates applied by CEG are derived from commodity price forecasters' long and short-term HRC steel price expectations for trading in the US and European markets. The AER accepts that CEG's reliance on US and

189 Econtech, *Australian National, State and Industry Outlook*, 22 July 2008.
190 Reserve Bank of Australia, www.rba.gov.au/Statistics/exchange_rates.html (accessed 30 September 2008).

European forecasts may not produce an ideal forecast for the cost of fabricated steel used in the production of equipment purchased by NSPs, as this may be sourced from other markets. However, in the absence of more geographically accurate forecasts, the AER considers that the averaging of the US and European long-term market forecasts results in a reasonable approximation for the future price of HRC steel that affects the costs faced by Australian NSPs. The AER will reconsider the appropriateness of using these data should an alternative source arise in the future.

The AER has obtained the most recent Consensus Economics HRC steel price forecasts[191] and has recalculated the HRC component escalator, using the methodology set out in CEG's report, but taking the long-run forecast to represent 7.5 years for the purposes of data interpolation. This is consistent with the assumption that a 5 to 10 year horizon is reflective of the long-term, of which 7.5 years is the mid point. For the period to 2007–08 the AER has obtained Bloomberg historical data on HRC steel prices in the US and Europe.

Labour and "other" components

CEG has incorporated a labour component into its estimate of fabricated steel escalators, weighted at 26 per cent of production cost. CEG has assumed that this cost component will experience positive real growth during the next regulatory control period. The rate of this growth has been estimated using Econtech's general wage forecasts across the Australian economy. The remaining input cost components of fabricated steel identified by CEG include profit margins and taxes. These are weighted at 60 per cent by input cost and are assumed to remain constant in real terms in the calculation of the CEG fabricated steel escalator.

CEG has used Australian ABS input-output tables to derive the proportion of labour costs in fabricated steel production in Australia. The AER's considerations on the CEG methodology for applying a producers' labour input cost component to manufactured goods is set out above and with respect to CEG's proposed general producers' labour cost escalator in the discussion of indirect labour costs. The AER has principled concerns about the introduction of this type of cost escalation factor, and also notes that CEG has not substantiated that the Australian input-output and wage data presented is relevant to its claims. Accordingly the AER does not accept CEG's proposed labour cost component for steel.

CEG has developed escalators for other base metals such as copper and aluminium, and has relied on the prices of less processed inputs as proxies for copper and aluminium products used in equipment purchased by NSPs. The AER considers the same approach should be applied for fabricated steel, and has decided to use the most recent long-term Consensus Economics HRC steel forecasts as a proxy for changes in the price of fabricated steel, weighted at 100 per cent. This therefore removes the distinction between CEG's proposed input components to the fabricated steel escalator and simplifies the derivation of the escalator, which is consistent with the approach to forecasting other metals cost escalators.

[191] Consensus Economics, *Energy & metals consensus forecasts: Minerals Monitor*, 28 July 2008.

The AER's conclusion on CEG's proposed real steel cost escalators for the next regulatory control period is set out in table 4.15.

Table 4.15: AER conclusion on fabricated steel escalators (real % change, year ended June)

	2008	2009	2010	2011	2012	2013	2014
CEG proposal	0.2	0.1	0.3	0.2	0.2	0.2	0.2
AER conclusion	53.8	–3.7	–0.6	–3.4	–2.5	–3.0	–3.4

Source: CEG; AER analysis

Crude Oil

In its recent ElectraNet transmission determination, the AER accepted CEG's proposed data sources and considered that they can be used to provide reliable estimates of both actual and forecast crude oil price escalators. The AER remains of this view and maintains its position that the NYMEX crude oil light futures prices should be averaged over 20 trading days to remove inherent day-to-day volatility. The AER has taken a 20-day average of daily NYMEX crude oil light futures prices, which results in updated crude oil forecasts.[192]

In accordance with its preference to use the most recent data where possible, the AER's final determination will incorporate updated NYMEX data when the final determination is published in 2009.

Using data published at the time of this draft decision, the AER's conclusion on crude oil escalators is set out in table 4.16.

Table 4.16: AER conclusion – Crude oil, percent change to year ending June (real AUD/barrel, 30 June 2009)

	2008	2009	2010	2011	2012	2013	2014
CEG proposal	24.4%	12.3%	–3.8%	–1.3%	–0.5%	–2.0%	–0.9%
AER conclusion	43.5%	–13.4%	1.5%	1.7%	0.1%	–0.6%	–0.1%

Source: CEG; AER analysis

Exchange rate

The AUD/USD exchange rate forecasts are used as to convert escalators based on futures/market prices (e.g. crude oil, steel prices etc) which are only quoted in US dollar terms.

Exchange rates are a particularly volatile economic variable, driven by numerous factors and are consequently notoriously difficult to forecast both in the short,

[192] The AER's sample period was between 14 August and 15 September 2008.

medium and long-term.[193] While the AER accepted the use of an Econtech exchange rate forecast in its recent ElectraNet transmission determination, it notes that the potential volatility of exchange rates brings any single source of forecast into question.

The exchange rate forecasts proposed by CEG from Econtech use forecasts of an exchange rate at five points in time only through the next regulatory control period—that is, the exchange rate on 1 July of each year. However, irrespective of the accuracy or inaccuracy of Econtech's exchange rate forecasting, the very nature of a point in time forecast, particularly in a volatile market, is not necessarily likely to be representative of the AUD/USD exchange rate faced by businesses purchasing equipment throughout the next regulatory control period.

The AER notes that there is little apparent difference between Econtech's latest forecasts and those used as part of Transend's proposal and will rely on Econtech's forecasts. As current exchange rates have moved significantly since Transend submitted its proposal, the AER will take account of the actual exchange rate at the time of its final decision and determination in 2009.

The AER considers that an exchange rate forecast prepared by Econtech at the time of the final decision will represent a realistic expectation of forecast exchange rates over the next regulatory control period. Using the most recent data from this source, the AER's conclusion on the AUD/USD exchange rate forecast is set out in table 4.17. The AER will obtain updated fata from this source for its final determination.

Table 4.17: AER conclusion – AUD/USD exchange rate forecast, at 1 July of period

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
AUD per USD	0.85	0.96	0.88	0.84	0.82	0.80	0.79

Sources: Econtech, *Australian National State and Industry Outlook*, 22 June 2008, p. 110.

Producers' margin

The AER considers that the introduction of a new producer's margin escalator is inappropriate as it:

- represents a movement beyond the AER's obligation to provide regulated businesses a reasonable opportunity to recover efficient costs towards providing compensation for changes in input costs at a very fine level of detail. The AER considers it sufficient to monitor whether the cost of finished goods, as opposed to the component parts, need to be escalated above or below CPI

[193] See for example Blundell-Wignall, Fahrer, Heath *Major Influences on the Australian Dollar Exchange Rate* 1993, www.rba.gov.au/PublicationsandResearch/Conferences/1993/WignallFahrerHeath.pdf.

- is not supported by robust data.

Producers' margins will already be embedded in base cost estimates (i.e. as at 30 June 2007). What is in question is the extent to which the existing producers' margins are expected to change in real terms over the forthcoming regulatory control period and, if a real change is expected, how to reliably measure it.

CEG has recommended the use of EBIT and EBITDA to measure producer margins. The producers' margin being measured is defined as the difference between the price of a unit and the cost of producing that unit. Increases in EBIT (or EBITDA) could be the result of:

- an increase in prices, and/or
- an increase in volumes, and/or
- a decrease in costs.

This was noted by ABB (one of the equipment suppliers examined by CEG), in its latest financial report:

> EBIT and EBIT margin rose, mainly reflecting the improved cost efficiency of higher factory loadings, continuing operational improvements and a supportive pricing environment.[194]

On this basis, the AER considers that it is unreasonable to use EBIT (or EBITDA) as a direct proxy for margins (or increased prices). The AER does not consider it appropriate to allow NSPs to recover costs associated with other aspects of an increase in EBIT.

The AER also notes CEG's acknowledgement that there are limited long-term forecasts of producers' margins available, and considers this to be a significant issue in forming an estimate with any degree of reliability.[195] CEG has used six financial forecasts and, in effect, is basing its forecasts on a sample of three firms – ABB, Prysmian and Nexans. In doing so CEG has not demonstrated that these three firms are representative of the entire market supplying equipment to Australian network service providers.

In the AER's view, the estimates of a producers' margin presented by CEG:

- are highly uncertain,
- are based on forecasts of few equipment suppliers, and
- contain unreasonable assumptions about the relationship between EBIT (and EBITDA) and price increases.

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[194] ABB's 2008 second quarter results, accessible at: www.abb.com/cawp/seitp202/b4ca86e07eeda409c125749000162bcb.aspx

[195] Transend, Transend revenue proposal, op. cit., Appendix 15—Competition Economists Group, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 35.

The AER rejects the producers' margin escalator proposed by CEG as it does not meet the underlying objective for inclusion in forecast costs under clause 6A.6.7(c) of the NER. The AER considers their addition would represent a movement beyond the AER's obligation to provide a reasonable opportunity to recover efficient costs and also represent a level of compensation for costs that is inconsistent with the general incentive framework.

The effect of the AER's decision to not apply real cost increases associated with the producers' margin escalator is to allocate the proportion of costs assigned to this escalator to the "other" escalation category, which is escalated by CPI only.

Construction costs

The Econtech engineering construction cost forecasts used by CEG were obtained from the Construction Forecasting Council's (CFC) website. The AER has obtained updated engineering construction cost forecasts from this source and deflated them by CPI in order to provide real forecasts.[196] The AER notes that there is no publicly available updated data on engineering construction costs from Macromonitor.

There is some difference between the construction cost forecasts provided by CEG and the updated Econtech construction cost forecast. Given the change in economic conditions since 2007, the AER considers that it is reasonable to adopt the updated Econtech construction cost forecasts as they reflect the most recent information and therefore are a reasonable expectation of movements in construction costs into the next regulatory control period. Further, the AER does not consider it appropriate to rely on the forecasts presented by Macromonitor because there is little information available on the methodology used to forecast engineering construction costs.

Accordingly, the AER will apply the updated Econtech construction cost forecasts to Transend's capex proposal. The AER's conclusion on forecast construction cost escalators is set out in table 4.18.

Table 4.18: AER conclusion – construction cost escalations (per cent, real)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Average
AER	–0.3	–1.9	0.4	1.2	1.1	1.0	1.0	0.9

Lag in application of escalators

In its draft decision for the SP AusNet transmission determination, the AER reviewed a proposal from SKM to recognise a 1−2 year lag effect between base metals prices (i.e. copper, aluminium) and transmission equipment prices (i.e. power transformers, switchgear). Based on an analysis of the movements in base metals prices against relevant producer price indices (PPIs) published by the Australian Bureau of Statistics (ABS), the AER concluded that:

[196] Econtech, *Australian National State and Industry Outlook*, 22 July 2006.

> 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.[197]

The effect of this was to 'shift' the peak in base metals prices from 2006−07 to 2007−08, on the assumption that movements in transmission equipment prices lag movements in base metals prices by twelve months.

Transend has proposed a one year lag to copper and aluminium, consistent with the AER's decision for SP AusNet. CEG also recommended applying a lag to crude oil prices.

It is noted that neither CEG nor Transend have presented any new evidence to justify a lag between movements in base metals and equipment prices. In particular, there has been no evidence presented to support a lag between movements in crude oil prices and electrical equipment prices. Therefore, given the lack of evidence to support the proposal, the AER does not consider it reasonable to apply a lag for crude oil prices.

The AER has also re-examined the case for a one year lag application of base metals such as copper and aluminium escalators, using similar analysis to that presented in the SP AusNet transmission determination and taking account of further data that is now available. It is noted that at the time of the SP AusNet decision, the extent of a lag in the data was somewhat unclear, as noted by the AER:

> Overall, growth in the PPI appears to track growth in base metals prices quite closely after 2005, possibly indicating a greater flexibility built into contracts after this point in time. The data tends to suggest that any significant lag (i.e. >1 year) persistent over the period 2003-2005 may have been transitory, and has since subsided. Further, given that base metals prices are expected to return to around the long-run average over the period 2006-07 to 2013-14, the two indices may begin to track quite closely again (as in the pre-boom period 1998-2002).[198]

Although the PPIs examined are imperfect proxies for the electrical equipment purchased by network businesses, the AER considers that they provide a useful indicator of the relative growth rates at various stages of production.

The quarterly change in LME prices for copper and aluminium against ABS PPIs over the period 1998−2008 is presented at Appendix J. Based on the data presented, the AER does not consider that a lag between movements in base metals and electrical equipment prices is evident. While the two indices clearly do not have a one-to-one relationship, there is a strong correlation—both in the magnitude and timing of price increases. Any lag between movements in base metals and movements in the PPIs selected for analysis appears to be, at most, three to six months.

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[197] AER, *SP AusNet transmission determination 2008–09 to 2013–14: Draft decision*, 31 August 2007, p.90

[198] AER, *SP AusNet transmission determination 2008–09 to 2013–14: Draft decision*, 31 August 2007, p.322

On this basis the AER has revised its view from the SP AusNet decision, and now considers that there is no need to recognise a lag between movements in base metals prices and electrical equipment prices. Accordingly, the AER does not agree with the application of a one year lag to copper and aluminium prices.

Appendix J provides further details on the AER's consideration of the non-labour construction costs escalators.

Mapping Weights to Escalators

Transend proposed weights for mapping escalators to components of generic project types. [199] The AER has adjusted the mapping of the weights to the escalators as shown in table 4.19.

Table 4.19: AER conclusion – 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					
Buildgs & Demolition							100					
General Other [a]												100
Transport			100									
Material - others [b]												100
Plant Hire & Establishment							100					
Labour-External - Civil & General							100					
Labour- External - EGW								100				
Labour - Internal								100				
Labour - Other					100							

[199] Transend, Transend revenue proposal, op. cit., p. 82.

Land (NW)	100			
Land (N)		100		
Land (S)			100	
Non-Network				100

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 82. As modified by the AER.

Note:

(a) Producers' margin and Producers' labour have been rejected by the AER. Transend's proposed weightings against these categories have been re-assigned to a new 'General Other' category which is escalated by CPI.

(b) Transend proposed mapping 80 per cent of Material–others to Producers' labour and the remaining 20 per cent was mapped to Crude Oil for transport. The AER has mapped 100 per cent of Material-others to CPI.

As discussed above, the AER has rejected the application of producers' margin escalators and producers' labour costs escalators. The effect of this is that the weightings proposed by Transend have been mapped to a new 'General Other' category which is escalated by CPI.

Similarly, the 80 per cent weighting originally mapped to 'General Labour' in the 'Material – Others' category represented a weighting for producers' labour and has been re-mapped to 'CPI'. [200] Transend had also originally included a further 20 per cent weighting to 'Crude oil' because these materials are based on delivered cost. However, the AER notes that Transend has included a Transport category and therefore considers that all transport allowances should already be included in this category. The AER is not satisfied that Transend has justified this duplication. The AER also notes that while Transend pays delivered costs for materials, the cost of the fuel is borne by the supplier, not Transend. The AER considers mapping 100 per cent of the cost of 'Material – Others' to CPI better reflects the escalation of these materials.

Overall, the AER considers that the application of its materials cost escalators and the revised mapping of weights will reasonably reflect the efficient costs that a prudent TNSP operating in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Cost estimation risk factor

Transend proposal

Transend proposed to apply a cost estimation risk factor of 3.13 per cent based on the methodology and modelling developed by Evans & Peck (E&P).[201] The risk factor is applied only to network projects and has been modelled as a separate cost driver to other cost escalation factors. E&P used the following process to develop the inputs to the risk model:

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[200] Transend, Response to information request No. 265, submitted 20 October 2008.

[201] Transend, Transend revenue proposal, op. cit., p. 85.
Transend, Transend revenue proposal, op. cit., Appendix 25—Evans & Peck, *Risk assessment of Transend capital works program review for 2009-2014 regulatory reset period*, May 2008.

1. Risk workshop—E&P conducted a risk workshop with Transend to identify each risk element for both inherent and contingent risk categories and the probability of each risk occurring for generic project types.

2. Inherent risk—To calculate the effect of inherent risks in the other projects, EP determined a risk profile for each asset class. Applying this risk profile to each individual project cost estimate derives the risk adjusted cost estimate.

3. Contingent risks—To calculate the effect of contingent risks, each risk element was assigned a consequential annual dollar value of occurrence and a likelihood of occurrence based on a minimum, most likely and maximum probability.

Using these inputs, a Monte Carlo simulation was undertaken to develop a likely range of costs for the overall capex program.[202] The proposed risk factor represents a P50 scenario. The simulation results showed that the risks facing the capex program totalled around $21 million, which is equivalent to 3.15 per cent of the base capex estimate—that is, the base capex estimate is increased by a cost estimation risk factor of 3.15 per cent. [203]

Consultant review

WorleyParsons noted that Transend has applied a systematic risk-based evaluation developed by E&P rather than apply a contingency amount to each project. Its review of the risk report found that the outputs of the modelling process were not unreasonable but it noted that the validity of the output of the workshops was dependent on the quality of the inputs. WorleyParsons considered it was not in a position to verify and quantify the outputs from the workshop process. WorleyParsons found no evidence to suggest that contingent risks were included in Transend's capital expenditure forecast.

Notwithstanding its observation that the AER's final decision for ElectraNet allowed a global risk adjustment of 2.6 per cent, WorleyParsons agreed with E&P's assertion that Transend could be expected to have a higher risk adjustment factor than the mainland TNSPs because of the lower diversity and number of Transend's projects

AER considerations

The AER recognises that the cost estimation risk analysis is aimed at providing efficient allowances for costs likely to be incurred as part of the project portfolio cost estimation process. This is due to an underlying assumption that there is a higher probability that costs will increase rather than decrease. The AER considers that a detailed risk analysis is inherently complex as there is a lack of information about the types of unforeseen risks being mitigated. The AER accepts that it is not possible to

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202 Pert distributions were assigned to each contingent risk element as part of the Monte Carlo simulation.

203 The value of the cost estimation risk factor is indicative and will vary subject to the actual projects included in the network capex program.
Transend, Response to information Request No. 107, Capex collector model v6.2 31 July 2008, confidential, submitted 31 July 2008.

explicitly identify all the risks captured by the analysis because many of them are unforeseen and their cost impacts are unknown.

The E&P methodology and modelling approach adopted by Transend involved the identification of risk elements and assigned probabilities and cost impacts through a risk workshop. The AER notes that the risk workshop was based on a systematic evaluation of past evidence of actual occurrences or the actual cost impacts of the risk elements identified by Transend. As such, the AER considers that Transend's projected risk profiles and costs are based more on actual past outcomes rather than arbitrary projections.

The AER notes that Transend has introduced initiatives to overhaul its previous cost estimation practices, which resulted in significant cost overruns in the past.

The AER notes that Transend stated it has not included contingent risks in the development of the cost risk adjustment factors applied to the forecast network capex projects. [204] Based on the information available before it, the AER is satisfied that Transend has sufficiently demonstrated that the risks included in its risk model are those that are suitably transferred to users and it has not inappropriately transferred typical operational business risks that are usually considered as being within the control of its management to users.

The AER considers that it is reasonable to provide a cost estimation risk factor to take account of risks that are outside of Transend's control when estimating projects. It accepts that Transend has sufficiently established that there is a tendency for outturn costs to be greater than forecast costs, due to factors unforeseen at the time of preparing the project cost estimates.

In allowing a risk factor for Transend's project cost estimates, the AER recognises that there is a potential for double counting if risks that are captured through the risk factor have not been stripped out of individual project estimates as part of the base project costs. Transend advised that project cost variations due to cost escalations in commodities and labour markets were explicitly excluded from the scope of the E&P work. [205] WorleyParsons' detailed review of sample projects did not identify that Transend has double counted for the risks that are captured by the proposed risk factor. Therefore, the AER is satisfied that the base planning objects and base planning rates developed by Transend do not take account of the risks that are outside Transend's control and that the base project costs do not double count for such risks.

On balance, the AER is satisfied that a 3.15 per cent 'global' risk factor will provide Transend with a total forecast capex allowance that reasonably reflects the efficient costs a prudent TNSP in Transend's circumstances would require to achieve the capex objectives. [206]

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[204] Transend, Response to information request no. 255, submitted 16 October 2008.

[205] ibid.,

[206] The value of the cost estimation risk factor is indicative and will vary subject to the actual projects included in the network capex program.

Application of escalators to the capex program

Transend proposal

Transend's approach to escalating the forecast capex in its capex collector model was based on applying weighted escalators for labour, non-labour construction, land and non-network capital projects over the next regulatory control period.[207] The land value escalation was based on real land escalation forecasts provided to Transend by Brothers & Newton. Transend engaged CEG to develop inflation forecasts for non-transmission capex projects and non-labour input costs escalators for predicting future rates of escalation for project construction costs.

Consultant review

WorleyParsons noted that the AER was separately reviewing Transend's proposed labour cost escalators. WorleyParsons considered that Transend's proposed average growth in real land costs was not unreasonable. WorleyParsons also considered that CEG's approach for developing forecast movements in non-labour cost components was transparent and presented a reasonable basis for escalating price movements.

WorleyParsons considered that Transend's capex collector model represented a consistent and reasonable basis for the preparation of Transend's capex forecasts.

AER considerations

The AER considers that the escalators should be applied on an annual basis over the next regulatory control period. It considers that the application of the escalators on an annual basis will reasonably reflect the efficient costs that a prudent TNSP operating under the circumstances of Transend would require to achieve the capex objectives.

Conclusion

In summary, the AER's conclusion is that:

- Transend's proposed base planning objects are reasonable and provide an appropriate basis to estimate the costs of its forecast capex program.
- Transend's S-curves are reasonable for the purposes of developing the capex profile of different projects.
- Transend's proposed land and easement escalators for the 2009-10 to 2013-14 financial years are appropriate for the purposes of estimating forecast land value growth.
- Transend's proposed labour escalation rates are not reasonable for the purposes of estimating forecast wages growth and should be substituted with the labour escalation rates shown in tables 4.10 and 4.12.
- Transend's proposed materials cost escalators are not reasonable for the purposes of estimating forecast electricity infrastructure equipment cost growth and should be substituted with the materials cost escalators rates shown in tables 4.14 to 4.18.

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[207] Transend, Capex and opex models, confidential.

- Transend's proposed cost estimation risk factor of 3.15 per cent is reasonable for the purposes of the portfolio cost estimation of its forecast capex program.

- The escalators should be applied on an annual basis over the next regulatory control period.

The overall effect of the AER's adjustments results in a reduction of $11 million in Transend's ex ante capex allowance. It is important to note that, for consistency, the AER's adjustments to the forecast capex allowance for real capex escalations have been made after all of the AER's other project-specific adjustments have been made.[208] The AER considers that this adjustment is necessary to determine the forecast capex allowance which reasonably reflects the efficient costs that a prudent TNSP operating in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

4.6.7 Contingent projects

This section sets out the AER's consideration of Transend's proposed contingent projects and any other projects from the ex ante capex allowance that should be treated as contingent projects.

Regulatory requirements

The AER is required to assess contingent projects in accordance with clause 6A.8.1 of the NER. To accept a proposed contingent project the AER must be satisfied that:

- the project is reasonably required to be undertaken to achieve the capex objectives

- the proposed contingent capex is not otherwise provided in the ex ante capex allowance and reasonably reflects the capex criteria

- the indicative cost exceeds either $10 million or 5 per cent of the maximum allowed revenue (MAR) for the first year of the regulatory control period (cost threshold)

- the information provided in relation to contingent projects complies with the AER's submission guidelines made under clause 6A.10.2

- the proposed trigger event is appropriate.

Clause 6A.8.2 of the NER sets out the requirements to amend a revenue determination where a trigger event for a contingent project identified in that revenue determination occurred.

Transend proposal

Transend proposed that 9 projects with a total indicative cost of $509 million be included as contingent projects in its revenue determination. These projects, their

[208] The adjustments to Transend's forecast capex escalators were made after applying the project adjustments set out in section 4.6.5.

proposed triggers and indicative costs as proposed by Transend are set out in table 4.20. Transend stated that, based on its modelling of its maximum allowed revenue for the first year of the next regulatory control period, $10 million is the cost threshold for contingent projects in its revenue proposal.[209]

Table 4.20: Transend's proposed contingent projects ($m, 2008–09)

Project name	Trigger	Cost
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 a second circuit	Demand growth in the southern region, leading to successful application of the regulatory test	22
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[ed] cost benefit assessment (including analysis and discussion with customers at Queenstown and Newton on the long-term plans)	12
Total indicative cost		509

Submissions

RTA considered that the contingent project triggers (provided at Appendix 18 of Transend's proposal) were not appropriate within the meaning of clause 6A.8.1(b)(4) of the NER because the triggers are expressed in vague and subjective terms.[210]

Consultant review

WorleyParsons was required to assess whether Transend's proposed contingent projects met the contingent project criteria and whether there were any projects in the proposed ex ante allowance that would be more appropriately classified as contingent projects.

WorleyParsons noted that business cases had not been prepared for the projects because they were in a very early stage of development. Although alignment with Transend's strategic business objectives had not been articulated, project drivers had been identified and aligned with the NER capital expenditure objectives.

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[209] Transend, Transend revenue proposal, op. cit., p. 95.

[210] RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 4–5.

WorleyParsons considered the contingent projects relied primarily on the successful application of the regulatory test and, therefore, specific trigger events had not been proposed by Transend. Transend reviewed the contingent project proposals and subsequently presented more detailed information, including specific trigger events as well as the successful completion of the regulatory test. [211] The indicative cost was also revised for six projects.

Based on its review WorleyParsons concluded that it is satisfied that all contingent projects proposed by Transend meet the NER requirements. WorleyParsons noted that:

- The proposed trigger events meet the requirements of clause 6A.8.1(c) of the NER.
- The St Helens and Trevallyn contingent projects depend on high load growth scenarios.
- Although the timing of the contingent projects is uncertain, there is a reasonable likelihood of the trigger events occurring in the next regulatory control period.
- None of the contingent projects proposed by Transend should be included in the ex ante capex projects.

WorleyParsons did not recommend any ex ante capex projects be treated as contingent projects.

AER considerations

The AER notes that all of the proposed contingent project costs are greater than the $10 million cost threshold set out in clause 6A.8.1(b)(2). Further, WorleyParsons reviewed the projects and associated cost estimates and agreed that each proposed contingent project would exceed $10 million. The AER notes WorleyParsons' advice that Transend's proposed contingent project cost estimates are above the $10 million cost threshold and, therefore, accepts that the proposed contingent projects satisfy the cost threshold.

In its submission, RTA was concerned that the proposed contingent project triggers were expressed in vague and subjective terms. The AER has reviewed Transend's contingent project information and considers the revised proposed trigger events for the nine contingent projects address the uncertainty associated with the scope of these projects.[212] The trigger events satisfy clause 6A.8.1(c) which states the matters that the AER must give weight to in determining a trigger. In particular, the proposed trigger events are probable during the next regulatory control period but the project should not be included in the ex ante allowance because the costs associated with the capital works are not sufficiently certain (clause 6A.8.1(c)(5)(ii)). Further, the AER considers that the trigger events are reasonably specific and capable of objective

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[211] Transend, Response to information request nos.134 &135, submitted 14 August 2008.

[212] Transend, Response to information request nos.134 &135, submitted 14 August 2008.
Transend, Response to information request no.178, submitted 20 August 2008.
Transend, Response to information request no.192, submitted 25 August 2008.

verification (clause 6.8.1(c)(1)) and are described in such terms that their occurrence is all that is required for amending a revenue determination.[213]

The AER has also confirmed that none of the proposed contingent projects are included (in part or in whole) in the forecast capex for the next regulatory control period. The AER considers that Transend's proposed contingent projects satisfy the requirements of clause 6A.8.1 of the NER.

Ex ante capex projects treated as contingent projects

The AER notes that, based on its detailed review of ex ante capex projects, WorleyParsons did not recommend any ex ante capex projects be treated as contingent projects.

Conclusion

The AER has approved 9 contingent projects for Transend with a total indicative cost of $412 million. Table 4.21 sets out the AER's approved contingent projects and the indicative costs. Table 4.22 sets out the AER's approved triggers for the approved contingent projects. Appendix E provides a summary of all the contingent projects approved by the AER and describes the specific triggers and indicative costs for these projects.

Table 4.21: AER's approved contingent projects and indicative costs ($m, 2008–09)

Project name	Transend's proposal (31 May 2008)	Transend's amended proposal [1] (14 August 2008)	AER's conclusion
Sheffield–George Town new transmission line	147	67	70
Burnie–Smithton new transmission line	85	84	88
Sheffield–Farrell new transmission line	80	76	79
Sheffield–Burnie new transmission line	77	50	52
St Helens new 110/22 kV connection site	43	44	46
Palmerston– Sheffield 220 kV transmission line augmentation	22	21	22
Waddamana– Lindisfarne 220 kV transmission line a second circuit	22	21	22
Trevallyn Substation new 220/110 kV injection point	21	20	21
Queenstown Substation security upgrade	12	11	11
Total indicative cost	509	394	412

[213] National Electricity Rules, clause 6A.8.1(c)(4).

Source: 1. Transend, Response to information request nos. 134 & 135, confidential, submitted 14 August 2008. Indicative costs are in $2007-08 dollars.

Table 4.22: AER's approved contingent projects and project triggers

Project name	Project trigger
Sheffield–George Town new transmission line	Committed and/or advanced generation in the north-western and/or western regions in excess of 50MW
Burnie–Smithton new transmission line	Committed and/or advanced generation projects in the north-western region in excess of 50MW
Sheffield–Farrell new transmission line	At least 50MW of committed and/or advanced generation projects in the west coast area
Sheffield–Burnie new transmission line	Demand in Tasmania's north-western region exceeding 360MW and/or in excess of 50MW committed and/or advanced generation projects in the north-western region
St Helens new 110/22 kV connection site	Demand forecast in the east coast region exceeding 55MW
Palmerston– Sheffield 220 kV transmission line augmentation	At least 50MW of actual, committed and/or advanced generation projects in the north-western and/or western regions
Waddamana– Lindisfarne 220 kV transmission line a second circuit	Demand forecast in Tasmania's southern area exceeding 880MW or Gordon power station not being able to provide reactive support when the southern area load exceeds 775MW
Trevallyn Substation new 220/110 kV injection point	Demand in Tasmania's northern area exceeding 320MW and is forecast to exceed 355MW within 3 years
Queenstown Substation security upgrade	Transend is unable to negotiate non-network solutions that enable it to meet the minimum network performance requirements for the Queenstown and Newton load

4.6.8 Deliverability of the capex program

Transend's forecast capex is predominately determined based on expected demand, the Tasmanian network performance requirements regulations and the need to replace ageing assets. An assessment of deliverability is made because under the capex incentive framework a TNSP is able to retain, within the regulatory control period, the excess return on and of capital associated with a lower than approved capex allowance.

Transend proposal

Transend recognised that its proposed capex program of $681 million is a significant increase when compared to the capex allowance of $362 million ($2008-09 and

adjusted for CPI) provided in the ACCC's 2003 revenue cap decision for the current regulatory control period.[214] Although the program is approximately 90 per cent larger in dollar terms, Transend stated that a significant proportion of this additional capex requirement is attributable to higher input costs, and significant plant and equipment expenditure rather than work increases in actual physical terms. It also stated that the capital works program it has delivered in the current regulatory control period is significantly larger than any program delivered in previous years.[215] Further, Transend considered this had been done in an environment of significantly increasing input costs.

Transend stated that it was confident about delivering the higher capex program in the next regulatory control period and noted the following initiatives that it has implemented, or commenced to implement to ensure deliverability: [216]

- Internal staffing—Transend has identified that delivery of its capital program requires increased staff levels for the provision of technical advice, contract account management and project support services. It has also identified a need for an in-house specialist technical capability including protection and control field-based resources.

- Contractor panels—Transend is establishing a series of contractor panels to create a sustainable service provision market in Tasmania. Transend expects this will enable the selected contractors to plan and invest in people, training and equipment to undertake the projects in Transend's proposed capital program.

- Design standardisation—Transend stated that transmission line and substation design standardisation will assist the outsourcing of design work and early procurement of long lead-time items.

Submissions

The EUAA expressed concern about Transend's ability to efficiently execute its capex program, given the size of the program. [217]

Consultant review

WorleyParsons requested Transend to provide a detailed resourcing plan discussing internal and external resourcing requirements and proposed strategies to acquire the necessary resources to deliver its proposed works program. Transend prepared and provided a Resoucing Plan for review by the AER and its consultants. [218]

Overall, WorleyParsons concluded that Transend should be able to deliver its capex program, because:

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214 Transend, Transend revenue proposal, op. cit., p. 38.
215 ibid., p. 56.
216 ibid., p. 95.
217 EUAA, *EUAA submission to the AER on Transend's 2009 to 2013 revenue proposal*, August 2008, p. 8.
218 Transend, *Resourcing Plan* (Issue 1.0, August 2008), confidential, submitted 22 August 2008.

- Transend has demonstrated an ability to ramp up its capex program during the current regulatory control period
- Transend's potential construction contractors have provided written confirmation that they have sufficient resources to undertake the proposed capex program.

Nuttall Consulting noted that WorleyParsons undertook the review of the business-wide aspects of Transend's proposal including the deliverability and resourcing requirements relating to the capex program. It commented that it had no reason to consider that WorleyParsons' findings on the deliverability and resourcing requirements relating to the capex program would not cover the asset renewal projects reviewed by Nuttall Consulting.[219]

That said, Nuttall Consulting's review of Transend's asset renewal capex proposal noted that the asset renewal capex profile included a number of large substation redevelopment projects towards the end of the next regulatory control period. While recognising that the timing of the proposed Creek Road and Tungatinah substation redevelopment projects was linked to timing of works for the Waddamana-Lindisfarne 220 kV transmission line project, Nuttall Consulting noted the possibility that the projects may be delayed or deferred without increasing risks to Transend or to consumers. Further, Nuttall Consulting considered there may be opportunity for prudent deferral of works relating to the Farrell and New Norfolk secondary system replacements projects. However, Nuttall Consulting did not provide a detailed analysis of the viability of deferring these projects. Nuttall Consulting noted that there could be valid reasons for not deferring projects.[220]

AER considerations

Initiatives—In-house staffing levels and external contractor panel arrangements

The AER notes that a key initiative implemented by Transend to enable it to deliver the capex program is its new works prioritisation system and enhanced AMIS. WorleyParsons has reviewed Transend's capital governance framework and investment processes and initiatives including AMIS and the works prioritisation system that will enable Transend to deliver its proposed capex program. Based on its experience, WorleyParsons found that the processes implemented by Transend are in line with good industry practice.

The AER notes that WorleyParsons reviewed Transend's proposal in relation to deliverability of its proposed capital program and requested further detailed information in order to assess whether adequate resources are likely to be available to Transend in order to undertake its proposed capex program.

The AER also notes that Transend has identified a requirement to increase internal staffing levels, particularly in relation to specialist technical functions associated with transmission system operations. WorleyParsons reviewed Transend's proposed initiatives to meet its internal staffing requirements. It considered that it is probable

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219 Nuttall Consulting, Nuttall Consulting report, op. cit., p.5–6.
220 ibid., p.75–80.

that Transend will be able to fill its identified staff vacancies, although it may be difficult to recruit staff in 'technical' areas.

WorleyParsons has noted that Transend has developed initiatives to bridge its existing resourcing gaps and it appears that the necessary external resources will be available to deliver Transend's capital program. The AER notes that Transend is proposing to establish new contractor panels to better manage availability of third-party resources in delivering its capital program. Transend has indicated that securing committed contractors with a continuous workload is one of its desired outcomes from this approach. The AER notes that potential contractor service providers have provided assurances to Transend that they are interested in participating in the contractor panel arrangements and they are capable of engaging and providing the required resources to deliver Transend's capex program.[221]

The AER notes that design standardisation will enable Transend to establish standard designs for new substations and that this could provide benefits across Transend's asset renewal capex program in this instance, as its proposed asset renewal projects are predominantly substation related. Based on the detailed Resourcing Plan submitted by Transend and the positive interest Transend has received from potential contractor panel members, the AER is satisfied that Transend has taken meaningful steps to ensure that its approach to delivering the proposed capex program is focused towards ensuring deliverability.

For the reasons discussed above, the AER considers that the initiatives implemented or being implemented by Transend are likely to provide it with the potential to be able to deliver the amended forecast capex program.

Capital expenditure profile—asset renewal driven projects

The AER notes the EUAA's concern, raised in its submission, on whether Transend can deliver the proposed capex program since the proposed allowance is much higher than the capital works program being delivered by Transend in the current regulatory control period.

While WorleyParsons and the AER consider Transend has implemented appropriate strategies to facilitate deliverability of the forecast capex program, there is a risk that given the scale involved, Transend may not be able to deliver some of the projects within the proposed timeframe. The AER notes that under the ex ante framework set out in the NER, a TNSP is able to retain the excess return on and return of capital where actual capex is less than the allowance provided. To this end, if Transend is not able to implement all the asset renewal driven capex projects within the proposed timeframe over the next regulatory control period it will retain the associated benefit of the excess return on and return of capital relating to the lower than forecast capex.

The AER notes Nuttall Consulting's finding that a significant portion of the capex required in the next regulatory control period is driven by substation redevelopment projects. In particular, substation redevelopments driven by the replacement of Reyrolle OS10 circuit breakers in the profile of the forecast capex is weighted heavily towards the later years of the next regulatory control period.

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[221] Transend, Response to information request no.63, confidential, submitted 22 August 2008.

Further the AER understands that failure to deliver all the asset renewal projects associated with replacement of Reyrolle OS10 circuit breakers within the next regulatory control period may not materially affect the risks identified given that the AER expects all the relevant circuit breakers to be replaced within the 10 year timeframe proposed for completion of the circuit breaker replacement program. [222]

Nuttall Consulting identified that more detailed economic analysis may lead to prudent deferral of a number of projects to the early years of the regulatory control period commencing 2014-15. These projects are:

- 110 kV substation redevelopment projects associated with replacement of Reyrolle OS10 circuit breakers
- the Farrell and New Norfolk secondary system replacement projects
- the Burnie–Waratah wood pole replacement project.

While noting that potential members of Transend's contractor panels have provided feedback that the capex program is deliverable, the AER is aware that the timing of the Creek Road and Tungatinah substation redevelopment projects (both of which are associated with replacement of Reyrolle OS10 circuit breakers) is dependent on works relating to the Waddamana-Lindisfarne 220 kV transmission line project. Given that the Waddamana-Lindisfarne 220 kV transmission line project is the largest project in Transend's capex program, it is conceivable that project delays may be experienced either because of delays in this project or for a number of other reasons which may include labour or material supply difficulties, planning difficulties or network outage restrictions.

Nuttall Consulting's review focused on assessing the prudence and efficiency of proposed asset renewal capex projects to enhance the deliverability of the capex program. The AER notes there may be valid reasons (including safety considerations) for not deferring asset renewal capex projects. In the particular case of the replacement of Reyrolle OS10 cisruit breakers, the AER notes that project deferral would still accord with Transend's circuit breaker strategies for the replacement of the Reyrolle OS10 circuit breakers over the next 10 years.[223] However, in the absence of detailed project economic analysis by Transend, the AER considers that it is reasonable for the asset renewal capex profile of the above-mentioned program and projects to remain adjusted as proposed by Nuttall Consulting.

For the reasons discussed above, the AER is satisfied that Transend has the potential to deliver the adjusted forecast capex program during the next regulatory control period.

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222 Transend, *Reyrolle Type 110/OS 110 kV circuit breaker Condition Assessment Report* (Issue 1.1, August 2008), p. 11, submitted 1 September 2008.

223 Transend, *Reyrolle Type 110/OS 110 kV circuit breaker Condition Assessment Report* (Issue 1.1, August 2008), p. 11, submitted 1 September 2008.

4.6.9 Allocation of assets to prescribed services

Submissions

RTA stated that the AER should ensure that the allowance sought by Transend should be properly allocated to prescribed transmission services and not include negotiated transmission services. In particular, RTA noted that an augmentation or extension to the transmission network as a result of new generation should not be allocated to a prescribed transmission service. RTA also stated that the AER should carefully review the cost and timing of the forecast capex program.[224]

AER considerations

Under chapter 6A of the NER Transend is only entitled to an allowance for future capital expenditure in relation to assets providing prescribed services. However, for the purposes of the next regulatory control period, it is relevant to consider clause 11.6.11 which details the arrangements for the grandfathering of existing customer connections. The AER notes that the proposed redevelopment of certain substations as proposed by Transend may, under clause 11.6.11, result in some assets no longer being eligible for inclusion in the Transend capital expenditure allowance.

Transend has not advised the AER of any specific assets which are affected by this provision. The AER also notes that a rule change currently under consideration by the AEMC will, if adopted, result in a change to the eligibility of particular assets to be included in the regulated asset base of a TNSP.[225]

The AER notes that were a project such as the Tungatinah substation redevelopment to proceed in the next regulatory control period, then the possibility exists of some assets providing connection services to the generators co-located at that site being inappropriately included in the Transend capital expenditure allowance if the proposed rule change does not proceed.

4.7 AER conclusion

In its revenue proposal, Transend proposed a forecast capex allowance of $681 million ($2008-09). This forecast amount was subsequently revised by Transend to an amount of $685 million ($2008-09) to remove errors identified in the capex proposal and to incorporate the latest available CPI figures. [226]

The AER has considered and assessed Transend's proposed forecast capex allowance of $685 million ($2008–09), and for the reasons outlined in this chapter, is not satisfied it reasonably reflects the capex criteria under clause 6A.6.7(c) being:

- the efficient costs of achieving the capex objectives

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[224] RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 3–5.

[225] The AEMC's review of cost allocation arrangements for transmission services can be found at www.aemc.gov.au .

[226] Transend, Response to information request no. 107, confidential, submitted 31 July 2008.

- the costs that a prudent operator in the circumstances of the relevant TNSP would require to achieve the capex objectives, and
- a realistic expectation of the demand forecast and cost inputs required to achieve the capex objectives.

In reaching this conclusion, the AER has had regard to the capex factors set out in clause 6A.6.7(e) of the NER.

As the AER is not satisfied that Transend's forecast capex reasonably reflects the capex criteria, under clause 6A.6.7(d), the AER must not accept the forecast capex allowance in Transend's revenue proposal. Therefore, the AER is required under clause 6A.14.1(2)(ii) to provide an estimate of the total capex that Transend will require over the next regulatory control period which the AER is satisfied reasonably reflects the capex criteria, taking into account the capex factors.

Based on its analysis of Transend's proposed ex ante capex allowance and the advice of WorleyParsons and Nuttall Consulting the AER has decided not to accept Transend's forecast capex allowance as proposed. In accordance with clause 6A.14.1(2), the AER has estimated a forecast capex allowance it is satisfied reasonably reflects the capex criteria and which reduces Transend's proposal by $55 million. This represents a reduction of around 8 per cent of Transend's proposed forecast capex of $681 million and results in a revised forecast capex allowance of $626 million. Of this reduction, no amount is transferred to contingent projects.

The AER has also revised the escalations that Transend has applied in its revenue proposal. On the basis of updated forecasts for CPI and the escalators detailed in this chapter and appendix J, the forecast capex allowance for Transend is adjusted by $11 million to $615 million for the next regulatory control period.

The AER's revised ex ante capex allowance is set out in table 4.22. In addition, the AER has approved an indicative contingent projects allowance of $412 million.

Although the adjustments made by the AER for the most part are set out on a project specific basis, it notes that the total capex after all of these adjustments is only an allowance. The AER's project specific conclusions should not be taken to bind Transend to a particular set of project specific capex budgets—Transend has the ultimate discretion on how it allocates its capex allowance.

This revised allowance of $615 million over the next regulatory control period represents the AER's estimate of the total capex it is satisfied that a prudent operator in the circumstances of Transend would require to achieve the capex objectives.

Table 4.22: AER's conclusion on Transend's ex ante allowance ($m, 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Transend's proposal (31 May 2008)	158.0	173.4	106.5	118.5	124.3	680.7
Adjustment resulting from detailed project reviews [a]	–1.4	–5.0	–3.7	–19.7	–25.2	–55.0

Application of annual escalators	–2.0	–1.8	–1.6	–2.0	3.1	–10.6
AER's total adjustments	–3.4	–6.8	–5.3	–21.8	–28.3	–65.6
AER's ex ante capex allowance	154.6	166.6	101.2	96.8	96.0	615.1

Note: The AER will update the capex model with the latest CPI data at the time of its final transmission determination.
(a) These adjustments relate to augmentation, easement and replacement projects.
(b) This includes adjustments to escalation from 2006–07 to 2008–09 dollar, land (and easement) and materials escalators.

5 Cost of capital

5.1 Introduction

This chapter sets out the AER's estimate of an efficient (market-based) benchmark weighted average cost of capital (WACC) or the rate of return for Transend over the next regulatory control period. The key issues considered include the WACC parameters specified in the NER and the determination of the risk-free rate, debt risk premium and inflation forecast.

The AER's considerations of debt and equity raising costs, and corporate tax allowances is not set out in this chapter because the AER has decided they will be recovered as operating expenditure (opex) rather than through the return on capital. Accordingly, the analysis of debt and equity raising costs is found in chapter 6 and the analysis of corporate tax is found in chapter 9 of this draft decision.

5.2 Regulatory requirements

Clause 6A.6.2 of the NER requires that the return on capital be calculated by applying the rate of return to the value of the regulatory asset base (RAB) as determined in chapter 3 of this draft decision.

The AER must determine the rate of return in accordance with clause 6A.6.2 of the NER. Clause 6A.6.2(b) provides that the rate of return for a TNSP is a nominal post-tax WACC calculated in accordance with the following formula:

$$\text{WACC} = k_e \frac{E}{V} + k_d \frac{D}{V}$$

where:

k_e = the return on equity

k_d = the return on debt

E/V = the market value of equity as a proportion of the market value of equity and debt, which is 1 – D/V

D/V = the market value of debt as a proportion of the market value of equity and debt, which is deemed to be 0.6.

It also states that the return on equity (k_e) is determined by using the capital asset pricing model (CAPM):

$$k_e = r_f + \beta_e \times \text{MRP}$$

where:

r_f = the nominal risk-free rate of return for the regulatory control period determined in accordance with clause 6A.6.2(c)

MRP = the market risk premium, which is deemed to be 6 per cent

β_e = the equity beta which is deemed to be 1.

It also states that the return on debt (k_d) is calculated as:

$$k_d = r_f + DRP$$

where:

DRP = the debt risk premium for the regulatory control period is determined in accordance with clause 6A.6.2(e).

5.3 Transend proposal

In estimating the WACC for its revenue proposal, Transend has used the values for the WACC parameters set out in the NER. For the purposes of its revenue proposal Transend has calculated a nominal vanilla WACC of 10.65 per cent. The parameters underlying Transend's calculation of the WACC are presented in table 5.1.

Table 5.1: Transend's proposed WACC parameters

Parameter	Transend's proposal
Risk-free rate (nominal)	6.37%
Expected inflation rate	2.54%
Debt risk premium	3.13%
Market risk premium	6.00%
Corporate tax rate	30%
Value of imputation credits	50%
Proportion of equity funding	40%
Proportion of debt funding	60%
Equity beta	1.00
Nominal vanilla WACC	10.65%

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 161.

5.4 Submissions

The Energy Users Association of Australia (EUAA) noted that the AER is currently undertaking a review of the parameters used in calculating the WACC. It argued that the parameters emerging from this review should be applied in determining

Transend's WACC and that failing to do so would result in the use of out-of-date parameters.[227]

The EUAA also stated that the averaging period used to calculate the risk-free rate and debt risk premium should appropriately reflect the current credit crisis and global slow-down.[228]

AER considerations

Consistent with recent determinations, the AER will set the averaging period for the risk-free rate and the debt risk premium as close as possible to the date of the final decision so that conditions prevailing in financial markets and faced by Transend are reflected in the risk free rate and debt risk premium.

5.5 Issues and AER considerations

5.5.1 The WACC parameters specified in the NER

Businesses are typically funded by a combination of equity and debt. Therefore, a weighted average cost of equity and debt must be established to derive the rate of return. This is usually referred to as the WACC. The derivation of the WACC requires several parameters. Many of these parameters have values specified in the NER. Where the NER does not specify a value, it specifies a method for determining the value.

The NER specifies values for the equity beta and the market risk premium to be used to calculate the return on equity using the CAPM. The NER also specifies the value of debt as a proportion of the value of equity and debt (or gearing) to be used when calculating the WACC.

Transend proposal

Transend has estimated the return on equity using the CAPM and adopted the parameter values specified in the NER for the equity beta, market risk premium (MRP) and gearing.

Submissions

The EUAA argued that the parameters emerging from the AER's WACC review should be applied in determining Transend's WACC and that failing to do so would result in the use of out-of-date parameters.[229]

AER considerations

Based on the NER requirements, the parameters and values as outlined in section 5.2 of this draft decision have been applied by the AER for the purposes of determining the WACC for Transend.

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227 EUAA, *Submission to Australian Energy Regulator review of Transend's revenue proposal for 2009/10 to 2013/14*, August 2008, p. 9.
228 ibid., p. 9.
229 ibid., p. 9.

The AER will not apply the WACC parameters or methods determined by the WACC review it is currently undertaking. The AER notes that clause 6A.6.2(h) of the NER only allows parameters or methods determined by the WACC review to be adopted for revenue proposals that have been submitted to the AER after the completion of the review.

5.5.2 The risk-free rate

The risk-free rate measures the return an investor would expect from an asset with zero volatility and zero default risk. The yield on long-term Commonwealth Government Securities (CGS) is often used as a proxy for the risk-free rate because the risk of government default on interest and debt repayments is considered to be low.

In the CAPM framework, all information used for deriving the rate of return should be as current as possible. While it may be theoretically correct to use the on-the-day rate as it represents the latest available information, this can expose the TNSP to day-to-day volatility. For this reason, an averaging method is used to minimise volatility in observed bond yields.

Regulatory requirements

Clause 6A.6.2(c) states that the nominal risk-free rate is to be determined by the AER:

> … on a moving average basis from the annualised yield on Commonwealth Government bonds with a maturity of 10 years using:
>
> (1) the indicative mid rates published by the Reserve Bank of Australia; and
>
> (2) a period of time which is either:
>
> (i) a period ('the agreed period') proposed by the relevant Transmission Network Service Provider, and agreed by the AER (such agreement is not to be unreasonably withheld); or
>
> (ii) a period specified by the AER, and notified to the provider prior to the commencement of that period, if the period proposed by the provider is not agreed by the AER under subparagraph (i),
>
> and, for the purposes of subparagraph (i):
>
> (iii) the start date and end date for the agreed period may be kept confidential, but only until the expiration of the agreed period; and
>
> (iv) the AER must notify the Transmission Network Service Provider whether or not it agrees with the proposed period within 30 business days of the date of submission of the Revenue Proposal under clause 6A.10.1(a).

Clause 6A.6.2(c) states that if there are no CGS with a maturity of 10 years on any day in the averaging period, the AER must determine the nominal risk-free rate by:

> … interpolating on a straight line basis from the two Commonwealth Government bonds closest to the 10 year term and which also straddle the 10 year expiry date.

Transend proposal

Transend nominated an averaging period of 10 days to calculate the risk-free rate. Transend proposed an indicative risk-free rate of 6.37 per cent based on annualised CGS yields with a maturity of 10 years for the purposes of its proposal, recognising that the AER will determine the applicable risk-free rate at the time of its final determination.[230]

Submissions

The EUAA noted concerns regarding recent volatility within financial markets and recommended that the AER carefully consider the effects of the current credit crisis and global slow-down when approving the averaging period used to calculate the risk free rate and the debt risk premium.

AER considerations

Clause 6A.6.2(c) of the NER requires the AER to determine the nominal risk-free rate using annualised CGS yields with a maturity of 10 years.

In accordance with clause 6A.6.2(c) Transend proposed an averaging period to estimate the risk-free rate. The AER does not agree with the period proposed on the basis that the proposed dates were too far removed from the date of the final determination and the commencement of the regulatory control period. The AER specified a period that is closer to the final determination date (based on an averaging period of 10 business days). The AER has agreed to keep the start and end dates of the averaging period confidential until the expiration of the period as requested by Transend.

For this draft decision, the moving average of 10 days for CGS yields with a 10-year maturity for the period ending 17 October 2008 results in a proxy nominal risk-free rate of 5.27 per cent (effective annual compounding rate). The AER will update the risk-free rate, based on the AER specified averaging period, at the time of its final decision.

5.5.3 The debt risk premium

The debt risk premium (or debt margin) is added to the nominal risk-free rate to calculate the return on debt, which is an input for calculating the WACC. The debt risk premium is the margin above the risk-free rate that investors in a benchmark efficient TNSP are likely to demand as a result of issuing debt to fund the business operations. It is intended to equate to a commercial cost of debt.

The debt risk premium varies depending on the entity's operational and financial risk as well as the term of the debt. This can be characterised as a credit rating. Applying the return on debt (as a percentage) to the RAB, adjusted for the assumed gearing, will generate the interest expense for regulatory purposes (also referred to as the cost of debt).

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[230] Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, Transend revenue proposal, 31 May 2008, p. 158.

Regulatory requirements

Clause 6A.6.2(b) states that the return on debt is calculated as:

$$k_d = r_f + DRP$$

Where:

r_f = the nominal risk-free rate

DRP = the debt risk premium for the regulatory control period determined in accordance with clause 6A.6.2(e).

Clause 6A.6.2(e) of the NER states that 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.

Transend proposal

Transend has proposed a debt risk premium of 3.13 per cent for the purposes of its proposal, recognising that the AER will determine the applicable debt risk premium using market data at the time of its final decision.[231] Transend envisaged that the AER's final decision will use the same averaging period as used in calculating the risk free rate.

Transend calculated this debt risk premium of 3.13 per cent, in accordance with the methodology established by the AER in previous determinations, using market data over the 10 trading days to 30 April 2008.

Submissions

The Major Employers Group (MEG) noted that Transend have calculated their debt risk premium based on a 10 day average leading up to its revenue proposal submission. MEG argued that it is not immediately clear why such a short period is used as a matter of course and recommended an averaging period of two to three years.

AER considerations

In previous revenue determinations the AER conducted a review which compared the estimated average daily fair yields for corporate bonds with BBB+ credit rating and maturity of up to 10 years from the Bloomberg and CBASpectrum databases over a period. Differences when comparing the average yields for actual bonds with the estimated average fair yields from the two databases were observed. The review indicated that Bloomberg provides estimates of BBB+ rated, long-term fair yields which are more consistent with the observed yields of similarly rated actual bonds. The AER has therefore decided to use the fair yields estimated by Bloomberg, rather than CBASpectrum, for determining the benchmark debt risk premium margin for Transend.

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[231] Transend, Transend revenue proposal, op. cit., p. 159.

The AER has previously used BBB 10-year corporate bond fair yields sourced from Bloomberg for the purposes of establishing a 10-year benchmark debt risk premium with a BBB+ credit rating.[232] In late October 2007, Bloomberg ceased publication of its BBB fair yields for bonds with 9 or 10-year maturities. The AER understands that the decision to cease publication was based on a lack of data for these long-dated corporate bonds (within the BBB credit rating category) from which Bloomberg could produce a fair yield. The longest maturity BBB bond fair yield now published by Bloomberg is 8 years.

Due to the unavailability of the Bloomberg fair yields for BBB rated 10-year corporate bonds, it is necessary to adopt an alternative proxy for deriving a 10-year BBB+ benchmark debt risk premium, as required by the NER.[233] The AER recently considered this issue and the details are set out in its final decision on the SP AusNet transmission determination.[234] Specifically, the methodology applied by the AER is to take the Bloomberg fair yield for BBB rated 8-year corporate bonds and add the Bloomberg fair yield spread between A rated 8 and 10-year corporate bonds, in order to derive a proxy 10-year BBB+ corporate bond yield. The AER considers that this methodology remains appropriate for the purposes of determining the benchmark debt risk premium for Transend.

Consistent with previous regulatory practice, the AER considers that the debt risk premium should be determined with reference to the same averaging period that was adopted for determining the risk-free rate. For this draft decision, the 10-day moving average benchmark debt risk premium for the period ending 17 October 2008, based on BBB+ rated corporate bonds with a maturity of 10 years, is 3.28 per cent (effective annual compounding rate).[235] Adding this debt risk premium to the nominal risk-free rate of 5.27 per cent provides a nominal return on debt of 8.55 per cent. The AER is satisfied that the debt risk premium is consistent, under clause 6A.6.2(e) of the NER, with the required margin between the 10-year CGS yield and observed Australian benchmark corporate bond yields corresponding to BBB+ credit rating and maturity of 10 years.

The debt risk premium will be updated by the AER based on this methodology at the time of its final decision. As outlined above in relation to the risk-free rate, the AER did not agree with the averaging period originally nominated by Transend and has substituted an alternative averaging period to use in its calculations for the final decision.

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[232] Bloomberg's BBB fair yields are assumed to approximate BBB+ fair yields due to the estimation technique employed and the market being disproportionately weighted with longer term BBB+ rated bonds.

[233] The proxy corporate bond yield less the risk-free rate produces the debt risk premium.

[234] AER, *SP AusNet transmission determination, 2008–09 to 2013–14: Final decision*, January 2008, p. 94–98.

[235] Bloomberg's BBB fair yields are assumed to approximate BBB+ fair yields due to the estimation technique employed and the market being disproportionately weighted with longer term BBB+ rated bonds.

5.5.4 Forecast inflation

The expected inflation rate is not an explicit parameter within the WACC calculation (when expressed in real terms); however, it is used in the post-tax revenue model (PTRM) to forecast nominal allowed revenues. It is an implicit component of the nominal risk-free rate, with implications for the return on both equity and debt.

Regulatory requirements

Clause 6A.5.3(b)(1) states that the PTRM must specify:

> … a methodology that the AER determines is likely to result in the best estimates of expected inflation

Historically, the AER has used an objective market-based approach to forecast the expected inflation rate—calculated as the difference in the CGS (nominal) and the indexed CGS yields. However, since late 2006 a downward bias in the indexed CGS has become evident due to the limited supply of these securities. Consequently, using this method potentially results in an overestimate of expected inflation. This limitation was recognised in the AER's PTRM guideline for TNSPs.[236]

In its recent final determinations for ElectraNet and SP AusNet, the AER applied the RBA's short-term inflation forecasts for the first two years of the regulatory control period and adopted the mid-point of its target inflation band (that is, 2.5 per cent) for the remaining eight years. An implied 10-year forecast is derived by averaging these individual forecasts. This aligns the inflation forecast to the term of the risk-free rate.

Transend proposal

Transend proposed an annual inflation forecast of 2.54 per cent per annum for the next regulatory control period. This has been determined based on a two part method to setting the long term forecast inflation over a 10-year period, which is similar to that applied by the AER in recent transmission determinations:

- determining a short term forecast of inflation for the first two year period based on a reliable forecast
- adoption of the mid-point of the Reserve Bank of Australia (RBA) target inflation band of 2–3 per cent beyond that period due to the inherent difficulties in forecasting inflation over the longer term.

Whilst Transend noted that the AER's final decision on Electranet used the RBA's February 2008 Statement on Monetary Policy as the source of inflation forecasts for the two years to June 2010, Transend stated that it is noteworthy that the Governor of the Reserve Bank stated in a media release on monetary policy dated 6 May 2008 that 'considerable uncertainty remains about the outlook for demand and inflation.[237] Along with other NSW network businesses, Transend engaged the Competition Economists Group (CEG) to provide advice on escalation factors, which included estimates of inflation for 2009 and 2010 of 2.8 per cent and 2.4 per cent

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[236] AER, *Electricity transmission network service providers—Post-tax revenue model: Final decision*, September 2007, p. 9–10.

[237] Transend, Transend revenue proposal, op. cit., p. 160.

respectively.[238] By applying the AER's method and utilising the CEG forecasts, Transend proposed an average forecast inflation rate for the 10-year period of 2.54 per cent.[239]

Submissions

Rio Tinto Alcan argued that the AER should continue to forecast inflation in accordance with the methodology used in the ElectraNet and SP AusNet decisions rather than the approach recommended by CEG in Appendix 14 to Transend's proposal.

AER considerations

The AER has determined in previous transmission determinations that a method that is likely to result in the best estimate of inflation over a 10-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 10-year forecast is derived by averaging these individual forecasts.

The inflation forecasting methodology proposed by Transend in its revenue proposals is broadly similar to that applied by the AER for its previous transmission determinations.[240] The difference between the two approaches, however, is the range of sources used to establish the 10-year average inflation estimate. Transend's proposed methodology draws on forecasts from a number of independent economic forecasters,[241] while the AER's approach in previous transmission determinations relies on the RBA's inflation forecasts and the mid-point of its target band.

The AER notes the RBA's responsibility for monetary policy in Australia means it is an independent authority on inflation expectations. The AER considers that the RBA's inflation forecasts are objective and represent the best estimates of forecast inflation for the purpose of this draft decision. The RBA's statement on monetary policy examines a wide variety of objective data influencing inflation in both the domestic and international financial markets to develop its inflation forecast. This forecast is produced on a regular basis and is publicly available, including supporting analysis and reasoning. The AER's approach uses this RBA report. This provides consistency and transparency in the AER process for deriving an inflation forecast.

In the absence of an objective market-based approach, the AER considers that its methodology remains appropriate for the purposes of determining an inflation forecast in its transmission determinations. The AER has updated the inflation forecast for the first two years of the regulatory control period using the latest published RBA inflation expectations as shown in table 5.2. The AER considers that, based on a

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238 CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 6.
239 Transend, Transend revenue proposal, op. cit., p. 161.
240 AER, *ElectraNet transmission determination 2008–09 to 2012–13: Final decision*, 11 April 2008, p. 69. See also AER, *SP AusNet transmission determination 2008–09 to 2013–14: Final decision,* January 2008, p.99–106.
241 CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p.6.

simple average, an inflation forecast of 2.55 per cent per annum produces the best estimate for a 10-year period to be applied in the PTRM for this draft decision.

Table 5.2: AER's inflation forecast

	June 2010	June 2011	June 2012	June 2013	June 2014	June 2015	June 2016	June 2017	June 2018	June 2019	Average
Forecast inflation	3.00	2.50[a]	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.55

Source: RBA, *Statement on monetary policy*, 11 August 2008, p. 62.
(a) The RBA has not yet released a forecast for the year ending June 2011. This forecast will be available and adopted by the AER at the time of the final decision. The mid-point of its target inflation band has been assumed for the purposes of this draft decision.

The AER recognises that inflation forecasts will change in line with market sensitive data. Regulatory practice in Australia has been to update these parameter values at the time of making a final determination to take account of most recent information. Accordingly, the AER will update the inflation forecast to be used in the PTRM based on this methodology at the time of its final decision.

5.6 AER conclusion

The NER prescribes a number of the WACC parameter values to be adopted by the AER for the purposes of setting a rate of return for TNSPs. For the parameters where the values have not been prescribed—nominal risk-free rate and the debt risk premium—the NER sets out the methodology to be used by the AER for determining the values.

For this draft decision, the AER has determined a nominal vanilla WACC of 9.64 per cent for Transend. The WACC is less than that proposed by Transend due to a decline in annualised yields on Commonwealth Government Bonds since Transend submitted its revenue proposal.

Table 5.3 outlines the WACC parameter values for this draft decision. The AER will update the nominal risk-free rate and debt risk premium, based on the agreed averaging period, and the expected inflation rate at the time of its final decision.

Table 5.3: AER's conclusion on Transend's WACC parameters

Parameter	Transend's proposal	AER's conclusion
Risk-free rate (nominal)	6.37%	5.27%
Risk free rate (real)[a]		2.66%
Expected inflation rate	2.54%	2.55%
Debt risk premium	3.13%	3.28%
Market risk premium	6.00%	6.00%

Gearing	60%	60%
Equity beta	1.00	1.00
Nominal pre-tax return on debt		8.55%
Nominal post tax return on equity		11.27%
Nominal vanilla WACC	10.65%	9.64%

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 161.

6 Operating and maintenance expenditure

6.1 Introduction

This chapter details Transend's operating expenditure (opex) proposal, submissions received from interested parties, a summary of the AER's consultant reviews and the AER's assessment of Transend's opex allowance for the next regulatory control period. The AER has reviewed Transend's opex proposal against the requirements of the NER.

The key issues reviewed include:

- the efficiency of the base year
- cost drivers such as labour, materials, and growth of the asset base
- controllable costs including field operations and maintenance, transmission services, transmission operations, asset management and corporate services
- un-controllable costs such as debt and equity, network support and self-insurance.

The opex forecasts in Transend's revenue proposal refer to its requirements for the provision of prescribed transmission services in the next regulatory control period.

6.2 Regulatory requirements

6.2.1 Opex objectives

Clause 6A.6.6(a) of the NER provides that a transmission network service provider (TNSP) must include in its revenue proposal the total forecast opex for the regulatory control period in order to achieve the opex objectives, which are to:

(1) meet the expected demand for prescribed transmission services over that period

(2) comply with all applicable regulatory obligations associated with the provision of prescribed transmission services

(3) maintain the quality, reliability and security of supply of prescribed transmission services and

(4) maintain the reliability, safety and security of the transmission system through the supply of prescribed transmission services.

6.2.2 Opex criteria and factors

Clause 6A.6.6(c) provides that the AER must accept the forecast opex included in a revenue proposal if the AER is satisfied that the total forecast opex for the regulatory control period reasonably reflects the opex criteria, which are:

(1) the efficient costs of achieving the operating expenditure objectives

(2) the costs that a prudent operator in the circumstances of the relevant TNSP would require to achieve the operating expenditure objectives and

(3) a realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.

In making this assessment, the AER must have regard to the opex factors set out in clause 6A6.6(e):

(1) the information included in or accompanying the revenue proposal

(2) submissions received in the course of consulting on the revenue proposal;

(3) such analysis as is undertaken by or for the AER and is published prior to or as part of the draft decision of the AER on the revenue proposal under rule 6A.12 or the final decision of the AER on the revenue proposal under rule 6A.13 (as the case may be)

(4) benchmark operating expenditure that would be incurred by an efficient TNSP over the regulatory control period

(5) the actual and expected operating expenditure of the TNSP during any preceding regulatory control periods

(6) the relative prices of operating and capital inputs

(7) the substitution possibilities between operating and capital expenditure

(8) whether the total labour costs included in the capital and operating expenditure forecasts for the regulatory control period are consistent with the incentives provided by the applicable service target performance incentive scheme in respect of the regulatory control period

(9) the extent to which the forecast of required operating expenditure of the TNSP is referable to arrangements with a person other than the provider that, in the opinion of the AER, do not reflect arm's length terms

(10) whether the forecast of required operating expenditure includes amounts relating to a project that should more appropriately be included as a contingent project under clause 6A.8.1(b).

Clause 6A.6.6(d) of NER states that if the AER is not satisfied that a TNSP's forecast opex reasonably reflects the opex criteria then the AER must not accept the forecast opex in a revenue proposal. If the AER does not accept the total forecast opex proposed by a TNSP, clause 6A.14.1(3)(ii) of the NER requires the AER to include in its draft decision:

> …an estimate of the total of the Transmission Network Service Provider's required operating expenditure for the regulatory control period that the AER is satisfied reasonably reflects the operating expenditure criteria, taking into account the operating expenditure factors.

6.3 Transend proposal

In its proposal, Transend notes that operating expenditure is driven by several factors such as the:

- size, condition and accessibility of the transmission network and its exposure to faults
- number and density of customers
- legal obligations faced by the TNSP.

Further, operating and maintenance expenditure covers a wide range of Transend's activities[242], including:

- operating its transmission network to maintain continuity of supply
- monitoring the condition of network assets, and undertaking maintenance
- handling fault calls from customers, repairing assets and restoring supply
- handling complaints about the quality and reliability of supply, and communicating with customers and contractors
- managing the company and its relations with external stakeholders
- providing information technology systems to support corporate planning, financial management and human resource management.

6.3.1 Opex forecasting methodology

Transend forecasts its opex by defining a base year opex and modelling the impact of future cost drivers and efficiency factors on all components of its base year expenditure.

In defining its base year opex, Transend proposed its efficient opex as 2006–07. It then adjusted base year estimates (zero base) for changes in the mode and scope of its operation in the next regulatory control period. It also used a bottom up approach to forecast a significant amount of opex where it was considered that the base year did not accurately reflect future expenditure requirements. This is a significant change from merely making scale and step changes to a base year estimate.

6.3.2 Outline of Transend's submission

Transend has proposed a net opex of $280.4 million for the 2009-14 regulatory period (see table 6.1). This is an increase of $107.2 million (or 62 per cent) from the current 2004-09 period.

[242] Transend, operating expenditure cost templates assumptions, p. 4-5.

Table 6.1: Transend's forecast opex by category and year ($m, 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	5 years Totals
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 expenditure	**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	0.9	1.0	1.1	1.2	1.2	5.4
Equity raising	2.4	2.4	2.4	2.4	2.4	12.1
Self-Insurance	0.8	0.8	0.8	0.8	0.8	4.0
Total Operating expenditure	**53.7**	**54.7**	**54.6**	**58.0**	**59.2**	**280.4**

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p.126.

Broadly, Transend offered several reasons for the forecast rise in the next regulatory period, including:

- increasing real wage growth, driven by skills shortages in Australia
- increasing asset growth and additional resources to support capital program and systems control
- increased legislative obligations
- other changing circumstances and obligations.[243]

6.3.3 Submissions

The following stakeholders made submissions on the opex component of Transend's revenue proposal:

- Australian Paper (AP)
- Major Employers Group (MEG)

[243] Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, Transend revenue proposal, 31 May 2008, p.130.

- Energy Users Association (EUAA)
- Hydro Tasmania (HT)
- Rio Tinto Alcan (RTA).

These submissions are discussed in general below and where relevant in specific sections of this opex chapter. A copy of these submissions can be found on the AER's website at: www.aer.gov.au.

Some themes emerged during consultation on the Transend's revenue proposals including:

- *the efficient base year:* its calculation including adjustments, which year should it should be and reasons why the AER should reject Transend's efficient base year
- *labour costs:* staffing levels increases and labour costs escalators in light of unchanged demand forecast and slower economic conditions
- *scale factors and the relationship between opex and capex:* whether there is any efficiency to be gained from an increase in Transend's capex program
- *equity and debt raising cost:* whether debt and equity raising costs should be allowed.

Furthermore submissions were concerned about the:

- amount of opex sought in the next regulatory period
- lack of adequate justification for these expenditure within the revenue proposal
- ability of stakeholders to participate in the review due to information asymmetry.[244]

MEG further noted that Transend's proposed scope changes appeared to be claims made in the current regulatory period.[245]

6.4 Consultant review

The AER engaged WorleyParsons to review Transend's opex proposal. The terms of reference required WorleyParsons to review and analyse the following matters in relation to the contribution of opex forecasts to Transend's delivery of prescribed transmission services:

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[244] Rio Tinto Alcan, *Transend Transmission Revenue Cap 2009/10-2013/14 – Submission by Rio Tinto Alcan to the AER* August 2008, p.10.

Hydro Tasmania, *Transend Revenue Proposal*, August 2008, p.1.

[245] MEG, *Major Employer Group (Tasmania) submission to AER on Transend Revenue Proposal,* August 2008, p. 7.

(1) the efficiency of Transend's forecast opex for each year of the next regulatory period and whether there exists any scope for efficiencies

(2) the appropriateness of Transend's allocation of opex costs to specific activities, including the distinctions between regulated and non-regulated activities; routine maintenance and refurbishments/renewals; and the treatment of joint and common costs such as corporate administration expenses, financing charges and depreciation

(3) the effectiveness of Transend's operating practices and procedures and asset management system in ensuring only necessary and efficient opex occurs

(4) the key internal and external factors that may affect the level of efficient opex required by Transend over the next regulatory period

(5) the appropriateness of Transend's methodology to forecast its opex requirements

(6) the appropriateness of any trade-off between capex and opex.

WorleyParsons reviewed Transend's business model, maintenance policies and processes, and found that Transend was a relatively efficient TNSP, noting:

> A physical examination of current and planned opex works indicated that all actual or planned works were prudent and in accordance with industry best practices.[246]

WorleyParsons was reasonably satisfied with Transend's opex proposal. The only recommended adjustment to Transend's forecast opex was a reduction for one inventory officer position to Transend's scope changes of $1k in 2008/09 and $75.6k from 2009/10 to the end of the regulatory period. WorleyParsons' overall recommendation compared to Transend's (including adjustments resulting from oversight and new data) proposal is shown in table 6.2. The recommendation is discussed in detail in section 6.5.3.

Table 6.2: WorleyParsons' recommended adjustments and opex forecast ($m, 2008–09)

		2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
Field operations	Transend[a]	16.5	17.7	18.0	18.5	19.5	90.1
		16.5	17.7	18.0	18.5	19.5	90.1
and maintenance	WPs	–	–	–	–	–	–
	Difference						
Transmission services	Transend[a]	7.8	8.2	8.4	8.7	9.0	42.2
	WPs	7.7	8.1	8.3	8.7	8.9	41.1
	Difference	–0.1	–0.1	–0.1	–	–0.1	–0.4

[246] WorleyParsons, *Review of the Transend Transmission Network Revenue Proposal 2009-2014 An independent review prepared for the Australian Energy Regulator*, WorleyParsons report, October 2008, p. 231.

Transmission operations	Transend[a]	5.1	5.3	5.5	5.7	5.9	27.6
	WPs	5.1	5.3	5.5	5.7	5.9	27.6
	Difference	–	–	–	–	–	–
Asset management	Transend[a]	6.6	6.9	8.6	10.6	9.7	42.4
	WPs	6.6	6.9	8.6	10.6	9.7	42.4
	Difference	–	–	–	–	–	–
Corporate	Transend[a]	9.8	9.9	10.1	10.5	10.9	51.1
	WPs	9.8	9.9	10.1	10.5	10.9	51.1
	Difference	–	–	–	–	–	–
Total controllable opex	Transend[a]	45.9	48.0	50.6	50.4	55.0	253.4
	WPs	45.8	47.9	50.5	50.4	54.9	253.0
Difference		–0.1	–0.1	–0.1	–	–0.1	–0.4
Network support	Transend[a]	3.9	2.6	–	–	–	6.6
	WPs	3.9	2.6	–	–	–	6.6
Difference		–	–	–	–	–	–
Debt raising	Transend[a]	0.9	1.0	1.1	1.2	1.2	5.4
	WPs	0.9	1.0	1.1	1.2	1.2	5.4
Difference		–	–	–	–	–	–
Equity raising	Transend[a]	2.4	2.4	2.4	2.4	2.4	12.1
	WPs	2.4	2.4	2.4	2.4	2.4	12.1
Difference		–	–	–	–	–	–
Self-insurance	Transend[a]	0.8	0.8	0.8	0.8	0.8	4.0
	WPs	0.8	0.8	0.8	0.8	0.8	4.0
Difference		–	–	–	–	–	–
Total opex[a]	Transend[a]	53.9	54.9	54.9	58.3	59.5	281.4
	WPs[b]	53.8	54.8	54.8	58.2	59.4	281.0
Difference[b]		–0.1	–0.1	–0.1	–0.1	–0.1	–0.4

(a)Variation of proposed opex from Transend's revenue proposal are due to several minor adjustments due to errors and Transend using the latest quarterly CPI (June 2008) data.
(b)Totals may not add due to rounding.
Source: WorleyParsons, *Review of the Transend Transmission Network Revenue Proposal 2009-2014 An independent review prepared for the Australian Energy Regulator*, October 2008, p. 209.

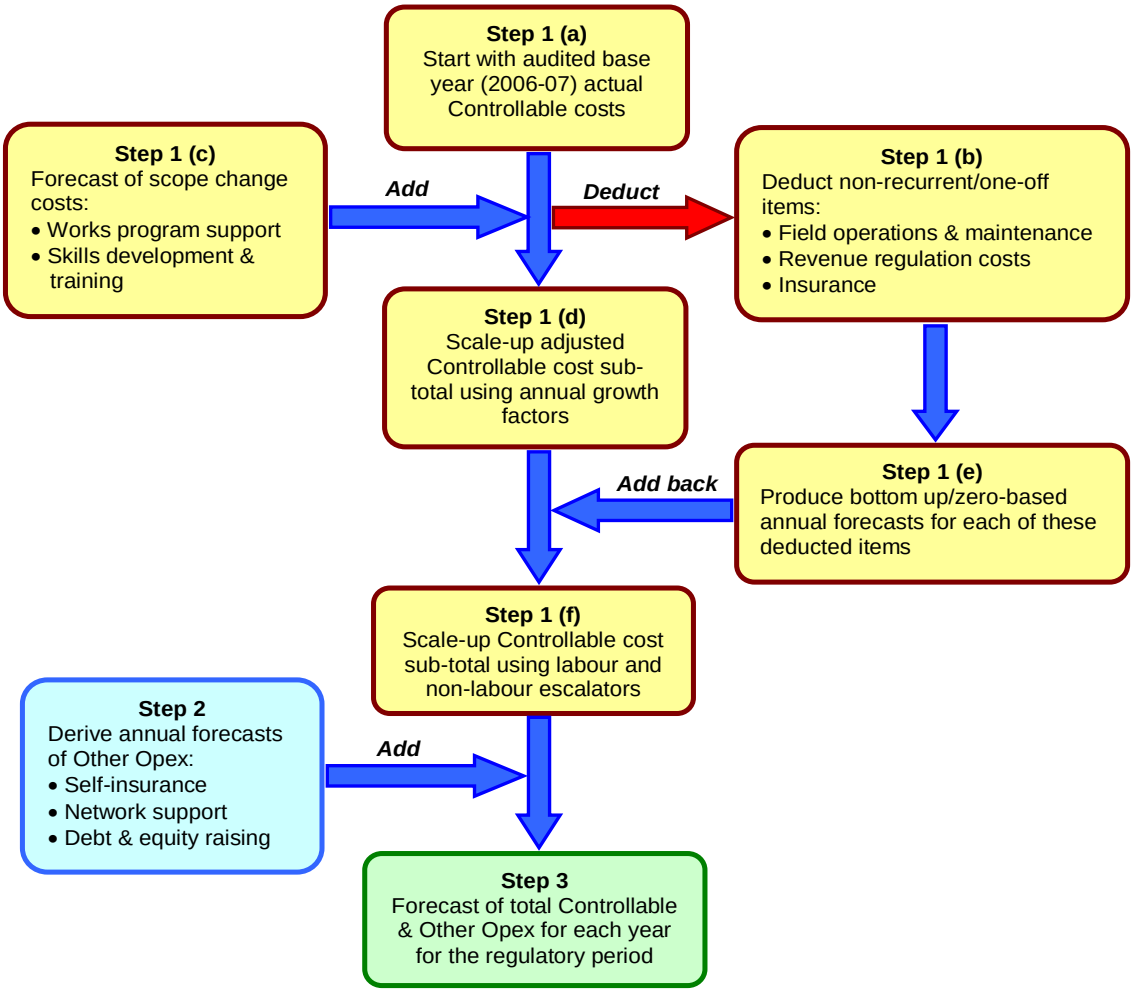
6.5 Issues and AER considerations

6.5.1 Transend's forecasting methodology

Transend forecasts its opex requirement using both base year extrapolation and zero base estimates, derived using a bottom up approach.[247] Figure 6.1 illustrates this process and the AER considerations for each component are discussed:

- Step 1 (a) in section 6.5.2
- Steps 1 (b) and (e) in sections 6.5.2, 6.5.6, 6.5.7, 6.5.8, 6.5.9 and 6.5.10
- Step 1 (c) in section 6.5.3
- Step 1 (d) in section 6.5.4
- Step 1 (f) in section 6.5.4
- Step 2 in sections 6.5.11, 6.5.12 and 6.5.13

Figure 6.1



Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 112

[247] Transend, Transend revenue proposal, op. cit., p. 112.

Consultant review

WorleyParsons reviewed the forecasting methodology and stated that it was philosophically appropriate (the method employed was correct) and that the calculations were performed accurately and in accordance with the stated assumptions.[248]

AER considerations

The AER considers that Transend has provided a robust methodology for forecasting its opex requirement for the next regulatory control period. It accepts the use of zero base forecasts for some opex components as well as extrapolation of base year opex for the remaining opex categories. Specific issues regarding opex methodology and forecasts are considered below.

The AER has used Transend's forecasting methodology and models to review the efficient opex required by Transend in the next regulatory control period. However the AER considers that a number of corrections and adjustments to the asset growth, capex collector[249] and opex model are required. Many of these changes impact on the model in more than one area. For this reason the total impact of the individual changes is different to the consolidated impact of all the changes. Where the AER has noted an efficient opex requirement for a specific category of expenditure, the amounts specified reflect the amounts derived from the consolidated model, incorporating all changes and not just the specific change discussed. These adjustments are:

- the opex model with the June 2008 quarter's CPI
- land values escalation within the asset growth model[250]
- asset growth to include only prescribed assets[251]
- capex collector model for labour, materials and non-labour escalators which flows through to the asset growth model
- opex model for labour escalators.

The adjustments for labour, materials and non-labour escalation are discussed in detail in section 6.5.4 and 6.5.5 respectively.

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[248] WorleyParsons, WorleyParsons report, op. cit., p.230.

[249] Transend's capex collector model captures capex data from Transend's AMIS system.

[250] This was an adjustment to repair a discrepancy within the model. The impact to net opex was immaterial.

[251] The overall impact of this adjustment was immaterial as Transend has a small number of non-prescribed assets.

6.5.2 Efficient base year

Transend has identified 2006–07 as the base year for forecasting opex in the next regulatory control period noting. This is the most recent full year of audited accounts available.[252] Transend submitted that this approach was consistent with recent AER decisions.

Table 6.3: Actual and allowed opex for 2006–07 ($m, 2008–09)

	Total opex
ACCC 2003 revenue cap decision	33.3
Transend's actual opex	40.5
Difference	–7.2

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 128. CPI adjusted.

Submissions

The EUAA submitted that 2006-07 should not be used as the basis for the efficient base year costs. It noted that there is no evidence to suggest that Transend were efficient and that 2006-07 should not be regarded as an efficient base-year due to the inclusion of one-off costs.[253]

RTA submitted 2006-07 should not be used as the basis for efficient base year despite recent AER precedents in other decisions. The RTA noted that 2006-07 was the second highest annual opex allowance approved by the ACCC and that the efficient base year should be adjusted for one-off costs. Furthermore, RTA contend that TNSPs should not be allowed to select the base year of its forecast, as they will ultimately select the year with the highest possible forecast allowance.

Consultant review

WorleyParsons reviewed Transend's actual 2006–07 opex and supported Transend's view that 2006/07 was an efficient base year from which to forecast from. WorleyParsons also noted that opex in 2006/07 was conservative.[254]

WorleyParsons' analysis recognised that the base year forecasts apply to only a limited number of opex components, with several major expenditure items being forecast using a zero base approach.

WorleyParsons concluded that there was no indication to suggest that the base year data was inappropriate for its use in the forecasting methodology.[255]

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252 Transend, Transend revenue proposal, op. cit., p.116.

253 EUAA, *EUAA submission to the AER on Transend's 2009 to 2013 revenue proposal*, August 2008, p. 5-6.

254 WorleyParsons, WorleyParsons report, op.cit., p.185.

255 ibid p.185.

AER considerations

Transend has proposed using 2006–07 audited outcomes as the base for its opex projections as it was the most recent full year for which audited financial data was available at the time it developed its revenue proposal application. The AER considers that the alternative of using more recent data, that has not been audited, increases the likelihood of inaccuracies being introduced to the opex forecasts for the next regulatory period. Therefore, Transend's proposal to use 2006–07 data as the basis for its opex forecasts appears reasonable.

Further, Transend engaged:

- Parsons Brinckerhoff to undertake a comparative benchmarking exercise of its corporate overhead costs[256]
- KPMG to review the commercial relationship between Transend and Aurora and Hydro Consulting Services (including the cost structure of these relationships)[257]

to demonstrate that the 2006/07 year was an efficient base year to begin forecast.

The AER has compared Transend's opex in 2006–07 against the efficient amount forecast in the 2003 revenue cap decision. Transend's actual opex in 2006–07 was $7.2 million higher than the efficient forecast amount of $33.3 million.

Under the regulatory framework (Draft Statement of Regulatory Principles) which applied at the time of the 2003 determination the requirement was:

> that a TNSP should not be allowed to carry the effects of an over-spend from one period into the next without a thorough examination of the details. In the absence of verified justification, a carry-over simply allows a TNSP to spend as it wishes, knowing that any over-spend will be factored into the revenue determination in the next period.

Therefore, it was essential that the AER verify the reasons for this overspend in order to accept or reject Transend's propose efficient base year. As indicated earlier, Transend provided several reasons to justify this over expenditure. The AER has conducted a review of Transend's expenditure in the current regulatory period by testing the validity and reliability of these claims to determine the efficient base year by:

- reviewing Transend's external contracts
- reviewing invoices, internal budget papers, business cases and financial models

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[256] Transend, Transend revenue proposal ,op. cit., Appendix 23—PB, Benchmark comparison of Transend's corporate overhead and shared costs, April 2008, p. ii.

[257] KPMG, *Supplier arrangements, Review of commercial relationship between Transend Networks Pty Ltd and Aurora Energy Pty Ltd*, June 2008, confidential.

KPMG, *Supplier arrangements, Review of commercial relationship between Transend Networks Pty Ltd and Hydro Consulting Services*, June 2008, confidential.

- reviewing internal processes and documentations for business practices.

The categories reviewed and the information provided by Transend to support these claims are summarised in table 6.4.

Table 6.4: Costs categories review

Cost categories	Reason
Business Planning, Regulation & Compliance	Additional costs for revenue reset.
Easement management	Management of trees outside easements and additional costs of managing easements associated with compliance with the *Threatened Species Act* and the *Aboriginal Heritage Act*.
Compliance costs	Costs associated with administering and managing compliance with Transend's electricity supply industry (ESI) and other obligations.
Business continuity management	Increase in cost (undertaking independent Business Impact Assessments, security reviews by State Security Unit, participating in Regional Emergency management Committees, improving documentation, training in BCM and testing of BCM plans to meet requirements of: ▪ Commonwealth Attorney General's Department guideline as Transend's assets were classified as part of national critical infrastructure ▪ licence requirements ▪ corporate governance and good industry practice.
Business and finance	Increased scope of internal audit to accommodate audit reviews of non financial aspects of the business due to increasing compliance issues / complexity of the business and as per outcomes of Business Risk Reviews and Board approved Internal Audit Plans.
IT	Additional costs of hosting and maintaining its own IT data centre and infrastructure and backup sites (previously a shared cost with Hydro and Aurora provided through Logica); ▪ additional requirements and complexities of maintaining and supporting IT systems in the NEM (additional business systems, security and reliability requirements, disaster recovery requirements etc) ▪ higher software licensing costs to cater for business growth (both users and software requirements) ▪ additional costs associated with state wide WAN.

Transmission Operations Group	Additional costs associated with increased labour costs including staff transfer
Substation maintenance	Additional costs mainly relating to the increase in: ▪ Aurora Energy labour contract rates ▪ additional ground and building maintenance costs ▪ additional security cost for substations ▪ additional instrument transformer testing and pressure vessel inspections.
Connections and Strategic Development	Additional costs associated with: ▪ increased labour costs ▪ increasing focus on power quality issues, developing a long term grid vision and the development of market modelling to comply with TAPS.
Protection and control	Additional costs for the rectification of 20 REF 511 relays.

The AER's review was focused on testing the validity of these expenditures which included analysing whether the base year contained non-recurrent expenditures. While the AER acknowledges that it is difficult in a review of this form to confirm whether these expenditures are efficient, the AER has seen no evidence to suggest that the over expenditures do not reflect prudent decisions.

The AER notes the EUAA's and RTA's concern regarding Transend's staffing levels. The AER has reviewed Transend's staffing levels and nothing has come to our attention that any increases in staffing levels were either imprudent or inefficient. Furthermore, reviewing employee numbers in isolation does not give a true picture as an increase in employee numbers does not necessarily result in higher operating costs as external contractor costs may be reduced. Having said this, the AER has a concern with Transend's labour rate escalation forecast. This is discussed in section 6.5.4.

The AER notes RTA's and MEG's concerns regarding non-recurrent expenditure in the base year. The AER has found no evidence in its investigation to suggest the base year contains such costs.

The AER notes the comments by WorleyParsons concerning benchmarking.[258] Given the limitations of benchmarking, the AER was not able to determine that the variance in Transend's level of opex from the industry norms supported a conclusion that it is inefficient.

Furthermore, the AER considers that it was inappropriate to use the previous two years as the efficient base year given the considerable and permanent changes to Transend's operations due to NEM entry and Basslink.

[258] WorleyParsons, WorleyParsons report, op. cit., p.224.

The AER considers that in view of WorleyParsons' recommended position, ITOMS benchmarks and the AER's own investigations, the opex of $40.5 million represents an adequate base year amount from which to forecast opex Transend's requirements for the next regulatory period.

6.5.3 Scope changes

Variations to Transend's base year opex requirement will occur if the nature of Transend's operations and maintenance activities change. Changes in the scope of opex may arise due to new regulatory or compliance obligations or from expenditure program changes that impact on costs. Transend listed works program support and skills development as scope change in its revenue proposal.

Works program support

Works program support relate to the employment of additional resources required to undertake several functions to deliver Transend's capex program. [259]

Transend stated the additional resources are required in order to deliver the increased scope of work associated with the more complex works programs in the next regulatory period.[260] Its expenditure forecasts are shown in table 6.5.

Table 6.5: Transend's works program support ($m, 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
Works program support	3.0	2.7	2.5	2.4	2.5	13.1

Source: Transend opex model: variation of proposed opex from Transend's revenue proposal due to several minor adjustments for errors and updated quarterly CPI (June 2008) data.

Submissions

The EUAA submitted that there was little basis for substantial increases to Transend's opex given:

- economies of scale and economies of scope should decrease cost per unit of electricity distributed
- the absence of structural changes in the Tasmanian economy that might justify a higher opex
- there was no evidence of reliability or delivery failure provisions of transmission services that could justify greater opex.[261]

[259] Transend, Transend revenue proposal, op. cit., p.118-119.

[260] ibid, p. 118-19.

[261] EUAA, *EUAA submission to the AER on Transend's 2009 to 2013 revenue proposal*, August 2008, p. 6.

Consultant review

WorleyParsons has examined the business cases of the proposed expenditure and based on their experience recommended to the AER that Transend's proposed expenditure on scope changes should be reduced by disallowing funding for one inventory officer position.[262]

AER considerations

Transend has forecast costs of $13.1 million for additional resources needed to sufficiently manage its existing and forecast networks. The AER reviewed the supporting documentation for each new position sought in light of WorleyParsons expressed reservations as to the need for one inventory officer position. The AER notes that Transend has undertaken a significant program in the current regulatory period to update and improve its internal systems and processes to better manage its resources and assets. The AER considers that the additional positions sought here are integral to that process. The WorleyParsons recommendation does not demonstrate that the position is not required but states a judgement that the need is not well explained. Having reviewed Transend's business cases and noting the significantly expanded capex program in the next regulatory period, the AER considers, on balance, that it is not appropriate to adopt WorleyParsons recommendation. The AER agrees with Transend that this level of expenditure is appropriate to meet the opex objectives.

The AER therefore considers Transend's estimates of $13.1 million reasonably reflect the costs that a prudent operator would require for works program support over the next regulatory control period.

Skills development and training

Transend stated the need for initiatives to develop and retain skilled resources is driven by the skills shortages that have been evident in the past three years.[263] The skills development initiatives include technical traineeship and sponsorship of university graduates. Table 6.6 shows the costs proposed by Transend.

Table 6.6: Transend's proposed skills development and training costs ($m, 2009–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
Skills development costs	0.2	0.2	0.2	0.2	0.2	1.1

Source: Transend opex model: variation of proposed opex from Transend's revenue proposal due to several minor adjustments for errors and updated quarterly CPI (June 2008) data.

[262] WorleyParsons, WorleyParsons report, op.cit., Table 2.8, p.208.

[263] Transend, Transend revenue proposal, op. cit., p. 119-20.

Consultant review

WorleyParsons supported the inclusion of the skills development initiatives in the scope change estimates. WorleyParsons noted the difficulties experienced by Transend in attracting and retaining suitable staff and considered that these costs will allow Transend to compete more effectively in the tight labour market.[264]

AER considerations

Similar to other TNSPs, Transend's needs for power engineers has been growing. This is mainly due to an ageing workforce, lower number of graduates with power engineering qualification and an increasing capital works program. A 2004 report prepared for Engineers Australia confirms both facets of Transend's justification for increased expenditure on skills development.[265]

The median age for power engineers is 41–45 years, with 40 per cent of power engineers over the age of 45, and 27 per cent over 50. Further, power engineers under 26 make up only 6 per cent of the total number of power engineers in the industry. The DEEWR's research published in February 2007 showed a continued shortage of electrical engineers in Tasmania.[266]

The AER considers Transend's estimates of $1.1 million reasonably reflect the costs that a prudent operator would require for skills development and training over the next regulatory control period.

6.5.4 Escalation: Electricity, gas and water (EGW) sectors labour

Transend obtained advice from the Competition Economists Group (CEG) on forecast annual labour escalation rates for the electricity, gas and water (EGW) sectors.[267]

CEG relied on forecasts produced by Macromonitor and Econtech to derive its labour escalators for the EGW sectors in Tasmania. The labour cost escalators from Macromonitor and Econtech are shown in table 6.7.

Table 6.7: CEG – Labour cost growth rates in the EGW sectors (per cent, real year ended June)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Macromonitor (TAS)*	2.4	3.6	2.4	0.5	2.3	4.3	4.9
Econtech (AUS)	2.0	2.8	5.6	5.0	3.9	3.4	3.1

[264] ibid.p. 206

[265] Gosbell V, and Robinson D, *Assessing the future of electrical power engineers, A report on electrical power engineering manpower requirements in Australia,* Institute of Engineers Australia, 2004.

[266] Department of Education, Employment and Workplace Relations, *Science building and engineering professions occupational reports*, February 2007.

[267] Competition Economists Group, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008.

Source: Competition Economists Group, *Escalation factors affecting expenditure forecasts: a report for Transend,* April 2008, p. 7.

Notes: *Productivity adjusted

The Econtech national forecasts used by CEG are based on a report to the AER for the SP AusNet and VENCorp revenue resets.[268]

The report by Macromonitor was commissioned by TransGrid, Transend and the NSW DNSPs. The Macromonitor report calculates productivity adjusted or unit labour costs for the EGW sectors in Tasmania.[269]

Macromonitor noted that the actual labour cost involved with undertaking a given amount of activity is not purely determined by the rate of wages per hour, but also by the number of hours work required. Macrcomonitor stated that in examining the changes in an organisation's labour costs over time, a more meaningful measure than nominal wages is labour cost per unit of output, or per unit of activity. The change in this measure over time reflects both changes in wages and changes in labour productivity.[270]

Macromonitor has forecast annual productivity declines in the utility sectors over the next few years which becomes positive from 2011–12. The same general trend is expected in Tasmania. Between 2007–08 and 2013–14, Macromonitor has forecast an average annual productivity reduction of 0.9 per cent in the Tasmanian EGW sectors.[271] Macromonitor attributes the decline in productivity to a continuing upturn in the economy, together with a tight labour market and difficulties in attracting and retaining skilled staff.

CEG deflated Macromonitor's nominal labour cost escalators by its estimate of CPI to obtain the real escalators.[272] CEG also calculated real unit labour costs by using Macromonitor's forecasts for average annual changes in productivity growth, rather than individual annual productivity forecasts. CEG derived real unit labour costs by subtracting average productivity growth from growth in real wages.

CEG recommended that an average of the escalation factors calculated by Econtech and Macromonitor is an appropriate forecast of labour cost escalators for the EGW sectors in Tasmania. CEG did not provide any justification for averaging data from the two sources. The labour cost escalators recommended by CEG are shown in table 6.8.

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[268] Attachment D, Econtech, *Labour cost growth forecasts*, 19 September 2008.

[269] Macromonitor, *Forecasts of cost indicators for the electricity transmission sector, New South Wales & Tasmania*, February 2008.

[270] Macromonitor, *Forecasts of cost indicators for the electricity transmission sector, New South Wales & Tasmania*, February 2008, p. 8.

[271] Competition Economists Group, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 10.

[272] CEG use its own CPI forecasts to deflate Macromonitor's labour cost forecast.

Table 6.8: CEG's wage growth for electricity, gas and water sectors in Tasmania (per cent, real year ended June)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
TAS growth	2.2	3.2	4.0	2.7	3.1	3.9	4.0

Source: Competition Economists Group, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 8.

Consultant review

The AER engaged Econtech to provide advice on wage forecasts for the utilities sectors Tasmania.[273] Econtech's labour cost growth rates for the utility sectors in, Tasmania are shown in table 6.9.

Table 6.9: Econtech labour escalation rates— Electricity, gas and water sectors (per cent, real year ended June)

	2007–08*	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
TAS growth	–3.0	2.0	2.9	2.8	2.5	2.4	1.9

Source: Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, Attachment D, 19 September 2008, p. 10 – 12.

Econtech has provided these forecasts using an updated version of the model it developed for its report to the AER in August 2007. In particular, the forecasts provided by Econtech incorporate:

- a simplified, but enhanced approach to labour cost forecasting
- national accounts data from December 2007 (which was published by the Australian Bureau of Statistics (ABS) in March 2008)
- average weekly earnings data obtained by request from the ABS in August 2008
- policy measures introduced in the 2008–09 federal budget
- an extension of the forecast period from 2015–16 to 2016–17.[274]

These forecasts are broadly consistent with Econtech's national forecasts. Over the next regulatory control period, Econtech has forecast an average growth rate 2.3 per cent (real) for the Tasmanian utilities sectors. In comparison, the forecast average growth rate for the utility industry in Australia is 2.6 per cent (real).

[273] Econtech is an economic consulting firm that specialises in economic modelling, forecasting and policy analysis. Econtech *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008.

[274] Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 4.

Econtech made the following observations on the utility sectors in Tasmania:

- The forecast annual wage growth for the utility sectors in Tasmania is expected to be higher than the all-industry average over the forecast period.

- The shortage of skilled workers in the utilities sectors continues to be a significant driver of labour costs. Electrical and engineering professionals are included in the Department of education, Employment and Workplace Relations (DEEWR) "Skill Shortage List" for Tasmania.

- A number of initiatives have been introduced to increase the supply of skilled workers. For example, the Australian Government, through its Skilling Australia Policy, will provide 450,000 new training places over the next four years. However, most of these initiatives represent a long-term solution and are therefore not expected to have a material impact in the short-term.

- The Australian Government has put in place a number of initiatives to lift permanent and temporary migration. Such initiatives have the potential to relieve skills shortages in the short-term, however, there are concerns over the ability of this additional labour to meet industry demand.

- An aging workforce in the utility industry may also put further strain on the supply of skilled labour.

- The fact that electricity, gas and water are essential services means that businesses have a greater imperative to attract and maintain skilled workers, and are more likely to absorb wage increases in order to maintain labour supply.

- The utility industry has had difficulty in retaining skilled staff due to demand booms in related industries. The utility industry employs a large proportion of electricians, electrical and other engineers which are occupations also employed extensively by the construction and mining industries.

Econtech reviewed the methodology used by CEG to forecast labour cost growth rates in the EGW sectors in Tasmania.[275] Econtech stated that CEG's approach of averaging the Macromonitor and Econtech labour cost forecasts was misguided because these forecasts were not comparable. In particular, Econtech noted:

- The report prepared by Macromonitor does not contain any description of the methodology used to forecast wages growth, which makes it difficult to evaluate the labour cost growth forecasts produced by Macromonitor. Further, Macromonitor does not use any econometric techniques to derive its forecasts.[276]

- While reasons were put forward in the Macromonitor report to explain forecasts of productivity, there was no clear methodology provided that outlined how productivity was forecast.

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[275] Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 38 – 42.
[276] Macromonitor, *Forecasts of Cost Indicators for the Electricity Transmission Sector – Forecasting Methodology*, 1 September 2008, p. 3.

- Unlike the Macromonitor forecasts, the Econtech forecasts of wages growth do not remove productivity growth. Econtech's forecasts of wage growth represent the general increase in labour costs over and above inflation as well as specific compensation to labour for increases in productivity. Since Econtech's forecasts incorporate compensation for increases in productivity, they are not equivalent to the Macromonitor labour cost forecasts.[277]

- The 2007 Econtech labour forecasts adopted by CEG are based on the national economy, whereas the Macromonitor forecasts are specific for Tasmania.

AER considerations—CEG

The AER has examined the EGW wage growth forecasts put forward by CEG for Tasmania. Based on Econtech's advice the AER does not consider that the averaging methodology employed by CEG to forecast wages growth in the utility sectors for Tasmania sufficiently robust. In particular, the AER notes Econtech's advice that the Macromonitor and Econtech forecasts are not comparable and that averaging the two forecasts is likely to provide inaccurate forecasts of labour cost escalation.

In addition to the inappropriateness of averaging data from Econtech and Macromonitor, the AER does not consider that the CEG proposed labour cost growth rates are a reasonable reflection of the likely future labour costs as they are not based on the most recent information available. The AER notes Econtech's advice that since it provided forecasts of labour cost growth rates to the AER in August 2007 (which were used by CEG), the economic climate has changed considerably, resulting in some pressure being taken off wages growth.[278] In particular, Econtech stated that:

> Projections of annual labour cost growth rates for overall state and territories have moderated in the past 12 months. The Reserve Bank of Australia (RBA) raised the official cash rate by 25 base points on four separate occasions since August 2007. The extent of the slowdown in household spending and credit expansion from within the household and business sector lead to the RBA to cut interest rates by 25 base points in September 2008. Despite this interest rate cut, the outlook for economic growth remains weak and the unemployment rate is expected to rise over the forecast period. These factors have combined to take some pressure off wages growth at the state and national level, since the last forecasts provided to the AER in 2007.[279]

The AER also does not consider it appropriate to rely on the forecasts presented by Macromonitor because there is no description of the methodology used to forecast wages growth or productivity.

For these reasons the AER does not accept CEG's proposed labour cost growth rates for Tasmania.

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[277] The LCM incorporates labour productivity via the employment forecasts used in MM2 (macroeconomic model of the Australian economy). MM2 incorporates labour productivity assumptions through its own labour productivity index, PSkill. PSkill is an input into the model and not an output. MM2 also incorporates assumptions regarding the growth in labour efficiency for each industry. Labour efficiency in each industry is then used to augment PSkill.

[278] Econtech, L*abour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 24.

[279] ibid., p. 24.

Further, the AER notes that Transend operates under an Enterprise Bargaining Agreement (EBA) or Award. The AER asked Transend to provide the actual wage increases set out under its respective EBA or Award. The wage increases for 2007–08 for Transend[280] is 4.6 per cent nominal (or a 0.4 percent increase in real terms). Transend's EBA will expire in December 2008 and the actual wage increases for 2008–09 are generally not available.

Given that the actual wage data is available for 2007–08, the AER will apply the actual wage increase provided for under the EBA. From 2008–09 onwards the AER proposes to apply Econtech's Tasmanian labour cost forecasts to the Transend opex and capex proposals.

The AER's conclusions on EGW growth rates are provided in tables 6.10. On average, the Econtech labour cost forecasts are lower than the CEG forecasts for Tasmania during the next regulatory control period. This is largely because the economic climate has changed considerably since the last Econtech forecasts provided to the AER in 2007, resulting in some pressure being taken of wages growth.

Table 6.10: AER conclusion—Tasmanian EGW growth rates (per cent, real year ended June)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Average
CEG	2.2	3.2	4.0	2.7	3.1	3.9	4.0	3.5
Econtech/ Transend EBA	0.4	2.0	2.9	2.8	2.5	2.4	1.9	2.5

Source: Competition Economists Group, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 8; Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, appendix D, 19 September 2008, p. 11.
Note: The average is calculated for 2009–10 to 2013–14 (the next regulatory control period)

For the reasons outlined above, the AER considers that the application of the Econtech forecasts for wages growth in the EGW sectors for Tasmania reflect the efficient costs that a prudent operator in the circumstances for Transend would require to achieve their capex and opex objectives.

Furthermore, given the recent economic impacts resulting from the financial crises, the AER intend to reassess these escalators in light of these new circumstances its final decision.

6.5.5 Asset growth factors

Transend used asset growth to escalate its base year expenditure. Forecast opex is escalated by the asset growth factors to take into account additional operational requirements resulting from asset developments on the transmission network. This is because a larger network requires greater opex to operate and maintain. Escalation on materials costs and other non-labour escalators, which impacts the capex and hence

[280] Transend, Response to AER request for information no. 238, submitted 16 September 2008.

the asset growth factors, are discussed in chapter 4 and Appendix I of this draft determination.

While Transend has accounted for asset growth in its opex model, it has acknowledged that this will not always result in a proportional increase in opex. This is due to:

- the existence of economies of scale and
- optimisation of capex/opex trade off applied in the Works Plan Management System
- which allow Transend to obtain efficiencies resulting from a larger network.

These economies of scales (or scale factors) reduce the impacts assets growth. The asset growth and scale factors are set out in table 6.11 and 6.12 respectively.

Table 6.11: Asset growth (per cent)

	2009–10	2010–11	2011–12	2012–13	2013–14
Substations	0.1%	8.1%	2.6%	5.3%	0.5%
Transmission Lines	0.0%	7.8%	2.3%	1.5%	0.0%
Protection & Control	0.1%	10.0%	3.0%	6.4%	0.9%
Easements	0.0%	1.2%	4.8%	18.7%	16.3%
Land and buildings	37.2%	24.4%	0.0%	9.7%	0.0%
Total	**0.4%**	**8.1%**	**2.5%**	**3.8%**	**0.7%**

Source: Transend asset growth model.

Table 6.12: Transend's proposed scale factors (per cent)

	Scale factor
Field operations & maintenance	NA
Operational communications	NA
Transmission services	25%
Transmission operations	25%
Asset management	25%
Corporate	10%

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 85.

It should be noted that a scale factor is not applied to field operations and maintenance because the works planning systems has already captured these savings.[281]

Submissions

RTA submitted that Transend should apply a scale factor similar to those of Powerlink and ElectraNet to field operations and maintenance as potential for economies of scale would apply given Transend's capex replacement and renewal program.[282]

Consultant review

WorleyParsons reviewed the application of the asset growth escalator and was satisfied that the calculation of growth factors now accurately reflects the referenced source material.[283]

AER considerations

The AER recognises that the quantity of the assets in service will impact on opex requirements. However, it has also previously recognised the impact of economies of scale when estimating the increase in opex required to account for increases in the asset base.

Transend has based its asset growth economies of scale on those proposed by ElectraNet and Powerlink, but taking into account factors specific to its circumstances.[284]

On balance, the AER considers that the asset growth escalation factors provided by Transend are reasonable, noting WorleyParsons recommendation for a prudent TNSP.

The AER will apply the scale factors proposed by Transend to the asset growth factors. The asset growth factors are based on forecast asset growth for each category of asset in the next regulatory control period. The forecast of asset growth used will reflect the changes incorporated in the capex forecasts by the AER (including escalators used for materials, labour, and non-labour and the deferral of certain asset renewal projects). The revised asset growth values are shown in table 6.13, and are applied in the opex model to derive controllable opex forecasts.

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281 Transend, operating expenditure scale factors, p.5.

282 RTA, op. cit., p. 10.

283 WorleyParsons, WorleyParsons report, op. cit., p.182.

284 For example, Transend has adopted a scale factor of 25 for asset management, whilst ElectraNet and Powerlink used 10.

Table 6.13: AER conclusion — Asset growth factors (per cent)

	2009–10	2010–11	2011–12	2012–13	2013–14
Substations	0.1%	8.0%	2.5%	5.1%	0.5%
Transmission Lines	0.0%	7.6%	2.2%	1.4%	0.0%
Protection & Control	0.1%	9.8%	2.9%	6.3%	0.8%
Easements	0.0%	1.1%	4.1%	17.0%	14.9%
Land and buildings	33.5%	21.8%	0.0%	8.8%	0.0%
Total	**0.4%**	**7.8%**	**2.4%**	**3.7%**	**0.7%**

Source: Transend asset growth model.

6.5.6 Field operations and maintenance

Transend submitted that field operations and maintenance include the costs of managing and maintaining substations, protection and control, operational communications, transmission lines and easement. Table 6.14 shows the total field maintenance expenditure proposed by Transend.

Table 6.14: Transend's field operations and maintenance opex ($m, 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
Field operations and maintenance						
Substations	5.7	6.2	6.5	6.4	6.7	31.5
Protection and control	1.1	1.0	1.2	1.3	1.3	5.9
Operational communications	3.2	3.4	3.5	3.7	3.7	17.5
Transmission lines	4.3	4.7	4.4	4.7	5.3	23.4
Easements	2.3	2.3	2.4	2.4	2.5	11.8
Total	**16.5**	**17.7**	**18.0**	**18.5**	**19.5**	**90.1**

Source: Transend opex model.

Consultant review

WorleyParsons considered the methodology and resulting forecasts for field operations and maintenance reasonable. WorleyParsons also concluded that maintenance practices were in accordance with industry best practice and therefore prudent.[285]

AER considerations

The AER notes that Transend's base year expenditure is only slightly below the average expenditure incurred in field operations and maintenance. The AER also considers Transend's methodology to be appropriate—it utilises the Works Plan Management System (or works program)[286] to determine expenditure going forward.

The AER, however, has concerns about the growth assumptions being made within the asset growth model and therefore does not accept Transend's proposed estimate for field operations and maintenance. This is due to the proposed estimates for labour, materials and non labour escalators (as discussed in sections 6.5.4 and 6.5.5). The AER considers an estimate that reasonably reflects prudent field operations and maintenace expenditure to be $88.9 million over the next regulatory control period. Table 6.15 shows the total transmission services expenditure allowed by the AER.

Table 6.15: AER conclusion — Transend's field operations and maintenance opex ($m, 2008–09)

2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
16.4	17.5	17.8	18.2	19.0	88.9

Source: Transend opex model.

6.5.7 Transmission services

Transend submitted that transmission services expenditure includes the function associated with providing engineering and asset services, management of field operating and maintenance contracts, environment and safety management, asset condition monitoring and analysis and works planning and coordination.[287] It has forecasts these costs by extrapolating base year expenditures by asset growth, labour cost growth and non-labour cost growth. Table 6.16 shows the total transmission services expenditure proposed by Transend.

285 WorleyParsons, WorleyParsons report, op. cit., p. 186.

286 Within AMIS is a Works Plan Management system which recognises individual assets to which maintenance standards are to be applied. The works program system also includes capex plans for augmentation and connection works and provides a single integrated repository of all opex and capex costs from 2007/08 to 2013/14 and beyond.

287 Transend, operating expenditure cost templates assumption, p.4

Table 6.16: Transend's transmission services opex ($m, 2008–09)

2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
7.8	8.2	8.4	8.7	9.0	42.2

Source: Transend opex model.

Consultant review

WorleyParsons considered the methodology and resulting forecast to be reasonable.

AER considerations

The AER notes that Transend's base year expenditure is only slightly below the average expenditure incurred in transmission services in the current regulatory period. The AER also considers Transend's methodology to be appropriate—it forecasts these costs from a base year amount escalating them using asset growth, labour costs growth and non-labour cost growth (see sections 6.5.4 and 6.5.5 for discussions on escalators).

The AER, however, has concerns about the growth assumptions being made and therefore does not accept Transend's proposed estimate for transmission services. This is due to the proposed estimates for labour, materials and non labour escalators (as discussed in sections 6.5.4 and 6.5.5). The AER considers an estimate that reasonably reflects prudent transmission services expenditure to be $40.6 million over the next regulatory control period. Table 6.17 shows the total transmission services expenditure allowed by the AER.

Table 6.17: AER conclusion — Transend's transmission services opex ($m, 2008–09)

2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
7.6	7.9	8.1	8.4	8.5	40.6

Source: Transend opex model.

6.5.8 Transmission operations

Transmission operations involve 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 network. Table 6.18 shows the total transmission operations expenditure proposed by Transend.

Table 6.18: Transend's transmission operations opex ($m, 2008–09)

2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
5.1	5.3	5.5	5.7	5.9	27.6

Source: Transend opex model.

Consultant review

WorleyParsons considered the methodology and resulting forecast to be reasonable.

AER considerations

The AER notes that Transend's base year expenditure is only slightly above the average expenditure incurred in transmission operations in the current regulatory period. The AER also considers Transend's methodology to be appropriate—it forecasts these costs from a base year amount escalating them using asset growth, labour costs growth and non-labour cost growth (see sections 6.5.4 and 6.5.5 for discussions on escalators).

The AER, however, has concerns about the growth assumptions being made and therefore does not accept Transend's proposed estimate for transmission operations. This is due to the proposed estimates for labour, materials and non labour escalators (as discussed in sections 6.5.4 and 6.5.5). The AER considers an estimate that reasonably reflects prudent transmission operations expenditure to be $26.5 million over the next regulatory control period. Table 6.19 shows the total transmission operations opex allowed by the AER.

Table 6.19: AER conclusion — Transend's transmission operations opex ($m, 2008–09)

2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
5.0	5.2	5.3	5.5	5.6	26.5

Source: Transend opex model.

6.5.9 Asset management

Transend submitted that asset management expenditure includes the functions of operational activities that support the development and ongoing management of transmission assets. This includes asset strategy, customer management, grid planning, project initiation, regulation and compliance and system modelling and planning.[288] It has forecast these costs by extrapolating base year expenditures by asset growth, labour cost growth and non-labour cost growth. Table 6.20 shows the total asset management opex proposed by Transend.

[288] Transend, operating expenditure cost templates assumption, p.4

Table 6.20: Transend's asset management opex ($m, 2008–09)

2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
6.6	6.9	8.6	10.6	9.7	42.4

Source: Transend opex model.

Consultant review

WorleyParsons considered the methodology and resulting forecast to be reasonable.

AER considerations

The AER notes that Transend's base year expenditure is only slightly below the average expenditure incurred in asset management in the current regulatory period. The AER also considers Transend's methodology to be appropriate—it forecasts these costs from a base year amount escalating them using asset growth, labour costs growth and non-labour cost growth (see sections 6.5.4 and 6.5.5 for discussions on escalators).

The AER, however, has concerns with the growth assumptions being made and does not accept Transend's proposed estimate for asset management. This is due to the forecast estimates for labour, materials and non labour escalators (as discussed in section 6.5.4 and 6.5.5). The AER considers an estimate that reasonably reflects prudent asset management expenditure to be $40.9 million over the next regulatory control period. Table 6.21 shows the total asset management opex allowed by the AER.

Table 6.21: AER conclusion — Transend's asset management opex ($m, 2008–09)

2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
6.5	6.7	8.3	10.2	9.2	40.9

Source: Transend opex model.

6.5.10 Corporate

Corporate support costs include general corporate support and insurance.

General corporate support

Transend's corporate support costs include revenue reset costs which are removed from the base year estimate and directly included only in those years in which they will be incurred. The remaining corporate support costs are forecast by extrapolating the base year amount to reflect network growth and changes in labour and non-labour costs. Table 6.22 shows the total general corporate support expenditure proposed by Transend.

Table 6.22: Transend's corporate opex ($m, 2008–09)

2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
9.8	9.9	10.1	10.5	10.9	51.1

Source: Transend opex model.

Consultant review

WorleyParsons considered the methodology and resulting forecast to be reasonable.

Telecommuncation

Transend corporate forecast includes a provision for additional costs that it will incur in maintaining its telecommunication facilities in-house. [289] The AER has assessed these costs and has found them to be prudent. However, the AER also notes that Transend has advised that these costs are likely to change as a result of current negotiation between Transend and Hydro Tasmania.

AER considerations

The AER considers the corporate forecast methodology appropriately takes into account one off costs and changes to expenditures in the current regulatory period. Transend's adjusted base year expenditure (excluding insurance) is only marginally greater than the average expenditure over the current regulatory period.

The AER, however, has concerns with the growth assumptions being made and does not accept Transend's proposed estimate for corporate expenditure. This is due to the reduction in the estimates for labour, materials and non labour escalators (as discussed in section 6.5.4). The AER considers an estimate that reasonably reflects prudent corporate expenditure to be $49.7 million over the next regulatory control period.

Further, the AER notes the potential changes to corporate costs resulting from telecommunications and will review these costs if new information comes to its attention in a revised submission.

Insurance

Transend's corporate forecast includes an insurance estimate of $5.5 million.[290] This estimate was based on information provided by Marsh taking into account Transend's claims history, risk profiles and business growth.

Consultant review

WorleyParsons noted that the insurance cost forecast was developed by an insurance actuary and is consistent with costs in the current regulatory period.

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289 Transend currently contracts out its telecommunications to Hydro Tasmania but intends to purchase and manage its own facilities in the next regulatory control period.

290 Transend, Transend revenue proposal, op. cit., p. 114.

AER considerations

The AER notes that it has previously accepted insurance[291] cost forecasts on the basis of actuarial advice prepared for specific TNSPs, rather than extrapolating base year data. Using actuarial advice to prepare insurance cost forecasts recognises that the insurance market will be impacted by a number of factors, and TNSPs are essentially price takers in a global market.

Due to independent actuarial advice, the AER considers Transend's proposed insurance forecasts represent the costs a prudent operator in Transend's circumstances would reasonably require to meet the opex objectives in the next regulatory control period. Table 6.23 shows the total corporate opex proposed by Transend.

Table 6.23: AER conclusion — Transend's corporate opex ($m, 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
	9.6	9.7	9.8	10.1	10.4	49.7

Source: Transend opex model.

6.5.11 Self-insurance

Transend provided a board resolution to self insure for the following events:

- Network related events greater than $20,000 as defined below:
  - Losses for which insurance is commercially unavailable or excluded under a policy of insurance (e.g. 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
- Non-network property risks such as vandalism, theft and damage (loss events for insured risks below existing insurance policy deductibles).[292]

Marsh Risk Consulting Services (Marsh) undertook an actuarial assessment for Transend to calculate these risks.[293] This forms the basis for the quantification of the proposed self-insurance allowance included in Transend's forecast opex for the next regulatory control period.

Transend is proposing a self-insurance allowance of $3.9 million ($2008-09) for the next regulatory control period.

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[291] AER, *Powerlink Queensland transmission network revenue cap 2007–08 to 2011–12: Draft decision*, 8 December 2006, p. 141.

[292] Transend, Transend revenue proposal, op. cit., Appendix 21—Marsh, *Transend self-insurance risk quantification report*, May 2008.

[293] ibid.

Consultant review

In its report, WorleyParsons did not comment on specific components of Transend's self-insurance proposal for the next regulatory period. However, WorleyParsons noted that the self-insurance expenditure for the current regulatory control period (relating to remedial foundation works for six transmission towers affected by "uninsurable"[294] sink hole problems) was reasonable and indicative of a well run organisation.

AER considerations

The AER has assessed Transend's self-insurance claims to determine whether the proposed allowances reasonably reflect the prudent and efficient costs of self-insurance in the context of the opex objectives.

The AER considers that to be eligible for self-insurance an event must be insurable. An insurable event involves a risk that is predictable and measurable to be able to estimate the amount that needs to be set aside to provide for future uncertain probable losses. In addition, for a risk to be insurable:

- it must not represent an exposure to catastrophic loss for the insurer. The insurer must be able to charge a premium high enough to cover not only claims expenses, but also to cover the insurer's expenses
- the loss should be random in nature (not under the control of the insured), to prevent intentional losses.

In this context, the AER considers that a self-insurance allowance is prudent and efficient if it satisfies the above criteria.[295] In particular, the probability of an event occurring and the costs associated with the event (and therefore the associated insurance premium) must have been reasonably determined.

If these conditions have not been met, the AER considers that the insurability of the event has not been demonstrated and the claim for self-insurance has therefore been rejected.

Having reviewed the analysis by Marsh and the assessment by WorleyParsons, and having consulted with Transend on particular aspects of the self-insurance proposal, the AER is satisfied that Transend's proposed allowances for self-insurance for the most part meet the above criteria. Therefore the AER considers that they reasonably reflect the prudent and efficient costs of self-insurance in the context of the opex objectives.

The AER raised with Transend its concerns regarding WorleyParsons' statement that sinkhole problems were "uninsurable". If sinkholes are indeed uninsurable, its inclusion in Transend's self-insurance proposal would not satisfy the AER's criteria for self-insurance. Transend clarified that sinkhole problems are insurable in that it involves a risk that is sufficiently predictable and measurable to be able to estimate

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[294] WorleyParsons, WorleyParsons report, op. cit., p.177.

[295] Insurance is not effective for risks that are not insurable. For example, risks that are not measurable, if insured, will be difficult for the insurer to quantify, and thus the insurer is unable to charge the correct premium.

the amount that needs to be set aside to provide for future uncertain probable losses.[296] However, underwriters approached by Transend generally do not offer to insure this type of risk or propose an excessive premium. The AER accepts this further explanation and hence, has allowed the inclusion of self-insurance for sinkhole problems.

The AER does not consider that Transend's proposed self-insurance premiums are prudent and efficient with respect to the amounts attributed to terrorism/terrorist attack. Whilst the AER was concerned that the premium may not present a realistic expectation of the costs of self-insurance required in the next regulatory control period, after further investigation no adjustments has been made. This is discussed further below.

Terrorism/terrorist attack

Transend faces the risk that a malicious and deliberate act of sabotage by way of terrorism or terrorist attack is undertaken by a third party. This would impact on Transend's ability to provide transmission services, and/or the costs associated with providing such services.

Appendix 21 to the revenue proposal indicates that a terrorism event is covered under the premium for "Damage to substations", which includes 6 other risk categories, and "Liability risks", which include a number of risk categories and subcategories. Transend also advised that a terrorism event is one of the events covered by the proposed $125k in respect to under-deductible exposure to major events.[297] However, neither Marsh nor Transend were able to provide to the AER the weightings or amounts of the self-insurance proposal attributable to a terrorism event.

Under the NER a terrorism event is a defined pass through event.

Given the difficulty associated with calculating a risk premium for a terrorism event and that a terrorism event is listed as a defined pass through event under the NER, the AER considers that the claim for self-insurance should be rejected.

The AER notes that, in the case of the self-insurance premium for "damage to substations", terrorism is one of seven events for which Transend propose to self-insure. It is, however, the only category of event for which there is no prior experience on which to base an estimate of likely claims. The AER has considered the premium estimates for those categories that have been explicitly priced and notes that the dominant costs are related to transformers, equipment failure and to physical events. These items account for the bulk of the premium claimed. The AER accepts Transend's advice when it stated that no separate allowance associated with a terrorism event was included in the proposal and this element is not a material component of the total amount claimed for other insured events. The AER considers in these circumstances that the cost of further investigating the component of the self-insurance proposal attributable to a terrorism event would be greater than any likely

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[296] Transend, Response to information request No. 264, self-insurance, submitted 11 October 2008.

[297] Transend, Transend revenue proposal, op. cit., Appendix 21—Marsh, *Transend self-insurance risk quantification report*, May 2008, p.17.

savings. For these reasons, the AER proposes to make no adjustment to the self-insurance allowance despite rejecting the component attributable to a terrorism event. However, Transend/Marsh are to erase the words "terrorism" or "terrorist attack" (or other related words) from Appendix 21 in keeping with the AER's assessment that a risk premium for a terrorism event is difficult to quantify and that a terrorism event is a pass through event under the NER.

6.5.12 Network support

Transend submitted that its network support costs are based on an estimate of the costs to provide network support services that are required to manage two existing transmission network constraints associated with the Liapootah- Chapel Street and Chapel Street-Ridson transmissions lines.[298] Transend forecast its network support costs based on an existing service provider contracts, that includes fixed and variable cost components.

AER considerations

Under the NER, network support pass-through adjustments will be made for the difference between allowed and actual network support payments.

Given the AER's assessments in 2005 and 2007 of this arrangement with Hydro Tasmania[299], the AER accepts the proposed network support payment to be incorporated into the forecast opex allowance for the next regulatory control period.

6.5.13 Debt raising costs

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

According to the Allen Consulting Group (ACG) the debt raising cost being considered should be the transaction cost of re-financing fixed rate bonds to the value of the notional gearing component of the regulated firm's regulatory asset base (RAB) only.[300] The allowed debt benchmark does not relate to:

- acquisitions by the regulated firm
- non-core construction or investment activities that are being undertaken.

Therefore, the transaction costs associated with the benchmark cost of debt should not relate to activities outside of the re-financing of bonds for the regulated firm's core activities.[301]

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[298] Transend, Transend revenue proposal, op. cit., p.90.

[299] Letter from Sebastian Roberts, ACCC, to Steven Clarke, Transend, dated 8 March 2005 and letter from Chris Pattas, AER, to Michael Green, Transend, dated 27 April 2007.

[300] Allen Consulting Group, *Debt and equity raising transaction costs: final report to the ACCC*, December 2004.

[301] Allen Consulting Group, *Debt and equity raising transaction costs: final report to the ACCC*, December 2004, p. 5.

Transend engaged Competition Economists Group (CEG) to advise it on appropriate costs of raising debt.[302] CEG recommended that the cost of raising debt be set by reference to both direct and indirect costs.

- direct costs—the direct fees charged by the underwriter, credit rating agency and so on
- indirect costs—the cost of issuing capital at a discount in the market to sell it.

CEG recommended that the unit cost of raising debt be set at least equal to 15.5 basis points per annum (bppa) of the amount of debt to be raised.[303] Of this unit cost of 15.5 bppa, 3.0 bppa is included for indirect costs and the remainder represents the direct costs. This margin results in Transend's proposing a debt raising cost allowance of $5.4 million ($2008–09) for the next regulatory control period.[304] Table 6.24 shows the resulting debt raising cost allowance proposed by Transend for the next regulatory control period.

Table 6.24: Transend's proposed debt raising cost allowance ($m, 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013-14	5 years Total
Debt raising cost	0.9	1.0	1.1	1.2	1.2	5.4

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 123.

CEG noted that the yield to maturity on debt issued by private placement is at least 19 basis points higher than debt issued by public placement. CEG argued that it is a form of cherry-picking for the AER to set interest rates based on debt issued publicly and to restrict debt raising cost estimates to evidence of direct costs in private placement markets by ignoring the higher indirect costs of raising debt in this manner.

Submissions received

The Energy Users Association of Australia (EUAA) argued that it is inappropriate to make allowances for debt raising costs as Transend has simplified debt management arrangements with all borrowings executed with Tascorp (except overdraft and credit card facilities) such that costs are already included in Transend's reported operational expenditure and any additional allowance would be double counting.

Rio Tinto Alcan (RTA) submitted that Transend's debt raising costs of $5.4 million over the regulatory period (for a benchmark cost of debt raising of 15.5 basis points) is too high and that recent AER decisions have assumed a debt raising cost of 8.1 to 8.5 basis points.

[302] Transend, Transend revenue proposal, op. cit., Appendix 19—Competition Economists Group, *Nominal Risk Free Rate, Debt Risk Premium and Debt and Equity Raising Costs for Transend*, May 2008.
[303] Transend, Transend revenue proposal, op. cit., p. 123.
[304] ibid.

AER considerations

As public debt issuance costs are not observable in the Australian market, a proxy is necessary. The CEG report stated "Livingston and Zhou (2002) find underwriter fees for private placements are not significantly different to public placements," and, therefore, private debt raising (issuance) costs are an appropriate proxy.[305] ACG in its 2004 report for the ACCC also argued that private underwriting costs are a fair proxy for public debt underwriting costs on the basis of the 2002 Livingston and Zhou study.[306] The AER agrees with these independently expressed views and uses private debt raising (issuance) costs as a proxy to set an allowance for public debt issuance costs.

Overall, the AER is using the best estimate of the debt risk premium on the chosen benchmark firm combined with the best estimate of the debt issuance costs on this benchmark firm. The AER considers that there is no inconsistency or under compensation to firms from using this approach.

CEG's proposed use of the yield from private debt is inconsistent with the efficient benchmark regulated firm that is assumed to be able to issue BBB+ public corporate debt to raise its debt capital.

The current assumption used by the AER is that the benchmark efficient firm operates at a BBB+ credit rating with 60:40 debt to equity ratio. It is implicit in the use of this benchmark that the firm can issue public corporate debt in the market at a BBB+ rating and at the average yield to maturity (YTM) associated with BBB+ public bonds. If firms effectively issue at a higher yield than BBB+, for example due to underpricing the debt, the firms are effectively issuing higher yielding, lower grade debt than they need to and they should meet any additional costs associated with such a sub-optimal practice. The proposed underpricing premium is therefore inconsistent with the assumed BBB+ benchmark and would suggest a lower level of capital efficiency by the firm.

CEG also argued that it is reasonable to assume BBB debt will be more underpriced than the average investment grade debt. CEG has, however, not provided any supporting evidence that BBB+ or even BBB debt is on average issued at a discount (underpriced).

The Saunder, Palia and Kim (2003) working paper uses debt issues in the United States over the period from 1970 to 2000. In addition, certain firms were excluded from the sample used by the author including all firms in regulated industries. The working paper cited by CEG also does not support the argument that Australian regulated firms are under compensated for the following reasons:

- There is no evidence that the average debt issuance costs of the average US firm is representative of the debt issuance costs of a stable regulated business in

[305] Transend, Transend revenue proposal, op. cit., Appendix 19—Competition Economists Group, *Nominal Risk Free Rate, Debt Risk Premium and Debt and Equity Raising Costs for Transend*, May 2008, p. 18.

[306] Allen Consulting Group, *Debt and Equity Raising Transaction Costs: Final Report*, December 2004 Report to the Australian Competition and Consumer Commission, p 19.

Australia. This is even more clearly the case with all regulated firms excluded from the sample used.

- Secondly, the working paper indicates that the lowest fifth percentile of firms pay a fraction of the debt issuance costs of the average firm. Using a mean estimate of firms across an economy to estimate debt issuance costs for regulated firms does not appear to be reasonable, given regulated firms have among the lowest cost of debt raising. It is also inconsistent with the benchmark used to set the costs of debt generally discussed above.

The current approach of the AER to use private debt issuance costs for Australian companies accessing the private debt markets is therefore a better reflection of public debt issuance costs of Australian firms than the study CEG cited by Saunders, Palia and Kim. On the basis of the information put forward, the AER is not satisfied that there is a need to provide indirect debt raising costs under the benchmark regulatory framework. Accordingly, the AER will maintain its current approach of providing benchmark debt raising costs in accordance with the ACG methodology as applied in previous revenue determinations.

Under this methodology, the ACG based its benchmark on debt raising costs applicable to Australian international bond issues and joint Australian market/international issues and found that the benchmark decreases as the number of bond issues increase.

In developing the benchmark, the ACG calculated a gross underwriting fee benchmark of 5.5 bppa based on a 5-year term. To this, it added allowances for legal and roadshow expenses; credit rating fees for the firm and for each issue of bonds; and registry and paying charges. The median bond issue size was determined to be $175 million.

In accordance with the ACG methodology, the AER updated the gross underwriting fee and bond issue size benchmarks using recent publicly available data. This resulted in the gross underwriting fee increasing from 5.5 bppa to 6.0 bppa and the median bond issue size increasing from $175 million to $200 million.[307] Table 6.25 shows the updated build up of debt raising costs and the total benchmark for various bond issues, based on the ACG's methodology.

Table 6.25: Benchmark debt raising costs for corporate bond issues

Fee	Explanation/source	1 issue	2 issues	3 issues	4 issues
Amount raised	Multiples of median bond issue size	$200m	$400m	$600m	$800m
Gross underwriting fees	Bloomberg for Australian internal issues, term adjusted	6.0	6.0	6.0	6.0
Legal and	$75k–$100k: industry sources	1.0	1.0	1.0	1.0

[307] The latest update by the AER indicates that the gross underwriting fee and median bond issue size have not changed.

roadshow					
Company credit rating	$30k–$50k (once off): S&P ratings	2.5	1.3	0.8	0.6
Issue credit rating	3.5 (2.5) basis points up front: S&P ratings	0.7	0.7	0.7	0.7
Registry fees	$3k/issue: Osborne Associates	0.2	0.2	0.2	0.2
Paying fees[a]	$1/$1m quarterly: Osborne Associates	0.0	0.0	0.0	0.0
Total	**Basis points per annum**	**10.4**	**9.2**	**8.7**	**8.5**

(a) Rounded to one decimal place.
Source: AER update of ACG, *Debt and equity raising transaction costs: final report to the ACCC*, December 2004.

Transend has an opening RAB of $987 million and an assumed benchmark gearing ratio of 60:40. The notional debt component of Transend's opening RAB is therefore around $592 million. Based on the ACG methodology, this debt size would require around three bond issues. As such, the AER considers that an allowance of 8.7 bppa for debt raising costs is a reasonable benchmark for Transend. Using the PTRM, this benchmark is multiplied by the debt component of Transend's opening RAB to provide an average allowance of $0.6 million per annum ($2008–09). Table 6.26 shows the AER's conclusion on the debt raising cost allowance for Transend.

Table 6.26: AER's conclusion on debt raising costs ($m, 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013–14	5 years Totals
Debt raising allowance	0.5	0.6	0.6	0.7	0.7	3.0

The AER considers this revised debt raising forecast represents the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the opex objectives in the next regulatory control period.

6.5.14 Equity raising costs

An entity incurs equity raising costs when it raises equity capital. These costs may include legal and brokerage fees, and marketing costs. For initial equity raising costs, the fundamental question is whether the RAB has already been determined. For utilities, costs for raising subsequent equity capital have generally been for acquisition activities outside the regulated business. The need for access to external equity funds would generally not be expected if the entity were financed in a manner consistent with regulatory benchmark assumptions.

According to the 2004 ACG report, firms finance subsequent capex in the least-cost manner.[308] That is, financing is sourced from retained earnings when possible and that debt financing is preferred to equity financing (this relates to the 'pecking order theory' of capital structure). External equity financing for subsequent capex should be considered only when a case is made that the retained earnings and additional borrowings are insufficient provided that the gearing ratio and other assumptions about financing decisions are consistent with regulatory benchmarks.

Transend stated that CEG has provided evidence from listed Australian businesses to suggest that a benchmark regulated utility would optimally maintain a dividend yield of 8.0 per cent even if it were raising significant equity capital. Transend proposed to adopt CEG's advice in estimating the amount of equity capital to be raised.

Similar to the cost of raising debt, CEG considered that equity raising costs must capture both direct and indirect costs of raising equity. CEG recommended that the unit cost of raising equity be set at 7.6 per cent of the amount of equity to be raised. Transend has proposed an equity raising cost allowance of $12 million ($2008–09) for the next regulatory control period.[309]

CEG state that exactly the same issues as those that relate to debt raising costs arise with respect to equity raising costs. Therefore, "any attempt to measure equity raising costs must capture both direct and indirect costs of equity raising."[310]

CEG argued that the AER's base equity issuance costs on advice from ACG only estimates the direct costs of raising equity. Therefore, CEG stated that "the current 3 per cent allowance for seasoned equity issues is too low given the substantial evidence of underpricing in the academic literature".[311]

Transend's proposed equity raising costs also includes equity raising costs in relation to its initial RAB.

Table 6.27 Transend's proposed equity raising cost allowance ($m, 2008–09)

	2009–10	2010–11	2011–12	2012–13	2013-14	5 years Total
Equity raising allowance	2.4	2.4	2.4	2.4	2.4	12.0

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 124.

[308] Allen Consulting Group, *Debt and equity raising transaction costs: final report to the ACCC*, December 2004, p. ix–xii.
[309] Transend, Transend revenue proposal, op. cit., p. 124.
[310] Transend, Transend revenue proposal, op. cit., Appendix 19—Competition Economists Group, *Nominal Risk Free Rate, Debt Risk Premium and Debt and Equity Raising Costs for Transend*, May 2008, p. 22.
[311] ibid.

Submissions

The EUAA argued that it is inappropriate to make allowances for equity raising costs as Transend has issued only 4 shares to the Minister for Energy and Treasurer and incurs no equity raising costs.

RTA submitted that Transend is not in the same position as ElectraNet and SP AusNet and is therefore not entitled to the same treatment with respect to the addition of equity raising costs associated with the RAB.

The Major Employers Group (MEG) argued that equity raising costs should be disallowed by the AER.

AER considerations

Indirect cost of raising equity

The AER accepts that underpricing is likely to exist for both initial public offerings and seasoned equity offerings (SEOs) but does not agree with CEG's proposal that this underpricing or indirect costs need to be included in the benchmark equity raising (issuance) costs allowed in a revenue determination. Even if underpricing for equity raising exists, the AER considers that:

- no compensation is required for such costs because it would be inconsistent with the benchmark regulatory framework applied to determine the weighted average cost of capital (WACC)
- the efficient benchmark network service provider should be able to raise capital without incurring underpricing costs.

It is assumed by the AER that in setting a benchmark allowance for equity raising costs it is regulating a hypothetical efficient benchmark firm. The efficient benchmark firm should be a large listed firm and while firms may operate under different structures to this they should not be compensated for any deviation from the benchmark.

The efficient benchmark firm is able to raise new capital with an SEO.[312] Where a firm can undertake an SEO, it can use a rights issue where the firm offer shares at a discount to its existing shareholders. This is the most common practice for SEOs. In a rights issue, even though the shares are offered at a discount, the firm's existing shareholders benefit from the entire discount and there is no true underpricing cost from this practice (i.e. there is no wealth transfer to new shareholders or loss by existing shareholders). If the existing shareholders do not wish to further invest in the firm they can usually sell their rights (as rights are normally tradable/renounceable and the issuing firm has the option of making them renounceable), or alternatively they can sell some of their shares to the value of the new investment. When viewed in this context, underpricing does not result in a loss of the firm value and therefore should not be compensated for.

[312] In relation to Government owned businesses, the guiding principle is that they should be treated the same under competitive neutrality and therefore assumed to be an efficient listed private enterprise that can raise equity through SEOs.

The efficient benchmark firm is also assumed to be able to raise capital by offering a given return (the awarded WACC). This rate of return implicitly includes compensation for all systematic risk. Therefore, the efficient benchmark firm already includes full compensation and an underpricing allowance—an extra form of compensation for risk for new investors—is not required. The allowed WACC is already determined to be sufficient to induce new investment, and further compensation is unnecessary and inconsistent with the assumptions of the benchmark regulatory framework and the use of the capital asset pricing model (CAPM). Importantly, the CAPM assumes all investors have the same required return and as such there should be no allowance for underpricing for new investment under this approach.

Finally, CEG has also implicitly argued that as underwriting and underpricing are substitutes, the expected underpricing 'cost' should be paid. This is based on the argument that greater (lesser) underpricing leads to lower (greater) underwriting fees. In relation to this the AER considers that, for traditional underwriting, where the underwriter effectively sells a put option to the issuing firm over some or all of the issue, there is likely to be an inverse relationship between the level of underpricing and the underwriting fee. This is because the lower the strike price on the underwriting option, the lower the probability that the underwriter will incur losses associated with the exercise of the option and therefore the resulting underwriting fee charged.

However, having reviewed equity issuance allowances the AER considers that there are actually strong arguments that the option component of the underwriting fee should not be paid. This is because the underwritten firm should expect to get a payoff with a present value equal to the fair value of the option. Therefore, if anything, CEGs argument appears to support the proposition that the current estimate of direct equity issuance costs should be reduced by the fair value of the option component of the underwriting fee. However, the magnitude of such an adjustment, if required, is yet to be resolved. These matters are the subject of further analysis and investigation by the AER.

Accordingly, the AER has not adjusted the current cost of seasoned equity offering allowances downwards to account for the option component of the underwriting fee in this draft decision.

Based on the information submitted, the AER is not satisfied that there is a need to take account of indirect unit cost of raising equity under the benchmark regulatory framework. Accordingly, the AER will maintain its current approach of using the direct unit cost of raising equity to determine a benchmark equity raising cost allowance when a case for external equity financing associated with forecast capex has been established. The AER notes that claims for indirect costs of equity raising have been considered and rejected by the UK regulator Office of Gas and Electricity Markets (OFGEM).[313]

[313] Office of gas and electricity markets, OFGEM, '*Transmission price control review: Final proposals'*, 4 December 2006, p. 59.

Equity raising requirement—cash flow analysis

The AER has reviewed the CEG analysis of Transend's benchmark cash flows to establish the requirement for equity raising costs associated with the equity component of its forecast capex over the next regulatory control period. The methodology applied to determine benchmark equity raising costs is summarised by the following steps:

- revenues less expenses (including opex, interest payments and tax) provides the internal cash flow
- internal cash flow less dividends to shareholders provides the retained cash flow
- retained cash flow is used to fund the equity component of capex
- unused retained cash flow, consistent with the pecking order theory, is carried over to the following year to fund the equity component of capex
- equity component of capex less retained earnings (where it is insufficient) indicates the additional equity required
- equity raising cost is calculated by multiplying the additional equity required with the assumed benchmark transaction cost for subsequent issues (discussed below).

This cash flow approach to determining an allowance for equity raising costs was considered by the AER in its recent ElectraNet, SP AusNet and Powerlink transmission determinations to be reasonable and consistent with the principles of benchmark financing arrangements, subject to some adjustments.[314] Similar adjustments are required to Transend's proposed cash flow modelling:

- 'depreciation' should be referenced to nominal straight-line depreciation (as specified in row 322 of the 'assets' sheet of the PTRM).
- 'interest payment' should be directly referenced to row 52 of the 'analysis' sheet of the PTRM which is labelled 'interest payments'.

Further, the AER accepts Transend's proposal to use 'smoothed' rather than 'unsmoothed' revenue (which is based on the timing of costs) in the cash flow analysis as this reflects the expected revenues that Transend will receive.

The main issue in contention with the cash flow analysis is the assumed amount of dividend payments. The AER has previously assumed a dividend yield of 3.5 per cent, which was based on the average dividend yield of a sample group of Australian companies that were expecting to undertake large capital expenditure programs.[315][316]

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[314] For example, see AER, *Powerlink Queensland transmission network revenue cap 2007–08 to 2011–12: Decision,* 14 June 2007, p. 99–102.

[315] The AER's cash flow analysis has used RAB value as a proxy for market value to apply the dividend yield assumption.

CEG advocated a dividend yield of 8.0 per cent, based on the ACG methodology submitted on behalf of ElectraNet in their 2008 revenue determination.

The AER has reflected on the use of the dividend yield in the cash flow analysis and notes the following weaknesses with making assumptions about the dividend yield:

- There is a lack of directly comparable firms from which to develop an average dividend yield. While the firms included in the UBS high yield utilities may bear similar characteristics to regulated TNSPs, it is not clear that they are all planning large capital works beyond normal capital expenditure levels. Further some of the sample firms employ trust company structures which are inconsistent with the benchmark company structure assumed for regulatory purposes.

- Dividend payments are made infrequently, generally only twice per annum. The dividend yield assumption is dependent on the market value of the company's equity. For publicly listed firms, this is taken to mean the share price. As the market value of equity may be volatile, reported dividend yields vary from day to day and are beyond the control of a company's management. Furthermore, dividend yields tend to be reported as the most recent 12 months of dividend payments divided by the current share price.

It should also be noted that when CEG's recommended dividend yield assumption is applied to the cash flow analysis using the correct depreciation measure, the resultant payout ratio is unsustainable at well over 100 per cent of net profit after tax. This is clearly an unreasonable set of assumptions.

The AER considers that these problems with the use of the dividend yield outlined above can be overcome by altering the assumptions in the cash flow analysis. Specifically, it is possible to make an assumption with respect to the dividend payout ratio rather than the dividend yield. The dividend payout ratio is the result of an explicit management decision rather than a potentially volatile market measure. It is also a more direct method to establish the amount of retained earnings available for investment and therefore the remaining amount required to be raised as equity. The assumption on the appropriate dividend payout ratio can be made so that the dividend payout ratio is consistent with the gamma value required by the NER.

One could argue that investors expect stable returns in the form of dividends and for that reason management choose an absolute dividend value rather than a portion of profits. Such a strategy could be used to smooth over fluctuations in profit from year to year. However, regulated TNSPs typically earn very stable revenues which mitigate year to year fluctuations that may be observed by the broader market. In other words, there is likely to be little difference in the dividends of a regulated TNSP between specifying the dividend amount and specifying the dividend payout ratio.

Accordingly, the AER has decided to amend the cash flow analysis to rely on the assumption of a given dividend payout ratio rather than a given dividend yield. For

[316] AER, *Powerlink Queensland transmission network revenue cap 2007–08 to 2011–12: Decision*, 14 June 2007, p. 99–102.

the purposes of this draft decision, the AER acknowledges a 70 per cent payout ratio can be considered as consistent with clause 6A.6.4(a) of the NER, which deems the assumed utilisation of imputation credits to be 0.5.[317] Further, such a payout ratio is consistent with sound management of the benchmark TNSP as a going concern—as opposed to implicitly applying a dividend payout ratio in excess of 100 per cent of earnings.[318]

Based on the capex allowance in this draft decision, the benchmark cash flow analysis indicates that Transend would be able to fund its capex program over the next regulatory control period with retained cash flows and therefore did not require additional equity finance, as shown in table 6.28. The AER does not consider Transend's proposed equity raising costs represent the efficient costs that a prudent operator in Transend's circumstances would require to meet the opex objectives in the next regulatory control period. Accordingly, the AER will not provide Transend an allowance for equity raising costs for the next regulatory control period.

Table 6.28: Benchmark capex funding requirement ($m, nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
Capital expenditure funding	**163.9**	**181.1**	**112.8**	**110.7**	**112.6**	**681.1**
Debt funding component	98.4	108.7	67.7	66.4	67.5	408.7
Equity funding component	65.6	72.5	45.1	44.3	45.0	272.5
Less: retained cash flows	54.2	58.4	61.4	67.3	74.9	316.1
Additional equity requirement	**11.4**	**14.1**	**–16.3**	**–23.1**	**–29.8**	**–43.7**

Note: Negative sign for the additional equity requirement row indicates that there are sufficient retained cash flows to finance the equity component of capex.

Equity raising costs for the value of the initial RAB

The AER notes that the RAB for Transend is set in schedule 6A.2.1 of the *NER* at $603.6 million as at December 2003.

[317] This observation was made in the ACCC's 2004 draft decision for TransGrid, which informed the ACCC's view that the assumed utilisation of imputation credits be 0.5 in the 2004 Statement of Regulatory Principles (SRP). It is also supported by a more recent estimate of the franking credit payout ratio contained in Hathaway and Officer, *The value of imputation tax credits – update 2004*, Capital Research Pty Ltd, November 2004. Matters relating to the assumed utilisation of imputation credits are currently under consideration in the context of the AER's WACC review to be finalised in March 2009.

[318] As noted, this is the outcome of assuming an 8.0 per cent dividend yield with corrected cash flow analysis that uses the correct measure of depreciation.

Transend's proposal refers to the most recent 2008 AER decisions in relation to ElectraNet and SP AusNet in respect of equity raising costs for the value of the initial RAB and states that its "circumstances prior to the ACCC's 2003 revenue cap decision were identical to those of ElectraNet and SP AusNet".[319]

The AER does not consider this to be the case. The circumstances surrounding ElectraNet and SP AusNet prior to the 2003 decision were different. In relation to the 2008 ElectraNet and SP AusNet decisions the issue was whether the RAB was established or 'locked in' and whether equity raising costs were allowed when the initial asset base was set and consequently whether the RAB was established inclusive or exclusive of equity raising costs.

In the 2008 SP AusNet decision the AER allowed equity raising costs in operating expenditure relating to its initial asset base on the basis new evidence presented by SP AusNet from ACG[320] dated October 2007 suggested it was set exclusive of equity raising costs.[321] Providing such costs in operating expenditure was also consistent with the (2002) revenue decision which provided an allowance for such costs in perpetuity.

The further ACG advice dated October 2007 followed the ACCC's 2004 engagement of ACG to undertake a review of the legitimacy of regulated utilities recovering equity raising costs and the benchmark value of such costs. ACG concluded that where the initial asset base has already been established and has been used to determine revenues based on the building block approach, equity raising costs must be considered to already be included.[322] The findings of this review have subsequently been consistently applied in AER decisions where the initial asset base has already been established and an operating expenditure allowance for equity raising costs has not been provided.[323] ACG's further advice on SP AusNet in October 2007 was particular to its circumstances and stated that ACG "stand by the advice we provided to the ACCC in 2004."[324]

In relation to the 2008 ElectraNet decision, the AER decided on the grounds of consistency following on from the SP AusNet decision to provide equity raising costs in relation to the initial value of ElectraNet's RAB. This was on the basis of similar circumstances where equity raising costs had been allowed in the previous (2002) revenue cap decision and the AER considering that the initial value of the RAB was

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[319] Transend, Transend revenue proposal, op. cit., p. 124.

[320] ACG, *SP AusNet draft decision: transaction cost of raising equity*, 12 October 2007, as found in 'Appendix O – ACG letter on equity raising costs', SP AusNet, *Electricity transmission revised* proposal 2008-09 – 2013-14, 12 October 2007.

[321] AER, *SP AusNet Victorian transmission network revenue cap 2008–09 to 2012–13: Decision*, 31 January 2008, p. 46-47.

[322] ACG, *Debt and equity raising transaction costs: final report to the ACCC*, December 2004, p. 61.

[323] See AER, *Powerlink Queensland transmission network revenue cap 2007–08 to 2011–12: Decision*, 14 June 2007, p. 97–98.

[324] ACG, *SP AusNet draft decision: transaction cost of raising equity*, 12 October 2007, p.3, as found in 'Appendix O – ACG letter on equity raising costs', SP AusNet, *Electricity transmission revised* proposal 2008-09 – 2013-14, 12 October 2007.

set exclusive of equity raising costs. In granting these equity raising costs to ElectraNet the AER elected to roll them into ElectraNet's RAB.[325]

In respect of Transend, the ACCC determined the initial asset base for Transend in accordance with clause 6.2.3(d) of the Tasmanian Electricity Code in its 2003 revenue cap decision. The AER notes that the valuation so determined was an acceptance of the Tasmanian Treasurer's valuation as at 30 June 2001.[326] This sum was then rolled forward by a number of adjustments to a value of $570 million at 30 June 2003. Following further adjustments the rolled forward value was set as $604 million at 31 December 2003. This process is fundamentally different to the basis on which the determinations for SP AusNet and ElectraNet were made. The AER considers that Transend's valuation was made inclusive of equity raising costs.[327] Also, at the time of the 2003 decision, the ACCC disallowed the proposed equity raising costs submitted by Transend.[328] It should also be noted that in the 2003 Transend revenue proposal that Transend did not apply to the ACCC for equity raising costs in relation to the value of its initial RAB.[329]

As noted the AER does not consider that Transend's circumstances are identical to that of SP AusNet, for whom the further ACG advice was prepared, and ElectraNet. Neither has Transend provided any evidence to suggest that the initial asset base was not inclusive of equity raising costs. On this basis it is not appropriate to retrospectively provide Transend with an allowance for equity raising costs associated with the value of Transend's initial RAB. The AER considers that this conclusion is consistent with the operating expenditure criteria, in that these costs do not satisfy clause 6A.6.6(c)(2) of the NER to reasonably reflect the costs that a prudent operator in the circumstances would require to achieve the operating expenditure objectives.

Whilst the outcome for Transend is different to that for SP AusNet and ElectraNet, the AER notes it results from the application of the same regulatory principles to different circumstances.

6.6 AER conclusion

The AER has considered Transend's forecast total opex of $281.4[330] million ($2008–09), and for the reasons outlined in this chapter is not satisfied that this total

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[325] AER, *ElectraNet transmission determination 2008–09 to 2012–13: Final decision*, 11 April 2008, p. 87–89.

[326] ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003, p. 26-7.

[327] The AER also notes the ACG advice that even if a valuation does not include equity raising costs a "locked in" value of the RAB should not be reopened to include an allowance. See ACG, *SP AusNet draft decision: transaction cost of raising equity*, 12 October 2007, p.3, as found in 'Appendix O – ACG letter on equity raising costs', SP AusNet, *Electricity transmission revised* proposal 2008-09 – 2013-14, 12 October 2007.

[328] ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003, p. 71-2.

[329] Transend, Revenue Cap Application 1 January 2004 to 30 June 2009, 14 March 2003, p. 84

[330] This figure was derived using the June 2008 quarter's CPI which was not available when transcend submitted its application.

opex forecast proposed by Transend reasonably reflects the opex criteria under clause 6A.6.6(c):

- the efficient costs of achieving the opex objectives
- the costs that a prudent operator in the circumstances of Transend would require to achieve the opex objectives, and
- a realistic expectation of the demand forecast and cost inputs required to achieve the opex objectives.

In drawing this conclusion the AER has had regard to the opex factors set out in clause 6A.6.6(e) of the NER.

As the AER is not satisfied that Transend's total forecast opex reasonably reflects the opex criteria, pursuant to clause 6A.6.6(d), the AER must not accept the forecast opex in Transend's revenue proposal. Therefore, the AER is required under clause 6A.14.1(3)(ii) to provide an estimate of the total opex that Transend will require over the next regulatory control period which the AER is satisfied reasonably reflects the opex criteria, taking into account the opex factors.

This revised estimate represents the AER's estimate of the total opex costs that a prudent operator in the circumstances of Transend would require to achieve the opex objectives. The AER is satisfied that the revised total forecast opex of $260.2 million over the next regulatory control period, reasonably reflects the opex criteria, taking into account the opex factors. This is shown by opex category in table 6.29.

Table 6.29: AER's conclusion on Transend's total opex allowance ($m, 2008–09)

Category	2009–10	2010–11	2011–12	2012–13	2013–14	5 years Total
Field operations and maintenance	16.4	17.5	17.8	18.2	19.0	88.9
Transmission services	7.6	7.9	8.1	8.4	8.5	40.6
Transmission operations	5.0	5.2	5.3	5.5	5.6	26.5
Asset management	6.5	6.7	8.3	10.2	9.2	40.9
Corporate	9.6	9.7	9.8	10.1	10.4	49.7
Total controllable expenditure	**45.1**	**47.0**	**49.4**	**52.3**	**52.7**	**246.6**
Network support	3.9	2.6	0.0	0.0	0.0	6.6
Debt raising	0.5	0.6	0.6	0.6	0.7	3.0

Equity raising	0.0	0.0	0.0	0.0	0.0	0.0
Self-insurance	0.8	0.8	0.8	0.8	0.8	4.0
Total Operating expenditure	**50.3**	**51.0**	**50.9**	**53.8**	**54.2**	**260.2**

Note: Transend's opex model was adjusted with the June 2008 CPI numbers which were not available when Transend submitted its application.

Table 6.30 sets out the AER's adjustments to Transend's forecast controllable opex allowance. These adjustments are derived from the opex model, and represent the consolidated impact of all the modelling corrections agreed by Transend and further adjustments reflecting the AER's conclusion on an efficient opex allowance. The AER notes that it will again review the escalators used herein before concluding its final decision and make further adjustments where necessary to reflect changed economic circumstances.

Table 6.30: AER's adjustments to Transend's controllable opex ($m, 2008–09)

	2008–09	2009–10	2010–11	2011–12	2012–13	5 years Total
Transend's proposed controllable opex	**45.9**	**48.0**	**50.6**	**54.0**	**55.0**	**253.4**
Adjustment to field maintenance and operations	–0.1	–0.2	–0.2	–0.3	–0.5	–1.2
Adjustment to transmissions services	–0.2	–0.2	–0.3	–0.4	–0.5	–1.6
Adjustment to transmission operations	–0.1	–0.2	–0.2	–0.2	–0.3	–1.1
Adjustment to asset manager	–0.2	–0.2	–0.3	–0.4	–0.5	–1.5
Adjustment to corporate	–0.2	–0.2	–0.2	–0.3	–0.5	–1.5
AER's adjusted controllable opex	**–0.8**	**–1.0**	**–1.1**	**–1.6**	**–2.3**	**–6.8**
Transend proposed uncontrollable opex	**8.0**	**6.9**	**4.3**	**4.4**	**4.4**	**28.1**
Adjustment to debt raising costs	–0.4	–0.4	–0.5	–0.5	–0.6	–2.4

Adjustment to equity raising costs	–2.4	–2.4	–2.4	–2.4	–2.4	–12.1
AER's adjusted uncontrollable opex	**–2.8**	**–2.8**	**–2.9**	**–2.9**	**–2.9**	**–14.4**
Total AER adjustments	**–3.6**	**–3.8**	**–4.0**	**–4.5**	**–5.3**	**–21.2**

Note: Total may not add up due to rounding.

7 Efficiency benefit sharing scheme

7.1 Introduction

This chapter sets out how the AER intends to apply its efficiency benefit sharing scheme (EBSS) to Transend. An EBSS aims to provide continuous incentives over time, to reward efficiency and penalise inefficiency, to focus on controllable costs and to ensure inappropriate capitalisation is avoided.

The AER published the EBSS under clause 6A.6.5(a) of the NER, which establishes that an EBSS will apply to Transend from 1 July 2009.[331] The scheme will not have a direct financial impact on Transend until the 2014–19 regulatory control period, when it will receive carryover benefits/penalties for efficiency gains/losses made during the next regulatory control period.

7.2 Regulatory requirements

Clause 6A.6.5(a) of the NER requires the AER to develop and publish an EBSS. An EBSS shares between TNSPs and transmission network users the efficiency gains or losses derived from the difference between a TNSP's actual opex and the forecast opex for a regulatory control period.

The EBSS carryover efficiency gains/losses for five years after the year in which the efficiency gain/loss is made. The calculation of efficiency gains/losses under the EBSS is outlined below.

The EBSS states that the AER will calculate an efficiency gain or loss in the first year of the regulatory control period using the following formula:

$$E_1 = F_1 - A_1$$

where:

A_1 = the actual opex incurred by the TNSP for year 1 of the regulatory control period

F_1 = the forecast opex accepted or substituted by the AER for that year in the relevant building block determination.

7.2.1 Subsequent years formula

Gains or losses that arise in the second and subsequent years of the regulatory control period will be calculated as:

$$E_t = (F_t - A_t) - (F_{t-1} - A_{t-1})$$

[331] AER, *Electricity transmission network service providers efficiency benefit sharing scheme*, September 2007.

where:

E_t = the efficiency benefit/loss in year t

A_t, A_{t-1} = the actual, or adjusted actual, opex incurred in years t and t–1 respectively

F_t, F_{t-1} = the forecast, or adjusted forecast, opex accepted or substituted for the years t and t–1 respectively.

7.2.2 Final year formula

The transmission determination for the next regulatory control period will be made by the AER prior to the completion of the current regulatory control period. For the purposes of the EBSS the AER will estimate the actual opex (A_5) required to calculate gains or losses for the final year of the next regulatory control period as follows:

$$A_5 = F_5 - (F_4 - A_4).$$

Where differences arise between this estimate and the actual expenditure amount of the final year, the efficiency gain or loss in the first year of the 2014–19 regulatory control period will be adjusted as follows:

$$E_6 = (F_6 - A_6) - (F_5 - A_5) + (F_4 - A_4).$$

Other provisions

The EBSS also makes provision for:

- adjustments to forecast opex allowances for the purpose of calculating carryover amounts to account for variations between forecast and outturn demand growth
- TNSPs to propose cost categories to be excluded from the operation of the EBSS.

7.3 Transend's proposal

The EBSS states that for the purposes of calculating carryover amounts, forecast opex should be adjusted for the cost consequences of the difference between forecast and actual demand growth over the regulatory control period. These adjustments should be made using the same relationship between growth and expenditure used in establishing the forecast opex. Transend did not discuss how it considered opex forecasts should be adjusted for actual demand growth at the end of the next regulatory control period when calculating carryover amounts.

The EBSS allows TNSPs to propose a range of additional cost categories to be excluded from the operation of the EBSS. The scheme requires that these cost categories must be proposed by a TNSP in its revenue proposal for the next regulatory control period. Transend proposed that pass through events, network support costs, debt raising costs, superannuation provisions, redundancy payments, equity raising costs and insurance and self-insurance costs should be excluded from the calculation of its efficiency benefits.

7.4 Submissions

The AER received no submissions on the application of the EBSS to Transend in the next regulatory control period.

7.5 Issues and AER considerations

7.5.1 Excluded cost categories

By default the EBSS excludes the costs of pass through events and non-network alternatives from the calculation of carryover amounts. In addition, the EBSS allows TNSPs to propose a range of additional cost categories to be excluded from the operation of the EBSS. The scheme requires that these cost categories must be proposed by a TNSP in their revenue proposal for the next regulatory control period.

Transend proposal

Transend proposed that pass through events, network support costs, debt raising costs, superannuation provisions, redundancy payments, equity raising costs and insurance and self-insurance costs should be excluded from the calculation of its efficiency benefits.

AER considerations

There are two factors that should be considered when assessing whether an opex category should be excluded from the EBSS. The first factor is whether or not the opex is controllable. The AER does not consider it appropriate for TNSPs to receive benefits or penalties through the EBSS for variances in its opex for cost categories over which it has no control.

The second factor is how actual expenditure for that cost category is used in setting opex forecasts for the following regulatory control period. The EBSS assumes that actual opex is used as a basis for setting future opex allowances. If this is not the case, for instance if opex forecasts for a given cost category were based on an external benchmark, the EBSS would not provide a continuous incentive to reduce opex.

On the basis of these two factors the AER considers it inappropriate to exclude from the operation of the EBSS for Transend over next regulatory control period the following opex cost categories:

- redundancy costs: The AER considers that redundancy payments are business decisions and hence are controllable costs. Consequently, the AER considers it is unreasonable to exclude them from the operation of the EBSS.

The AER considers it appropriate to exclude from the operation of the EBSS for Transend over next regulatory control period the following opex cost categories:

- debt and equity raising costs
- insurance and self-insurance costs
- superannuation provisions.

These are in addition to the costs of pass through events and non-network alternatives, which are explicitly excluded by EBSS.

The AER considers it appropriate that debt and equity raising costs be excluded from the operation of the EBSS on the basis that forecast costs are based on a benchmark efficient firm rather than the historical costs from Transend.

The AER recognises that insurance and self-insurance costs are, by their nature, uncontrollable to a significant extent. Consequently, the AER considers it reasonable that they be excluded from the operation of the EBSS.

The AER notes that a significant number of Transend's employees are members of defined benefit superannuation[332] schemes. Consequently, Transend's superannuation liabilities relating to these employees are impacted, among other things, by economic parameters used in calculating the current day-to-day liability for defined benefit superannuation provisions. Given that both of these factors are beyond the control of Transend, the AER considers it reasonable that superannuation costs be excluded from the operation of the EBSS.

7.6 AER conclusions

The AER will apply the EBSS to Transend for the next regulatory control period. In the event that actual demand growth is outside the range of scenarios modelled in the development of Transend's approved forecast capex and for the purposes of the EBSS, forecast opex should be adjusted based on the same models (opex and capex) used to develop Transend's approved forecast opex to incorporate the impact of actual demand growth on the commissioning of new assets.

The following opex cost categories will be excluded from the operation of the EBSS for the next regulatory control period:

- debt and equity raising costs
- insurance and self-insurance costs
- superannuation provisions.

These are in addition to the costs of pass through events and non-network alternatives, which are directly excluded by the EBSS.

The forecast controllable opex for Transend outlined in table 7.1 will be used to calculate efficiency gains and losses for the next regulatory control period, subject to adjustments required by the EBSS.[333]

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[332] Includes only superannuation provisions.

[333] AER, *Electricity transmission network service providers efficiency benefit sharing scheme*, September 2007, p. 7.

Table 7.1 Transend's forecast controllable opex for EBSS purposes ($m 2008/09)

	2009–10	2010–11	2011–12	2012–13	2013–14
Total forecast opex	**45.1**	**47.0**	**49.4**	**52.3**	**52.7**
Debt and equity raising costs	0.5	0.6	0.6	0.6	0.7
Insurance and self-insurance costs	1.7	1.8	1.9	2.0	2.1
Superannuation provisions	0	0	0	0	0
Non-network alternatives	3.9	2.6	0.0	0.0	0.0
Forecast opex for EBSS purposes	**39**	**42**	**46.9**	**49.7**	**49.9**

8 Service target performance incentive

8.1 Introduction

The AER's service target performance incentive scheme (the scheme) aims to encourage Transmission Network Service Providers (TNSPs) to maintain or improve the quality of service provided to customers. This chapter sets out Transend's proposal, WorleyParsons' review of Transend's proposal and the AER's considerations on the service target performance regime and values to be applied to Transend for the next regulatory control period.

Under a revenue determination regime, TNSPs can increase their profits for regulated activities by reducing their operating costs. Such cost reductions could result from efficiency gains or by allowing service levels to decline. The latter imposes costs on other market participants.

The scheme provides an incentive to TNSPs not to lower service levels when seeking to reduce operating costs and also to consider the interests of users when making operational management decisions. However, the AER acknowledges that the scheme should not encourage TNSPs to seek ongoing performance improvements where the costs of these improvements exceeds the benefits to users.

8.2 Regulatory requirements

8.2.1 NER requirements

Clause 6A.7.4 (a) of the NER requires the AER to publish a scheme that complies with the principles in clause 6A.7.4(b) of the NER.

The AER published the latest version of the service target performance incentive scheme on 7 March 2008.

8.2.2 Service target performance incentive scheme

The scheme sets out the parameters and sub-parameters that apply to Transend as well as the requirements for performance targets, caps, collars and other elements of the parameter definitions. The AER is required to assess Transend's proposed performance targets, caps, collars and other elements against the requirements of the scheme and the NER.

The AER's objectives, under clause 1.4, for the scheme are that it:

- contributes to the achievement of the national electricity objective
- is consistent with the principles in clause 6A.7.4(b) of the NER
- promotes transparency in the information provided by a TNSP to the AER and the decisions made by the AER
- 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 and reduce the market impact of transmission congestion.

8.2.3 Market impact of transmission congestion

The AER considered that two years of data was not a sufficient basis on which to develop a robust benchmark for Transend,[334] and therefore did not apply the market impact parameter to Transend for the forthcoming revenue reset.

8.3 Transend proposal

Transend's proposed performance targets, caps, collars, deadbands and weightings for each of the parameters that apply to it under the scheme are set out in table 8.1.

Table 8.1: Transend's proposed values and weightings

Parameter	Proposed values					
	Weighting	**Collar**	**Lower Deadband**	**Target**	**Upper Deadband**	**Cap**
Transmission circuit availability (critical)	20%	98.36%	98.94%	99.13%	99.32%	99.89%
Transmission circuit availability (non-critical)	10%	98.54%	98.95%	98.99%	99.03%	99.43%
Transformer circuit availability	15%	98.82%	99.23%	99.28%	99.33%	99.75%
Loss of Supply > 0.1 system minutes	20%	20	16	15	14	10
Loss of Supply > 1.0 system minutes	35%	5	3	2	2	0
Average outage duration (transmission lines)	0%	387	304	276	248	166
Average outage duration (transformers)	0%	1085	595	541	487	118

Source: Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, 31 May 2008, p. 137.

Transend's transmission system is comprised of a large number of sub-transmission assets operating at voltages of 6.6 kV, 11 kV, 22 kV, 33 kV and 44 kV. This has a direct impact on the parameters and proposed values that apply to Transend.

In September 2007, as part of finalising the Service Target Performance Incentive Scheme (STPIS) guidelines, Transend proposed changes to its parameters and sub-parameters for the forthcoming regulatory control period. These changes included separating the transmission line circuit availability sub-parameters into critical and non-critical, lowering the loss-of-supply frequency index threshold for large events from 2.0 system minutes to 1.0 system minute, and requesting that no weighting be applied to the average outage duration parameter due to the high level of variability in the data.

[334] AER, *Service target performance incentive scheme (incorporating incentives based on the market impact of transmission congestion): Explanatory Statement: Draft*, November 2007, p. 32.

Transend has proposed the following critical circuits:

Table 8.2: Transend's proposed critical circuits

Circuit ID	Voltage (kV)	Circuit Code	Circuit Name
E0026	220kV	LI-CS 2	Liapootah - Chapel Street
E0027	220kV	LI-CL-RE-CS 1	Liapootah - Chapel Street incl. Cluny & Repulse tee
E0028	220kV	GO-CS 1	Gordon - Chapel Street
E0243	220kV	GO-CS 2	Gordon - Chapel Street
E0244	220kV	LI-PM 1	Liapootah – Palmerston
E0249	220kV	LI-PM 2	Liapootah – Palmerston
E0259	220kV	PM-HA 1	Palmerston – Hadspen
E0260	220kV	PM-HA 2	Palmerston – Hadspen
E0291	220kV	PM-SH	Palmerston – Sheffield
E0403	220kV	SH-BU 1	Sheffield – Burnie
E0437	220kV	HA-GT 1	Hadspen - George Town
E0438	220kV	HA-GT 2	Hadspen - George Town
E0515	220kV	SH-GT 1	Sheffield - George Town
E0516	220kV	SH-GT 2	Sheffield - George Town
E0538	220kV	SH-FA 1	Sheffield – Farrell
E0539	220kV	SH-FA 2	Sheffield – Farrell
E0025	110kV	NN-CS	New Norfolk - Chapel Street
E0138	110kV	TA-NN 1	Tarraleah - New Norfolk
E0139	110kV	TA-NN 2	Tarraleah - New Norfolk
E0163	110kV	TA-TU 1	Tarraleah – Tungatinah
E0164	110kV	TA-TU 2	Tarraleah – Tungatinah
E0171	110kV	TU-LE-WA 1	Tungatinah - Waddamana incl. Lake Echo tee
E0173	110kV	TU-LE-WA 2	Tungatinah - Waddamana incl. Lake Echo tee
E0264	110kV	PM-HA 4	Palmerston – Hadspen
E0270	110kV	PM-HA 3	Palmerston – Hadspen
E0275	110kV	WA-PM 2	Waddamana – Palmerston
E0441	110kV	HA-TR 1	Hadspen – Trevallyn

E0442	110kV	HA-TR 2	Hadspen – Trevallyn

Source: Transend proposed critical circuits for the Service Target Performance Incentive Scheme.

8.4 Submissions

The AER received a submission from Rio Tinto Alcan (RTA) concerning Transend's scheme. RTA noted that in the AER's previous assessment of SP AusNet's revenue proposal, the AER rejected certain values for the scheme on the basis that the rewards for exceeding certain targets were greater than the penalties for failing to meet them.[335] In applying this principal, RTA reasoned that the AER should reject Transend's proposed deadband for the "loss of supply > 1.0 system minute" sub-parameter and the collar and cap for the "average outage duration (transformers)" sub-parameter.[336]

8.5 Consultants review

The AER engaged WorleyParsons to provide expert opinion on Transend's proposed performance targets, caps, collars, deadbands, weightings and certain elements of Transend's parameter definitions.

WorleyParsons, amongst other things, noted the following:

- The AER has accepted that Transend's revenue will not be at risk as a result of the average outage duration parameter but the parameter must be reported in the forthcoming period.[337]
- The data collection and reporting methodology employed by Transend has undergone several improvements since 2004 through the development of its Asset Management Information System (AMIS).[338]
- Five data points are inadequate to determine, with a high degree of confidence, that a dataset has a normal distributions. Notwithstanding this concern, WorleyParsons, after discussions with the AER, has employed this assumption.[339]
- It had concerns about aspects of the SKM methodology for calculating caps, collars and deadbands.[340]
- Its approach to determine caps and collars has been to use ±2 standard deviations from the mean. When the application of this methodology resulted in

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335 RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 15-16.
336 ibid., p. 16
337 WorleyParsons, *Review of the Transend Transmission Network Revenue Proposal 2009-2014 An independent review prepared for the Australian Energy Regulator*, WorleyParsons report, October 2008, p.235
338 ibid., p.238
339 ibid., p.240
340 ibid., p.240

a cap exceeding 100 per cent, WorleyParsons reduced the cap and collar to ±1 standard deviations from the mean.341

WorleyParsons recommended that the AER:

- reject the use of deadbands by Transend[342]
- make changes to Transend's proposed performance targets, caps and collars
- accept the weightings proposed by Transend.

Table 8.3 lists WorleyParsons' recommended STPIS targets. These targets do not include deadbands, which is consistent with the AER's more recent decision for Powerlink which had excluded proposed deadbands from the scheme and the decisions for ElectraNet and Sp AusNet, who had deadbands, and have not requested them.[343]

Table 8.3: WorleyParsons Recommended Collars, Targets, Caps, and Weightings

Sub-Parameter	Weighting	Collar	Target	Cap
Transmission circuit availability (critical)	20%	98.51%	99.13%	99.75%
Transmission circuit availability (non-critical)	10%	98.48%	98.97%	99.47%
Transformer circuit availability	15%	98.67%	99.28%	99.90%
Loss of Supply > 0.1 system minutes	20%	21	15	8
Loss of Supply > 1.0 system minutes	35%	4	2	0
Average outage duration (transmission lines)	0%	529	326	124
Average outage duration (transformers)	0%	1070	712	354

Source: WorleyParsons, *Review of the Transend Transmission Network Revenue Proposal 2009-2014 An independent review prepared for the Australian Energy Regulator*, October 2008, p. 243

341 WorleyParsons, WorleyParsons report, op. cit., p.241

342 ibid., p.244

343 For example: See AER, *Powerlink Queensland transmission network revenue cap 2007–08 to 2011–12: Decision,* 14 June 2007
AER, *SP AusNet transmission determination 2008-09 to 2013-14*, January 2008
AER, *ElectraNet transmission determination 2008–09 to 2012–13: Final decision*, 11 April 2008

8.6 Issues and AER considerations

8.6.1 Parameter definitions

Transend's parameter definitions are prescribed by the scheme. Appendix A of the scheme contains the standard definitions of the performance incentive scheme parameters for the service target performance component. Appendix B of the scheme contains the performance incentive scheme parameters and definitions applicable to individual TNSP's. The parameters that apply to Transend are set out in Appendix A and part 3 of Appendix B of the scheme.

The parameters that apply for the next regulatory control period are:

- transmission circuit availability
- loss of supply event frequency
- average outage duration.

Under clause 3.2 of the scheme, the AER must establish certain elements of some TNSP's parameter definitions in the transmission determination. These elements are identified in appendix B of the scheme for each TNSP. For Transend, the AER must establish:

- transmission line circuit availability (critical circuits)
- transmission line circuit availability (non-critical circuits)
- transformer circuit availability
- frequency of events where loss of supply exceeds 0.1 minutes
- frequency of events where loss of supply exceeds 1.0 minutes
- average outage duration - transmission line circuits
- average outage duration - transformer circuits.

Clause 3.2(b) of the scheme provides that the AER will assess Transend's proposals for these elements of the definitions against the objectives in clause 1.4 of the scheme. The AER may either approve these elements as proposed by Transend or substitute them with sub-parameters, which, in the AER's opinion, best satisfy the objectives in clause 1.4 of the scheme.

In its final decision on the scheme, the AER accepted that it would not be suitable to attach a financial incentive to the average outage duration parameter during the forthcoming regulatory control period. This is due to the fact that Transend's results

"*are highly volatile and vary significantly from year to year.*" [344] However, the AER still requires Transend to report its performance against this parameter.

8.6.2 Performance targets

Performance targets define a level of performance for each parameter at which Transend will not receive a financial reward or penalty.

Transend proposal

Transend commissioned SKM to produce its targets for the scheme. SKM has produced the targets for Transend by averaging the results from the five years to 2007 for every measure except for average outage duration which applied the five years to 2006.

Transend's proposed performance targets are listed in table 8.1.

Consultant review

WorleyParsons noted that Transend's performance targets must be equal to its average performance history over last five years and must also have been recorded consistently, based on the relevant parameter definitions.[345]

WorleyParsons was satisfied that the data provided by Transend over the last five years (2003-2007) was accurate and reliable and used this data to calculate Transend's recommended targets. Table 8.4 outlines the historical data used by WorleyParsons to derive the new sub-parameter values.[346]

Table 8.4 WorleyParsons analysis of historical annual service performance by Transend

Sub-Parameter[(a)]	2003[(b)]	2004	2005	2006	2007	5 Year Average
Transmission Ciruit Availability (Critical)	98.47%	99.33%	98.47%	99.70%	99.66%	99.13%
Transmission Ciruit Availability (Non-critical)	98.98%	99.35%	98.74%	99.04%	98.76%	98.97%
Transformer Circuit Availability	99.55%	99.31%	99.21%	98.79%	99.56%	99.28%
Loss of Supply >0.1 system minutes	17	18	13	16	10	15
Loss of Supply >1.0 system minutes	2	1	3	3	1	2

[344] AER, *Electricity transmission network service providers, Service target performance incentive scheme (incorporating incentives based on the market impact of transmission congestion)*, March 2008, p 6

[345] WorleyParsons, WorleyParsons report, op. cit., p.238

[346] ibid., p.238

Average Outage Duration (Transmission Lines)	288	304	367	197	476	326
Average Outage Duration (Transformers)	674	1033	244	511	1098	712

(a) All parameters for these years had deadbands
(b) 2003 results were prior to the commencement of the PI schemed and were not subject to any external audit.

AER considerations

Under clause 3.3(g) of the scheme, performance targets must be equal to the TNSP's average performance history over the most recent five years. However, the AER may approve a performance target based on an alternative period if it is satisfied that the period is consistent with the objectives of the scheme.

WorleyParsons considered the 2003 results to be in line with those from the audited years and had recommended the AER use them to obtain a larger sample size in calculating the average. The AER has opted to include the unaudited 2003 performance results in the calculation of targets for Transend on the basis that this data is extracted using the same approach as applies to audited data in following years from Transend's internal systems. The data for 2003 also appears to be in-line with results for later years. The targets for Transend are based on the average of the most recent 5 years results.

The AER also notes that the original performance incentive scheme has been in operations for 4 years at this time. Transend has made some large gains during this period.. In future, the AER expects it is more likely that marginal improvements in the level of service standards will occur. The AER believes that TNSP's should also be gaining some reward from the benefits of these improvements at the margin.

Further large-scale improvements by Transend during the period may be due to asset renewal. The AER considers that any major improvements in service standards will occur in latter part of the regulatory period when the majority of the substation redevelopments are completed. Any outages for these renewals will also negatively affect service standards performance for Transend during this period. The AER considers that the effect of Transends capital works should balance out in the service standards over the period.

Circuit availability

The AER considers that Transend's proposed performance target for the circuit availability parameter meets the requirements of the scheme. The performance target has been calculated by averaging Transend's performance over the previous five years and has been consistently recorded based on the parameter definitions that applied to Transend under the scheme.

The AER accepts the method used by Transend to calculate the performance targets for the critical and non-critical circuit availability parameters. However the non-critical transmission line circuit availability parameter proposed by Transend contained an error. WorleyParsons, in consultation with Transend, has corrected this error and altered the target from 98.99 per cent to 98.97 per cent.

The AER considers that the revised performance targets recommended by WorleyParsons for the non-critical transmission circuit availability parameter meet the requirements of the scheme. WorleyParsons calculated these performance targets by averaging Transend's historical performance over the previous five years The AER substitutes this performance target for Transend's next regulatory control period.

Loss of supply

The AER considers that the performance targets recommended by Transend and endorsed by WorleyParsons meet the requirements of the scheme for Transend's next regulatory control period.

Average outage duration

The AER rejects Transend's proposed performance target for the average outage duration parameter as it does not meet the requirements of the scheme. The AER is not satisfied that Transend's use of performance data from the period 2002 to 2006 represents the most recent 5 years data as required under under clause 3.3(g) of the scheme. The AER required Transend recalculate these values using the results from the period 2003 to 2007 as required by clause 3.3 (g) of the scheme. The recalculated value has been applied by the AER.

The AER considers that the performance target recommended by WorleyParsons, based on the most recent 5 years, meets the requirements of the scheme and substitutes the performance target in table 8.3 for Transend's next regulatory control period.

8.6.3 Deadbands

The scheme defines a deadband as:

> '…a performance target that is set over a range of values within which a TNSP neither receives a financial penalty nor financial rewards in the regulator year.'

Transend proposal

In its revenue proposal, Transend notes that SKM considered that the inclusion of a performance deadband for each sub-parameter was appropriate; as deadbands provided 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*." [347]

Transend notes that 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 further notes that it believes that the

[347] Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014,* Transend revenue proposal, 31 May 2008, p. 134.

methodology used by SKM for setting the proposed values is robust and consistent with clause 3.3 of the STPIS.

Submissions

RTA noted that the proposed deadband for the "loss of supply > 1.0 system minute" sub-parameter should be removed.

RTA submitted that Transend receives a reward as soon as it betters its target of 2 events (i.e. 0 or 1) but will incur no penalty unless it has 4 or more events. RTA argued that the deadband should be removed, such that a penalty will be attracted if Transend exceeds its target (i.e. 3 or more events).[348]

RTA further noted that SKM recommended that a deadband of 2 to 3 events be included on the basis that the performance in 2007 was particularly good due to unusually dry weather conditions (thus lowering the 5 year average). [349]

RTA did not believe that Transend's 2007 performance constituted a basis to depart from a 5 year average (as required under clause 3.3(g) of the STPIS) because dry weather conditions may continue over the coming regulatory period.[350]

RTA believed that the AER should reject the proposed deadband for the "loss of supply > 1.0 system minute" sub-parameter.[351]

Consultant Review

WorleyParsons discussed the use of deadbands, stating that the AER should consider using deadbands if it wanted to define a range of "normal" performance wherein no financial reward/penalty is applicable.[352] WorleyParsons submitted that the AER should remove deadbands if it wants to highlight system performance every year through the calculation of a reward/penalty – even though this approach might involve an increase in reporting volatility.[353]

WorleyParsons noted that other recently considered TNSP determinations have not included deadbands and this was not seen as having a great impact on the performance of the TNSP.[354] WorleyParsons recommended that deadbands should not apply to Transend.

However, were deadbands to apply, WorleyParsons did express concern about the calculation methodology used by SKM. WorleyParsons stated that its preferred methodology was to employ the use of standard deviations in order to determine the value of the deadband.

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348 RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 15-16.
349 ibid.., p. 16.
350 ibid.., p. 16.
351 ibid., p. 16.
352 WorleyParsons, WorleyParsons report, op. cit., p.242
353 ibid., p.242-243.
354 ibid., p.242-243.

AER considerations

The AER notes that RTA considers the deadbands on the loss of supply measure to be inappropriate. The AER has taken note of the RTA's position on deadbands and reviewed the use of deadbands throughout the scheme by Transend on all measures. The AER has reviewed all of the deadbands applied for by Transend.

The AER rejects the deadbands proposed by Transend under the objective of the scheme clause 1.4. The objective of the scheme consistent with clause 6A.7.4(b) of the Rules is to provide incentives for each TNSP to improve and maintain the reliability of its network for the benefit of users. The AER observes that deadbands create a 'safe harbour' in which no penalty or benefit applies to a TNSP. Therefore if a TNSP can operate in such a range they have no incentive to improve its performance.

The AER conducted separate assessments of the following deadbands against the objectives of the scheme:

- Transmission Circuit Availability (Critical)
- Transmission Circuit Availability (Non-Critical)
- Transformer Circuit Availability
- Loss of Supply >0.1 system minutes
- Loss of Supply >1.0 system minutes
- Average Outage Duration (Transmission Line)
- Average Outage Duration (Transformers)

Note: the average outage durations sub-parameters are discussed in more detail below.

Each deadband was assessed on its own merits and in accordance with the scheme.

The AER has come to the conclusion that notwithstanding this individual assessment process, each deadband fails to meet the objectives as outlined in clause 1.4 of the scheme. The AER has concluded that the use of deadband creates a 'safe harbour' which reduces incentives for performance improvement.

The AER in coming to its conclusion on deadbands notes concerns raised by PB Associates in the Powerlink decision about the "*…reduction in the sharpness of the measure…*" created by deadbands and prefers the use of single data points for these measures.

Transend has proposed the use of deadbands around its STPIS targets. The AER notes Transend's argument, as adopted from its consultant SKM, that deadbands:

> "account for the natural variation within a comparative year-on-year performance of an electricity transmission system. Performance within such a range should therefore neither be rewarded, nor penalised under the STPIS, as this was seen to be contrary to the primary objective of providing an incentive for performance improvements."

The AER has considered WorleyParsons' discussion of the use of deadbands. In the AER's opinion the objective of the scheme to improve performance makes it clear that the purpose of the scheme is to highlight performance of all TNSP's in each year. The AER does not support the view, as discussed by WorleyParsons, that the objective of the scheme is to produce a band of normal operation as this would undermines the objective to improve performance.

The AER considers the creation of a deadband for each of Transend's sub-parameters as essentially creating this area of 'normal operation' for a TNSP. If the TNSP has this normal operation zone it has no incentive to improve its performance. Whereas a single target point, despite the volatility of having movements around the target reflecting normal operations, gives the TNSP incentive to minimise disruptions to customers.

Therefore the AER considers that single point targets should be used in the service standards wherever practicable to meet the objective of the scheme.

The AER has studied past decisions and has noted that Transend, ElectraNet and SP AusNet were the only TNSP's to have deadbands over their last regulatory periods. Transend had deadbands applied to all of its targets in its original Performance Incentive scheme. Transend's position can be compared to SP AusNet, which only had deadbands applied to its average outage duration measures, and also to ElectraNet, which had deadbands applied on the loss of supply greater than 0.2 system minutes and average outage duration measures. SP AusNet and ElectraNet no longer have any deadbands applied to the STPIS in their most recent regulatory decisions.

The AER notes the purpose of the application of deadbands in the previous regulatory period appears to have been partially due to the low quality of the data used to inform the targets. Therefore, the deadbands were important, under the performance incentive scheme, to ensure that the targets were set appropriately and that TNSP's targets were not set too high or low. As such a target deadband was deemed appropriate for Transend's last regulatory period.

The STPIS targets for the next regulatory period are based on 4 years of AER audited data plus unaudited 2003 data which should offer reasonable targets for the sub parameters in the transmission availability sub-parameters, the transformer availability sub-parameters and the loss of supply sub-parameters.

The AER notes that the average outage duration measure was not reported against in the current regulatory period. It also notes that the data for this measure is highly volatile. Therefore, the AER considers any target set using this measure would require a deadband due to the uncertainty caused by the data.

However, the AER has rejected Transend's proposed deadbands for the average outage duration parameter as it does not meet the requirements of the scheme. The AER is not satisfied that Transend's use of performance data from the period 2002 to 2006 represents the most recent 5 years data as required under under clause 3.3(g) of the scheme.

The AER required Transend to recalculate the target for the average outage duration sub-parameters using the results from the period 2003 to 2007 as required by clause

3.3 (g) of the scheme. As part of its consideration, the AER has taken into account that Transend has no revenue at risk against this parameter. As such, the AER does not regard substituting deadbands for this measure to add any value to Transend's performance targets.

8.6.4 Caps and collars

The cap and collar for each parameter define the range of performance within which Transend will receive a financial reward or penalty. The cap and collar also determine the rate at which Transend will receive a bonus or penalty based on its annual performance. The cap is the performance value that results in the maximum positive financial reward for any one parameter and the collar is the performance value that results in the maximum negative financial penalty.

Transend proposal

Transend engaged SKM to develop a methodology for calculating the caps and collars for each of the parameters that apply to it under the scheme. SKM 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.

Transend's proposed caps and collars for each parameter are listed in Table 8.1.

Submissions

RTA noted that the collar and cap for the "average outage duration (transformers)" sub-parameter was proportionately greater than the cap. RTA noted that Transend's performance must be disproportionately worse before reaching the maximum penalty.

RTA noted that this set of arrangements was recommended by SKM in order to avoid "an unrealistically negative cap value".

RTA further noted that this sub-parameter will attract a zero weighting in the coming period and contended that if the AER permits Transend to include an asymmetric incentive in this decision, it will be harder to undo this outcome in future periods when performance against this parameter counts towards Transend's financial outcome under the scheme.[355]

Consultant review

WorleyParsons noted that in recent AER determinations and consultant reviews, the accepted methodology for the appropriate sub-parameter caps and collars has been the application of normal distribution statistics. WorleyParsons commented that five data points are inadequate to determine, with a high degree of confidence, that the datasets have normal distributions. Notwithstanding this concern, WorleyParsons after discussions with the AER has employed this assumption in its review.[356]

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[355] RTA, *Transend Transmission Revenue Cap 2009/10-2012/14: Submission by Rio Tinto Alcan to the Australian Energy Regulator*, August 2008, p. 16.

[356] WorleyParsons, WorleyParsons report, op. cit., p.240.

WorleyParsons expressed concern over aspects of SKM's caps and collars calculation methodology as used in its report to Transend. WorleyParsons noted that in SKM's report, the caps and collars were calculated by applying ±1.5 standard deviations from the mean as this approach appeared to provide a "better intuitive fit". WorleyParsons noted that SKM further claimed that by using 5% and 95% values from the generated normal distribution curves, SKM was effectively "simulating the effect of two (2) standard deviations either side of the target."[357]

WorleyParsons preferred the view expressed by PBA in its review of SP AusNet's performance over the methodology used by SKM. The AER concurred with the view taken by PBA. WorleyParsons quotes the essence of PBA's methodology as follows:

> "…the difference between the cap and collar values should be significantly wider than the natural fluctuation in measure that might arise due to exogenous events. Otherwise, natural variations in performance could lead to significant revenue swings and/or the cap/collar values being exceeded. To avoid this effect, the cap and collar values should ideally be about two standard deviations of the historical data, that is, if the natural variation is a normal distribution, one year in twenty would be expected to reach the cap or collar through natural variation. Use of a lesser standard deviation is not recommended, for instance, a standard deviation of 1.5 would lead to a probability of the cap/collar being reached approximately one in every seven years." [358]

WorleyParsons' has used ±2 standard deviations from the mean to determine the caps and collars. WorleyParsons noted that when the application of this methodology resulted in a cap exceeding 100%, the cap was reduced to ±1 standard deviation around the mean. It noted that this occurred for the transmission line circuit availability (critical) threshold were a cap/collar was calculated using ±1 standard deviation around the mean.

WorleyParsons' recommended caps and collars are outlined in Table 8.3.

AER considerations

The AER notes that the argument for the use of standard deviations is founded upon a belief that they represent a unit free measure based on the sample. The use of standard deviations from the mean removes the argument for the use of an assumption for a normal distribution to the sample the targets are based on.

WorleyParsons' use of the assumption of a normal distribution in order to make adjustments for caps and collars that violate limits is reasonable. This appears to be a variation on PB's recommendation for the SP AusNet decision. PB recommended that the AER apply asymmetric caps and collars of two standard deviations and one standard deviation in the limited direction. WorleyParsons proposes to apply a derivative of this format to caps and collars that are closer to symmetric.

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[357] Transend, Transend revenue proposal, op. cit., Appendix 10—Sinclair Knight Merz, *Transend's service target performance incentive scheme: Parameter values and weightings*, May 2008, section 3.3.2, p 14.

[358] PB for AER, *SP Ausnet Revenue Reset - An Independent Review*, 16 August 2007, p 217.

WorleyParsons recommended varying from the ±2 standard deviations methodology the AER has previously accepted for two measures:

- Critical transmission line circuit availability measure has been adjusted, ±1 standard deviations from the mean so that it does not violate the natural limit of 100 per cent.

- Average outage duration (Transformer) measure has been adjusted, using a ±1 standard deviations from the mean so that the lower bound limit is not less than 0 minutes. As set out in the next section, this parameter has been allocated a zero weighting and therefore will not affect the financial reward for Transend.

The AER has not accepted Worley Parsons recommendation to vary the methodology for setting caps and collars as the AER did not discern any material advantage over the approach currently applied by the AER in similar circumstances.

The AER will be applying -2 standard deviations to the collar and +1 standard deviations to the cap. This methodology, of applying 2 standard deviations to the collar and +1 standard deviations to the cap when the cap violated a natural limit (such as being greater than 100% or less than 0 minutes), has been previously accepted by the AER in the ElectraNet and SP AusNet decisions.

The AER has re-calculated the value of the collars for the two measures that violated this natural limit to be:

- Critical transmission line circuit availability measure has a collar of 97.90 per cent.

- Average outage duration (Transformer) measure has a collar of 1428 minutes.

The AER will be accepting WorelyParsons cap values for these two measures and substituting the collar values calculated here.

The AER notes that RTA has raised this issue in its submission noting that an asymmetric cap offers Transend a greater reward than penalty on this target. The AER is aware of this issue, but notes that the closer the cap is to a natural limit (such as 100% or zero outage minutes) the more skewed a TNSP's performance results become. In the AER's opinion the asymmetric cap and collar approach is the best option for TNSP's operating at a high level of service performance.

8.6.5 Weightings

Weightings are the proportion that each parameter contributes to Transend's maximum financial reward or penalty under the scheme. Clause 3.5 of the scheme notes the way in which each parameter and sub-parameter should be weighted.

Transend proposal

Transend proposed that the transmission circuit availability parameter account for a total of 45% of the maximum allowed revenue at risk. Transend noted that the separation of transmission line circuit availability to into critical and non-critical sub-parameters has increased the emphasis on the viability of critical transmission line circuits; an approach that is consistent with the objectives of the NER to '*improve and*

maintain the reliability of those elements of the transmission system that are most important to determining spot prices."[359]

Transend stated that transformer circuit availability does not have a material impact upon spot prices within the NEM, but it does have the potential to impact upon transmission system reliability.

The loss of supply frequency parameter is a measure of the impact of unplanned loss of supply on Transends' customers. Transend has proposed that of the two sub-parameters, a higher weighting should be 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.[360]

As previously noted, the AER has previously agreed that it is not suitable to attach a financial incentive to the average outage duration parameter during the forthcoming regulatory control period due to the parameter's high variability and the fact that results for this parameter vary significantly from year to year.[361]

Consultant Review

In its report WorleyParsons accepted the weightings as proposed by Transend in Table 8.1.[362]

AER Considerations

The AER accepts the weightings proposed by Transend and endorsed by WorleyParsons. The AER considers that the proposed weightings are consistent with the requirements in clause 3.5 and are consistent with the objectives in clause 1.4 of the scheme.

Transend proposed a relatively high weighting for loss of supply >1.0 system minutes parameter. This is appropriate as it reflects the principle that the scheme should provide incentives for TNSPs to reduce the number of loss of supply events for transmission network users. The zero weighting for the average outage duration parameter is also appropriate given the low confidence in the data currently available to determine performance targets.

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359 Transend, Transend revenue proposal, op. cit., p. 135.
360 ibid., p. 136.
361 ibid., p. 136
362 WorleyParsons, WorleyParsons report, op. cit., p.242.

8.6.6 Data collection and reporting

Clauses 3.3(d) and 3.3(g) of the scheme notes that data used to calculate the targets, collars and caps for the performance parameters and sub-parameters must be accurate and reliable and also equal to the TNSPs average historical performance over the most recent five years. The data used to calculate the performance target must be consistently recorded based on the parameter definitions that apply to the TNSP under this service component of the scheme.

Consultant review

WorleyParsons noted that the data collection and reporting methodology employed by Transend has undergone several improvements since 2004 through its use of the AMIS system. [363]

In its review of Transend's data collection and reporting methodology, WorleyParsons noted that all data collected, validated, and reported were subjected to a monthly internal audit by Transend's Network Performance and Strategy group staff. Further, WorleyParsons also noted that the data was also audited annually by the AER.[364] WorleyParsons was satisfied that the data is accurate and reliable, and included all exclusions in accordance with Appendix B of the STPIS guidelines.[365]

The historical data used by WorleyParsons to derive the new sub-parameter values is summarised in Table 8.6 above.

AER considerations

The AER considers that Transend's data recording and reporting systems for service target performance reporting are appropriate. Transend has been subject to the AER's annual review of service standards data collection and reporting systems since 2004. This review has consistently found that Transend's data collection and reporting systems were accurate and reliable.

WorleyParsons has recommended the use of 2003 unaudited data in the calculation of the STPIS targets. WorleyParsons has indicated that the 2003 results appear consistent with those for the audited period 2004 to 2007. The AER has decided to use the five years of data from 2003 to 2007 as the basis for calculating the schemes targets.

Transend will be required to report information on its service target performance in accordance with the scheme and the AER's information guidelines. The AER also expects that Transend will follow developments in market impact parameters and, as requested, provide commentary on the market impact data collected by the AER. This will assist the development of market impact parameters (to be applied to Transend during the regulatory control period commencing in July 2014).

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[363] WorleyParsons, WorleyParsons report, op. cit., p.237.
[364] ibid., p.238.
[365] ibid., p.238.

8.6.7 Revenue at risk

AER considerations

Under clause 2.6 of the scheme, the level of revenue at risk attached to Transend's performance against its parameters and values is 1 per cent of the maximum allowed revenue for each calendar year of the next regulatory control period.

The AER is currently considering placing additional revenue at risk on any market impact parameters incorporated into the scheme. This would not apply to Transend until the regulatory control period commencing in July 2014 by when it is expected the necessary baseline data will be available.

8.7 AER conclusion

The AER accepts the variations made by WorleyParsons to Transend's STPIS targets, caps and collars, with the exception of the collars for transmission line circuit availability (critical) and average outage duration (tranformer). The AER has substituted its own value for these collar values as discussed in the caps and collars section. The AER also rejects the use of deadbands by Transend for the scheme as discussed in the deadband sections. The AER accepts the weights Transend has proposed to apply to its parameters.

The definitions that apply to Transend for the next regulatory control period are set out in Appendix F of this draft determination. The performance incentive curves for each parameter are set out in Appendix G.

The caps, collars, performance targets and weightings to be applied to Transend during the next regulatory control period are set out in table 8.5.

Table 8.5: Caps, collars, targets and weightings to apply to Transend

Sub-Parameter	Weighting	Collar	Target	Cap
Transmission circuit availability (critical)	20%	97.90%	99.13%	99.75%
Transmission circuit availability (non-critical)	10%	98.48%	98.97%	99.47%
Transformer circuit availability	15%	98.67%	99.28%	99.90%
Loss of Supply > 0.1 system minutes	20%	21	15	8
Loss of Supply > 1.0 system minutes	35%	4	2	0
Average outage duration (transmission lines)	0%	529	326	124
Average outage duration (transformers)	0%	1428	712	354

9 Maximum allowed revenue

9.1 Introduction

This chapter sets out the AER's calculation of Transend's maximum allowed revenue (MAR) for the provision of prescribed transmission services for each year of the next regulatory control period, using the building block approach. The chapter also discusses the AER's consideration of Transend's proposed changes to the standard asset classes used to determine the regulatory depreciation allowance.

9.2 Regulatory requirements

Clause 6A.2 of the NER requires the AER to make transmission determinations for transmission network service providers (TNSPs), in accordance with chapter 6A in respect of prescribed transmission services and negotiated transmission services. A revenue determination forms part of the AER's transmission determination.

Clause 6A.4.2(a) of the NER requires a revenue determination to specify, amongst other things:

1. the amount of the estimated total revenue cap for the regulatory control period or the method of calculating that amount;

2. the annual building block revenue requirement for each regulatory year of the regulatory control period;

3. the amount of the maximum allowed revenue for each regulatory year of the regulatory control period or the method of calculating that amount;

9.2.1 Annual building block revenue requirement

Clause 6A.5.4 of the NER outlines the calculation of the annual building block revenue requirement for each year of the regulatory control period, which is comprised of the following components:

1. indexation of the RAB is calculated in accordance with clause 6A.6.1 and schedule 6A.2.

2. a return on capital for that year is calculated in accordance with clause 6A.6.2.

3. the depreciation for that year is calculated in accordance with clause 6A.6.3.

4. the estimated cost of corporate income tax of the TNSP for that year is determined in accordance with clause 6A.6.4.

5. the revenue increments or decrements for that year arising from the efficiency benefit sharing scheme (EBSS) as referred to in clause 6A.6.5.

6. the forecast opex is accepted or substituted by the AER in accordance with clause 6A.6.6.

7. the compensation for risks that are not otherwise compensated for.

9.2.2 Post-tax revenue model

Clause 6A.5.2 requires the AER to develop a post-tax revenue model (PTRM) to calculate the annual building block revenue requirement for each year of the regulatory control period using the approach described in clause 6A.5.4. A TNSP's revenue proposal must be prepared using the PTRM under clause 6A.5.1(a). For the purposes of this draft transmission determination, Transend must use the AER's finalised PTRM, which was published in September 2007.

The finalised PTRM estimates the MAR for each year of the regulatory control period by escalating the previous year's MAR using a CPI – X framework, based on the MAR that applies to the TNSP in the first year of the regulatory control period. The PTRM incorporates a forecast inflation rate to calculate the expected MAR, whereas the actual MAR is adjusted for actual inflation. Section 8.3 sets out this adjustment process.

Clause 6A.6.8(c) requires the X factor for each year of the regulatory control period to be determined such that:

1. the net present value (NPV) of the expected MAR for each year of the regulatory control period is equal to the NPV of the annual building block revenue requirement for each year of the regulatory control period and

2. the expected MAR for the last year of the regulatory control period is as close as reasonably possible to the annual building block revenue requirement for that year.

Providing they comply with the above requirements, the X factor for each year must be that nominated in the TNSP's revenue proposal. However, to the extent that the X factors nominated by the TNSP do not so comply, the X factor for each year will be those determined by the AER in its final decision.[366]

9.2.3 Adjustments to the revenue cap

The MAR is the revenue that a TNSP may earn in any year of the regulatory control period from the provision of prescribed transmission services. The MAR must be determined in accordance with part C of chapter 6A of the NER and the methodology set out in the revenue determination.

The AER may adjust the MAR for the following:

1. in accordance with clause 6A.7, adjust the revenue cap after making a revenue determination for:

    - reopening of the revenue determination for capital expenditure to respond to unforeseen circumstances
    - network support pass through
    - cost pass through

[366] National Electricity Rules, clause 6A.6.8(b).

- the service target performance incentive scheme applied to the TNSP.

2. in accordance with clause 6A.8, the inclusion of a contingent project.

3. in accordance with clause 6A.15, the revocation of a revenue determination or the amendment of a pricing methodology for wrong information or error.

9.3 The X factor, service target performance incentive and pass through amounts

The annual building block revenue requirement can be lumpy over the regulatory control period. To minimise the price impacts of the lumpiness, revenues are smoothed within a regulatory control period while maintaining the principle of cost recovery under the building block approach. Smoothing requires diverting some of the cost recovery to adjacent years within the regulatory control period so that the NPV of the smoothed revenues is equal to the NPV of the annual building block revenue requirement (unsmoothed revenue stream). That is, a smoothed profile of the TNSP's MAR is determined for the regulatory control period under the CPI – X mechanism.

The MAR for the first year is generally set equal to the allowed revenue (AR) for the first year of the regulatory control period:

$$MAR_1 = AR_1$$

where:

MAR_1 = the maximum allowed revenue for year 1

AR_1 = the allowed revenue for year 1.

The MAR for the subsequent year of the regulatory control period requires an annual adjustment based on the previous year's AR. That is, the subsequent year's AR is determined by adjusting the previous year's AR for actual inflation and the X factor:

$$ARt = AR_{t-1} \times (1 + \Delta CPI) \times (1 - X_i)$$

where:

AR = the allowed revenue

t = time period/financial year (for $t = 2, 3, 4, 5$)

ΔCPI = the annual percentage change in the ABS Consumer Price Index All Groups, Weighted Average of Eight Capital Cities from March in year $t - 2$ to March in year $t - 1$

X = the smoothing factor.

The MAR is determined annually by adding to (or deducting from) the AR, the service target performance incentive scheme revenue increment (or revenue decrement) in accordance with 6A.7.4, and any approved pass through amounts in

accordance with 6A.7.3 (see table 9.1 for the timing of calculating the AR and performance incentive):

$$MAR_i = \text{(allowed revenue)} + \text{(performance incentive)} + \text{(pass through)}$$

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

where:

MAR = the maximum allowed revenue

AR = the allowed revenue

S = the revenue increment or decrement determined in accordance with the service target performance incentive scheme

P = the pass through amount that the AER has determined in accordance with clauses 6A.7.2 and 6A.7.3

t = time period/financial year (for *t* = 2, 3, 4, 5)

ct = time period/calendar year (for *ct* = 2, 3, 4, 5).

Table 9.1: Timing of the calculation of allowed revenues and the performance incentive

t	Allowed revenue (financial year)	*ct*	Performance incentive (calendar year)
2	1 July 2009–30 June 2010	2	1 January 2008–31 December 2008
3	1 July 2010–30 June 2011	3	1 January 2009–31 December 2009
4	1 July 2011–30 June 2012	4	1 January 2010–31 December 2010
5	1 July 2012–30 June 2013	5	1 January 2011–31 December 2011
6	1 July 2013–30 June 2014	6	1 January 2012–31 December 2012

9.4 Transend proposal

Transend stated in its revenue proposal that it has applied the post-tax building block approach to calculate its proposed revenues. [367] It proposed that the calculation of the revenues be determined for a five-year regulatory control period. Transend's proposed revenues were determined on the basis of a nominal opening RAB of $987.3 million. It requested nominal unsmoothed revenues of $190.5 million in 2009–10, increasing

[367] Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014,* Transend revenue proposal, 31 May 2008, p. 165

to $266.4 million in 2013–14. Transend's MAR for 2008–09 is $144.6[368] million. Table 9.2 summarises Transend's total proposed annual building block revenue requirement (unsmoothed) for the next regulatory control period.

Table 9.2: Transend's proposed annual building block revenue requirement ($m, nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Return on capital	105.1	120.4	137.8	148.1	159.6	671.0
Return of capital	24.9	26.0	22.6	27.9	31.1	132.6
Operating expenditure	55.1	57.5	58.9	64.1	67.1	302.7
Opex efficiency payment	0.0	0.0	0.0	0.0	0.0	0.0
Net taxes payable	5.4	6.3	6.8	7.8	8.6	34.8
Annual building block revenue requirement (unsmoothed)	190.5	210.2	226.0	247.9	266.4	1141.1

Source: Transend PTRM

Transend has proposed to annually escalate its estimated MAR over the next regulatory control period by applying X factors corresponding to –28.5 per cent in the first year, and –6.4 per cent for each of the four remaining years. The estimated MAR for each year of the next regulatory control period is outlined in table 9.3.[369]

Table 9.3: Transend's proposed annual building block revenue requirement and maximum allowed revenue ($m, nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Annual building block revenue requirement	190.5	210.2	226.0	247.9	266.4	1141.1
Maximum allowed revenue (smoothed)	190.5	207.8	226.7	247.2	269.7	1141.9

Source: Transend PTRM

The implied energy delivered unit cost of this MAR is $17.41/MWh in 2009–10 increasing at a nominal average annual rate of 6.0 per cent per annum to $21.98/MWh in 2013-14. The AER estimates Transend's proposal, in nominal terms, will increase

[368] Transend's MAR for 2009-09 of $144.6 million consists of Allowed Revenue of $141.0 million and a notional Network Support amount of $3.6 million.

[369] While the total value of the annual building block revenue requirement is different to the total value of the expected MAR (smoothed), the two are equivalent in NPV terms.

the average residential customer bill by approximately $48 (3.4 per cent) in 2009-10 and an increase of $14 annually for the rest of the next regulatory control period. [370]

9.5 Standard asset classes and lives

9.5.1 Regulatory requirements

Clause 6A.6.3 of the NER requires that the depreciation schedules must use a profile that reflects the nature of the category of assets over the economic life of that category of assets. Transend has depreciated each asset class category in the RAB on a straight-line basis over the proposed economic life. Transend has followed standard practice by assigning a regulatory life to each category of assets that equates to its expected economic or technical life. Generally, the regulatory, economic and technical lives of an asset coincide.

9.5.2 Transend proposal

Transend have reviewed its current 9 asset classes and proposed to introduce 14 new regulatory asset classes. Transend propose to close off entry to its current 9 regulatory asset classes and fully depreciate them. Transend also proposes to accumulate current works in progress in the new regulatory asset classes in the next regulatory period.

Transend engaged SKM to carry out an assessment of the economic lives of Transend's new proposed regulatory asset classes which are used to determine the regulatory depreciation allowance over the next regulatory control period.[371] SKM was required to provide a report that 'includes an assessment of Transend's transmission equipment standard asset lives for each asset category'.

Transend's 14 Regulatory Asset Classes (RAC) with long term (60 year), medium term (40 or 45 year) and short term (3, 5, 10 or 15 years) are shown in the table 9.4.

Table 9.4: Transend's proposed standard lives and asset classes

Asset class	Standard asset life (years)
Transmission Line Assets – long life (60 years)	60
Transmission Line Assets – medium life (45 years)	45
Transmission Line Assets – short life (10 years)	10
Substation assets – long life (60 years)	60
Substation assets – medium life (45 years)	45

[370] Interpolated from Transend revenue proposal, page 6, a 3 per cent price increase, in real terms, caused by a $42 rise in price under the Transend proposal means the average end user electricity charge is $1400.

[371] Transend, Transend revenue proposal, op. cit., Appendix 24—Sinclair Knight Merz, *Assessment of economic lives for Transend regulatory asset classes*, 29 April 2008.

Substation assets – short life (15 years)	15
Protection and Control – short life (15 years)	15
Protection and Control – short life (3 years)	3
Transmission operations – short life (10 years)	10
Transmission operations – short life (3 years)	3
Other – medium life (40 years)	40
Other – short life (5 years)	5
Other – short life (3 years)	3
Land	n/a

SKM stated that they agreed in principle with the approach proposed by Transend. SKM further stated that Transend's proposed asset category economic lives satisfy the NER in that the proposed lives will provide depreciation profiles that reflect the nature of the asset categories.

SKM performed further comparisons with other electricity utilities to compare the age of assets. SKM found Transend's proposed asset category economic lives were consistent with other firms in the industry.

These new standard asset lives are reflected in Transend's depreciation policy and will be effective from the commencement of the next regulatory control period on 1 July 2009.

Transend has produced this new category breakdown to allow for longer asset lives. This is apparent in the SKM report which details the new regulatory asset classes.

Transmission Line Assets – Long Life (60 years)

Transend's adoption of a 60 year economic life for foundations, steel structures, conductor and earthwire are reported by SKM to be accurate.

Transmission Line Assets – Medium Life (45 years)

Transend has proposed an economic life of 45 years for wooden pole structures and transmission cables. This is consistent with the practices of most transmission utilities studied by SKM. This asset class also includes all insulator assemblies, dampers and galvanised steel earthwires.

Transmission Line Assets – Short Life (10 years)

Transend proposed that minor plant and equipment should be placed in this asset category.

Substation Assets – Long Life (60 years)

Transend proposed that substation foundation and all major steel structures be treated as long life assets. Other assets also included represent civil works that also have a long life.

Substation Assets – Long Life (45 years)

Transend proposes to include power transformers which SKM has shown to be consistent with those used by other utilities. SKM explains that NSP's apply the same substation bay economic life to all asset categories that make up the substation bay - including the supply and erection of electrical equipment, associated foundations and support structures. SKM points out that the supply and erection of the electrical equipment represents the greatest proportion of the capital value of a substation bay.

Substation Assets – Short Life (15 years)

Transend has proposed an economic life of 15 year for substation security systems, heating, ventilation, air conditioning, fire protection and operational equipment. SKM supports the use of a 15 year economic life for these asset categories.

Protection and Control – Short Life (15 years)

Transend proposes to adopt a15 year economic life for protection and control metering, monitoring SCADA NOCS and telecommunication schemes which SKM support as in-line with industry practice.

Protection and Control – Short Life (3 years)

Transend proposes an economic life for computer based equipment associated with SCADA and test equipment. SKM judges that this represents ordinary business practice.

Transmission Operations – Short Life (10 years)

Transend proposes that software, operational information systems and asset management information systems have an economic life of 10 tears. SKM supports this noting it reflects ordinary business practices.

Transmission Operations – Short Life (3 years)

Transend proposes information technology systems including computer networks, IT systems and personal computers. SKM supports Transend's use of this economic life for this asset class.

Other – Medium Life (40 years)

Transend proposes that centre buildings, office buildings, archive buildings and houses on Transend land (not including substation buildings) be included in this category. SKM supports the used of this economic life as appropriate.

Other – Short Life (5 years)

Transend proposes that mobile telephones, office equipment and furniture, motor vehicles and trailers all be given a 5 year economic life. SKM has supported this as ordinary business practice.

Other – Short Life (3 years)

Transend proposes computer based hardware have an economic life of 3 years. SKM has supported this as appropriate.

Land

Transend proposes to create a new land category. This will be the same as its current land and easements category. The two categories will exist in tandem over the next regulatory period.

9.5.3 Submissions

The Major Employers Group (MEG) noted that Transend has engaged in a large renewal program during the current regulatory period and continuing into the next regulatory period. MEG has suggested that the AER review the asset classes to ensure that straight-line depreciation covers the assets remaining lives.

9.5.4 AER considerations

Transend is proposing 14 new asset classes and the AER is approving them with some variation. The AER notes that Transend is not converting its current 9 asset classes into the 14 new asset classes. Transend's current 9 asset classes will be closed to new entry and each will be fully depreciated over its remaining life[372]. Effectively Transend has 23 asset classes going forward until the old asset classes are fully depreciated.

The AER has reviewed SKM's report and assessed Transend's regulatory asset classes in comparison to its peers. The AER, under clause 6A.6.3 of the NER, does not regard the following asset classes to adequately reflect its economic lives:

- Transmission Line Assets – Medium Life (45 years)
- Other – Short Life (5 years)
- Protection and Control – Short Life (3 years)
- Transmission Operations – Short Life (3 years)
- Other – Short Life (3 years)

The AER has accepted all other asset classes and standard asset lives proposed by Transend as being broadly consistent with its peers and its previous asset classes.

Transend is proposing to accumulate wood poles, insulator assemblies, dampers, galvanised steel earthwires and underground transmission cable capex in its new medium life Transmission Lines asset class to be applied to its forecast capex.

The AER is not satisfied that 45 years reflects the economic life of insulator assemblies, dampers and galvanised steel earthwires. The supporting information presented by Transend for insulators appears to be based on the expected lives of its

[372] Transend, Response to information request no. 247, submitted 26 September 2008

existing assets via its plans for the next regulatory period, not the expected life of new assets. As noted earlier, Transend has informed the AER it will be closing its current asset classes and fully depreciating them in future regulatory periods not moving these assets into the new regulatory classes. Therefore all assets in this class will be new.

The supporting information offered by Transend for adding dampers and galvanised steel earthwires to this asset class is solely based on the opinion of SKM. The AER has reviewed the standard asset lives and asset classes of other TNSPs. These assets are attributed the same standard life as the transmission line asset they are associated with. These assets are commonly associated with 60 year transmission line asset classes for other TNSP's. The AER is unaware of any other TNSP having disaggregated it regulated asset base to this degree.

The AER is not satisfied that 45 years represents the full economic lives of these assets as considered above. Following this reasoning the AER rejects a 45 year standard asset life for insulator assemblies, dampers and galvanised steel earthwires and have transferred these assets to the 60 year transmission line asset class.

In reviewing Transends proposed asset classes against other TNSP's (and DNSP's to assess wood pole standard asset lives), the AER notes that no other TNSP has a 45 year transmission asset class. Powerlink, before its 2008 decision, did have a 45 year wood pole asset class, however, this asset class was rolled into its general 60 transmission class when it was noted to be an immaterial amount. However, the AER notes that Transend's request for a wood pole asset life of 45 years would be in line with the NSW DNSP's current determinations.

Nuttall Consulting reviewed the Burnie-Warratah wood pole replacement project. In this project Transend is replacing its wood poles along this line with steel poles. This appears to be part of a network wide planned replacement of wood poles by Transend. Transend has informed the AER it will only be purchasing steel poles in the next regulatory period. The AER notes these steel poles should be treated as 60 year transmission assets by Transend.

The AER regards a 45 year standard asset life class as appropriate for wood pole transmission lines, as this is in line with other businesses. The AER accepts underground cables in the 45 year transmission class.

The AER has also reviewed the underground cables that Transend has proposed to place in the medium life 45 year transmission asset class. In performing its analysis the AER notes that Transend is proposing to spend approximately $25 million[373] on underground cables.

The AER has also reviewed other TNSP's and DNSP's standard asset lives. The AER regards a 45 year standard asset class as appropriate for underground transmission lines, as this is in line with other businesses. The AER accepts underground cables in the 45 year transmission class.

[373] Transend, Response to information request no.271, submitted 21 October 2008

The AER also notes that Transend has included bridges on access tracks in the 45 year category. Transend has made no explanation of what types of bridges they will be recording in this asset category. The AER has reviewed the economic life local councils place on bridges from the Australian Local Government Information Network (ALGIN)[374] transport information website. The information presented on this website shows bridges have an economic life on average of 42 years for timber bridges and 70 years for concrete bridges. On average this suggests bridges should have an economic life of 55 years. On this basis the AER regards the economic life of bridges will be more accurately reflected in the 60 years transmission asset class and rejects the use of this asset in this asset class.

The Other short life 5 year asset class is made up of motor vehicles and office equipment. The AER notes that other TNSPs commonly use separate office equipment and vehicle asset categories. Transend's combined life for these asset categories appears shorter than all other TNSPs for these categories. Other TNSP's commonly apply a life of between 8 to 13 years for office equipment, and 7 to 8 years for vehicles.

Based on Transend's non-network capital expenditure projects in its cost information template (Appendix 3 of Transend's proposal), approximately a third of the capital expenditure in the 5 year life category appears to relate to vehicles. Therefore, a life of 9 years (assuming 7 years for vehicles and 10 years for office equipment) appears more reasonable in light of the lives used by other TNSPs.

Transend's proposed short life assets for Protection and Control, Transmission Operations and Other all have a 3 year standard life. In comparison other TNSPs have a 5 year life for these assets. The AER notes that the majority of assets in these categories are computers. The AER notes in its 2008 ElectraNet decision[375], ElectraNet's asset class for computers was judged to have a standard life of 4 years. It also notes the Australian Tax Office ruling[376] for computers to be assigned a standard tax life of 4 years.

The AER, in line with its 2008 ElectraNet decision, rejects Transend's proposed asset life of 3 years for its short life assets, noting these assets are primarily computers, and will apply an asset life of 4 years.

A comparison of Transend's proposed standard asset lives and the AER Decision on Asset Lives is available in table 9.5.

Table 9.5: AER Decision standard lives and asset classes

Asset class	Transend Proposed Standard Asset Life (Years)	AER Decision Standard Asset Life (Years)

[374] Austalian Local Government Information Network, www.algin.net

[375] AER, *ElectraNet transmission determination 2008–09 to 2012–13: Final decision*, 11 April 2008, p. 102

[376] Australian Tax Office, Tax Ruling 2008/4 Income Tax: Effective Life of Depreciating Assets (applicable from 1 July 2008), www.ato.gov.au

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	4
Transmission operations – short life	10	10
Transmission operations – short life	3	4
Other – medium life	40	40
Other – short life	5	9
Other – short life	3	4
Land	n/a	n/a

The AER has also reviewed Transend's calculation of the remaining life of its current assets. Transend's methodology for producing this calculation locks in straight-line depreciation for its capex for each year of the current regulatory period. For Transend to use this approach to calculating remaining life, it needs to continue to calculate the depreciation schedules of all capex expenditure over its economic life.

The AER made an adjustment to Transend's use of CPI when calculating its remaining asset lives to bring it into line with the RFM and PTRM methodology. Transend applied a lagged CPI to its capital base when calculating its standard asset lives. Following discussions with the AER, Transend has altered its approach to apply actual CPI when calculating its remaining asset lives.

The AER has made further investigations and in its judgement Transend's remaining life calculations accurately reflects its assets economic lives. The AER notes that this will require Transend to continue to lock in its depreciation schedules when calculating its economic life.

The AER notes the issue MEG has raised concerning the application of straight-line depreciation covering the assets remaining lives. Transend is closing off its old asset classes to entry following the current regulatory period. Assets under construction and new assets will accumulate in the new asset classes with the new assets lives. Therefore the lives of the assets in the regulatory asset classes will not change over the period. The AER has also scrutinised Transend's approach to calculating its remaining asset lives and accepts this calculation as accurate.

9.5.5 AER Conclusion

The AER accepts Transend's proposed regulatory asset classes, with modifications to assets in the Transmission Line Assets 45 year asset class, as detailed in section 9.5.4, following the AER's review of other TNSP's standard asset lives for similar assets.

The AER also accepts the standard asset lives proposed by Transend in order to bring its asset lives in line with other TNSP's as outlined in the section above. A summary of the AER's decision on Transend's assets is summarised in table 9.5.

The AER accepts Transend's remaining life, adjusted for actual CPI to bring it into line with the PTRM and RFM as considered in the previous section.

9.6 AER assessment of building blocks

9.6.1 Opening asset base and roll forward

The NER requires that the roll forward of Transend's RAB, as at the end of each year of the next regulatory control period, is to be calculated by taking the opening RAB value, adjust it for inflation, add any additional capex, and then subtract disposals and depreciation for the year. The closing RAB value for one year becomes the opening RAB value for the following year.

As discussed in chapter 3, the AER has determined the opening value of Transend's RAB to be $993.6 million as at 1 July 2009. Based on this opening value, the AER has modelled Transend's RAB over the next regulatory control period as shown in table 9.6.

Table 9.6: AER's roll forward of Transend's regulated asset base ($m, nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14
Opening RAB	993.6	1133.2	1289.3	1379.0	1463.5
Net capital expenditure	154.6	166.6	101.2	96.8	96.0
Regulatory depreciation[(a)]	24.4	25.0	23.1	26.2	39.9
Closing RAB	1133.2	1289.3	1379.0	1463.5	1546.2

(a) Net of inflation adjustment to the opening RAB.

9.6.2 Forecast capital expenditure

As discussed in chapter 4, the AER has determined a forecast capex allowance for Transend of $615.1 million ($2008–09) during the next regulatory control period. The

annual nominal allowance is shown in table 9.6 and is used to calculate the roll forward value of Transend's RAB.[377]

9.6.3 Change from As Commissioned to As Incurred

In September 2007, the AER released the Electricity Transmission Network Service Providers Roll Forward Model final decision. The new guidelines moved TNSP's from recording capital expenditure on an "as commissioned' basis to an "as incurred" basis. Transend for the regulatory period 2004-2008/9 has recorded capex as commissioned. This has meant a 'work in progress' and a finance during construction amount needed to be added into the regulatory base that was not attributed to any project in the current period. The move to record expenditure as incurred will mean that work in progress and finance during construction automatically accumulates in the RAB rather than being calculated at the end of the regulatory period.

9.6.4 Depreciation

The AER has assessed Transend's depreciation schedules and considers the methods and rates used are in accordance with clause 6A.6.3(b) of the NER. The AER has made a minor adjustment to the calculation of remaining asset lives Transend uses. This adjustment means that Transend does not use lagged CPI in its calculation of asset lives.

Using a post-tax nominal framework, the AER has made allowances for nominal regulatory depreciation that sums the (negative) straight-line depreciation and the (positive) annual inflation effect on the opening RAB. Regulatory depreciation has been used to model the nominal asset values over the regulatory control period and to determine the depreciation allowance. In modelling the applicable straight-line depreciation component for Transend, the AER has based its calculation on the remaining life (for existing assets) and standard life (for new assets) of each asset class. Table 9.6 shows the resulting figures (also referred to as the return of capital).

9.6.5 Weighted average cost of capital

The AER has determined the annual return on capital allowance by applying the nominal vanilla weighted average cost of capital (WACC) to Transend's opening RAB for each year of the regulatory control period.

The nominal vanilla WACC of 9.64 per cent is based on a post-tax nominal return on equity of 11.27 per cent and a pre-tax nominal return on debt of 8.55 per cent. Table 9.9 shows the AER's return on capital allowance for this draft transmission determination.

9.6.6 Operating and maintenance expenditure

As discussed in chapter 6, the AER has determined that a forecast opex allowance for Transend of $260.2 million ($2008–09) for the next regulatory control period. Table

[377] In accordance with the timing assumptions of the PTRM, the nominal capex values include a half WACC allowance to compensate for the average six-month period before capex is added to the RAB for revenue modelling purposes.

9.10 shows the annual opex allowance, which equates to an average amount of $52.0 million per annum in real terms.

9.6.7 Operating and maintenance expenditure efficiency allowance

Transend has opted to be assessed under the draft statement of regulatory principles[378] (DRP). Under this framework the guideline states:

> *Opex incentive scheme*[379]
>
> The incentive to increase the efficiency of operating and maintenance practices is provided by:
>
> (a) allowing the TNSP to retain, during a regulatory control period, the difference between its actual opex and the forecast costs used to set the revenue cap
>
> (b) the mechanism by which the ACCC takes into account past expenditure out-turns when setting future expenditure targets
>
> (c) the carry-forward mechanism.

Therefore Transend has an incentive to reduce opex through keeping the difference between forecast and actual opex within the period. However, in the next regulatory period the average of any savings in this period will be offered as an incentive following the glide-path as presented in table 9.7.

As shown in table 9.7 Transend has overspent its opex allowance for the period.

Table 9.7: Calculation of annual efficiency savings ($m, 2008-09)

	2004 (Jan to Jun)	2004–05	2005–06	2006–07	2007–08[a]	2008–09[a]	Total
Opex allowance	15.9	33.8	38.5	36.8	35.6	35.8	196.4
Less: network support	0.0	0.3	1.4	0.7	3.0	3.6	8.9
Less: equity/debt raising costs	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Less: self-insurance	0.0	0.0	0.0	0.1	0.3	1.0	1.4
Adjusted allowance	15.9	33.5	37.1	36.1	32.3	31.2	186.1
Less: Controllable opex	15.4	33.4	39.5	40.1	43.9	45.4	217.7

[378] AER, *Draft Statement of principles for the regulation of electricity transmission revenue*, 18 August 2004.

[379] ibid, p. 7.

Total efficiency	0.5	0.1	–2.3	–4.0	–11.6	–14.2	–31.6
Average opex efficiency savings							–5.3

(a) Forecast figure. The AER will update the calculation of annual opex efficiency savings with the most recent forecast of controllable opex for 2007-08, 2008–09 and the latest CPI data, at the time of its final transmission determination.

In the 2004 TransGrid Revenue Cap decision[380] the ACCC stated:

> This regulatory mechanism is intended to provide a strong financial incentive to TNSPs to reveal efficiencies since if actual opex is below the forecast opex; shareholders retain the full benefit of the saving for the period of the control. On the other hand, if actual opex is above the forecast opex, shareholders face the full amount of that "overspend".[381]

In line with this previous ruling from the ACCC, the AER will not be proposing to carryover the penalty for the opex overspend as Transend's shareholders have already been penalised for this overspend.

Therefore, the AER accepts Transend's proposed zero opex efficiency saving and will be applying a glide path as presented in table 9.8.

Table 9.8: AER's efficiency glide path allowance ($m, 2008-09)

	2008–09	2009–10	2010–11	2011–12	2012–13	Total
Opex efficiency glide path	100 %	80 %	60 %	40 %	20 %	–
Opex efficiency allowance	0.0	0.0	0.0	0.0	0.0	0.0

As noted by Transend, the AER's first proposed efficiency benefit sharing scheme (EBSS) will apply to Transend in the next regulatory control period as required under clause 11.6.18 of the NER.[382] The EBSS has been presented in chapter 7.

9.6.8 Estimated taxes payable

The estimated tax building block relates to Transend's regulated activities only. Using the PTRM, the AER has modelled Transend's income tax liability during the next regulatory control period based on the tax depreciation and cash flow allowances provided in this draft transmission determination. The amount of tax payable is estimated using 60 per cent benchmark gearing, rather than Transend's actual gearing, and a statutory company income tax rate of 30 per cent. In accordance with clause 6A.6.4(a), the value of imputation credits (gamma) of 0.5 has been applied in calculating the net tax allowance.

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380 ACCC, *NSW and ACT Transmission Network Revenue Caps – TransGrid 2004/05-2008/09, Draft Decision*, 28 April 2004

381 ACCC, *NSW and ACT Transmission Network Revenue Caps – TransGrid 2004/05-2008/09, Draft Decision,* 28 April 2004, p. 24.

382 AER, *Electricity transmission network service providers efficiency benefit sharing scheme*, September 2007.

Under the post-tax nominal framework, the application of the statutory tax rate generates an effective tax rate that can provide more appropriate and cost-reflective revenue outcomes. The effective tax rate is defined as the difference between pre-tax and post-tax rates of return. It is sensitive to several factors, including the corporate tax rate and the range of available tax concessions that serve to lessen tax liabilities or defer them to a later period. Based on the approach to modelling the cash flows in the PTRM, the AER has derived an effective tax rate of 22.22 per cent for this draft transmission determination. Table 9.9 shows the AER's estimate of Transend's tax payments.

Table 9.9: AER's modelling of net tax allowance ($m, nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total [a]
Tax payable	9.3	10.7	12.3	13.5	14.7	60.4
Less value of imputation credits	4.6	5.4	6.1	6.7	7.3	30.2
Net tax allowance	4.6	5.4	6.1	6.7	7.3	30.2

(a) Figures do not total correctly due to rounding error

9.7 AER draft determination—maximum allowed revenue

Based on its assessment of the building block components and using the PTRM, the AER has determined an annual building block revenue requirement for Transend that increases from $176.4 million in 2009–10 to $239.8 million in 2013–14 ($nominal). Table 9.10 shows the annual building block calculations.

Table 9.10: AER's draft decision on annual building block revenue requirement ($m, nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
Return on capital	95.8	109.2	124.3	132.9	141.1	603.2
Regulatory depreciation	24.4	25.0	23.1	26.2	29.9	128.6
Opex allowance	51.6	53.7	54.9	59.5	61.5	281.1
Opex efficiency glide path	0.0	0.0	0.0	0.0	0.0	0.0
Net tax allowance	4.6	5.4	6.1	6.7	7.3	30.2
Annual building block revenue requirement (unsmoothed)	176.4	193.3	208.4	225.4	239.8	1043.1

The NPV of the annual building block revenue requirement for the next regulatory control period has been calculated to be $787.1 million. Based on this NPV amount, the AER has determined a nominal expected MAR (smoothed) for Transend that increases from $176.4 million in 2009–10 to $244.0 million in 2013–14, as shown in table 9.10. Transend's MAR for the next regulatory control period is calculated using

the formula described in section 9.3. The total revenue cap for Transend over the next regulatory control period is $1044.0 million.

To determine the expected MAR (smoothed) over the next regulatory control period the AER has applied an X factor of -18.9 per cent in the first year (based on setting the first year MAR equal to the annual building block revenue requirement for that year) and -5.8 per cent in subsequent years. The AER considers that this profile of X factors results in an expected MAR in the final year of the regulatory control period that is not unreasonably different to the annual building block revenue requirement for that year, and is therefore in accordance with clause 6A.6.8(c)(2) of the NER.

Table 9.11: AER's draft decision on the maximum allowed revenue ($m, nominal)

	2009–10	2010–11	2011–12	2012–13	2013–14	Total
MAR (smoothed)	176.4	191.3	207.4	225.0	244.0	1044.0
X factor	–18.9	–5.8	–5.8	–5.8	–5.8	–

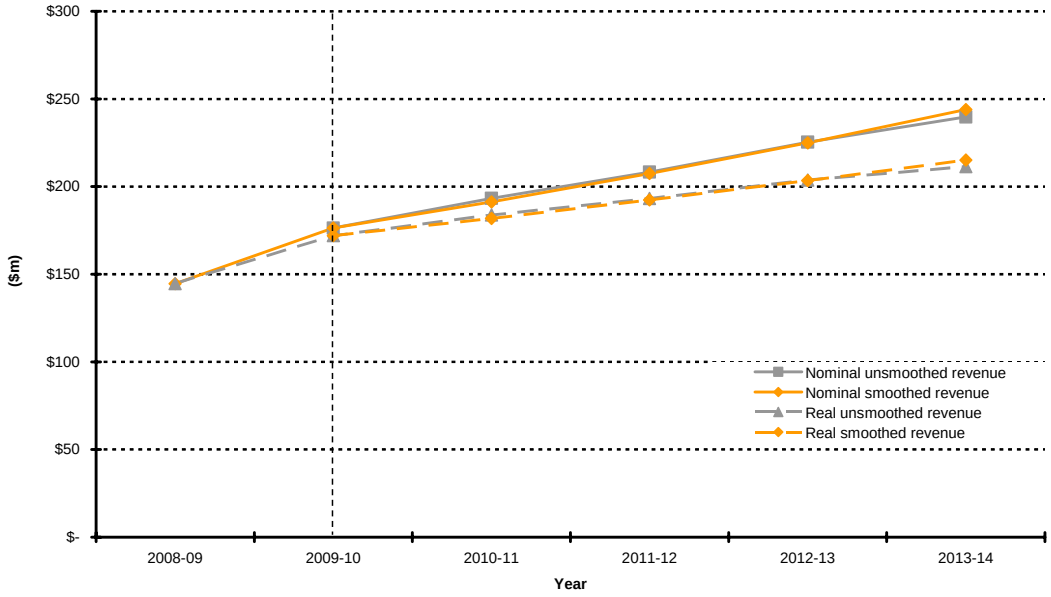
The revenue increase during the next regulatory control period consists of:

- An initial increase of 22.0 per cent (nominal) from 2008–09 to 2009–10.
- A subsequent average annual increase of 8.5 per cent (nominal) during the remainder of the next regulatory control period.

In real terms, the revenue increase during the next regulatory control period consists of an initial increase of 18.9 per cent from 2008–09 to 2009–10 and a subsequent annual average increase of 5.8 per cent per annum during the remainder of the next regulatory control period.

Figure 9.1 shows the revenue path allowed by this draft transmission determination (both smoothed and unsmoothed) in nominal and real terms.

Figure 9.1: Revenue path from 2009–10 to 2013–14 ($m)



9.8 Average transmission charges

Transend's MAR for the next regulatory control period is established through a building block approach. While the AER assesses Transend's proposed pricing methodology, actual transmission charges established at particular connection points are not approved by the AER. Transend establishes its transmission charges in accordance with its approved pricing methodology and the NER.

The effect of the AER's draft transmission determination on average transmission charges can be estimated by taking the annual MAR and dividing it by forecast annual energy delivered in Tasmania.[383] Based on this approach, the AER estimates that this draft transmission determination will result in an average increase of 8.1 per cent per annum (nominal) in average transmission charges over the next regulatory control period or an average increase of 5.4 per cent per annum in real terms ($2008–09).

The increase in the average transmission charges is greater than the average growth in the level of peak demand in Tasmania, which is forecast to increase by 2.2 per cent per annum over the next regulatory control period.[384] The increase in average transmission charges is primarily because of:

- Additions to Transend's asset base from over-expenditure on capex in the current regulatory period
- the need for increased capex associated with the new reliability standards specified in the Tasmanian Regulations. These new reliability standards are outlined in Appendix B of this decision

[383] The forecast energy delivered (customer sales) figures were obtained from the *Transend 2008 Annual Planning Report*.

[384] Transend, *Transend 2008 Annual Planning Report 2008*, 24 April 2008, pg. 136

- the urgent need to replace and maintain ageing assets
- high input costs such as construction materials and labour (as a consequence of the commodity/minerals boom and skills shortages respectively).
- increase in demand.

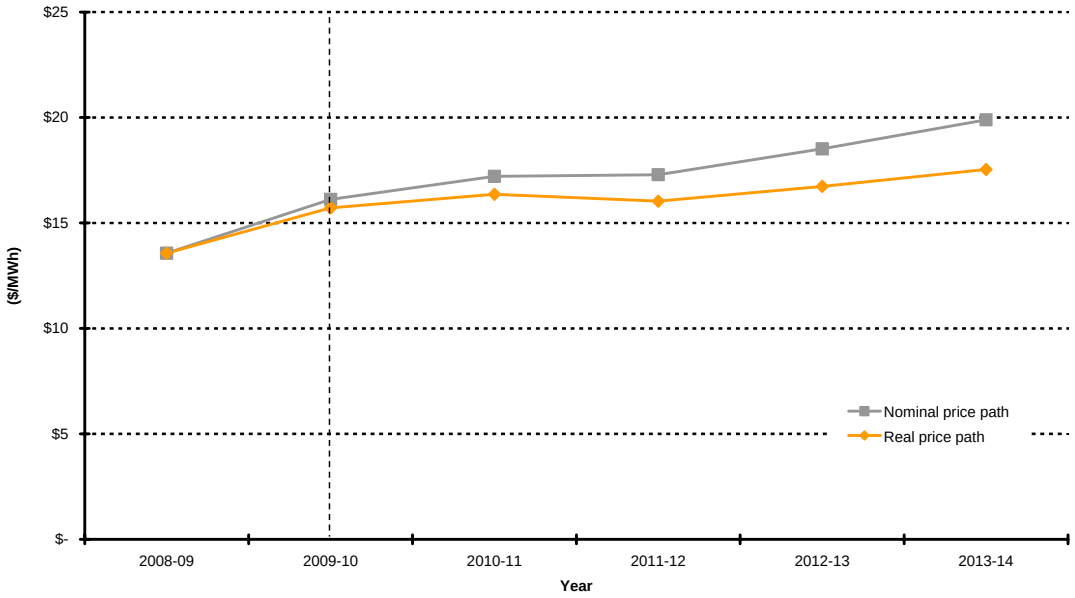
Transmission charges represent approximately 12 per cent[385] on average of end user electricity charges of $1400[386] in Tasmania. The AER estimates that, in nominal terms, the increase in average transmission charges under this draft transmission determination will add approximately $32 (or 2.3 per cent) in 2009-10 and approximately $12 for each subsequent year of the forthcoming regulatory period to the average residential customer's annual bill. Calculated on a nominal basis, Transend's proposed $42 real increase is equivalent to a $48 nominal increase in 2009-10 and the $6 real increase in each subsequent year is equivalent to $14 in nominal terms.

Figure 9.2 shows the resulting average price path of this draft transmission determination during the next regulatory period compared with the average price for the final two years of the current regulatory period in nominal and real terms ($2008–09). The average transmission charges in 2008–09 is $13.56 per MWh. Nominal average transmission charges are forecast to increase from around $16.12 per MWh in 2009–10 to $19.89 per MWh in 2013–14. Real average transmission charges are forecast to increase from around $15.71 per MWh in 2009-10 to $17.53 per MWh in 2013–14.

[385] The customer billing data is from the Office of the Tasmanian Energy Regulator. OTTER, Comparison of 2008 Australian Standard Offer Prices Report, February 2008, pg. 5

[386] Interpolated from Transend revenue proposal, page 6, a 3 per cent price increase, in real terms, caused by a $42 rise in price under the Transend proposal means the average end user electricity charge is $1400.

Figure 9.2: Price path from 2009–10 to 2013–14 ($/MWh)



10 Negotiating framework for negotiated transmission services

10.1 Introduction

The AER is required to assess Transend's proposed negotiating framework for the relevant regulatory control period in accordance with the requirements of rule 6A.9 of the NER.

The negotiating framework should stipulate the procedure to be followed by the transmission network service provider (TNSP) and the service applicant when negotiating the terms and conditions of access for negotiated transmission services. In accordance with chapter 6A Part K, in the event of an access dispute a commercial arbitrator must have regard to the negotiating framework.

There are three types of negotiated transmission services that a service applicant may request and negotiate with a TNSP. These services include:

- connection services (which might include entry, exit and TNSP to MNSP connection services)
- use of system services supplied by the shared transmission network that exceed or are below the networks specified performance standard under any legislation of a participating jurisdiction
- use of system services relating to augmentation or extensions required to be undertaken on a transmission network as described in clause 5.4A of the NER.[387]

The negotiating framework only relates to negotiated services. The pricing of prescribed transmission services is covered by the pricing methodology that applies to a TNSP, as discussed in chapter 12 of this draft determination.

This chapter sets out the process by which the AER has considered Transend's proposed negotiating framework under chapter 6A of the NER and the reasons for its determination in relation to the proposed framework.

Regulatory requirements

Clause 6A.2.2(2) of the NER states that a transmission determination made by the

AER pursuant to clause 6A.2.1 must include a determination relating to the TNSP's negotiating framework.

[387] National Electricity Rules, Definition "Negotiated Transmission Service", Chapter 10.

TNSP's proposal

In accordance with clause 6A.9.5(a) of the NER, a TNSP must prepare a document setting out the procedure to be followed during negotiations between that provider and any person who wishes to receive a negotiated transmission service from the provider, as to the terms and conditions of access for provision of the service. Under clause 6A.10.1(b) of the NER, the TNSP must submit its proposed negotiating framework to the AER at the same time that it submits its revenue proposal.

Consistent with clause 6A.9.5(b) of the NER, the negotiating framework for a transmission network service provider must comply with the applicable requirements of its transmission determination, and with the requirements of clause 6A.9.5(c) of the NER, which are discussed below.

Under clause 6A.10.1(c) of the NER, the proposed negotiating framework must comply with the requirements of, and must contain or be accompanied by such information as required by, the submission guidelines made for that purpose under clause 6A.10.

10.1.1 AER determination of negotiating framework

The AER must assess the TNSP's proposed negotiating framework under clause 6A.9.5(c) of the NER, which requires a TNSP's negotiating framework to specify:

- The requirement that a TNSP and service applicant negotiate the terms and conditions of a negotiated transmission service in good faith.
- A requirement for the TNSP to provide all commercial information that will allow effective negotiation.
- A requirement for the TNSP to provide a reasonable estimate of the costs of providing the negotiated transmission service and demonstrate that the charges reflect those costs.
- A requirement for the service applicant to provide all commercial information so that the TNSP may engage in effective negotiation.
- A reasonable time period for negotiation and a requirement for each party to use reasonable endeavours to adhere to the time period.
- A process for dispute resolution that allows for all disputes in relation to terms and conditions of access to be dealt with in accordance with part K of chapter 6A of the NER.
- Arrangements for the payment of a TNSP's reasonable direct expenses incurred in processing the application.
- A requirement that a TNSP determine the potential impact of the negotiated transmission service on other network users.
- A requirement that the TNSP must notify and consult with any affected network user and ensure that the provision of the negotiated transmission service does

not result in other network users non compliance with their obligations under the NER.

Clause 6A.9.3 of the NER requires the AER's determination relating to the negotiating framework to set out requirements that are to be complied with in respect of the preparation, replacement, application or operation of the provider's negotiating framework.

Under clause6A.14.1(6) of the NER, the AER must make a decision to either approve or refuse to approve the proposed negotiating framework. If the AER's decision is to refuse to approve the proposed negotiating framework, the AER must include in its decision an amended negotiating framework which is determined on the basis of the current proposed negotiating framework, and amended from that basis only to the extent necessary to enable it to be approved in accordance with the NER.[388]

10.2 Transend's proposal

Transend's negotiating framework stated that it applies to Transend and any service applicant who has made an application in writing for a negotiated transmission service. Any service applicant should apply and comply with the requirements of the negotiating framework. The negotiating framework requires that both parties in a negotiating process to negotiate in good faith the terms and conditions of access for the negotiated transmission service.[389] The requirements of the negotiating framework are additional to any requirements in chapters 4, 5 and 6A of the NER and if any inconsistencies exist, the requirements of the NER prevail.[390]

Where a negotiated transmission service is sought, the timeframes for commencing, progressing and finalising the negotiation and the commercial information required from Transend and the service applicant are set out in the negotiating framework.[391] The negotiating framework states that once an application is received from a service applicant both parties must use their reasonable endeavours to adhere to the proposed timeframes.[392]

Transend may suspend negotiations if the service applicant fails to pay the application fee by the due date as outlined in the proposed negotiating framework. Negotiations can recommence once the service applicant has paid the fee.[393]

The negotiating framework states that both Transend and the service applicant, upon commencing negotiations for a negotiated transmission service, are obliged to provide all relevant commercial information to enable both parties to engage in effective negotiations. The commercial information that Transend and the service applicant receive from each other may be subject to certain terms and conditions, including the

[388] National Electricity Rules, cl.6A.13.2(c).
[389] Transend, *Proposed negotiating framework*, 30 May 2008, clause 3, p.6.
[390] ibid., clause 4, p.6.
[391] ibid., clause 10, p.7-8.
[392] ibid., clause 10.2(a) p.7.
[393] ibid., clause 10.2(c), p.7-8.

condition that each party must treat the commercial information received from the other party as confidential unless both parties agree to the disclosure.[394]

The proposed negotiating framework also contains the requirement that Transend provide a reasonable estimate of the costs of providing the negotiated transmission service and demonstrate that the charges reflect those costs, including any increases or decreases as part of the provision of this commercial information.[395]

The negotiating framework establishes a process for the payment of the costs Transend incurs as a result of processing the application for a negotiated transmission service.[396] Transend may suspend negotiations if a service applicant does not pay an invoice by its due date. The application fee will be deducted from the reasonable costs incurred by Transend in processing the application for the negotiated transmission service. Transend may issue the service applicant with a notice setting out the reasonable costs incurred and requesting payment of amounts above the application fee. The service applicant is required to pay Transend any amount requested in the notice on the tenth business day after the date of the tax invoice.[397]

The negotiating framework stated that either party can terminate the negotiations. Where the service applicant terminates a negotiation, it must do so in writing. Transend may only terminate a negotiation in certain circumstances.[398]

The negotiating framework states that Transend should determine the potential impact of the negotiated transmission service on transmission network users. As a part of this process, Transend will notify and consult with any affected transmission network users and ensure that the negotiated transmission service does not result in non compliance with obligations relating to other transmission network users under the NER.[399]

The negotiating framework states that all disputes arising between parties, regarding terms and conditions of access for the negotiated transmission service are subject to part K of chapter 6A of the NER.[400]

10.3 Submissions

Hydro Tasmania stated that it is reviewing Transend's negotiating framework and reserves the right to raise issues regarding it later in the AER's consultation process.

10.4 Issues and the AER's considerations

The AER notes clause 6A.2.2 requires that a transmission determination to include:

394 ibid., clauses 7 and 9, p.6 and 7.
395 ibid., clause 8, p.6-7.
396 ibid., clause 13, p. 8–9.
397 ibid., clause 13 (c) and (d), p.8.
398 ibid., clause 16, p.9-10.
399 ibid., clause 14, p.9.
400 ibid., clause 11, p.8.

a determination relating to a TNSP's negotiating framework

a determination that specifies the negotiated transmission service criteria that shall apply to a TNSP.

Clause 6A.9.3 requires the AER's determination relating to the negotiating framework to specify requirements that are to be complied with in respect of the preparation, replacement, application or operation of the TNSP's negotiating framework.

The AER considers that Transend has prepared its proposed negotiating framework in accordance with the requirements of clause 6A.9.5, and that the application or operation of the framework is also specified in accordance with clause 6A.9.5.

However, the NER does not explicitly address how or when a TNSP should replace its negotiating framework. Transend has stated that the negotiating framework applies for the regulatory control period from1 July 2009 to 30 June 2014.[401]

The AER considers Transend's negotiating framework as submitted is compliant with clause 6A.9.5(c) of the NER.

10.5 AER's conclusions

As required by clause 6A.14.3(f) of the NER, the AER approves Transend's negotiating framework for the next regulatory control period.

The AER has assessed Transend's negotiating framework and considers that the negotiating framework is compliant with clause 6A.9.5(c) of the NER.

[401] Ibid., clause 1.2, p.4.

11 Negotiated transmission service criteria

11.1 Introduction

The NER requires that the AER include negotiated transmission service criteria (NTSC) as a part of a TNSP's transmission determination.[402] Section 9.1 of this draft decision describes negotiated transmission services. Unlike the other components of a transmission determination, TNSPs are not required to submit criteria to the AER.

The NTSC sets out the criteria that must be applied by the TNSP in negotiating the terms and conditions of access, including the price and access charges for negotiated transmission services. The criteria must also be applied by a commercial arbitrator in resolving disputes relating to the terms and conditions of access and access charges for negotiated transmission services.

11.2 Regulatory requirements

Under clause 6A.2.2 of the NER, the AER is required to make a determination specifying the criteria that apply to a TNSP as part of its transmission determination for that TNSP. The AER's determination must set out the criteria to apply to a TNSP in negotiating the provision of negotiated transmission services, specifically:

- the terms and conditions of access for negotiated transmission services, including the prices that are to be charged
- access charges which are negotiated by the provider during that regulatory control period.[403]

The criteria must also be applied by a commercial arbitrator to resolve disputes about negotiated transmission services, specifically:

- the terms and conditions of access for the negotiated transmission service, including the price that is to be charged for the provision of that service by the TNSP
- access charges that are to be paid to or by the TNSP.[404]

Clause 6A.9.4(b) of the NER requires that the criteria must give effect to, and be consistent with, the negotiated transmission service principles specified in clause 6A.9.1.

In accordance with clause 6A.11.3 of the NER, the AER published its proposed criteria for Transend, and Transend's revenue proposal, proposed negotiating framework, proposed pricing methodology and supplementary information in June 2008.

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402 National Electricity Rules, clause 6A.2.2(3)
403 National Electricity Rules, clause 6A.9.4 (a)(1).
404 National Electricity Rules, clause 6A.9.4(a)(2),

11.3 Submissions

The AER received no submission on the proposed criteria for Transend.

11.4 Issues and AER considerations

The AER notes that the provisions of chapter 6A create a regime for the regulation of negotiated transmission services that is intended to be less intrusive than that applying to prescribed transmission services. In deciding on the negotiate/arbitrate framework the AEMC considered that there are fewer market failure concerns surrounding negotiated transmission services and that users of these services are likely to be large and well resourced, possessing countervailing market power enabling them to negotiate effectively. As such, these services are not subject to the direct revenue control applied to prescribed transmission services in revenue determinations. Instead, prices and conditions for negotiated transmission services are intended to be agreed through commercial negotiation, or failing agreement, determined through commercial arbitration.

The AEMC's decision puts the onus on the service applicant to scrutinise the efficient costs incurred by the TNSP in providing the negotiated transmission service. Further, the AEMC stated that end users of negotiated transmission services are likely to be larger and better resourced, providing a counterweight to the market power possessed by the TNSP.[405] The AER notes the AEMC's view that commercial negotiation is feasible for service applicants applying for negotiated transmission services. It therefore does not consider it necessary to insert an efficiency requirement into the criteria.

The AER therefore considers that the draft negotiated transmission services criteria released for consultation on 31 May 2008 should remain unamended.

11.5 AER determination

As required by clause 6A.9.4 of the NER the determination by the AER at appendix H specifies the negotiated transmission service criteria for Transend for the regulatory control period 1 July 2009 to 30 June 2014.

[405] ibid.

12 Pricing Methodology

12.1 Introduction

This chapter sets out the AER's considerations of Transend's proposed pricing methodology for prescribed services for the regulatory control period 1 July 2009 to 30 June 2014.

This chapter is set out as follows:

- Regulatory requirements under chapter 6A of the NER and the AER's pricing methodology guidelines
- Summary of Transend's proposed pricing methodology
- Submissions received on Transend's proposed pricing methodology
- Issues and AER's considerations
- AER's determination on Transend's proposed pricing methodology.

12.2 Regulatory requirements

12.2.1 NER requirements

Clause 6A.24.1(b) of the NER defines a pricing methodology in terms of the pricing principles (as set out in rule 6A.23 of the NER):

> A pricing methodology is a methodology, formula, process or approach that, when applied by a Transmission Network Service Provider:
>
> (1) allocates the aggregate annual revenue requirement for prescribed transmission services provided by that provider to:
>
> (i) the categories of prescribed transmission services for that provider; and
>
> (ii) transmission network connection points of Transmission Network Users; and
>
> (2) determines the structure of the prices that a Transmission Network Service Provider may charge for each of the categories of prescribed transmission services for that provider.

In accordance with clause 6A.10.1(e) of the NER, Transend's proposed pricing methodology must:

> (1) give effect to and be consistent with the Pricing Principles for Prescribed Transmission Services; and
>
> (2) comply with the requirements of, and contain or be accompanied by such information as is required by, the pricing methodology guidelines made for that purpose under rule 6A.25.

Clause 6A.14.3(g) of the NER requires the AER to approve Transend's proposed pricing methodology in its draft decision if it is satisfied that it meets the two

requirements set out above. If the AER refuses to approve any aspect of Transend's proposed pricing methodology in its draft decision, clause 6A.12.1(e) requires the draft decision to include details of the changes required or matters to be addressed before it will be approved.

12.2.1 Pricing methodology guidelines

The AER's pricing methodology guidelines (the guidelines)[406] were developed in accordance with clause 6A.25.1(a) of the NER.

The guidelines specify or clarify:

(a) the information that is to accompany a proposed pricing methodology;

(b) permitted pricing structures for the recovery of the locational component of providing prescribed TUOS services;

(c) permitted postage stamp pricing structures for prescribed common transmission services and the recovery of the adjusted non-locational component of providing prescribed TUOS services;

(d) the types of transmission system assets that are directly attributable to each category of prescribed transmission services; and

(e) those parts of a proposed pricing methodology, or the information accompanying it that will not be publicly disclosed without the consent of the TNSP. [407]

12.3 Transend's proposal

On 31 May 2008 Transend submitted its proposed pricing methodology to the AER. Transend stated that its proposed pricing methodology is a fulfilment of its obligation under the NER and the AER's pricing methodology guidelines to prepare a proposed pricing methodology for prescribed transmission services. Transend's proposed pricing methodology outlines:

- the calculation of the aggregate annual revenue requirement (AARR)
- allocation of assets to categories of prescribed transmission service to derive the annual service revenue requirement (ASRR) for each category of service
- allocation of the ASRR to individual connection points
- the derivation of prices and charges for each category of prescribed transmission service
- billing arrangements, prudential requirements, prudent discounts and Transend's proposed approach for ensuring it complies with its approved pricing methodology

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406 AER, *Electricity transmission network service provider - pricing methodology guidelines*, October 2007.

407 NER, cl. 6A.25.2

- hypothetical worked examples required to comply with the information requirements of the guidelines.

In November 2000, Transend published its original Transmission Pricing Policy based on the principles set out in the Tasmanian Electricity Code. It was regularly updated, including when Transend became subject to the then National Electricity Code. Transend stated that the information included in a pricing methodology includes all the information contained in, and expands upon, the Transmission Pricing Policy. Thus Transend will discontinue publication of the Transmission Pricing Policy from 1 July 2009.[408]

In line with past practice, Transend elected to use either contract agreed maximum demand or historical energy to calculate prescribed common transmission service prices and the non-locational component of prescribed TUOS service prices. This is in accordance with clause 2.3(b)(1) of the pricing methodology guidelines.

Transend stated that it will use prevailing contract agreed maximum demand to derive the price for the locational component of *prescribed TUOS services*. This is in accordance with clause 2.2(c)(1) of the pricing methodology guidelines.

12.4 Submissions

The AER received 1 submission on Transend's proposed pricing methodology.

The Major Employers Group (MEG) recommended that Transend's pricing methodology should reflect Hydro Tasmania's influence on the operation and configuration of the system.

MEG also recommended that "the AER ensure that transmission and sub-transmission assets are considered separately and that general TUOS charges be limited to transmission assets only. Further it is recommended that revenues associated with sub-transmission assets should be charged to the specific transmission customers that are the beneficiary [sic] of such assets."[409]

12.5 Issues and AER considerations

12.5.1 Treatment of radial lines

Transend proposal

Appendix 2 of the proposed pricing methodology describes three radial lines connecting both generator and load. In the case of the Gordon-Chapel Street 220kV line, the energy flow is primarily from Gordon Power Station to the Chapel Street substation except when Gordon is not generating, in which case energy flows from

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408 Differences between the Transmission Pricing Policy and the proposed pricing methodology is discussed in section 4.6 of the proposed pricing methodology.

409 MEG, *Major Employer Group (Tasmania) submission to AER on Transend Revenue Proposal*, August 2008, p.9.

Chapel Street substation to Gordon Power station then to the load at Strathgordon. A similar situation is found in the other two radial lines.

As outlined in section 7.3 of Transend's proposed pricing methodology, radial transmission lines in existence as at 1 January 2004, including the 3 radial lines mentioned above, are proposed to be classified as *prescribed TUOS services*. Transend stated that this was a continuation of past practice and avoids price shocks relating to existing assets.

AER considerations

The means of determining the *attributable cost share* is set out in clause 6A.22.3 of the NER. It is based on the costs of the transmission assets "directly attributable" to the provision of a category of prescribed transmission services The term directly attributable is explained on page 34 of the AEMC's *Rule Determination National Electricity Amendment (Pricing of Prescribed Transmission Services) Rule 2006 No.22* (the Rule Determination). In the case of clause 6A.22.3 it refers to assets that are "used or required to provide" that category of *prescribed transmission services*. The 3 radial lines could therefore be said to be directly attributable to both *prescribed entry services* and *prescribed TUOS services* (as those terms are defined in chapter 10 of the NER).

The Guidelines clarify a number of aspects in relation to the preparation by a TNSP of its pricing methodology. In section 2.4, the Guidelines confirm that transmission lines that connect a generator to the transmission grid can be directly attributable to both *prescribed entry services* (section 2.4(a)(1) and *prescribed TUOS services* (section 2.4(a)(3)).

The application of the definition of *attributable cost share* therefore results in a portion of the AARR (that which corresponds to the radial lines in question) being attributable to two categories of prescribed transmission service. The way in which this should be attributed is provided for in clause 6A.23.2(d). This is confirmed in page 36 of the Rule Determination.

Clause 6A.23.2(d) has a cascading effect. The costs of the relevant asset are to be allocated first to *prescribed TUOS services*, but only to the extent of the stand-alone amount for that category of *prescribed transmission services*. Next, costs are similarly allocated to *prescribed common transmission services*. The stand-alone amount is the cost of the asset had it been developed just to provide for that category of *prescribed transmission services*.

According to clause 6A.23.2(d), the remainder of the cost of the line, that is, the difference between the actual cost of the line and the stand-alone amount determined for *prescribed TUOS services*, should be attributed to *prescribed entry services* and *prescribed exit services* (clause 6A.23.2(d)(3)).

Transend's proposed approach is to continue its previous practice and attribute a component of costs in excess of the stand-alone amount to the *prescribed TUOS services* category. This is not consistent with the pricing principles for prescribed

transmission services[410]. Therefore, Transend's pricing methodology proposal does not comply with the NER. According to clause 6A.14.3(g), the AER is obliged to approve a pricing methodology proposal if it gives effect to the "Pricing Principles for Prescribed Transmission Services" (which are set out in rule 6A.23). Since that is not the case the AER has decided not to accept the pricing proposal in these circumstances according to clause 6A.14.3(a).

12.5.2 Determination of locational component prices for prescribed TUOS services

Transend proposal

Subsequent to the lodgement of their proposal, Transend notified the AER that there may be a possibility for the distortion of prices arising from Transend's proposed pricing methodology. This arises because of differences in the measure of demand used to calculate prices and the measure of demand used to calculate charges for the locational component of *prescribed TUOS services* as outlined in section 9.4 of the proposed pricing methodology.

Transend uses prevailing contract agreed maximum demand, which is in accordance with clause 2.2(c)(1) of the guidelines, to convert lump sum amounts (derived from CRNP or modified CRNP) into prices.

During each billing period, locational charges are determined by multiplying the locational price for each connection point by the relevant billing demand. Billing demand is calculated to be the greater of a transmission customer's 30-minute maximum demand and the product of that customer's 30 minute maximum apparent power and their minimum power factor (a worked example is provided in section 9.4.2 of the proposed pricing methodology).

Transend explained that, because the contract agreed maximum demand will exceed the billing demand, this would result in a shortfall between the annual charge and the lump sum figure subject to the 2% rule in clause 6A.23.4(f) of the NER. Under clause 6A.23.4(h), the resulting under-recovery of the ASRR may be recovered by the TNSP through the non-locational component of *prescribed TUOS services*. The larger the contract agreed maximum demand the larger is this shortfall. Transmission customers therefore have the incentive to nominate a large contract agreed maximum demand to minimise their charges with the resulting shortfall being passed on to other customers.

AER considerations

The AER considers that the distortion of prices described above is contrary to the aim of promoting efficient operation and use of electricity services with respect to price under the national electricity objective. The AER notes Transend's cooperation in identifying and addressing this concern.

The AER requests that Transend make the necessary amendments to its proposed pricing methodology to minimise the distortion of prices as described above. In particular, the AER requests that Transend amend the proposed pricing methodology

[410] NER, rule 6A.23 and cl. 6A.24.1(c)(1).

such that the measure of demand used to calculate the *prescribed TUOS services* locational price is consistent with the measure of demand used to calculate the *prescribed TUOS service* locational component charge.

12.5.3 Issues raised in submissions

MEG submission

The MEG stated its concern that Transend's pricing methodology should reflect Hydro Tasmania's influence on the operation and configuration of the transmission system. One purpose of the NER and the guideline is to encourage price structures that, over time, ensure that the price each transmission customer pays is commensurate with the benefit it receives from the use of the TNSP's services.

AER considerations

The issue raised by the MEG is a complex matter that cannot realistically be addressed in a single determination. The Tasmanian transmission system has evolved over a substantial period of time and under vastly different governance and operational imperatives, especially prior to Tasmania's entry into the national electricity market. Regarding the approach taken by Transend to the pricing of radial lines, the AER notes that the changes the AER has requested will address in part the issue raised by the MEG. Further progress will depend on the continuing effect of the application of the NER to new network investments in Tasmania as transmission customers seek new connection arrangements in response to changing circumstances.

Regarding the MEG's comments about sub-transmission assets being included in Transend's asset base, Chapter 10 of the National Electricity Rules defines a transmission network as a network operating at voltages typically greater than 66 kV. However, as set out in more detail in appendix B, Transend's transmission licence describes the Transend transmission network as extending "from the connection points for the Generation Sites and Transmission Sites listed … to the connection points for the Demand Sites and Transmission Sites listed". As a result, the Transend network, unlike its peers, is defined to include assets that operate at 6.6 kV, 11 kV, 22 kV, 33 kV, 44 kV, 110 kV and 220 kV. Therefore, the AER concludes that sub-transmission assets are properly included in the Transend asset base.

The AER has analysed Transend's proposed pricing methodology and considers that the pricing methodology broadly complies with the guidelines and clause 6A.24.1(c) of the NER. However, the AER has concluded that the proposed methodology is non-compliant in two respects discussed in sections 12.5.1 and 12.5.2 above.

12.6 AER determination

The AER has decided not to approve Transend's proposed pricing methodology.

The AER considers Transend's proposed pricing methodology for the forthcoming regulatory period is, in a number of respects, not compliant with the requirements of the NER. In accordance with clause 6A.12.1(e) of the NER, the AER's draft decision includes details of the matters to be addressed before the AER will approve the methodology. The matters Transend must address in its revised pricing methodology are:

1. Transend is to amend the proposed pricing methodology, in particular section 7.3 and Appendix 2, such that costs related to radial lines connecting generator and load are attributed according the pricing principles as set out in rule 6A.23.

2. Transend is to amend the proposed pricing methodology such that the measure of demand used to calculate the *prescribed TUOS services* locational price is consistent with the measure of demand used to calculate the *prescribed TUOS service* locational component charge.

Appendix K to this draft decision sets out further changes of an editorial nature to be made by Transend to the proposed pricing methodology.

While it is not a requirement under the pricing principles or the guidelines, the AER considers that it would be beneficial for Transend to specify the points in the transmission network where costs will be allocated and prices determined in its proposed pricing methodology. The AER requests that Transend provide these details in a revised proposed pricing methodology.

Appendix A: AER guidelines applied in Transend determination

Chapter 6A of the NER was gazetted in November 2006. The NER required the AER to publish several transmission guidelines in September and October 2007. In accordance with these requirements, the AER published a number of transmission guidelines which Transend were required to comply with in producing a revenue proposal. These guidelines are:

- the Post-Tax Revenue Model that applies to Transend is the final model released by the AER on 28 September 2007
- the Roll-Forward Model that Transend will apply was developed by the AER in accordance with clause 11.6.9 of the NER
- the Efficiency Benefit Sharing Scheme (EBSS) that applies to Transend is the final scheme released by the AER on 28 September 2007
- the Service Target Performance Incentive Scheme that applies to Transend is the final scheme released by the AER on 7 March 2008
- the Submission Guidelines that apply to Transend are the final guidelines released by the AER on 28 September 2007
- the Cost Allocation Guidelines that apply to Transend are the final guidelines released by the AER on 28 September 2007
- the Pricing Methodology Guidelines that apply to Transend are the final guidelines released by the AER on 29 October 2007

These guidelines apply for setting Transend's determination for the 2009-14 regulatory control period.

Opening Revenue Asset Base

In determining an opening regulated asset base (RAB) for a transmission determination, the AER is bound by the relevant provisions of the NER. Clause 6A.6.1 and schedule 6A.2 of the NER outline the approach that is used to determine the opening RAB. The AER also uses its roll forward model to determine the roll forward of the RAB.

Schedule 6A.2.1(c) of the NER provides that the RAB for the first regulatory year must be determined by rolling forward the RAB value set out in the schedule. For Transend this value is $603.6 million (as at 31 December 2003). This value is then adjusted to allow for the difference between estimated capital expenditure (capex) and actual capex in the previous regulatory period. Schedule 6A.2.1(f) of the NER outlines how this value is further adjusted to roll forward and calculate the value of the RAB at the beginning of the first year of the regulatory control period.

Past capital expenditure and roll forward of the RAB

Clause 11.6.9 of the transitional provisions provides that the value of the RAB for the first regulatory control period under the revised NER may also be adjusted to have regard for an existing revenue determination and any other arrangements agreed between the AER and the transmission network service provider. In accordance with

this provision the AER has undertaken an ex post prudence assessment of the capex commissioned in the current regulatory period as this is foreshadowed in the ACCC's 2003 revenue cap decision for Transend.[411]

The 2003 Transend revenue cap decision was made by the ACCC based on the framework contained in its *Draft statement of regulatory principles for the regulation of transmission revenues* (DRP).[412] Accordingly, the AER has rolled forward Transend's RAB consistent with the DRP rather than the methodology outlined in schedule 6A.2.1(f) of the NER.

[411] ACCC, *Tasmanian Transmission Network Revenue Cap 2004–2008/09: Decision*, 10 December 2003.

[412] ACCC, *Draft statement of principles for the regulation of transmission revenues*, 27 May 1999.

Appendix B: Summary of reliability standards in Tasmanian Electricity Supply Industry (Network Performance Requirements) Regulations

The Office of the Tasmanian Energy Regulator (OTTER) administers Transend's licence for operating the Tasmanian electricity transmission network. As a condition of this licence, Transend must comply with all relevant laws, rules, codes and guidelines, including the Tasmanian Electricity Code (the TEC).[413] The National Electricity Rules (NER) also require Transend to comply with all relevant regulatory obligations, which include the TEC and the Tasmanian Electricity Supply Industry (Network Performance Requirements) Regulations 2007 (the regulations).

As Tasmania is a participating jurisdiction in the National Electricity Market (NEM) the operations of its power systems is governed by the NER. In accordance with the NER, the Reliability Panel (the panel) of the Australian Energy Market Commission (AEMC) is required to determine the reliability and power system frequency standards for the NEM.[414] Transend use the unserved energy (USE) indicator, as well as frequency and duration loss of supply for both firm (N-1 or N-2) and non-firm (N) connection sites to measure reliability.[415]

Under the NER any proposed augmentation to the transmission system by Transend must satisfy the regulatory test set by the AER. The regulatory test has two alternative limbs: a market benefits limb and a reliability limb.[416] To satisfy the reliability limb, Transend must be able to demonstrate that the proposed augmentation will meet the minimum network performance requirements specified in the regulations.[417]

The regulations set out the minimum network performance requirements that a planned power system of a Transmission Network Service Provider must meet in order to satisfy the reliability limb of the regulatory test in the NER. Table B.1 shows the minimum network performance requirements for Transend.

Transend is obligated to ensure that its network is capable of meeting these standards.

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413 Office of the Tasmanian Energy Regulator, *Transend Supply Industry Transmission Licence*, 18 December 1998, as amended 9 May 2007, clause 3.1.

414 National Electricity Rules, Clause 8.8.1(a)(2)

415 Where N, N-1 and N-2 are industry measures of the number of redundant circuits capable of supplying a load centre. N means no redundancy, N-1 one level of redundancy, etc.

416 ibid., Clause 5.6.5A(b)

417 Tasmanian Electricity Supply Industry (Network Performance Requirements) Regulations 2007, s 4, Note 1.

Table B.1: Minimum network performance requirements for Transend

Event	Maximum load capable of being interrupted	Maximum unserved energy to load that is interrupted/active energy exposed to interruption	Approximate Unserved energy %	Approximate system minutes	Further requirements
Intact system					
Credible contingency event	25 MW	300 MWh	0.0026% USE	10 system minutes	Nil
Single asset failure	850 MW	3 000 MWh	0.026% USE	100 system minutes	Load that is interrupted is not to be capable of resulting in a black system
Non-intact system					
Credible contingency event		18 000 MWh	0.155% USE	600 system minutes	Nil

Source: Tasmanian Electricity Supply Industry (Network Performance Requirements) Regulations 2007, section 5(1).

Note: The current NEM reliability target is 0.002% USE. The standard requires that there should be sufficient generation and bulk transmission capacity so that, over the long term, no more than 0.002% of the annual energy requirements of consumers in any region is at risk of not being supplied.[418]

In addition, Transend has to gain ministerial approval for any proposed augmentation which exceeds $15 million. The regulations require that where Transend is proposing to undertake an augmentation that is driven by the minimum network performance requirements, ministerial approval must be sought first. This requirement is intended to allow the Minister an opportunity to review reliability driven augmentation to ensure that not only are technical standards being met, but that its direct and indirect economic, social and environmental benefits outweigh its direct and indirect economic, social and environmental costs.[419]

In May 2006, the AEMC reliability panel adopted the Tasmanian reliability standards that were previously set by the Tasmanian Reliability and Network Planning Panel (TRNPP).[420] This approach, as set out in the TRNPP's November 2005 determination, was selected to better align the Tasmanian approach to reliability with the NEM.[421] These standards are:

Contingency capacity reserve standard

[418] Office of the Tasmanian Energy Regulator, Reliability and Network Planning Panel, *The 2007 Reliability Review Report*, April 2008, p. 55.

[419] Tasmanian Electricity Supply Industry (Network Performance Requirements) Regulations 2007, section 6.

[420] AEMC Reliability Panel, *Tasmanian reliability and frequency standards determination*, 28 May 2006, p. 9.

[421] Office of Tasmanian Energy Regulator, Tasmanian Reliability and Network Planning Panel, *Capacity Reserve Standards for the Tasmanian Power System Determination*, November 2005, p. 5.

Not expressly set, taking into account the processes NEMMCO has in place to acquire and schedule sufficient ancillary services to cover the critical single credible contingency events to meet frequency standards.

Short and medium term capacity reserve standard
The short and medium term capacity reserve standard is the size of the most critical single credible contingency event possible on the Tasmanian Power System. This could be due to either the disconnection of one operating generation unit or the disconnection of one major item of transmission plant.

Unserved energy standard
Unserved energy resulting from the failure of generating equipment is not to be more than 0.002 per cent per annum.

Transend is required to plan and develop its network based on these requirements. [422] Transend must also develop management and compliance plans which include a number of performance measures. [423] To assist OTTER to monitor and report on the performance of Transend, Transend is required to report performance information to OTTER under the Electricity Supply Industry Performance and Information Reporting Guideline (the guideline). The guidelines are used to measure how effective these management and compliance plans are in reaching the required targets.

In calculating unserved energy for the minimum network performance requirements as set out in Table B.1, the regulations also allow for a maximum period for replacement or repairs of assets. These requirements are set out in Table B.2.

Table B.2: Asset replacement or repairs

Asset	Maximum time for replacement or repairs of assets
Transmission Line	48 hours
Transformer	8 days
Autotransformer	18 days

Source: Tasmanian Electricity Supply Industry (Network Performance Requirements) Regulations 2007, section 5(3).

Low voltage assets in the Transend network.

The Transend network includes assets that operate at 6.6 kV, 11 kV, 22 kV, 33 kV, 44 kV, as well as the usual transmission voltages of 110 kV and 220 kV. A transmission network normally operates at voltages greater than 66 kV. However, Transend's transmission licence extends to low voltage assets normally associated with distribution.

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422 Office of Tasmanian Energy Regulator, Tasmanian Reliability and Network Planning Panel, *Capacity Reserve Standards for the Tasmanian Power System Determination*, November 2005, p. 15.

423 Under Clause 12.8.1 of the Tasmanian Electricity Code, Transend is required to develop management and compliance plans.
Tasmanian Electricity Supply Industry (Network Performance Requirements) Regulations 2007

Rule 5.2.3(f) requires a network service provider comply with "applicable regulatory instruments". In turn, the glossary includes in the relevant definition for Tasmania:

> *"(6) Tasmania:*
>
> *(a) the Electricity Supply Industry Act 1995;*
> *(b) all regulations made and licences ("Licences") issued under the Electricity Supply Industry Act;*
> *(c) all regulatory instruments under the Electricity Supply Industry Act or the Licences (including, without limitation, determinations of the Tasmanian Electricity Regulator under the Electricity Supply Industry (Price Control) Regulations); and*
> *(d) the Tasmanian Electricity Code issued under section 49A of the Electricity Supply Industry Act."*

Accordingly, in determining the scope of assets included in Transend's asset base regard must be had to the requirements of Transend's transmission licence and the Tasmanian ESI Act. Under the Tasmanian ESI Act, a network operating at 88 kV or above is deemed to be a transmission network. Also, Transend's transmission licence describes the transmission network as extending:

> *"…from the connection points for the Generation Sites and Transmission Sites listed … to the connection points for the Demand Sites and Transmission Sites listed … (the connection point and connection assets associated with the transmission system are described in the relevant connection agreement)".*[424]

Due to these licence conditions, additional low voltage (< 66kV) assets must be included in Transend's regulated asset base.

See: Electricity Transmission Licence issued to Transend Networks on 18 December 1998.

Appendix C: Review of ex post projects

This appendix sets out the AER's consideration of Transend's ex post projects, including WorleyParsons' and Nuttall Consulting's recommendations based on their separate detailed reviews of a sample of projects.

WorleyParsons' review of ex post projects

WorleyParsons reviewed 10 projects:

- North East transmission line – Norwood-Scottsdale-Derby 110kV transmission Line
- Mowbray substation
- Upgrade of Creek Road-Risdon 110kV transmission line
- Establishment of a 33kV connection point at Risdon substation
- Wesley Vale substation: additional 11kV circuit breaker installation
- Asset management information system phase 2
- Secondary equipment store (construction)
- Substation security upgrade
- Strategic accommodation South
- IT and business applications

WorleyParsons' discussion of its detailed project review can be found in Appendix B of its report.

Project ND0519—North East transmission Line – Norwood-Scottsdale-Derby 110kV transmission Line

Transend proposal

Transend indicated that this project had a cost of $34.1 million.

The project involved the design and construction of a new double circuit 110 kV transmission line from Norwood Substation to Scottsdale Substation and a single 110 kV circuit from Scottsdale Tee to Derby Substation.

This project was required to replace and upgrade the last remaining 88 kV transmission line in Tasmania from the Norwood substation. The remaining 88 kV transmission system had been in service since 1936 and had a number of supply, reliability, regulatory compliance, operational and safety issues.

Transend had developed an overall strategy for north-east Tasmania electricity supply which included the construction of the new 110kV transmission line and had also considered a connection application from Hydro Tasmania for proposed wind farm developments.

In 2004, the Transend Board approved the project and subsequent additional cost increases relating to the project have also been approved. The transmission line was commissioned in June 2007.

The main drivers for the project were to ensure:

- security of supply
- reliability of supply
- compliance with the Tasmanian Electricity Code (TEC), technical standards and the transmission licence
- the connection agreement with Aurora Energy
- asset condition
- operational, safety and environmental issues.

WorleyParsons' review

The WorleyParsons report provided detailed information the project's timing, strategic alignment, Transend's evaluation of alternative options and consideration of non-network solutions, Capex/Opex Trade-offs, regulatory considerations, governance and efficiency considerations.

WorleyParsons noted the following:

- Transend has demonstrated that there was a justifiable need for this project and it was an integral part of the strategy to improve the various supply issues that related to the north east region of Tasmania.
- the investment was efficient, as it was one phase of a multi phase program to address network issues in the north east area over an extended time frame, it was put to tender, and the result was a relatively low cost solution consistent with good industry practice.
- the investment processes and procedures adopted by Transend for this project appear to have ensured that prudent capital expenditure was undertaken.
- the final cost of $34.1 million was reasonable when compared with estimates prepared by WorleyParsons based on similar projects.
- the project appears to have been prudently planned, scoped and executed. Appropriate levels of project governance were also in place. WorleyParsons is of the opinion that the project passes a prudency test assessment.

AER assessment

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

WorleyParsons noted that this project was the first transmission line replacement project that Transend had undertaken. The AER notes that Transend identified this project as being a necessary component of its broader strategy to improve the security of supply to north-east Tasmania. Further, WorleyParsons noted it was presented with evidence showing improved network reliability performance to customers following project commissioning.

Planning delays and other works identified during transmission line construction also contributed to the increased costs. The project budget approved by Transend's Board was increased on receipt of contractor submissions to a competitive tendering process for the required transmission line works. However, WorleyParsons considered the final project costs to be reasonable based on its own estimates for similar projects. The AER considers that the cost increase highlighted the discrepancy between current market costs and unsatisfactory project estimates based on costs developed for statutory asset valuations. The AER notes that the basis for scope increase arose from detailed investigation of the proposed transmission line route which identified necessary line route changes. The AER is also aware of the general increases in input and construction costs that have occurred over the current regulatory control period and this is discussed in Appendix J.

Having considered the project information provided by Transend and WorleyParsons' advice, the AER agrees that the scope/cost increases were justified. The AER also notes that business cases were presented to the Transend Board to inform it of relevant new information likely to affect the project, including project costs.

The AER notes this project is part of Transend's broader strategy to improve the security of supply to north-east Tasmania. It also notes that Transend has applied the market benefits limb of the regulatory test in the development of this project and it has been presented to, and approved by, the Tasmanian Reliability and Network Planning Panel. The AER notes that a number of network and non-network solutions were considered and evaluated against a selection of scenarios and that the preferred option (double circuit 110 kV transmission line) provided the greatest market benefits across the scenarios.

The AER notes WorleyParsons' finding that the technical design arrangements are in line with standard industry practice and it accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $34.1 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Project ND0036—Mowbray substation

Transend proposal

Transend indicated that this that this project had a cost of $10.3 million.

The project involved the establishment of a substation at Mowbray with an initial capacity of 40 MVA. The substation is supplied by a single 110 kV transmission line from Trevallyn Substation and firm capacity is provided via two dedicated 22 kV feeders, also emanating from Trevallyn Substation. Provision was made in the substation design for an additional transmission line bay, a second transformer and additional distribution feeders.

This project was required to address poor feeder performance in the Launceston area and capacity limitations at Trevallyn and Norwood Substations. The project was the fourth of four key elements of a major Launceston Area Supply Upgrade Program.

The main drivers for the project were to enhance:

- reliability of the urban and rural distribution feeders.
- security of the CBD and urban feeders.
- capability of the distribution feeders to transfer capacity between the Trevallyn and Norwood Substations.
- capacity of the Trevallyn and Norwood Substations.
- future demand growth requirements.

WorleyParsons' review

The WorleyParsons report provided detailed information the project's timing, strategic alignment, Transend's evaluation of alternative options and consideration of non-network solutions, Capex/Opex Trade-offs, regulatory considerations, governance and efficiency considerations.

WorleyParsons noted the following:

- Transend has demonstrated that there was a justifiable need for this project as there was need to remedy to unsatisfactory reliability, security and capacity of the transmission and distribution systems in the greater Launceston area.
- the investment was efficient as it was one phase of a multi phase program to address network issues over an extended time frame, and this phase was a low cost solution consistent with good industry practice.
- the investment processes and procedures adopted by Transend for this project appear to have ensured that prudent capital expenditure was undertaken.
- the final cost of $10.49 million is reasonable when compared with estimates prepared by WorleyParsons based on similar projects.
- documentation from Aurora Energy showing markedly improved 22kV feeder reliability levels in 2007 when compared to 2001/02 is consistent with the expectations of this project.
- this project appears to have been prudently planned, scoped and executed. Appropriate levels of project governance were also in place. WorleyParsons is of the opinion that the project passes a prudency test assessment.

AER assessment

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

The AER notes that Transend identified this project as being necessary to improve the reliability, security and capacity of transmission and distribution systems in the greater Launceston area. The project was jointly presented by Transend and Aurora Energy for endorsement by the Tasmanian Reliability and Network Planning Panel (TRNPP) and in November 2002, the TRNPP advised the proposal met the regulatory test requirements. Further, the AER notes that Transend had considered both the transmission and distribution networks in developing the project and the 2 stage development of the Mowbray substation was considered to be a 'low cost solution'. That is, currently only stage 1 of the project has been constructed and firm capacity is established by interconnectors operating in parallel between the Trevallyn and Mowbray substations.

The AER notes that 4 projects options were evaluated and the basis for comparison was the net change in market benefit which required consideration of capex, demand side management and co-generation schemes, operations and maintenance, network losses and customer costs. Further, the preferred option (the Mowbray substation) was to be developed in 2 stages. The AER notes that WorleyParsons considered this was a low cost solution because only a single transmission line and transformer have been constructed and firm supply capacity has been achieved by interconnecting Trevallyn and Mowbray substations. The AER also notes WorleyParsons considered that Transend had achieved a low cost, efficient solution by considering and utilising both the transmission and distribution systems.

The AER has considered the project information provided by Transend and it agrees that the scope/cost increases were justified because of issues identified during project construction associated with the civil works and the need to underground the 110 kV transmission line to satisfy street clearance requirements. The AER notes that Transend had sought to arrange an overhead supply but this was opposed by the local council, culminating in legal proceedings which favoured the council. The AER accepts therefore, that the underground supply option was justified in this instance. The AER notes that project planning approval delays and other works identified during project construction contributed to project scope changes and increased costs. The AER notes that Transend's Board approved the project business case and it received monthly project updates during project construction. The AER is aware of the general increases in input and construction costs that have occurred over the current regulatory period. The AER notes the project was implemented using a 'design and construct' contract and Transend managed the project via the project's lead contractor. WorleyParsons considered the final project costs to be reasonable based on its own estimates for similar projects.

For the reasons discussed, the AER accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $10.3 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Project ND0573—Upgrade of Creek Road-Risdon 110kV transmission line

Transend proposal

Transend indicated that this that this project had a cost of $0.3 million.

The project involved increasing the capacity of the Creek Road–Risdon and Chapel Street–Risdon 110 kV transmission lines to 800 amps. There were two stages for the upgrade:

- stage 1- upgrading two lines from 75°C to 90°C with minimal expenditure
- stage 2 -replacing the existing copper conductor with a new, high temperature conductor.

This project comprised stage 1.

The project was required to reduce the amount of load at risk and reduce the duration that the transmission lines are operated non-firm. The project also involved the modification of the conductor attachment levels on some structures to achieve increased conductor-to-ground clearance in order to increase the maximum conductor operating temperature.

The main drivers for the project were to:

- mitigate business risk and to increase the capacity of the Chapel Street–Risdon and Creek Road–Risdon 110 kV transmission lines.
- increase capacity of the Chapel Street–Risdon and Creek Road–Risdon 110 kV transmission lines to enable either of these transmission lines to be removed from service at a later date to complete stage 2 of the project without load shedding.

WorleyParsons' review

The WorleyParsons report provided detailed information the project's timing, strategic alignment, Transend's evaluation of alternative options and consideration of non-network solutions, Capex/Opex Trade-offs, regulatory considerations, governance and efficiency considerations.

WorleyParsons noted the following:

- Transend has demonstrated that there was a justifiable need for this project as there was need to mitigate business risk and to increase the capacity of the Chapel Street–Risdon and Creek Road–Risdon 110 kV transmission lines.
- the investment was efficient as Transend contracted a service provider for the work that had appropriate, proven and recent experience in the design and contract management or similar projects.
- the investment processes and procedures adopted by Transend for this project appear to have ensured that prudent capital expenditure was undertaken.

- the final cost of $273,000 is reasonable when compared with estimates prepared by WorleyParsons based on similar projects.

- this project appears to have been prudently planned, scoped and executed. Appropriate levels of project governance were also in place. WorleyParsons is of the opinion that the project passes a prudency test assessment.

AER assessment

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

The AER notes that Transend identified this project as being necessary to reduce the amount of load at risk of load shedding at the nearby Nyrstar zinc smelter, and to reduce the duration that the 110 kV transmission lines are operated 'non-firm'.

The AER notes that the 2 project options considered were 'do nothing' and 'upgrade the lines' and that the transmission line upgrade was selected because it achieved the necessary line rating increase with a low estimated budget cost. WorleyParsons noted that the upgrade of the 110 kV lines was also critical to enable either of these lines to be removed from service to complete stage 2 of the project without load shedding. Further, the AER notes that the timing of this project was aligned with project works at the Chapel Street substation and therefore coordinated outages for the projects' works assisted efficient delivery of both projects and minimised outage times.

The AER notes that the project business case was presented for approval by the Transend Managing Director and no variations to the approved business case were required. The project was implemented with the assistance of external contractors and WorleyParsons considered the final project costs to be reasonable based on its own estimates for similar projects.

The AER has considered the project information provided by Transend and it accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $0.3 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Project ND0511—Establishment of a 33kV connection point at Risdon substation

Transend proposal

Transend indicated that this that this project had a cost of $6.8 million.

The project involved the redevelopment of the existing 11 kV switchroom area for the new 33 kV switchboard, two station service transformers, wholesale metering, AC and DC supplies, protection and control, supervisory control and data acquisition and communication including the provision of two new 110/33 kV transformers, and an existing transformer reconfigured for 33 kV output and the removal of asbestos from the switchroom and associated equipment.

This project was required to provide Aurora Energy with a 33 kV connection point at the Risdon substation which had a firm capacity of 120 MVA and to decommission the existing 22 kV infrastructure.

The main drivers for the project were to:

- complete the fourth stage of the Hobart Area Supply Upgrade (HASU) strategy; a program jointly developed by Transend and Aurora Energy to convert the existing 22 kV Hobart area sub-transmission network to 33 kV.

The WorleyParsons report provided detailed information the project's timing, strategic alignment, Transend's evaluation of alternative options and consideration of non-network solutions, Capex/Opex Trade-offs, regulatory considerations, governance and efficiency considerations.

WorleyParsons' review

WorleyParsons noted the following:

- Transend has demonstrated that there was a justifiable need for this project and it was an integral part of the Hobart Area Supply Upgrade Strategy jointly developed by Transend and Aurora Energy to convert the existing 22 kV sub-transmission network to 33 kV.

- the investment was efficient as it was one phase of a multi phase program to address network demand issues in the Hobart area over an extended time frame, and this phase was a relatively low cost solution consistent with good industry practice.

- the investment processes and procedures adopted by Transend for this project appear to have ensured that prudent capital expenditure was undertaken.

- the final cost of $6.8 million is reasonable when compared with estimates prepared by WorleyParsons based on similar projects.

- this project appears to have been prudently planned, scoped and executed. Appropriate levels of project governance were also in place. WorleyParsons is of the opinion that the project passes a prudence test assessment.

AER assessment

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

The AER notes that Transend and Aurora Energy jointly developed the Hobart Area Supply Upgrade Strategy (HASU) and presented it for endorsement by the RNPP. This project and its timing has been driven by Aurora Energy's need to establish connection points for customer supply and was commissioned in stages to align with Aurora Energy's network 33 kV network upgrade program. The AER accepts WorleyParsons' advice that the final cost was reasonable and, given the HASU has been implemented in a number of stages over an extended period of time, that there was no evidence of significant over-design of the substation.

The AER notes that Transend's Board approved the project business case and the project was delivered without variation to the approved business case. The project was implemented by Aurora Energy Contract Services following a competitive tender process. Further, WorleyParsons considered the final project costs to be reasonable based on its own estimates for similar projects.

Further, the AER notes that this project is a 'connection' project and that Transend is required to prepare an 'offer to connect' in accordance with the requirements set out in Chapter 5 of the NER on receipt of an application to connect to its network.[425] The AER also notes that 5 options were considered for this project and Transend used a least cost analysis to identify the most cost effective solution to provide the 33 kV network requested by Aurora Energy.

The AER has considered the project information provided by Transend and it accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $6.8 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Project ND0705—Wesley Vale substation: additional 11kV circuit breaker installation

Transend proposal

Transend indicated that this that this project had a cost of $0.2 million.

The project involved the installation of an additional 11 kV circuit breaker and associated protection, control and metering equipment at Wesley Vale Substation.

This project was required to accommodate Aurora Energy's application for an additional 11 kV connection point at Wesley Vale Substation. The purpose was to establish separation of the electricity supply for PA Mill and TWP and provide electricity supply directly to TWP from Wesley Vale Substation.

The main drivers for the project were to:

- accommodate Aurora Energy's application for a connection point
- mitigate business risk by reducing non compliance with transmission laws and regulations increasing flexibility in dealing with customers.

WorleyParsons' review

The WorleyParsons report provided detailed information the project's timing, strategic alignment, Transend's evaluation of alternative options and consideration of non-network solutions, Capex/Opex Trade-offs, regulatory considerations, governance and efficiency considerations.

WorleyParsons noted the following:

[425] NER clauses 5.3.5 and 5.3.6(d).

- Transend has demonstrated that there was a justifiable need for this project as it resulted from a connection enquiry from Aurora Energy in line with the provisions of clause C5.3.3 (b) of the NER.

- the investment was efficient as standardised designs were implemented and the installation required only a variation to an existing construction contract thus eliminating any contract start-up costs.

- the investment processes and procedures adopted by Transend for this project appear to have ensured that prudent capital expenditure was undertaken.

- the final cost of $231,000 is reasonable when compared with estimates prepared by WorleyParsons based on similar projects.

- WorleyParsons is of the opinion that the project passes a prudency test assessment.

AER assessment

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

The AER notes that Transend undertook this project in response to an application from Aurora Energy for an additional 11 kV connection point to provide supply directly to one of its customers.

Further, the AER notes that this project is a 'connection' project and that Transend is required to prepare an 'offer to connect' in accordance with the requirements set out in clauses 5.3.5 and 5.3.6(d) of the NER on receipt of an application to connect to its network. The AER also notes that the option to install the circuit breaker addressed Aurora Energy's connection application request and that Transend installed equipment identical to that already installed at Wesley Vale substation and, therefore, there was no special design requirement for this project.

The AER notes that the project business case was approved in 2006 by Transend's Acting Managing Director and the project was delivered without variation to the approved business case. The project was implemented, by a variation to an existing contract for works, by a third party contractor, Areva, because, at that time, Areva was completing separate works for Transend at the Wesley Vale substation. The AER notes that WorleyParsons considered the final project costs to be reasonable based on its own estimates for similar projects.

The AER has considered the project information provided by Transend and it accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $0.2 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Project ND0614—Asset management information system (AMIS) phase 2

Transend proposal

Transend indicated that this that this project had a cost of $4.8 million.

The project involved the consolidation of primary asset management functions and information on the WASP Asset Management System. The project also provided for integration between WASP and ancillary asset management systems and other core Transend systems.

This project was required to allow information from disparate databases to be synchronised, cross-related and provided to users in composite views.

The main driver for the project was to:

- facilitate the development of an asset management system to support improved asset management and the asset life cycle management process.

WorleyParsons' review

The WorleyParsons report provided detailed information the project's timing, strategic alignment, Transend's evaluation of alternative options and consideration of non-network solutions, Capex/Opex Trade-offs, regulatory considerations, governance and efficiency considerations.

WorleyParsons noted the following:

- asset management, effective asset operation and effective regulatory management all require access to consistent, accurate and up-to-date asset information.

- the investment was efficient as all project components were subject to their own individual business case and all were consistent with an overarching AMIS strategy.

- the investment processes and procedures adopted by Transend for this project appear to have ensured that prudent capital expenditure was undertaken.

- this project appears to have been prudently planned, scoped and executed. Appropriate levels of project governance were also in place. WorleyParsons is of the opinion that the project passes a prudence test assessment.

AER assessment

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

The AER notes that Transend undertook this project to develop an asset management system to support its asset management processes. The project has comprised a series of sub-projects, developed on the basis of separate individual business cases. Further, the AMIS project has spanned six years to date, since the initial project approval in January 2002, and, given information technology improvements over time, solutions have been adopted, subject to business objective and scope constraints. The AER also notes that, given the duration of the AMIS project, Transend has applied a risk management approach to identify and manage risks which could have a material effect on the delivery of the program objectives. Although WorleyParsons did not comment on the final project costs, the AER considers the project costs to be

reasonable because of the approach taken by Transend in implementing AMIS as a series of sub-projects supported by individual business cases.

The AER has considered the project information provided by Transend and it accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $4.8 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Project ND0765—Secondary equipment store (construction)

Transend proposal

Transend indicated that this that this project had a cost of $3.0 million.

The project involved redevelopment of the former Main Transmission Line (MTL) building and included:

- the engagement of Stanton Management Group (SMG) to project manage the redevelopment, the development of purpose-built storage facilities for protection and control equipment, the provision of a test bench area, relocation of the information technology configuration and storage area, increases in facility storage space, the provision of a meeting room and the provision of alternative accommodation.

This project was required due to the fact the current store is considered inadequate for the storage of protection and control secondary systems. Further, Transend's lease of the current store from Aurora Energy expires on 30 June 2010 with no extension possible.

The main drivers for the project were to:

- address access issues, fire risk, dust control problems, a lack of temperature control, insufficient space, inadequate test facilities, risk of damage associated with shared use of panel testing space, unsuitable storage and remoteness from Transend's Maria Street Campus.

WorleyParsons' review

The WorleyParsons report provided detailed information the project's timing, strategic alignment, Transend's evaluation of alternative options and consideration of non-network solutions, Capex/Opex Trade-offs, regulatory considerations, governance and efficiency considerations.

WorleyParsons noted the following:

- Transend has demonstrated that there was a justifiable need for this project as there was need for a controlled environment store to house critical spares.

- the investment was efficient as the project was tendered and project management has been assigned to a service provider experienced in the building industry.

- the investment processes and procedures adopted by Transend for this project appear to have ensured that prudent capital expenditure was undertaken.
- this project appears to have been prudently planned, scoped and executed. Appropriate levels of project governance were also in place.
- WorleyParsons is of the opinion that the project passes a prudency test assessment.

AER assessment

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

The AER notes that Transend undertook this project because it considered its existing store was inadequate for housing secondary systems equipment and Aurora Energy had advised that it would not renew the lease for the current store on expiry in 2010. The project was evaluated as part of Transend's Facilities Management Plan strategy plan developed in 2006.[426] The AER notes that Transend selected its preferred option using a least cost analysis and the project is supported by a business case. Further, the AER notes that the project had development approval and the relevant building was available and ready for construction.

Although WorleyParsons did not comment on the final project costs, the AER considers the project costs to be reasonable because third party contractors were engaged to implement the project following a competitive tender process.

The AER has considered the project information provided by Transend and it accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $3.0 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Project ND0437 and ND0827—Substation security upgrade

Transend proposal

Transend indicated that this that this project had a cost of $30.3 million.

The project involved a comprehensive program of integrated asset management activities designed to reduce the risks associated with unauthorised access to Transend's electricity transmission infrastructure.

The major components were:

- security fencing upgrades & replacements, substation building upgrades, provision of access control systems, provision of intruder detection systems (including powered fencing) and the installation of visual monitoring systems.

[426] Transend, *Facilities Management Plan Transend Strategy Paper* (Issue 1.0, August 2006), submitted 8 July 2008, p. 16.

This project was required to further implement Transend's asset security strategy.

The main drivers for the project were to:

- ensure the safety of the public, employees and contractors.
- adequately protect transmission assets from damage.
- comply with the relevant acts, codes, standards and guidelines.
- meet the requirements of good electricity industry practice.
- address recommendations and opportunities for improvement by auditors and insurers.
- enhancing remote asset monitoring capability.

WorleyParsons' review

The WorleyParsons report provided detailed information the project's timing, strategic alignment, Transend's evaluation of alternative options and consideration of non-network solutions, Capex/Opex Trade-offs, regulatory considerations, governance and efficiency considerations.

WorleyParsons noted the following:

- Transend has demonstrated that there was a justifiable need for this project as there was need to mitigate business risk;
- the investment was efficient as it is part of an overall risk mitigation strategy which provides a comprehensive, integrated approach to effectively manage the risks associated with asset security and to ensure that Transend's assets comply with the applicable Australian standards and the ENA guidelines; and
- the investment processes and procedures adopted by Transend for this project appear to have ensured that prudent capital expenditure was undertaken.
- this project appears to have been prudently planned, scoped and executed. Appropriate levels of project governance were also in place. WorleyParsons is of the opinion that the project passes a prudency test assessment.

AER assessment

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

The AER notes that Transend undertook this project to mitigate its business risk relating to litigation and negative publicity as a consequence of unauthorised access to its electricity infrastructure assets. The project will be commissioned across both the current and next regulatory control periods and it is supported by an Asset Security Strategy approved in 2005 by Transend's Board.

The AER notes that Transend considered 5 project options and the preferred options was selected after considering both cost and works coordination with projects

proposed for the next regulatory control period. The AER notes the project is also supported by business cases and third party contractors have been engaged to implement the project.

Although WorleyParsons did not comment on the final project costs, the AER considers the project costs to be reasonable because contractors were engaged following a competitive tender process. The AER also accepts WorleyParsons' advice that the project will ensure that Transend's assets comply with relevant Australian standards and the Energy Networks Australia's (ENA)guidelines. Further, the AER notes Transend engaged Parsons Brinkerhoff Associates to review and provide comment on its site-specific risk assessment template to ensure compliance with the ENA guidelines.

The AER has considered the project information provided by Transend and it accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $30.3 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Project ND0393—Strategic accommodation south

Transend proposal

Transend indicated that this that this project had a cost of $6.8 million.

The project involved the development of a fit for purpose building to accommodate (co-locate) Transend southern-based staff.

This project was required to address the issue that southern based staff were based across two sites, which led to a number of business inefficiencies.

The main driver for the project was to:

- enable co-location of Transend staff to maximise operational efficiencies and capitalise on a united workforce.

WorleyParsons' review

The WorleyParsons report provided detailed information the project's timing, strategic alignment, Transend's evaluation of alternative options and consideration of non-network solutions, Capex/Opex Trade-offs, regulatory considerations, governance and efficiency considerations.

WorleyParsons noted the following:

- Transend has demonstrated that there was a justifiable need for this project as there was need to maximise operational efficiencies and capitalise on a united workforce.
- the investment was efficient as the project was tendered and there was no excess of accommodation provided.
- the investment processes and procedures adopted by Transend for this project appear to have ensured that prudent capital expenditure was undertaken.

- WorleyParsons notes that already accommodation shortage issues have returned as staff are currently being accommodated at both the Maria Street and Moonah sites.

- This project appears to have been prudently planned, scoped and executed. Appropriate levels of project governance were also in place. WorleyParsons is of the opinion that the project passes a prudence test assessment.

AER assessment

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

The AER notes that Transend undertook this project to optimise operational efficiencies and capitalise on the operational benefits to the business resulting from a united workforce. At the time that the project was being evaluated, the purchase and development of at Creek Road/Maria Street was assessed as being the least cost option which delivered the business accommodation objectives. The project is supported by business cases and third party contractors were engaged to implement the project. Further, the AER notes that the late identification of a requirement for additional car parking at the site was subject to a separate business case rather than being incorporated into this project via a project scope variation.

Although WorleyParsons did not comment on the final project costs, the AER considers the project costs to be reasonable because contractors were engaged following a competitive tender process. Further, the project was tendered and the AER notes that WorleyParsons considered that no excess accommodation was provided. However, although Transend recognised a need to maximise operational efficiencies and capitalise on a united workforce, the AER notes that accommodation shortage issues have returned and Transend staff are currently accommodated at the Maria Street and Moonah sites.

The AER has considered the project information provided by Transend and it accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $6.8 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Various projects—IT and business applications

Transend proposal

Transend indicated that this that this project had a cost of $2.6 million.

The project involved the implementation of a number of projects that relate to IT and other business applications. Each project has a total nominal cost of less than $1 million.

This project was required to maintain ongoing investment in information technology to support operational and business applications.

The main drivers for the project were to:

- enhance the efficiency of business operations.
- address compliance matters associated with operation in the National Electricity Market.
- satisfy regulatory and licence obligations.
- ensure appropriate IT security and capacity.
- facilitate efficient business operations in the Tasmanian power industry.
- efficiently undertake power system operations, modelling and analysis.
- adequately protect critical infrastructure.

Specific investment drivers were identified in each business case.

WorleyParsons' review

The WorleyParsons report provided detailed information the project's timing, strategic alignment, Transend's evaluation of alternative options and consideration of non-network solutions, Capex/Opex Trade-offs, regulatory considerations, governance and efficiency considerations.

WorleyParsons noted the following:

- Transend has demonstrated that there was a justifiable need for this project as all of the project drivers are real and relevant.
- the investment was efficient as all project components were subject to their own individual business case and all were consistent with an overarching asset management framework.
- the investment processes and procedures adopted by Transend for this project appear to have ensured that prudent capital expenditure was undertaken.
- Transend's Corporate IT spend per employee benchmarks favourably against other TNSPs.
- this program of work appears to have been prudently planned, scoped and executed. Appropriate levels of project governance were also in place.
- WorleyParsons is of the opinion that the project passes a prudency test assessment.

AER assessment

The AER has considered the project information provided by Transend and WorleyParsons' findings from its detailed project review.

The AER notes that Transend undertook this project establish its own IT infrastructure rather than continue to rely on IT services provided under an agreement with Hydro Tasmania. The project has upgraded or replaced IT systems and applications depending on business needs. The AER notes that Transend has assigned

its corporate IT assets into an asset category grouping like assets together. Further, each asset category has an individual Asset Management Plan with a defined scope.

Although WorleyParsons did not comment on the final project costs, it noted that Transend's corporate IT spend per employee was favourable in two TNSP benchmarking studies; one benchmarking study was conducted by KPMG in 2006 and, in 2007, a second benchmarking study was conducted by PB Associates in the course of its review of corporate support functions operating expenditure for Transend. The AER considers that the benchmarking studies support Transend's claims that the project costs are reasonable. Further, the project components appear consistent with Transend's overarching asset management framework.

The AER has considered the project information provided by Transend and it accepts WorleyParsons' advice that this project appears to have been prudently planned, scoped and executed. The AER will include the amount of $2.6 million (nominal) in the RAB, as proposed by Transend, and accepts that this amount represents prudent and efficient expenditure.

Nuttall Consulting's review of ex post projects

Nuttall Consulting summarised a number of projects in its ex post review including Transend's 110kV substation redevelopments, substation secondary projects and transmission line projects. The detailed project summaries can be found in Appendix A of Nuttall Consulting's report.

Extracts from the Nuttall Consulting report regarding the projects discussed here follows the AER assessment discussion.

AER assessment

The AER notes that the ACCC's 2003 revenue decision had stated Transend should "demonstrate that its renewal expenditures are economically justified and that there are no, more cost effective, alternatives".[427] In view of this requirement expressed in the ACCC's 2003 decision, the AER engaged Nuttall Consulting to undertake a thorough review of asset renewal expenditure.

Nuttall Consulting has noted that WorleyParsons has reviewed the business-wide aspects of Transend's capex proposal including the review of capital governance systems and/or processes, the overall asset management strategy (including development and underlying systems), deliverability and resourcing requirements and cost estimation processes and systems. As such, Nuttall Consulting considered that it had no reason to consider that WorleyParsons' findings on these matters would not cover the asset renewal projects reviewed by Nuttall Consulting.

The AER notes that both WorleyParsons and Nuttall Consulting noted that all reviewed past capex projects were implemented in accordance with Transend's systems and process documentation. As set out in its 2003 decision, the ACCC stated an intention to closely examine Transend's asset renewal program. Transend provided

[427] ACCC, Tasmanian transmission network revenue cap 2004–2008/09: Decision, 10 December 2003, p. 42.

business case documentation in support of its renewal projects and, for a number of the past projects reviewed, the project options adopted were found not to be supported by economic analysis or financial evaluation to a standard that Nuttall Consulting considered satisfactory in light of the ACCC's 2003 decision.

Further, the AER notes that, at WorleyParsons' and Nuttall Consulting's request, Transend developed a document attempting to reconcile the projects identified at the time of the ACCC's 2003 decision and the projects which will be implemented during the current regulatory control period. In seeking to further explain the reasons for the overexpenditure above the ACCC's 2003 allowance, Transend revised the allocation of capital projects between the development and renewal capex categories.[428] The AER notes that the 'reallocation' of projects between the various capex categories has not altered the fact that Transend have overspent its total capex allowance, as approved by the ACCC in its 2003 decision.

The AER agrees with observations made by Transend and Nuttall Consulting that economic appraisal is only one element of the overall project evaluation and approval process. Nevertheless, the AER considers economic appraisal to be a necessary element undertaken as a matter of course in project investment evaluations, particularly where a business' investment processes and procedures highlight the importance of selecting the option with the highest NPV of benefits commensurate with acceptable levels of risk. [429]

The Nuttall Consulting review considered that Transend's assets and associated strategies fell into the two broad categories of substations and lines. The sample of asset management plans provided to Nuttall Consulting by Transend indicated that Transend's renewal program was focussed on substations, particularly the power transformer, EHV circuit breaker and HV switchgear asset classes. Although the main components of the renewal projects were related to asset renewal, there were also non-renewal project drivers. However, Nuttall Consulting found no evidence that the non-renewal elements of the renewal projects reviewed were not needed.[430]

The AER notes that Nuttall Consulting did not consider that Transend's economic analysis of its asset renewal capex projects was sufficient to demonstrate that no alternative project option or project timing could have been selected. Notwithstanding this, the AER accepts Nuttall Consulting advice that, based on its detailed project reviews, there was no evidence to suggest that Transend's actual project option selection and timing was not prudent. The AER accepts Nuttall Consulting's advice that Transend's overall network past capex is prudent and that the projects, as developed, were efficient and consistent with good industry practice.

However, the AER notes that Nuttall Consulting found that capex was not required during 2008-09 for the Burnie–Waratah wood pole replacement project. [431] Given this

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428 Transend, *Capital expenditure profiles and variations for the period January 2004 to June 2014 (Issue 0.4, August 2008)*, submitted 27 August 2008.

429 Transend, Investment Evaluation of Network Projects Guideline, Issue 1.0, June 2008.

430 Nuttall Consulting, *Review of Transend Revenue Proposal Asset Renewal Capital Expenditure: A report to the Australian Energy Regulator*, Nuttall Consulting report, October 2008,, p. 49.

431 Nuttall Consulting, Nuttall Consulting report, op. cit., p. 48.

was discussed by Nuttall Consulting and Transend in the course of the detailed project review and Transend did not provide further evidence that refutes Nuttall Consulting's finding, the AER accepts Nuttall Consulting's finding. Transend's network capex to be commissioned during the current regulatory control period will be adjusted accordingly.

Based on the evidence presented and the conclusions of WorleyParsons and Nuttall Consulting, the AER considers the total amount of $409.7 million (nominal) for network past asset renewal capex is prudent.

Summaries of projects considered in Nuttall Consulting's detailed project review

Nuttall Consulting summarised a number of projects in its ex post review including Transend's HV switchgear and transformer replacements, transmission lines and optical fibre ground wire (OPGW) projects. Specifically, Nuttall Consulting reviewed the following projects:

- Burnie substation 22 kV switchgear replacement
- Palmerston substation HV switchgear and transformer replacement
- Lindisfarne substation: 33 kV switchgear replacement
- Triabunna substation HV switchgear and transformer replacement.
- George Town substation network transformers T1, T2 and T3 replacement
- Chapel Street substation: replacement of network transformers
- Sheffield Substation 110 kV redevelopment
- George Town substation B bus replacement
- Palmerston 220 kV substation: primary equipment upgrades
- Burnie to Port Latta 110 kV transmission line reconductor
- West Coast and Mersey Forth OPGW project

Nuttall Consulting's detailed ex post project review can be found in Appendix A of its report.

Burnie substation 22 kV switchgear replacement

The project involved the replacement of:

- the existing 11 HV outdoor switchbays the protection and control associated with the switchbays and auxiliary AC systems.

The project also included the installation of:

- an additional 6 HV switchbays at the request of Aurora Energy, an additional 2 HV switchbays for station service transformers and the upgrade of the SCADA system to cover the 220 and 110 kV assets.

The actual capex for this project was $3.3 million (nominal), with the majority of this capex in the January to June 2004 period.

The business cases defined the asset renewal needs for this project as being HV switchgear, protection and AV systems. The business cases defined the non-renewal needs as Additional Aurora Energy feeders and SCADA.

The option costs or an economic appraisal of these options was not included, or discussed, in the business cases. Nuttall Consulting has sighted no other information that provides any form of economic appraisal of these project options.

Palmerston substation HV switchgear and transformer replacement

The project involved the replacement of:

- the existing 6 HV indoor switchbays (originally outdoor), the existing 7.5 MVA transformer and the protection and control associated with the switchbays.

The project also included additional works to cover:

- the increase in the transformer rating to 25 MVA, an additional 2 HV switchbays at the request of Aurora Energy, an additional 2 HV switchbays for station service transformers and the upgrade of the SCADA system to cover the EHV and HV assets.

The actual capex for this project was $4.0 million (nominal), with the project commissioned in 2006/07.

The business case defines the asset renewal needs as relating to HV switchgear, transformers and protection. The business case defines the non-renewal needs as additional Aurora Energy feeders, increases in transformer capacity and SCADA.

The option costs or an economic appraisal of these options was not included, or discussed, in the business cases. Nuttall Consulting has sighted no other information that provides any form of economic appraisal of these project options.

Lindisfarne substation: 33 kV switchgear replacement

The project involved the replacement of:

- the existing 7 HV indoor switchbays, the protection and control associated with the switchbays and auxiliary AC and DC supplies.

The project also included additional works to cover:

- an additional 2 HV switchbays at the request of Aurora Energy, an additional 2 HV switchbays for station service transformers and the upgrade of the SCADA system to cover the EHV and HV assets.

The actual capex for this project was $3.4 million (nominal), with the project commissioned in 2005/06.

The business case defines the asset renewal needs as HV switchgear and protection. The business case defines the non-renewal needs as additional Aurora Energy feeders and SCADA.

The option costs or an economic appraisal of these options was not included, or discussed, in the business cases. An independent assessment of this project was undertaken by Ascension consulting /Meritec in 2002.

Triabunna substation HV switchgear and transformer replacement

The project involved the replacement of:

- the existing 3 HV outdoor switchbays, the existing two 7.5 MVA transformers, the protection and control associated with the switchbays and transformers and the auxiliary supplies.

The project also included additional works to cover:

- an additional 2 HV switchbays at the request of Aurora Energy (plus 2 further switchbays to provide dedicated feeder switchbays), an additional 2 HV switchbays for station service transformers and the upgrade of the SCADA system to cover the EHV and HV assets

The actual capex for this project was $4.3 million (nominal), with this project commissioned in 2006/07.

The business case defines the asset renewal needs as HV switchgear Transformer and Protection. The business case defines the non-renewal needs as additional Aurora Energy feeders and SCADA.

The option costs or an economic appraisal of these options was not included, or discussed, in the business cases. An independent assessment of this project was undertaken by Ascension consulting / APC Worley in 1999.

George Town substation network transformers T1, T2 and T3 replacement

The project involved the replacement of:

- two existing network transformers.

The project also included additional works to cover:

- additional switchbay works to allow for the installation of an additional transformer prior to the transformer replacements indicated above.

The project also included other minor enhancements, including upgrades to the DC supplies and work related to the improved system and physical security at George Town.

The actual capex for this project was $19.6 million (nominal), with components of the project being commissioned in 2007/08 and 2008/09.

The business cases define the asset renewal needs as relating to network transformers. The main non-renewal element of this project is the switchbay works to allow for the energisation of the spare transformer at George Town, prior to the replacement of the two units.

The option costs or an economic appraisal of these options was not included in either of the business cases.

Chapel Street substation: replacement of network transformers

The project involved the replacement of:

- three existing 120 MVA network transformers and protection and control panels associated with the transformers.

The project also included additional works to cover:

- the upgrade of the transformers to 200 MVA units and an upgraded screen based SCADA system for the substation.

The actual capex for this project was $8.1 million (nominal) with this project commissioned in 2004/05 to 2005/06. Transend has advised that $4.8 million of this project has been incorrectly assigned in the AER's cost information template to project ND0554 (New Norfolk – South transmission line redevelopment

The business case defines the asset renewal needs as being for network transformers and protection. The business case defines the non-renewal needs as being for an upgrade of the transformer rating and SCADA.

An economic appraisal of these options was not included in the business case.

Sheffield substation 110 kV redevelopment

The project reviewed involved the replacement of:

- the 4 remaining Sprecher and Schuh 110 kV circuit breakers, the voltage transformers associated with the 110 kV busbars and two 110 kV transmission lines (plus the installation of line voltage transformers on a number of 110 kV transmission lines), 99 post insulators, protection and control systems associated with 6 transmission lines, the SCADA system and AC and DC supplies.

The actual capex for this project was $6.9 million (nominal), with this project commissioned in 2007/08 and 2008/09.

The business case defines the asset renewal needs as being the Sprecher and Schuh circuit breakers, Voltage transformers (VTs), post insulators, protection and control, SCADA and Auxiliary systems (AC and DC supplies).

The option costs or an economic appraisal of these options was not included, or discussed, in the business cases. Nuttall Consulting has sighted no other information that provides any form of economic appraisal of these project options.

George Town substation B bus replacement

The project involved the replacement of:

- the 220 kV "B" bus at George Town, protection and control systems associated with 2 transmission lines and lightning protection at 220 kV switchyard.

The project also includes the replacement of protection systems and the installation of dedicated line VTs on the lines that supply an industrial customer.

The actual capex for this project was $6.2 million (nominal), with elements of this project commissioned in 2004/05, 2007/08 and 2008/09.

The business case defines the asset renewal needs as being for 220 kV bus gantry structures, protection and control, lightning protection and works for lines supplying the industrial customer.

The option costs or an economic appraisal of these options was not included in the business case. Nuttall Consulting has sighted the option costs contained in the independent reports for the gantry structure element of this project. These broadly align with Transend's qualitative reasoning in its option selection in the business case.

Palmerston 220 kV substation: primary equipment upgrades

The project involved the replacement of:

- the voltage transformers for a 220 kV transmission line, and the installation of dedicated line voltage transformers on 6 other 220 kV transmission lines, the 220 kV current transformers associated with one network transformer and one transmission line, a number of 220 kV post insulators, protection and control systems associated with one transformer and two transmission lines, and the panels housing the transformer protection system and lightning protection at the 220 kV switchyard.

The actual capex for this project was $5.7 million (nominal), with the project commissioned in 2007/08.

The business case defines the asset renewal needs as Line VTs, the current transformers, the post insulators, protection and control and lightning protection.

The option costs or an economic appraisal of these options was not included in the business case. Nuttall Consulting has sighted no other information that provides any form of economic appraisal of these project options.

Burnie to Port Latta 110 kV transmission line reconductor

The project involved the replacement of:

- the conductor of the Burnie to Port Latta 110 kV transmission line.

The project also included elements that were more specifically related to the augmentation of the line. These works included:

- the upgrade of the Burnie to Port Latta structures to allow the operation of the line at 64 degrees (involving raising and strengthening approximately 50 per cent of the existing towers).

The actual capex associated with this project in the cost information template is $20 million (nominal), with the project commissioned in 2007/08. However, this amount includes another project to augment the line from Port Latta to Smithton.

The business case defines the asset renewal needs as pertaining to the replacement of the conductor due to safety and reliability risks and the poor condition of the conductor.

The business case defines the non-renewal needs as augmentation requirements driven by the forecast load increases for the area.

The option costs or an economic appraisal of these options was not included in the business case. Nuttall Consulting has sighted no other information that provides any form of economic appraisal of these project options.

West Coast and Mersey Forth OPGW project

The West Coast and Mersey Forth OPGW project is part of Transend's strategy to roll out optical ground wire (OPGW) across its transmission network. The project involves the installation of OPGW over 133 km of its transmission lines in that area.

A significant portion of the project concerns the replacement of the existing ground wire on the Farrell to Sheffield line with OPGW (85 km). The remainder involves the installation of OPGW on other transmission lines in that area, which do not currently have ground wire coverage.

The overall cost for this project was to be recovered partly through the regulated shared and connection services, and unregulated activities through the sale of communication bandwidth. The unregulated portion was assumed to be 25% of the overall shared network component. This was based upon the communication element of the OPGW accounting for half the costs of the project, and only half of this component being required for regulated services of the shared network.

The actual regulated portion of the project cost is $6.9 million, occurring in 2006/07.

The business case defines the asset renewal needs as that the existing earth wire was inadequate to withstand the likely maximum fault current.

An economic appraisal of the options was not included in the business cases. Nuttall Consulting has sighted no other information that provides any form of economic appraisal of these project options.

Appendix D: Review of ex ante capital expenditure

This appendix sets out the AER's consideration of Transend's forecast capex program, including WorleyParsons' recommendations based on its detailed review of a sample of projects and Nuttall Consulting's recommendations based on its detailed review of capex renewal projects.

It is noted that although Transend has prepared its forecast capex proposal on a detailed project-by-project basis, and the AER has for the most part assessed expenditure in this way, the AER's conclusions relate to a total forecast capex allowance. Therefore the AER's project-specific conclusions should not be taken to bind Transend to a particular set of project-specific capex budgets — Transend has the ultimate discretion in how it spends its capex allowance.

WorleyParsons' review of ex ante projects

WorleyParsons reviewed 10 projects:

- Waddamana – Lindisfarne 220kV Transmission Line
- Strategic Easement Acquisition
- Newstead Substation New 110/22 kV Connection Site
- George Town Substation 220kV Security Upgrade
- Asset Management Information System
- Chapel Street Control Centre Backup
- Substation Asset Condition Monitoring Enhancement Program
- Corporate IT Package Systems
- Electrona Stage 2 Development; and
- New Norfolk HV Protection Upgrade.

WorleyParsons' discussion of its detailed project review can be found in Appendix B of its report.

Project ND0575—Waddamana – Lindisfarne 220kV Transmission Line

Transend proposal

Transend indicates that this that this project has an estimated cost of $ 97.266 million ($2008–09). Including cost escalators and risk factors, Transend's proposed expenditure totals $ 119.908 million ($2008–09).

This is the largest project identified in Transend's capital works program and amounts to about 17.5% per cent of Transend's proposed capex allowance for the next regulatory control period.

The project involves the provision of a second 220kV injection point for the Southern region of Tasmania. The injection point will be located at Lindisfarne substation. The work is to be completed in two stages, with Stage 1 of the project to be completed within the next regulatory control period. Stage 1 comprises of the following works:

- construction of a new 220kV switchyard at Waddamana substation near the existing Waddamana substation with a tee into each of the two existing Liapootah-Palmerston 220kV transmission lines.

- construction of a new 220kV switchyard at Lindisfarne substation, adjacent to the existing 110kV switchyard, comprising one 220/110 kV 200 MVA auto-transformer with associated 220kV and 110kV switch bays and associated protection, control and metering equipment.

- decommissioning of the existing Waddamana-Lindisfarne 110kV transmission line and the construction of the existing easement of a new 220kV transmission line from Waddamana to Lindisfarne, on double circuit towers strung on one side only.

Stage 2 of the project, estimated to commence after the end of the next regulatory control period, will comprise of the installation of a second auto-transformer at the Lindisfarne substation and the stringing of a second 220kV circuit.

This project is required to minimise the risk of supply interruptions in Tasmania. The supply of electricity in the southern region of Tasmania (including Hobart) is currently heavily reliant upon the Chapel Street substation as it is the only 220 kV injection point in the area. The transmission network in the southern region of Tasmania also currently has insufficient capacity to supply the entire customer load during cold conditions. The network can supply up to 640MW of electricity however maximum demand currently exceeds 640MW during cold periods. When demand is in excess of supply, the network risks voltage collapse due to overloading of the transmission lines.

The existing Waddamana-Lindisfarne 110kV transmission line was constructed in the 1920's to operate as an 88kV line. There are also ground clearance, conductor, power failure, tower and condition problems with the current line.

Transend currently has a network supply agreement with Hydro Tasmania which aims to mitigate the risk of supply interruptions in southern Tasmania. The agreement allows for a shortfall in transmission capacity to be mitigated by constraining on-generation from the Gordon power station and other power stations on the lower Derwent River and the costs of this agreement are treated as pass throughs. The agreement, as it currently stands, does not solve all of the network constraint problems in southern Tasmania.

The main drivers for the project are to:

- provide adequate capacity to meet southern region demand.
- improve the security of supply to the southern region by reducing reliance on the 220 kV transmission lines that connect to the Chapel Street substation.
- replace infrastructure that has reached the end of its asset life.

WorleyParsons' review

WorleyParsons noted the following:

- Transend has demonstrated that there is a justifiable need for the project, to provide adequate capacity to meet the southern region demand and to improve the security of supply to the southern region.
- the project has twice gone through the regulatory test process, requiring extensive project justification each time.
- Transend considered 12 options in its initial studies and has considered a reasonable range of options. As a part of this process, Transend has considered non-network options demand side management in four key areas of the project. Transend concluded hat it was reasonable to rule out demand side management as an alternate option to the proposed development and did not include demand side management in further reviews. WorleyParsons concurred with this approach and believes that Transend has selected the most efficient project.
- Opex/Capex trade-offs are not a significant issue for this project.
- Transend has selected the most efficient project on the basis of market benefit analysis. Transend engaged McLennan Magasnik Associates (MMA) to conduct an assessment of the market benefits of grid reinforcement in southern Tasmania.
- the level 1 estimates used for the revenue proposal provide a reasonable basis for forecasting the expenditure for this project.
- the design selected by Transend is appropriate for the circumstances and is in accordance with good industry practice. There is a difference of less than 1% in the NPV of the two network options (i.e. a staged double circuit augmentation versus a straight double circuit augmentation) under the majority of scenarios.
- the project has been developed in conformity with Transend's policies and procedures, particularly the investment process governance framework and the project initiation and development procedure.
- the project timing aligns with MMA's recommendation that the project proceed as soon as possible, with the net market benefits achievable from 2010 under most scenarios.
- there were no inaccuracies identified in the information supplied by Transend.
- the design of the 220kV Waddamana-Lindisfarne proposed by Transend is appropriate in the circumstances and in accordance with good industry practice.

- the estimated cost of the project has significantly increased over the earlier estimates. However, there is no evidence to suggest that Transend has over-estimated the cost of the project and WorleyParsons is satisfied that the forecast costs are reasonable considering the work proposed.

Submissions

The EUAA submitted that it had concerns about Transend's ability to control its capex. It noted that the Waddamana to Lindisfarne project has had significant cost blow outs and in view of this, it may be better for network support agreements to continue in order to defer or further avoid significant expenditure.[432]

MEG submitted that the AER and its consultants should carefully review the delay in the Waddamana–Lindisfarne project to ensure that any costs as a consequence of the delay were managed to the standard of good electricity industry practice, any claimed unavoidable increases were prudent and that approved expenditure was not diverted to other projects simply as a consequence of the delay.[433]

AER assessment

Transend's cost information templates indicate that this project has an estimated cost of $118 million ($2008–09). This is the single largest project identified in Transend's capital works program and it amounts to about 17 per cent of Transend's proposed ex ante capex allowance.

This project includes the construction of a new double-circuit 220 kV transmission line (strung initially on one side only) between Waddamana and Lindisfarne and an extension of the Lindisfarne substation. Transend has stated the project has passed the market benefit limb of the regulatory test and is currently being implemented.[434] The project is expected to be commissioned by 2011.

The AER notes that the Waddamana–Lindisfarne 220 kV transmission line and substation project is an element of Transend's Southern Augmentation project included in the development capex category for the current regulatory control period and approved by the ACCC in its 2003 decision.[435] The AER also notes that Transend is currently reliant on a network support agreement to maintain reliable supply to the southern region in peak periods. Although this agreement has enabled Transend to maintain supply to Hobart pending the proposed augmentation, Transend has expressed concern that a failure event affecting the Gordon to Hobart transmission line or generation availability would severely jeopardise supply reliability in the southern region.

The AER has reviewed the project information provided by Transend and notes the project has twice been subjected to the regulatory test process. The regulatory test has

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[432] EUAA, *EUAA Submission to the AER on Transend's 2009 to 2013 Revenue Proposal* , p.iii & 7.

[433] MEG, *Major Employer Group (Tasmania) Submission to AER on Transend Revenue Proposal*, p.1

[434] Transend, *Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014*, Transend revenue proposal, 31 May 2008, p. 8.

[435] ACCC, *Tasmanian transmission network revenue cap 2004–2008/09: Decision*, 10 December 2003, p. 30.

required extensive project justification and the AER notes the recent economic studies by MMA showing net market benefits are achievable from 2010 under most scenarios.[436] The AER notes this analysis has been conducted consistent with the requirements of the regulatory test.

The AER accepts WorleyParsons advice that the technical design selected by Transend is appropriate for the circumstances and in accordance with good industry practice. Although the estimated project cost is significantly higher than initially proposed, the AER agrees with WorleyParsons that there is no evidence that Transend has over-estimated the likely actual project cost. The AER notes WorleyParsons' observation that there is less than 1 per cent NPV difference between a staged double circuit augmentation and a double circuit augmentation under the majority of network development scenarios.

The AER considers that a secure and reliable transmission system is vital to an efficient electricity market. The AER considers this project is required to improve the security of supply to the southern region of Tasmania and accepts WorleyParsons' advice that the Waddamana–Lindisfarne 220 kV transmission line project meets the capex objectives. In this regard, the AER has considered the EUAA's submission that network support agreements continue in order to defer or further avoid expenditure is not appropriate as it would not adequately resolve the longer-term security of supply issues addressed by this project.

Having reviewed the project information provided by Transend (including the economic analysis by MMA) and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Project ND1001—Strategic Easement Acquisition

Transend proposal

Transend indicates that this that this project has an estimated cost of $ 15.297 million ($2008–09). Including cost escalators and risk factors, Transend's estimated expenditure is $ 21.192 million ($2008–09).

The project includes high level investigations which determine the potential future location of easements and substations, to facilitate future prescribed Transmission system augmentation. Where prudent, easements or land allotments are purchased to assist with future network augmentations or connections.

Strategic investigations into land or easement acquisition are undertaken to achieve this aim. The strategic investigations take into account, amongst other things, development adjacent to easements, encroachments into the easements, environmental impacts and increases in land values over time.

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[436] McLennan Magasanik Associates, *Report to Transend: Assessment of market benefits from grid reinforcement in Southern Tasmania*, 15 June 2007. This report can be found at www.transend.com.au.

The strategic investigations also include an assessment of the existing way-leaves (where relevant) and high level environmental impact assessment.

An easement investigation and acquisition project will be undertaken in the next regulatory control period for the Sheffield-Burnie new transmission line project. Further, investigations for transmission line projects will be undertaken for the Liapootah-Chapel Street corridor, the alternative 110kV supply to Devonport - Wesley Vale and the Tasman Peninsula transmission line in the next regulatory control period. Investigations for substations will be undertaken at Exeter/Devonport, Staverton Switchyard and Dunalley Substation.

The main drivers for the project are to:

- ensure the efficient delivery of the capital works program.
- allow the timely completion and approval of development applications.
- minimise the costs associated with land acquisition for transmission augmentation or connection projects.
- enhance the likelihood that overhead transmission line options will gain approval.
- complete the acquisition of suitable easements and land to minimise barriers to the delivery or implementation of planned augmentations or connections.

WorleyParsons' review

WorleyParsons noted the following:

- Transend has assessed three options in relation to the project. Strategic easement acquisition was Transend's preferred option and WorleyParsons support this approach while recognizing the increasing difficulties and costs in obtaining easements over time.
- Transend has demonstrated that there is a justifiable need for the project to ensure the efficient delivery of its capital works program.
- the forecast costs for the project are reasonable considering the work proposed.
- the project aligns with Transend's strategic plans, governance arrangements and Capex polices and procedures.
- Transend has based its proposed timing on the easements being procured eight years prior to the line being required under a medium growth scenario. This results in significant expenditure in 2012-12 to 2013-14. Transend carried out a NPV comparison of six options covering a range of load growth and timing scenarios in support of the proposed timing. WorleyParsons calculated the NPV for two further options, the conclusion of which was that the procurement of easements in the final two years of the Next Regulatory Control Period presented the lowest cost.

- the proposed project cost and timing as proposed by Transend is reasonable and should be included in the ex ante cap.

Submissions

MEG submitted that Transend should be encouraged to defer land acquisition until it is truly necessary, including the use of options to purchase land that may be used in the future.[437]

AER assessment

Transend's proposed capex for land and easements over the next regulatory control period is $21 million ($2008–09). This is a significant increase compared to the $0 million incurred during the current regulatory control period. The AER has reviewed this capex category to determine whether Transend's proposed allowance reasonably reflects the efficient costs that a prudent TNSP in Transend's circumstances will reasonably incur to achieve the capex objectives.[438]

The land and easements capex category comprises one specific strategic easement purchase project (ND1001 Strategic easement acquisition). The project sets out Transend's easement acquisition strategy for the next regulatory control period. In summary, easement acquisition is proposed for the Sheffield–Burnie 220 kV capacity upgrade and easement investigation is proposed for 3 transmission lines and 3 substation development projects.[439]

The AER recognises that Transend is concerned with potential development delays and notes that Transend considers that acquiring easements 'well in advance' of a project has a strategic value. The AER has reviewed the strategic easement acquisition project and notes that the underlying network augmentation project that drives the project (the Sheffield–Burnie 220 kV transmission line) is listed as a contingent project in the next regulatory control period. Although the Sheffield–Burnie 220 kV transmission line has been identified as a contingent project, one of the trigger events is related to high load growth in that area and the AER notes, subject to the load growth rate, it is possible this project (and, therefore, the associated easement) may be required sooner than currently proposed by Transend.

The AER notes the sensitivity of Transend's NPV analysis to the timing of the easement acquisition for the Sheffield–Burnie 220 kV transmission line. The AER also notes that WorleyParsons tested the sensitivity of Transend's NPV economic analysis by deferring the easement acquisition for one and two years respectively in the case of the medium demand growth scenario. WorleyParsons found that the net present cost of the acquisition was increased by $0.9 million and $1.3 million respectively and, therefore, was satisfied with Transend's proposed timing of the easement land acquisition. The AER has reviewed the NPV economic analysis and is satisfied, in this instance, it is reasonable to provide Transend an allowance for the

[437] MEG, *Major Employer Group (Tasmania) Submission to AER on Transend Revenue Proposal*, p.8

[438] National Electricity Rules, clause 6A.6.7(c).

[439] Transend, Response to information request no.114, submitted 30 July 2008.

Sheffield–Burnie 220 kV transmission line easement because the need and timing have been sufficiently demonstrated and supported by the economic analysis.

Given the defined timing and cost of the specific easement acquisition project related to the Sheffield–Burnie 220 kV transmission line, the AER considers that it is reasonably likely that these costs will be incurred during the next regulatory control period.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Project ND0931—Newstead Substation New 110/22 kV Connection Site

Transend proposal

Transend indicates that this that this project has an estimated cost of $ 16.701 million ($2008–09). Including cost escalators and risk factors, this project has an estimated cost of $ 20.519 million ($2008–09).

The project involves the construction of a new 22kV connection site in the Newstead area and involved the following works:

- termination of the new Mowbray-Norwood 110kv transmission line on two termination towers at the Newstead substation.
- installation of 2 x 60 MVA 110/22kV transformers and associated switchgear.
- development of the substation site including permitter fence, roadways, earth mat, lighting, control building and lighting protection.
- associated protection and control schemes.

The project will be implemented within the context of developments with the Norwood-Mowbray 110kV transmission line. The 22kv supply from Mowbray substation is expected to become non-firm in 2011 and Aurora Energy has submitted a connection application for a new 22kV connection site in the Newstead area to cater for demand growth.

The current arrangement at Norwood substation does not comply with clause 5(1)(a)(iv) of the Electricity Supply Industry (Network Performance Requirements) Regulations 2007 in that “the unserved energy to load that is interpreted consequent on damage to a network element resulting from a credible contingency event is not capable of exceeding 300MWh at any time.”

The main drivers for the project are to:

- improve security and reliability of supply to the Launceston area to comply with the minimum network performance levels under the ESI regulations.
- cater for forecast demand growth in the Launceston CBD and surrounding areas.

Transend and Aurora Energy conducted joint planning studies to determine the best solution for the Launceston area to address both the security of supply and reliability issues.

WorleyParsons' review

WorleyParsons noted the following:

- Transend has demonstrated that there is a justifiable need for the project, to improve security and reliability of supply to the Launceston area to comply with the ESI regulations and to cater for forecast demand growth.

- the option proposed by Transend is reasonable given the alternative options mooted. Transend and Aurora Energy jointly determined that the best solution to ensure reliability and security of supply to the Newstead arena and to meet Aurora Energy's requirements to establish a new 110/22kV substation in the Newstead area. WorleyParsons concurred with this assessment, given the physical constraints in running addition distribution feeders from Norwood substation.

- the project is at an early stage of development, but the project has been developed in conformance with Transend's policies and procedures, particularity the Investment Process Governance Framework.

- the cost estimates for this project align with the values contained in Transend's Capital Accumulation Model. The design for this project is appropriate and the forecast costs are reasonable for the work proposed.

- the project is required now and has been timed to align with the construction of the Norwood –Mowbray transmission line, which is scheduled for 2012.

- the project aligns with Transend's strategic plans, governance arrangements and Capex policies and procedures.

- there were no inaccuracies identified in the information provided in relation to this project.

- the proposed project cost and timing as proposed by Transend is reasonable and should be included in the ex ante cap.

AER assessment

Transend's cost information templates indicate that this project has an estimated cost of $21 million ($2008–09). This is the third largest project identified in Transend's connection network capex category. The two largest projects in the same category have an estimated cost of $23 million ($2008–09) each.

This project includes a new 110/22 kV substation in the Newstead area of Launceston. The AER notes that the Newstead area is currently supplied from Mowbray and Norwood substations and the 22 kV feeders are heavily loaded. Further, Aurora Energy submitted connection applications to Transend for firm 50 MVA supply at Mowbray substation by winter 2009 and the establishment of a new 22 kV connection site at Newstead.

The AER also notes that Transend and Aurora Energy have jointly identified existing constraints in the electricity transmission and distribution systems supplying the Launceston area and joint planning between Transend and Aurora Energy identified the combination of the Norwood-Mowbray 110 kV transmission line and a new connection point at Newstead has been identified as the preferred option. The AER notes that Transend has indicated the new 22 kV connection site at Newstead will be implemented with the Norwood-Mowbray 110 kV transmission line project to achieve efficiency in works delivery.

The AER notes that Transend and Aurora Energy have jointly determined that the establishment of the Newstead substation will ensure reliability and security of supply to the Newstead area. The AER notes Aurora Energy's advice that there are physical restrictions at the existing distribution sites which serve the Newstead area. Both substations are reported to be heavily loaded. Transend and Aurora Energy believe there may be a need to refurbish these substations in future but space limitations at the existing sites preclude expanding the existing distribution system without the establishment of a new substation. Therefore, the AER accepts WorleyParsons' advice that Transend has demonstrated the project is required to improve security and reliability of supply in the Launceston area and to cater for forecast demand growth.

The AER notes that this project is classified as a 'large network asset' and will be subject to consultation under clause 5.6.6 of the NER and, therefore, it is possible that an alternative solution may be identified in the course of the public consultation process.[440] The AER also notes that Transend has not yet submitted a business case for internal approval, however, it is proposing to apply the reliability limb of the regulatory test to select the project option which maximises the net economic benefit. The AER accepts WorleyParsons advice that the technical design for this project is appropriate and that the estimated project cost is reasonable for the work proposed.

Further, the AER notes that this project is a 'connection' project and that Transend is required to prepare an 'offer to connect' in accordance with the requirements set out in clauses 5.3.5 and 5.3.6(d) of the NER on receipt of an application to connect to its network. The AER has confirmed with Aurora Energy that this is a priority project in the next regulatory period.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Project ND0657—George Town Substation 220kV Security Upgrade

Transend proposal

Transend indicates that this that this project has an estimated cost of $14.497 million ($2008–09). Including cost escalators and risk factor, the project has an estimated cost of $18.361 million ($2008–09).

[440] Clause 5.6.6 of the NER discusses the consultation processes required for establishment of new large transmission network assets.

The project involves the redevelopment of the George Town Substation 220kV switchyard from the existing double busbar arrangement to a circuit breaker and a half arrangement. The redevelopment will also include a number of asset arrangements and the building of a second control building. The project will further involve:

- the submission of a development application for the substation to George Town Council to cover the works associated with the project
- completion of additional land purchase from Rio Tinto to secure suitable land to allow this redevelopment project to continue.
- construction of a new 220kV solid busbar (busbar E).
- removal of the existing 220kV busbar (busbar A).
- extend the existing substation to accommodate the new 220kV switchyard arrangement.
- construction of a second control building, next to the existing 220 kV capacitor bank.
- modification of the existing GT-HD 220 kV transmission line No.2 bay and the Auto Transformer T3 bay to a circuit breaker and a half arrangement.
- modification of the existing GT-HD 220 kV transmission line No.1 bay and the Auto Transformer T2 bay to a circuit breaker and a half arrangement.
- modification of the existing GT-SH 220 kV transmission line No.1 bay and the Auto Transformer T1 bay to a circuit breaker and a half arrangement.
- modification of the existing GT-SH 220 kV transmission line No.2 bay to a double circuit breaker arrangement. This arrangement will allow easy conversion to circuit breaker and a half if a new 220kV bay is installed opposite this transmission line.
- relocation of CT's on A752, B752, C752 and D752.
- relocation of the protection schemes associated with GT-HD 220 kV transmission line No.2, GT-SH 220 kV transmission line No.2, Auto Transformer T1 and T3 to the new control building. Relocation of the Rio Tinto No.5 protection scheme is also included.
- installation of new protection schemes to facilitate the redevelopment works.
- installation of second AC, DC, SCADA and communications systems to minimise the impact of the substation if a catastrophic failure occurs in one control building.
- substation infrastructure and ancillary works at George Town substation.
- infrastructure construction, testing and commissioning.

The main drivers for the project are that George Town Substation 220kV currently does not meet the network performance requirements under the ESI regulations and certain assets need to be replaced due to condition and performance issues.

George Town Substation is a critical node of the 220 kV transmission system in Northern Tasmania. It is the termination node for the Basslink DC transmission link, and it supplies Aurora Energy customers and major industrial customers in the George Town area, including Rio Tinto and Temco. Transend is concerned that the current substation can not provide reliable and secure supply to its customers.

Transend has also received connection applications for connections at George Town Substation switchyard from Alinta Pty Ltd / Babcock & Brown and from Gunns. These connection applications were considered when analysing the options for George Town Substation to ensure that the proposed development does not cause impediments for the addition of these connection points.

WorleyParsons' review

WorleyParsons noted the following**:**

- the project is at an early stage of development, but has been developed in conformance with Transend's policies and procedures, particularly the Investment Process Governance Framework.

- Transend has demonstrated that there is a justifiable need for the project, to sustain the reliability and security of a critical node in the transmission network and to comply with regulatory obligations.

- the option proposed by Transend is reasonable. The options were modelled using the SUBREL computer software to calculate reliability indices under two scenarios (import and export), analysing all credible outage events. Transend's preferred option took into account project objectives and costs and was satisfactory to WorleyParsons based on the information provided.

- Transend's cost estimates are based on level one estimates and the design for this project is appropriate and the forecast costs are reasonable for the work proposed.

- the project is required now and is timed to align with other work at George Town substation.

- the busbar configuration proposed by Transend is common throughout the industry for use at 220kV and is appropriate for this installation.

- no inaccuracies in relation to the information provided on this project have been identified.

- the proposed costs and timing of the project as proposed by Transend are reasonable and should be included in the ex ante cap.

Submissions

Rio Tinto Alcan noted that Transend is responsible for operating and managing the system in a manner that is both prudent and efficient –it cannot justify its revenue

proposal simply by claiming that its expenditure is necessary to ensure system security.

AER assessment

Transend's cost information templates indicate that this project has an estimated cost of $18 million ($2008–09). This is the third largest project identified in Transend's augmentation network capex category.

This project includes redevelopment of the George Town 220 kV substation switchyard, building a second control building and the replacement of a number of assets. The AER notes that the George Town substation is the connection point for the Basslink DC transmission link and it supplies Aurora Energy customers and a number of Tasmania's major industrial customers. Further, in developing the project, Transend has sought a solution which minimises impediments to further customer connections at the substation.

The AER notes that Transend has completed a computer modelling study to evaluate 12 development options and assess viable solutions to improve the supply reliability and achieve compliance with the jurisdictional minimum network performance requirements. The AER considers the range of options studied to be adequate for a project of this scale as a basis for initial decision making. Further, the AER recognises that the results of the modelling study have informed Transend's selection of a preferred project option.

As the project is classified as a small network augmentation, the AER further notes it will be subject to a consultation process in accordance with the requirements of clause 5.6.6A of the NER and, therefore, it is possible that an alternative solution may be identified in the course of the public consultation process.[441] The AER also notes that Transend has not yet submitted a business case for internal approval, however, it is proposing to apply the reliability limb of the regulatory test to select the project option which maximises the net economic benefit.

The AER acknowledges that the existing substation arrangements present a compliance issue under the NER and local jurisdictional minimum network performance requirements developed by the Tasmanian RNPP. The AER notes that WorleyParsons reviewed the justification for this project and agrees with Transend that the existing design is not appropriate for a critical node on the Tasmanian transmission system. The AER accepts WorleyParsons advice that the proposed technical design for the project is appropriate. The AER notes that, at this stage, Transend is proposing to implement the project using a 'design and construct' contract and it expects to engage experienced contractors to undertake the work and, therefore the AER accepts WorleyParsons advice that the proposed costs are reasonable.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably

[441] Clause 5.6.6A of the NER discusses the consultation requirements associated with the establishment of new small transmission network assets.

reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Project ND1043—Asset Management Information System (AMIS)

Transend proposal

Transend indicates that this that this project has an estimated cost of $6.0 million ($2008–09). Including cost escalators and risk factor, the project has an estimated cost of $7.238 million ($2008–09).

The Asset Management Information System (AMIS) supports business processes, including asset records management, works management, works planning, performance reporting and other elements. The project involves systems improvement and development of AMIS to ensure that asset management strategies can be effectively and efficiently implemented. Transend states that development of AMIS will assist in converting its asset management strategies into activities that can be implemented.

Transend proposes to enhance its core asset management system by developing and implementing many components of an advanced asset management system. The project will build on the information systems that currently constitute Transend's AMIS and will deliver enhancements to further integrate business systems and business processes support the management of transmission system assets.

The main drivers for the project are to improve asset management and enhance productivity.

WorleyParsons' review

WorleyParsons noted the following:

- it supported the ongoing development of AMIS of the next regulatory control period.
- there is a justifiable need for the project, to improve asset management and enhance productivity.
- given the successful track record for the development and implementation of the AMIS to date and Transend's strong drive to improve asset management and enhance productivity, the option of developing AMIS is preferred over the "do nothing" option.
- Transend's cost estimates are based on experience with the project to date, with expected hours and hourly rates assessed by experience staff. There is no evidence to suggest that Transend's cost estimates on the project are unreasonable.
- the project is at an early stage and the project aligns with Transend's strategic plans, governance arrangements and capex policies and procedures.
- WorleyParsons considered that it is reasonable for Transend to continue to develop AMIS over the Next Regulatory Control Period, to support improving

asset management and enhance productivity and that there will be flexibility as to the timing of individual initiatives within the program.

- there was a minor discrepancy in the information provided in relation to the project, but this has been clarified and the matter was not material.

- the proposed costs and timing of the project as proposed by Transend are reasonable and should be included in the ex ante cap.

AER assessment

Transend's cost information templates indicate that this project has an estimated cost of $7.1 million ($2008–09). The Asset management information systems (AMIS) project consolidates primary asset management functions and information on the Works assets scheduling and programming system. The AER notes the AMIS implementation commenced in 2003 and continuing development and enhancement is an organisational initiative included in Transend's *Strategic Plan 2008*.[442] The AER also notes the key investment driver of this project is the facilitation of the development of an asset management system to support improved asset management and the asset life cycle management process and, therefore, continuing AMIS development is preferred to the 'do nothing' option.

The AER notes the project includes a number of individual sub-projects which will each be subject to a business evaluation and that recent (AMIS) project costs have informed Transend's proposed project cost estimates. The AER also notes that, as a result of this project, Transend is proposing to increase its opex by increasing the number of support staff and the proposed project cost estimates have been developed using historical costs. WorleyParsons considered the project appears to be prudently planned, scoped and executed because, although the project is at a very early stage, it has been developed in accordance with Transend's policies and procedures. The AER notes that, based on its ex post prudency review of the AMIS project in the current regulatory period, WorleyParsons considered that Transend had demonstrated a 'successful track record' for the development and implementation of AMIS to date.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Project— Control Centre Backup

Transend proposal

Transend indicates that this project has an estimated cost of $ 5.070 million ($2008–09). Including cost escalators and risk factor, the project has an estimated cost of $6.340 million ($2008–09).

[442] Transend, *Strategic Plan 2008:Planning period: 2008-09 to 2013-14*, confidential, submitted 2 July 2008, p. 33.

The project involves the upgrade of the current back up facilities, either by developing the existing substation site or by relocating to an alternative site. Transend has proposed to conduct a review to determine the most appropriate and cost effective way to address the developing business requirements prior to committing to asset replacement or site modification. Transend proposed to commence the project early in the next regulatory control period, consistent with other priorities.

The main drivers for this project are the mitigation of business risk, compliance with the requirements of NEMMCO and the State Emergency Plan.

WorleyParsons' review

WorleyParsons noted the following:

- Transend has demonstrated that there is a justifiable need for the project, to mitigate business risk associated with the loss of key systems. Effective back up facilities for network operations and corporate IT functions are essential for an electricity transmission business.
- Transend is currently considering a range of options for the implementation of the project. The proposed initial review will determine the most appropriate option to address issues with the current arrangements.
- Transend's cost estimates are founded on preliminary estimates provided by a firm of engineers and planners, based on recent experience, prior knowledge of the site and current standard cost rates. WorleyParsons has not evidence to suggest that the forecast costs are not reasonable for the work proposed.
- although there may be some flexibility with regard to timing, WorleyParsons was satisfied that that the project needs to be completed within the next regulatory control period.
- the project aligns with Transend's strategic plans, governance arrangements and capex policies and procedures.
- there were no inaccuracies identified in the information provided in relation to the project.
- the proposed costs and timing of the project as proposed by Transend are reasonable and should be included in the ex ante cap.

AER assessment

Transend's cost information templates indicate that this project has a total cost estimate of $6.2 million over the next regulatory control period. This is the single largest business support project and the project is proposed to be completed by the end of the third year of the next regulatory control period. The relevant substation site is currently used by network operations and corporate IT groups to back-up control centre and co-primary infrastructure. The project proposes to upgrade the current back-up facilities either by developing the existing site or relocating to an alternative site.

The AER notes WorleyParsons considered there is a need for the project to be completed during the next regulatory control period as effective back-up facilities for network operations and corporate IT functions are essential for an electricity transmission business. The AER agrees there is a need to mitigate business risk associated with loss of key systems.

The AER notes that Transend's project cost estimates are based on preliminary estimates provided by third party engineers and planners for the development of the relevant site. Although the third party's preliminary cost estimates were drawn from recent relevant project experience and knowledge of the existing substation services, the AER notes the project cost estimates are based on preliminary estimates by third-party contractors which have been prepared on the basis of their relevant experience and current industry standard costing rates. It also notes that an initial review will be conducted to determine the most cost effective approach for upgrading the current back-up facilities. The AER notes that Transend is considering 5 options including redeveloping the existing site and relocating to an alternative site. The AER accepts WorleyParsons' advice that it found no evidence the forecast costs were not reasonable for the work proposed.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Project ND1002—Substation Asset Condition Monitoring Enhancement Program

Transend proposal

Transend indicates that this that this project has an estimated cost of $3.594 million ($2008–09). Including cost escalators and risk factors, the project has an estimated cost of $4.541 million ($2008–09).

The project involves a substation asset condition monitoring program and a power transformer condition monitoring program.

The substation asset condition monitoring program contains a number of initiatives, including power transformer condition monitoring programs, instrument transformer condition monitoring programs, circuit breaker remote conditioning monitoring, substation asset visual monitoring equipment and the purchase of test equipment.

The power transformer condition monitoring program consists of the installation of on-line temperature monitoring systems, on-line insulating oil analysis systems, tap changer oil sampling facilities and on line transformer moisture removal systems.

The program also includes:

- an on-line temperature monitoring system for power transformers.
- an on-line insulating oil analysis system for power transformers.
- tap changer oil sampling facilities.

- a on-line transformer moisture removal system.
- instrument transformer condition monitoring programs.
- insulating oil sampling facilities.
- on line monitoring of capacitive voltage transformers.
- circuit breaker remote condition monitoring.
- substation asset visual monitoring.
- on-line monitoring of capacitive voltage transformers.
- condition monitoring test equipment.
- SF6 gas analyser and leakage detector.
- partial discharge detection equipment.
- portable dissolved gas analysis unit.
- high voltage test equipment.

The main drivers for this project are to improve asset management, enhance productivity and improve health and safety for employees.

WorleyParsons' review

WorleyParsons noted the following:

- Transend has demonstrated that there is a justifiable need for the project in order to improve asset management and enhance productivity.
- Transend's cost estimates are based on Transend's experience and recent procurement costs of similar equipment by Transend and others and there is no evidence to suggest that these estimates are unreasonable.
- there will be flexibility as to the timing of individual initiatives within the program, however, the implementation of the program over the Next Regulatory Control Period may improve asset management and enhance productivity.
- the project aligns with Transend's strategic plans, governance arrangements and Capex polices and procedures.
- no inaccuracies in were identified with the information presented in relation to this project.
- the proposed costs and timing of the project as proposed by Transend are reasonable and should be included in the ex ante cap.

AER assessment

Transend's cost information templates indicated that this project has an estimated cost of $4.5 million ($2008–09). The AER notes the project involves the implementation of asset condition monitoring initiatives that will enable realisation of business benefits including early detection and possible prevention of asset failure, improved maintenance practices and collection of data relating to equipment performance.

The AER notes Transend's *Substation Asset Condition Monitoring Enhancement Program* documents the various initiatives developed following Transend's comprehensive review of its asset management strategies and condition monitoring techniques. The AER also notes that the initiatives will facilitate the maintenance practices discussed in Transend's asset management plans and that, in the case of transformer moisture removal systems, Transend has been able to trial equipment to assess effectiveness prior to purchase.

WorleyParsons stated that it supports the implementation of the asset condition monitoring initiatives in the next regulatory control period in order to realise the benefits of improved asset management and enhanced productivity. Further, WorleyParsons has noted that expected savings in opex due to these initiatives have been quantified and included in Transend's opex forecasts for the next regulatory control period.

The AER notes that opex savings will result from reduced reliance on third parties to undertake the monitoring and testing of electrical plant and from reduced reliance on electrical testing of equipment because of on-line/remote monitoring. The AER also notes that Transend has estimated project costs based on its recent procurement costs of similar equipment and the timing of the installation of the equipment will be coordinated with planned maintenance work wherever possible.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Project ND1011—Corporate IT Package Systems

Transend proposal

Transend indicates that this that this project has an estimated cost of $3.920 million ($2008–09). Including cost escalators and risk factors, the project has an estimated cost of $4.211 million ($2008–09).

The project involves the upgrading of the existing IT package system or the procurement of new systems over the Next Regulatory Control Period as appropriate. The upgrade may include financial, human resources and compliance IT systems and the main component of the program relates to the implementation of an Enterprise Resource Planning (ERP) package.

The main drivers for this project are to deliver services that maintain reliability, efficiency, capacity and supportability in the areas of financial, human resources and compliance management.

WorleyParsons' review

WorleyParsons noted the following:

- Transend has demonstrated that there is a justifiable need for the program to sustain and enhance business, statutory and regulatory requirements.
- Three options were considered by Transend and the option that was chosen was to manage software replacement cycles as this option provided the greatest level of support for business requirements and minimised management and maintenance costs. Planned replacement also increases business productivity and leverages opportunities for systems integration.
- The implementation of the project will contribute to the mitigation of business risk.
- Transend has appropriately allocated the costs between Capex and Opex for the program.
- Transend's cost estimates are based on level 1 estimates and WorleyParsons is satisfied that the forecast costs are reasonable for the work proposed
- expenditure is required over the Next Regulatory Control Period to meet business needs and is timed to align with scheduled application lifecycle reviews.
- the project aligns with Transend's strategic plans, governance arrangements and Capex policies and procedures.
- no inaccuracies in the information provided in relation to the project were identified.
- the proposed costs and timing of the project as proposed by Transend are reasonable and should be included in the ex ante cap.

AER assessment

Transend's cost information templates indicate that this project has a total cost estimate of $4.2 million over the next regulatory control period. This is the single largest information technology project with $3.5 million (84 per cent of the project costs) proposed in the first year of the next regulatory control period.

WorleyParsons noted that IT systems need ongoing review and enhancement to support efficient and effective business operations. The AER notes that Transend considered 3 broad options including 'do nothing', 'replace software as it fails or becomes unsupportable' and 'manage software replacement cycles' and that further options analysis will be undertaken when preparing project business cases. The AER agrees with WorleyParsons' finding that the proposed project manages software replacement cycles for IT package systems and that this is a better approach in Transend's circumstances than reacting to software support and maintenance issues as they arise. The AER notes that the proposed systems are a mixture of third party products and custom developed software applications. The AER considers the systems proposed by Transend are the result of a detailed identification process rather than

based on a general solution. The AER notes that Transend has forecast the project costs using suppliers' indicative costs and historical costs for licence fees and systems maintenance and it accepts WorleyParsons' assessment that the estimated costs are reasonable.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Project ND0967—Electrona Stage 2 Development

Transend proposal

Transend indicates that this that this project has an estimated cost of $1.237 million ($2008–09). Including cost escalators and risk factors, the project has an estimated cost of $1.536 million ($2008–09).

The project involves the replacement of transmission line distance protection schemes on the Chapel Street-Kingston-Electrona, Chapel Street-Knights Road-Electrona and Knights Road Electrona transmission lines at Chapel Street, Kingston and Knights Road substations. The project is required to improve the security and the reliability of supply to Electrona and Knights Road substations by providing firm supply to them.

The main drivers for this project are to improve the security and reliability of supply to Electrona and Knights Road (and hence to Huon River and Kermadine) substations by providing firm supply to them; and replacing assets that are at the end of their useful lives.

WorleyParsons' review

WorleyParsons noted the following:

- Transend was able to demonstrate that there is a justifiable need for the project, to improve the reliability and security of supply to Electron and Knights Road substations by providing firm supply to them.
- following a review by one of its experienced protection engineers, WorleyParsons considered that the protection design was appropriate and in line with good industry practice.
- no other viable options were identified and as such, the option presented by Transend was accepted as reasonable.
- The cost estimates for the project are based on level 1 estimates and the forecast costs are reasonable for the work proposed.
- the project has been timed to tie in with the Electrona-Knights Road transmission line replacement project and this is later than the probable timing of non-conformance with the ESR (Network Performance Requirements) Regulations.

- the project aligns with Transend's strategic plans, governance arrangements and Capex policies and procedures.
- there were no inaccuracies identified in the information provided in relation to the project.
- the proposed costs and timing of the project as proposed by Transend are reasonable and should be included in the ex ante cap.

AER assessment

Transend's cost information templates indicate that this project has a total cost estimate of $1.5 million over the next regulatory control period. This is smallest projects proposed in the augmentation capex category for the next regulatory control period.

This project is being driven by Aurora Energy's request for development of its 11 kV Electrona substation connection to improve reliability and security of supply in the adjacent areas. The AER acknowledges that WorleyParsons' comments that it was unable to identify any other viable project options and, therefore, it accepted Transend's preferred project option to replace transmission line distance protection schemes at the Chapel Street, Kingston and Knights Road substations as being reasonable.

The AER notes that Transend considers that, without this project being implemented, it will be in breach of the jurisdictional minimum network performance requirements by 2009. The AER also notes that the proposed project timing is later than the probable timing of non-conformance with the jurisdictional minimum network performance requirements, however, it accepts WorleyParsons advice that the project timing is appropriately coordinated with the proposed Electrona–Knights Road 110 kV transmission replacement project works because of the need to utilise the optical ground wire for communications purposes. The AER notes that this project is classified as a 'small network asset' and will be subject to consultation under clause 5.6.6 of the NER and, therefore, it is possible that an alternative solution may be identified in the course of the public consultation process.[443] The AER also notes that Transend has not yet submitted a business case for internal approval, however, it is proposing to apply the reliability limb of the regulatory test to select the project option which maximises the net economic benefit.

Although a business case has not yet been submitted for the project, the AER notes that, at this stage, Transend is proposing to implement the project using a 'design and construct' contract and it expects to engage experienced contractors to undertake the work. The AER accepts WorleyParsons' advice that the technical design for this project is appropriate and that the estimated project cost is reasonable for the work proposed.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably

[443] Clause 5.6.6 of the NER discusses the consultation processes required for establishment of new large transmission network assets.

reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Project ND0729-3—New Norfolk HV Protection Upgrade

Transend proposal

Transend indicates that this that this project has an estimated cost of $0.942 million ($2008–09). In addition, Transend proposes to spend $0.01m in 2008/09. Including cost escalators and risk factors, the project has an estimated cost of $0.942 million ($2008–09).

The project involves the replacement of existing protection, metering and control schemes on all 22kV outgoing feeders, the provision of a facility for the connection of Aurora Energy's Power Quality Meters on all 22kV outgoing feeders, new relays to the bus blocking scheme associated with 22kV bus section A and B, the replacement of the existing bus over the current protection scheme associated with 22kV bus section A and B, the replacement of the existing transformer protection scheme on T1 and T2 with a standard protection transformer scheme house in a new stand alone panel and the connection of new relays to a new SCADA system.

The main driver for this project is to meet Aurora Energy's protection functionality requirements in order to improve supply reliability to consumers. It is anticipated that the project provide better protection coordination with Aurora Energy's distribution network, better power quality monitoring and assessment, remote monitoring, interrogation and adjustment capability and improved fault location leading to reduced outage duration.

WorleyParsons' review

WorleyParsons noted the following:

- Transend demonstrated that there is a justifiable need for the project, to meet Aurora Energy's protection functionality requirements in order to improve supply reliability to consumers.
- WorleyParsons has reviewed that protection design and considers that it is appropriate and in line with good industry practice, and that the proposed costs for the work as designed are reasonable.
- WorleyParsons was not able to identify any other viable options and accepted the option proposed by Transend as being reasonable.
- Transend's cost estimates are based on level 1 estimates and WorleyParsons is satisfied that the forecast costs were reasonable for the work proposed.
- the project has been timed to align with the timetable requested by Aurora Energy.
- the project aligns with Transend's strategic plans, governance arrangements and capex policies and procedures.

- No inaccuracies were identified in the information provided in relation to the project.
- the proposed costs and timing of the project as proposed by Transend are reasonable and should be included in the ex ante cap.

AER assessment

Transend's cost information templates indicate that this project has a total cost estimate of $1 million over the next regulatory control period. This is one of the smaller projects proposed in the connection capex category for the next regulatory control period.

This project is being driven by Aurora Energy's request for improvements to the HV distribution feeder protection at a number of substations, particularly to provide correctly graded protection system arrangements. The AER notes that this project is not subject to the regulatory test because the proposed cost is less than $1 million, however, the project has been included in the business case for upgrading protection at substations which was approved by Transend's Board in October 2007.

The AER notes that WorleyParsons has reviewed the proposed protection design and was unable to identify any other viable options. The AER accepts WorleyParsons' advice that the technical design for this project is appropriate and in line with good electricity industry practice and that the estimated project cost is reasonable for the work proposed. The AER notes that the project will commence in 2008-09 and be implemented by a third party (Hydro Consulting) in line with the timetable requested by Aurora Energy.

Further, the AER notes that this project is a 'connection' project and that Transend is required to prepare an 'offer to connect' in accordance with the requirements set out in clauses 5.3.5 and 5.3.6(d) of the NER on receipt of an application to connect to its network.

Having reviewed the project information provided by Transend and having regard to the advice of WorleyParsons, the AER is satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Nuttall Consulting's review of ex ante projects

Nuttall Consulting summarised a number of projects in its ex ante review including Transend's 110kV substation redevelopments, substation secondary projects and transmission line projects. The detailed project summaries can be found in Appendix B of Nuttall Consulting's report.

The information used by Nuttall Consulting was based in part upon Investment Evaluation Summaries (IES) prepared by Transend. Nuttall Consulting also considered project definition forms and other supporting material provided by Transend during the course of its review. Extracts from the Nuttall Consulting report regarding the projects discussed here follows the AER assessment discussion.

AER assessment

The AER notes that asset renewal capex represents 33 per cent of the total forecast capex proposal. As discussed in appendix C, it is in the asset renewal capex area that differences emerge in the findings of the AER's consultants.

The Nuttall Consulting review considered that Transend's assets and associated strategies fell into the two broad categories of substations and lines. The sample of asset management plans provided to Nuttall Consulting by Transend indicated that Transend's renewal program was focussed on substations, particularly the power transformer, EHV circuit breaker and HV switchgear asset classes. Although the main components of the renewal projects are related to asset renewal, there are also non-renewal project drivers

As part of its detailed review, Nuttall Consulting reviewed thirteen replacement projects with a total value of $141 million, which is 62 per cent of Transend's replacement capex.

Nuttall Consulting noted that Transend had assessed its management and replacement of ageing assets using a risk assessment methodology. Based on its review, Nuttall Consulting considered the various asset renewal strategies were reasonable, in principle. Nuttall Consulting also noted that Transend had established its corporate governance framework during the current regulatory control period and has comprehensively documented associated policies and procedures. However, Nuttall Consulting noted concerns relating to the standard of economic analysis supporting the projects in the proposed asset renewal capex.

The AER notes Nuttall Consulting's comments that the economic analysis for asset renewal strategies has an apparent bias to asset replacement rather than deferral of work. The AER agrees that Transend's asset renewal project business case documents do not typically include adequate economic analysis supporting selected asset renewal project options.

The AER considers that Transend has not presented sufficient justification for its proposed forecast $227 million (2008-09 dollars) asset renewal capex in the next regulatory control period. Based on the findings of its detailed project review, Nuttall Consulting recommended adjustments to the following:

- 110 kV substation redevelopment projects associated with replacement of Reyrolle OS10 circuit breakers
- the Farrell and New Norfolk secondary system replacement projects
- the Burnie–Waratah wood pole replacement project.

110 kV substation redevelopments – replacement of Reyrolle OS10 circuit breakers

Nuttall Consulting has identified that 110 kV substation redevelopments accounts for a large portion of Transend's asset renewal capex and that these are linked to the replacement of Reyrolle OS10 and Sprecher and Schuh HPF 110 kV circuit breakers. While the 110 kV circuit breaker replacement strategies are in line with other TNSPs, the significant number of replacements proposed for the next regulatory control period would reduce the average age of the circuit breakers from 23 years to 15 years by the

end of the period. This reduction in the average age of the circuit breakers is significant but is not supported by any information that this is prudent and efficient.

The AER agrees with Nuttall Consulting's opinion that this suggests the replacement plans are overly aggressive. Further, the AER considers that, on balance, the number of substation developments proposed for the last two to three years of the next regulatory control period is unlikely to be completed as proposed. In particular, the AER notes that the timing of the two largest proposed substation redevelopment (Creek Road and Tungatinah) is not well supported by the economic analysis and appears to have other uncertainties relating to the timing and cost of the redevelopments. That is, project delays may result from necessary consultation with customers affected by the proposed projects and from scope and cost changes relating to alternative innovative solutions tendered for the project work by third party contractors. However, the AER notes that identified safety issues at the Tungatinah substation may be a primary driver for the overall redevelopment of substation, given that existing equipment clearances do not meet current standards.

The AER has considered the information provided by Transend and the advice of Nuttall Consulting. It accepts Nuttall Consulting's recommendation to adjust the asset renewal capex program by reducing the total amount allocated to the 110 kV substation redevelopment projects associated with the Reyrolle OS10 circuit breakers. The AER considers a reduction of 40 per cent to these projects appropriately reflects the position that over half of the circuit breakers will be replaced in the next regulatory control period and it still accords with Transend's circuit breaker strategies for the replacement of the Reyrolle OS10 circuit breakers over the next 10 years.[444] The AER also considers the reduction proposed to the asset renewal capex program is appropriate because of Nuttall Consulting's finding that more detailed economic analysis may support deferral of a number of proposed asset renewal projects from the final two or three years of the next regulatory control period to the first few years in the regulatory period commencing July 2014.

Farrell and New Norfolk secondary system replacement projects

Nuttall Consulting reviewed two projects relating to replacement of secondary system assets. Transend's cost information templates indicate that the two projects (ND0914 Farrell substation secondary asset replacements and ND0961 New Norfolk substation 110 kV protection replacements) have an estimated cost of $18 million ($2008–09). Nuttall Consulting noted that Transend rejected the 'maintain and defer' option which its economic analyses indicated would provide the lowest net present cost value for each project.

Nuttall Consulting noted that Transend's economic analysis considered maintenance costs and risk costs were not included. Nuttall Consulting considered that certain elements (such as busbar protection schemes) would have higher risks and there may be diminishing returns in terms of the costs and the reduction in risk. Nuttall Consulting found that Transend's project economic analyses did not sufficiently

[444] Transend, *Reyrolle Type 110/OS 110 kV circuit breaker Condition Assessment Report (Issue 1.1, August 2008)*, p. 11, submitted 1 September 2008.

demonstrate that there would be a positive net benefit in undertaking the projects as proposed.

The AER accepts Nuttall Consulting's advice that the individual project analyses for the Farrell and New Norfolk secondary system replacement projects do not demonstrate that there is a clear need to undertake the proposed projects in the next regulatory control period.

The AER has considered the information provided by Transend and the advice of Nuttall Consulting. It accepts Nuttall Consulting's recommendation to adjust the asset renewal capex program by reducing the total amount allocated to the Farrell and New Norfolk secondary system replacement projects. The AER considers a reduction of 50 per cent to these projects appropriately reflects the position that an amount of 50 per cent of the proposed costs would be incurred to address the maintenance cost and system performance risks which account for a large proportion of the risks being addressed by the project. The AER also considers the reduction proposed to the asset renewal capex program is appropriate because of Nuttall Consulting's finding that more detailed economic analysis may support a 'maintain and defer' approach to the projects such that the projects can be undertaken in a staged approach with deferral of the later stages.

Burnie–Waratah wood pole replacement project

Transend's cost information templates indicated that this project has an estimated cost of $5.8 million ($2008–09). It involves the replacement of 30 existing wood pole structures with new steel poles. The transmission line was commissioned in 1967 and Transend's 3-yearly pole inspection program is the basis for identification of the wood pole structures to be replaced

Nuttall Consulting reviewed the project and noted that recent pole inspections have indicated that the poles may be in better condition than the average for their age. Based on the recent pole inspection results and the timing of the 3-yearly inspections, Nuttall Consulting considered it reasonable to estimate that only 15 poles will be replaced in the next regulatory control period.

The AER accepts Nuttall Consulting's advice that it is reasonable to consider the proposed costs for the Burnie–Waratah 110 kV transmission line wood pole replacements project is not reasonable because recent pole inspections indicate that the poles are in a better condition than the average for their age and, based on Transend's historical works programming actions, it is unlikely that any poles identified for replacement during the 2013-14 inspection will be replaced in that same year.

The AER has considered the information provided by Transend and the advice of Nuttall Consulting. It accepts Nuttall Consulting's recommendation to adjust the asset renewal capex program by reducing the total amount allocated to the Burnie–Waratah 110 kV transmission line wood pole replacements project. The AER considers a reduction of 50 per cent in 2011-12 and 100 per cent in 2013-14 to this project appropriately reflects the position that recent pole inspections indicate the poles are in better condition than average for their age. The AER also considers the reduction proposed to the asset renewal capex program is appropriate because the poles are inspected in a 3-yearly cycle and an inspection is programmed for 2013-14 and the

AER accepts Nuttall Consulting's advice that Transend is not likely to program the pole replacement works in that same year.

Having reviewed the project information provided by Transend and having regard to the advice of Nuttall Consulting, the AER is not satisfied that the proposed capex reasonably reflects the efficient costs that a prudent operator in the circumstances of Transend would require to achieve the capex objectives, as required by clause 6A.6.7(c).

Summaries of projects considered in Nuttall Consulting's detailed project review

110kV substation redevelopment projects

Nuttall Consulting reviewed 9 substation redevelopments. The George Town redevelopment project was also selected, but information was not received in time to undertake the review. The substations reviewed are outlined in table 1.1.

Table 1.1: Nuttall Consulting – Asset Renewal review of Substation Redevelopment

ID	Project	Forecast	Commissioning date
ND0910	Arthurs Lake Substation Redevelopment	$4.1m	2013
ND0908	Burnie Substation 110kV Redevelopment	$8.2m	2014
ND0733	Creek Rd Substation 110kV Redevelopment	$33.3m	2014
ND0907	Emu Bay Substation 110kV Redevelopment	$7.3m	2011
ND0968	Knights Rd Substation 110kV Redevelopment & HV Protection Replacement	$6.8m	2014
ND0949	Meadowbank Substation 110kV Redevelopment	$4.7m	2014
ND0953	Palmerston Substation 110kV Redevelopment	$13.8m	2014
ND0906	Railton Substation 110kV Redevelopment	$7.1m	2013
ND0709	Tungatinah Substation 110kV Redevelopment	$19.9m	2014

Source: Nuttall Consulting, *Review of Transend Revenue Proposal Asset Renewal Capital Expenditure: A report to the Australian Energy Regulator*, October 2008, p. 105–106.

Nuttall Consulting identified a number of issues with different assets and asset types at the substations it reviewed. These assets and issues affect different substations to varying degrees, but generally included the:

- 110 kV primary plant, including the Reyrolle OS10 and Sprecher and Schuh HPF circuit breakers, current and voltage transformers, disconnectors, and the post-type insulators, within the switchyards.

- associated secondary systems, which included protection and control relays at the substation, and in some cases SCADA.
- the primary plant and protection and control relays and the condition and performance of older asset types. These asset types have increased maintenance costs and deliver poorer system performance compared to newer assets.
- the voltage transformers and post-type-insulators, which potentially have an explosive failure mode, which imposes safety risks to personnel in the substation.
- in the case of the Tungatinah redevelopment, the primary plant related to the existing arrangements of the substation equipment, which do not comply with current standards associated with clearances.

Nuttall Consulting noted that the IES had covered a range of options for each project. These options covered a "maintain and defer" option and various replacement options. Economic analysis of the options was also provided by Transend in all cases except for the Tungatinah redevelopment.

Nuttall Consulting noted that for all projects the preferred option was selected based upon a qualitative and quantitative assessment of the issues addressed by the options, the capital cost of the options and economic analysis. Independent assessments were also considered by Nuttall Consulting on aspects of the Creek Road (1999) and Tungatinah (2005 & 2006) redevelopment projects. A detailed analysis table including an outline of the preferred option for each project is contained in Appendix B of the Nuttall Consulting report.

Nuttall Consulting also noted that the timing of the Tungatinah redevelopment may be affected by Transend's commercial negotiations with Hydro Tasmania on land purchases at the Tungatinah substation. Nuttall Consulting noted that Transend is confident that it will achieve appropriate resolution of access and connection issues at Tarraleah and Tungatinah switchyard and that this will allow the project to proceed as forecast in the revenue proposal.

Substation secondary projects

Nuttall Consulting reviewed two substation secondary projects; the Farrell substation secondary asset replacement project and the New Norfolk Substation 110 kV protection replacement project.

The Farrell substation secondary asset replacement project was forecast to be commissioned in 2101/11 for $11 million. The project involves the replacement of a number of protection schemes associated with the substation, plus other secondary systems including the SCADA system, DC supplies, relay panels and control room alterations.

Nuttall Consulting noted that the IES has identified a number of issues with the project:

- 220 kV and 110 kV busbar protection—These schemes are the only ones of this type on Transend's network and have recently suffered major failures. Transend

proposed to constrain generation in the event of a failure at Farrell which may constrain 200 MW of generation.

- 110 kV transmission line protection—The protection scheme uses protection relays with a history of failure. One of the lines has issues related to the performance of the existing protection schemes.

- Network transformer protection—Some of the relays associated with the two network transformers have a history of failure (same type to those on the 110 kV lines). Other relays have poor performance, which could lead to mal-operation.

- 220 kV line protection—The relays associated with the two 220 kV lines at Farrell have a history of failure (same type to those on the 110 kV lines). These two lines represent 2 of only 3 remaining 220 kV lines on the Tasmanian transmission network that do not have modern microprocessor based relays.

- Relay panels—The relay panels are an "open rack" design, which increases the risk of failure from moisture ingress and vermin.

- Existing SCADA remote terminal units—The existing terminal units are not compatible with modern protection panels. An upgrade would allow Transend to comply with NEMMCO standards.

Issues were also raised on disturbance recorders, fault location equipment, DC supplies and the implementation of a fire suppression scheme in the control room.

The IES considered three options for the project:

- the "maintain and defer" option, which assumes a deferment of the project by 5 years;

- a staged project, which breaks the project into three stages and undertakes these one year after another; and

- the implementation of a single integrated project.

Transend provided an economic analysis which considered the capital and maintenance costs of each option. Risk costs were not considered. The single integrated project option was selected as the least cost option that addressed the issues.

The New Norfolk substation 110 kV protection replacement is forecast to be commissioned in 2013/14 for $7 million. The project involves the replacement of a number of protection schemes associated with this substation and the replacement of voltage transformers.

Nuttall Consulting noted that the IES has identified a number of issues with the project:

- Protection schemes—The protection schemes are stated to be of a "static" technology and it was proposed that they replaced with 110 kV busbar protection and protection schemes for six 110 kV transmission lines. It was noted that there were problems with the protection schemes which result in

higher maintenance costs and increased risks to system performance through mal-operation. Some of the replacements are proposed to coordinate with the substation redevelopments at Creek Road, Meadowbank and Tungatinah, and one of the schemes is considered to be non-compliant with NER fault clearance times.

- Voltage transformers—The voltage transformers on one of the lines are in a poor condition and the type of transformer used is a safety risk has a history of explosive failure, although not on Transend's network.

The IES considered two options for the project:

- the "maintain and defer" option, which assumes a deferment of the project by 5 years;
- the implementation of the project as a single integrated project.

Transend provided an economic analysis which considered the capital and maintenance costs of each option. Risk costs were not considered. The single integrated project option was selected as the least cost option that addressed the issues raised.

Transmission line projects

Nuttall Consulting reviewed two transmission line projects, namely the Burnie – Waratah 110 kV Transmission line wood pole replacement project and the Knights Road to Electrona transmission line replacement project.

The Burnie to Waratah 110 kV Transmission line wood pole replacement project involves the replacement of number of existing wood pole structures with new steel poles. The project is forecast to be commissioned in two stages, with $2.5 million to be spent in 2011/12 for the replacement of 30 structures and $3.3 million to be spent in 2013/14 for the replacement of 40 structures. The forecast number of replacements is based upon the average failure rate curve for wood poles in Tasmania.

The Knights Road to Electrona transmission line replacement is forecast to be commissioned in 2010/11 for $12.6 million. The project involves the replacement of the existing line (structures and conductor) with a new line of a higher capacity. Transend considers this project is partly an augmentation, and as such, will be subject to the regulatory test.

Nuttall Consulting noted that the IES has identified a number of issues with the project including the poor condition of the conductor due to its age and the impact of recent bushfires, the poor condition of the structures (steel towers), sub-standard clearance (including 5 towers which remain non complaint) and environmental noise caused by corona discharge.

Nuttall Consulting noted that the augmentation of the existing capacity is required to ensure Transend can comply with its network performance requirements for the forecast load in that area i.e. a statutory reliability standard under the regulatory test.

Nuttall Consulting noted that the IES had examined a number of options which all involved the replacement of the line. The options were as follows:

- Option 1—Reconductor and augment the existing line.
- Option 2—New pole line, with the steel poles in the same location as the existing towers;
- Option 3—New tower line, with the new towers in the same location as the existing towers; and
- Option 4—New pole line with optimised pole locations

Option 4, is Transend's preferred option. In Transend's view the option addresses all issues and is the least costly.

Two independent reports have been supplied to support this project, including an independent "field" assessment of the towers (2004) and an independent "desk-top" assessment of the replacement options (2008).The preferred option in the "desk-top" assessment was Option 2. The "desk-top" assessment had concerns that an approval of option 4 would involve a new line and be subject to development application approval and may attract objections from landowners.

The "desk-top" assessment also noted that some reduction in the number of poles required for Option 2 may be achievable which would reduce costs. The assessment stated that a solution that sits between Option 2 and Option 4 can be explored further when a more detailed investigation is carried out.

Appendix E: Contingent projects and their triggers

This appendix sets out the drivers of approved contingent projects, their scope and specific trigger events. Under clause 6A.8.2 of the NER, Transend must demonstrate to the AER's satisfaction that the relevant trigger event relating to a contingent project has occurred before an assessment of any adjustments to Transend's maximum allowed revenue (MAR). Where a trigger event has occurred, the scope of the contingent project must not include any projects (or associated project scope) that were contained in Transend's approved ex ante capex allowance.

The AER has released its *Process guideline for contingent project applications under the National Electricity Rules – September 2007* [445](contingent project guidelines) to assist transmission network service providers (TNSPs) prepare contingent project applications that meet the NER processes and requirements. Under this guideline, the timing of the assessment process of a contingent project application includes pre-lodgement consultations. The AER envisages that at the end of the pre-lodgement process the TNSP should have a good understanding of the information required by the AER and also be in a position to submit an application that complies with the NER.

Where Transend makes a contingent project application, it is expected to comply with the contingent project guideline and accordingly, either before or during the pre-lodgement consultation it is expected to develop feasible options and costs that address the need for the project. Generally, the AER expects Transend to provide supporting information with its contingent project application that includes:

- the final regulatory test assessment
- tender submissions
- contracts
- other investment appraisals.

Burnie – Smithton New 110kV Transmission Line

The driver for this project is to allow for adequate network capacity in north-western Tasmania if new generation is connected to the network.

The scope of the project involves the construction of a new double circuit transmission line between Burnie and Smithton substations and an augmentation of the existing Burnie-Smithton transmission line. The indicative cost of this project is $88m (June 09, $).

The trigger for this project will operate if there are committed and/or advanced generation projects in the north-western region in excess of 50MW resulting in the

[445] www.aer.gov.au

successful application of the regulatory test for augmentation of the Burnie-Smithton transmission corridor.

Sheffield-Farrel New Transmission Line

The driver for this project is to provide adequate network capacity to allow for the connection of new generation in the north western and western regions of Tasmania.

The scope of the project involves the construction of a new transmission line between Sheffield and Farrell substations. The project may also involve the construction of a new switching station in the Staverton area near Cethana power station that would consolidate the three incoming circuits from the Farrell substation and the four incoming circuits form Cethana, Wilmot, Lemonthyme and Fisher power stations into the six circuits that would connect to Sheffield substation. The indicative cost of this project is $79 (June 09, $).

The trigger for this project will be if at least 50MW of committed and/or advanced generation projects in the west coast area resulting in the successful application of the regulatory test for augmentation of the Sheffield-Farrel transmission corridor.

Sheffield-George Town Second 220kV Transmission Line

The driver for this project is to provide adequate network capacity to allow for the connection of new generation in the north-western and/or western regions.

The scope of the project involves the establishment of a third 220 kV transmission line between Sheffield and George Town substations, including the construction of switch bays at Sheffield and George Town substations to cater for a new transmission line. The indicative cost of this project is $70m (June 09, $).

The trigger for this project will be committed and/or advanced generation in the north-western and/or western regions in excess of 50MW resulting in the successful application of the regulatory test for augmentation of the Sheffield-George Town transmission corridor.

Sheffield-Burnie New 200kV Transmission Line

The driver for this project is to provide adequate network capacity to allow the connection of new generation in the north-western and western regions and/or to cater for load growth in the region.

The scope of the project involves the establishment of a new double-circuit 220kV transmission line between Sheffield and Burnie substations, including the construction of switch bays and Sheffield and Burnie substations to cater for new circuits. The existing 220 kV Sheffield-Burnie transmission line will be decommissioned. The indicative cost of this project is $52m (June 09, $).

The trigger for this project is demand in Tasmania's north-western region exceeding 310MW and/or in excess of 50MW committed and/or advanced generation projects in the north-western region resulting in the successful application of the regulatory test for augmentation of the Sheffield-Burnie transmission corridor.

St. Helens New 110/22 kV Connection Site

The drivers for this project are to cater for the forecast demand growth in the St. Helens area and to comply with the minimum network performance levels under the ESI regulations.

The scope of the project involves the construction of an 110kV transmission line from Derby substation to a new connection site at St. Helens. The establishment of a new connection site at St. Helens would be the first stage of the long-term strategy to form a 110kV transmission connection between Derby and St. Marys substations. The indicative cost of this project is $47m (June 09, $).

The trigger for this project is the demand forecast in the east coast region exceeding 55MW resulting in the successful application of the regulatory test for augmentation of the transmission system to the St. Helens area.

Palmerston Sheffield 220kV Transmission Line Augmentation

The drivers for this project are to provide adequate network capacity to allow for the connection of new generation in the north-western and western regions.

The scope of the project involves the augmentation of the Palmerston-Sheffield 220 kV transmission line and the associated switch bays at Palmerston and Sheffield substations. The technical parameters for the augmented transmission line have not yet been determined in detail; however the indicative cost is based upon re-tensioning the Palmerston-Sheffield 220kV line to a design temperature of 80 degrees Celsius. The indicative cost of this project is $22m (June 09, $).

The trigger for this project is at least 50MW of actual, committed and/or advanced generation projects in the north-western and/or western regions resulting in the successful application of the regulatory test for augmentation of the transmission system to the Palmerston-Sheffield transmission corridor.

Waddamana – Lindisfarne Second 220 kV Circuit

The drivers for this project are to cater for forecast demand growth in southern Tasmania and to improve the security of supply to the southern region.

The scope of the project involves the installation of a second 220kV transmission circuit from Waddamana substation to Lindisfarne substation and a second 220/110 kV auto-transformer at Lindisfarne substation. The work would include the installation of:

- 99 kilometres of 220kv line to be strung on the existing double circuit towers;
- one new switchyard bay at Waddamana substation and two at Lindisfarne substation; and
- circuit breakers, associated protection and control and required civil works.

The indicative cost of this project is $22m (June 09, $).

The trigger for this project is either the demand forecast in Tasmania's southern area exceeding 880MW or Gordon power station not being able to provide reactive support when the southern area load exceeds 775MW resulting in the successful application of the regulatory test for augmentation of the transmission capacity into Southern Tasmania.

Trevallyn Substation New 220kV Injection Point

The drivers for this project are to cater for forecast demand growth in the northern area and to comply with the minimum network performance levels under the ESI regulations.

The scope of the project comprises the establishment of a transmission line from Hadspen substation to Trevallyn substation, and an additional 220/110 kV injection point at Trevallyn substation. The scope includes:

- 1.3 km of single circuit 220 kV transmission line
- 1 x 220kV switchgear bay
- 1 x 200MVA 220/110 kV auto-transformer
- 1 x110 switchgear bay
- associated protection and control foe 220kV circuit; and
- associated protection and control for 220/110 kV auto-transformer.

The indicative cost of this project is $21m (June 09, $).

The trigger for this project is demand in Tasmania's northern area exceeding 320MW and is forecast to exceed 355MW within 3 years resulting in the successful application of the regulatory test for augmentation of the Hadspen-Trevallyn transmission corridor.

Queenstown Transmission Security Upgrade

The driver for this project is to comply with the network performance requirements.

The scope of the security upgrade project comprises of the establishment of a 220/110 kV supply from a transmission circuit adjacent to Queenstown substation.

The indicative cost of this project is $21m (June 09, $).

The trigger for this project will come into effect if Transend is unable to negotiate non-network solutions that enable it to meet the minimum network performance requirements for the Queenstown and Newton load resulting in the successful application of the regulatory test for augmentation of the supply to Queenstown substation.

Appendix F: Parameter definitions

The following parameter definitions apply to Transend during its next regulatory control period.

Parameter 1	**Transmission circuit availability**
Sub-parameters	transmission line circuit availability (critical circuits) transmission line circuit availability (non-critical circuits) transformer circuit availability
Unit of measure	Percentage of total possible hours available
Source of data	Transend performance reporting system
Definition/formula	formula: $\left(\frac{\text{No. hours per annum circuits are available}}{\text{Total possible no. of defined circuit hours}}\right)\times 100$ definition: the actual circuit hours available divided by the total possible defined circuit hours available critical circuits are those lines which are in areas under direct NEMCCO oversight (except radial portions on the *transmission system* non-critical circuits are lines in areas under indirect NEMMCO oversight and the radial portions of the *transmission system* that are under direct NEMMCO oversight
Inclusions	'circuits' includes overhead lines, underground cables, power transformers circuit outages from all causes include planned, forced and emergency events, including extreme events
Exclusions	outages on assets that are not providing *prescribed transmission services* dedicated connection assets that supply a customer who has negotiated a higher (or lower) level of service required by the NER, where that customer has agreed to the cost (or discount) for that higher (or lower) level of service

	circuit outages caused by a fault or other even on a third party system e.g. intertrip signal, generator outage (including coincident outages), customer installation (including a customer request), or by direction by fire services or NEMMCO. *force majeure events*

Parameter 2	**Loss of supply event frequency**
Sub-parameter	frequency of events where loss of supply exceeds 0.1 minutes frequency of events where loss of supply exceeds 1.0 minutes
Unit of measure	number of events per annum
Source of data	Transend performance reporting system
Definition/formula	number of events greater than 0.1 system minutes per annum number of events greater than 1.0 system minutes per annum system minutes are calculated for each supply interruption by the 'load integration method' using the following formula: $\frac{\Sigma \text{ (MWh unsupplied} \times 60)}{\text{MW peak demand}}$ where: MWh unsupplied is the energy not supplied as determined by using NEM metering and substation load data. This data is used to estimate the profile of the load over the period of the interruption by reference to historical load data period of the interruption starts when a loss of supply occurs and ends when Transend offers supply restoration to the customer MW peak demand means the maximum amount of aggregated electricity demand recorded at entry points to the Transend transmission network and interconnector connection points during the financial year in which the event occurs or at any time previously the performance parameter applies to exit points only interruptions affecting multiple connection points at exactly the same time are aggregated (i.e. system minutes are calculated by events rather than connection point interruptions)
Inclusions	all unplanned outages exceeding the specified impact (that is, 0.1 minutes and 1.0 minutes) unplanned outages on all parts of the regulated transmission system extreme events

Exclusions	outages on assets that are not providing *prescribed transmission services* Dedicated connection assets that supply a customer that has negotiated a higher (or lower) level of service required by the NER, where that customer has agreed to the cost (or discount) for that higher (or lower) level of service circuit outages caused by a fault of other even on a third party system e.g. intertrip signal, generator outage (including coincident outages), fire services direction, customer installation (including a customer request), or by direction by fire services or NEMMCO. planned outages *force majeure events*

Parameter 3 Average outage duration

Sub-parameters	transmission line circuits transformer circuits
Unit of measure	minutes
Source of data	Transend performance reporting system
Definition/formula	$\frac{\text{Aggregate minutes of all unplanned outages}}{\text{Number of events}}$ the cumulative summation of the outage duration time for the period, divided by the number of outage events during the period where: outage duration time starts when a loss of supply occurs and ends when Transend offers supply restoration to the customer
Inclusions	forced outages where notification to affected customers is less than 24 hours (except where NEMMCO reschedules the outage after notification has been provided.
Exclusions	successful reclose events (less than one minute duration) outages on assets that are not providing *prescribed transmission services* dedicated connection assets that supply a customer who has negotiated a higher (or lower) level of service required by the NER, where that customer has agreed to the cost (or discount) for that higher (or lower) level of service circuit outages caused by a fault or other event on a third party system e.g. intertrip signal, generator outage (including coincident outage), fire services direction, customer installation (including a customer request), or by direction by fire services or NEMMCO planned outages *force majeure events* for all outages the duration is capped at seven days

Appendix G: Performance incentive curves

The following tables and figures represent the scale of the financial penalty or reward (y-axis) resulting from Transend's performance (x-axis) against each of its parameters. Tables F.1 to F.7 shows the set of linear equations presented in figures F.1 to F.7.

In accordance with the service target performance incentive scheme the s-factor result for each calendar year should be determined by the following formula:

$$S_{ct} = S_1 + S_2 + S_3 + S_4 + S_5 + S_6 + S_7$$

where:

S_{ct} = the total service standards factor (s-factor)

ct = the time period/calendar year

S_1 = s-factor for transmission line circuit availability (critical)

S_2 = s-factor for transmission line circuit availability (non-critical)

S_3 = s-factor for transformer circuit availability

S_4 = loss of supply event frequency > 0.1 system minutes

S_5 = loss of supply event frequency > 1.0 system minutes

S_6 = average outage duration - transmission line

S_7 = average outage duration - transformer

Note: Both of the average outage duration parameters has been given a zero weighting and therefore does not affect Transend's s-factor result during the next regulatory control period.

Figure G.1: Transmission line circuit availability (critical)

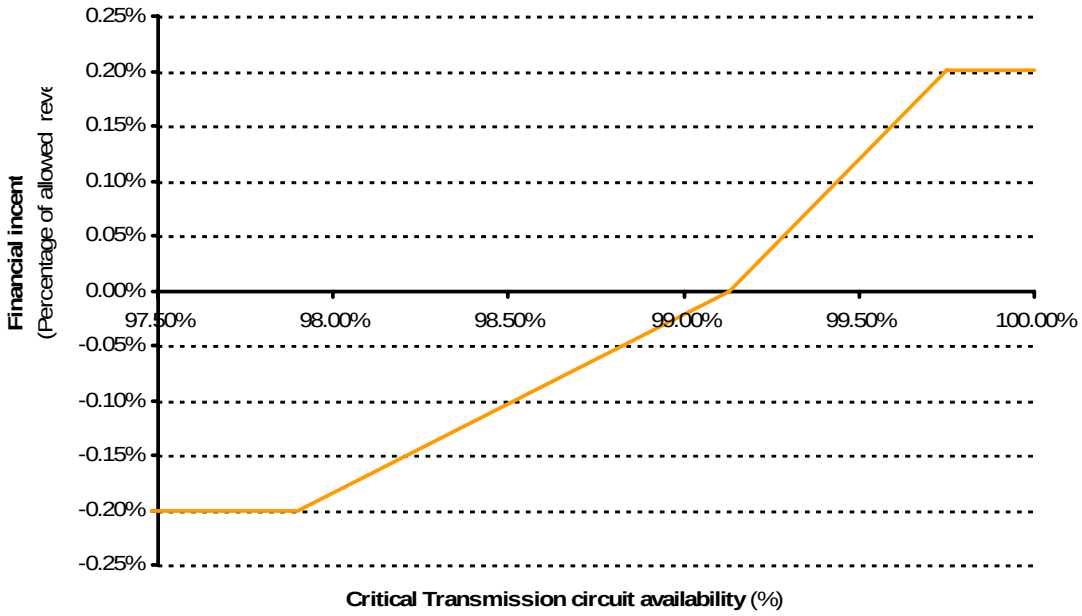

Table G.1: Transmission line circuit availability (critical)

							Where:					
S1	=	–0.002000							Availability	<		97.90%
S1	=	0.162602	x	Availability	+	–0.161187	97.90%	≤	Availability	≤		99.13%
S1	=	0.322581	x	Availability	+	–0.319774	99.13%	≤	Availability	≤		99.75%
S1	=	0.002000					99.75%	<	Availability			

Figure G.2: Transmission circuit availability (non-critical)

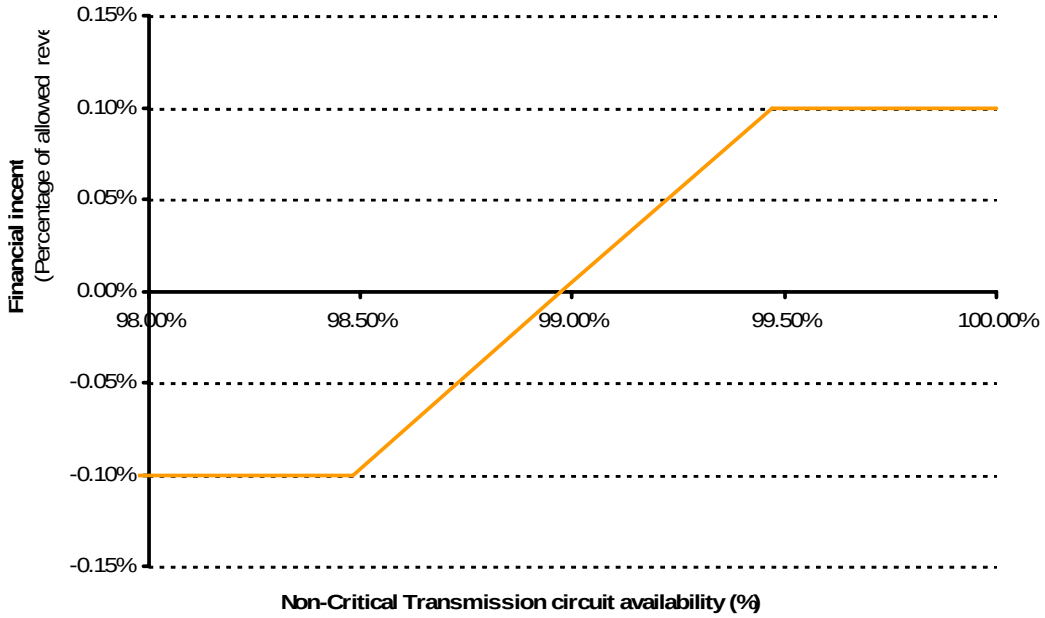

Table G.2: Transmission circuit availability (non-critical)

							Where:				
S2	=	–0.001000						Availability	<	98.48%	
S2	=	0.204082	x	Availability	+	–0.201980	98.48%	≤	Availability	≤	98.97%
S2	=	0.200000	x	Availability	+	–0.197940	98.97%	≤	Availability	≤	99.47%
S2	=	0.001000					99.47%	<	Availability		

Figure G.3: Transformer circuit availability

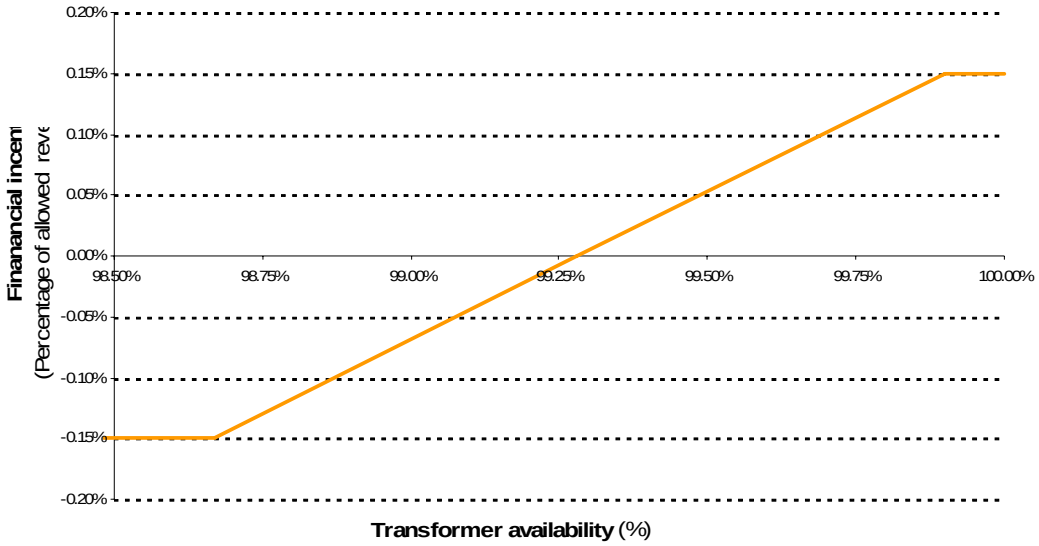

Table G.3: Transformer circuit availability

							Where:					
S2	=	–0.001500							Availability	<	98.67%	
S2	=	0.245902	x	Availability	+	–0.244131	98.67%	≤	Availability	≤	98.28%	
S2	=	0.241935	x	Availability	+	–0.240194	98.28%	≤	Availability	≤	99.90%	
S2	=	0.001500					99.90%	<	Availability			

Figure G.4: Loss of supply event frequency > 0.1 system minutes

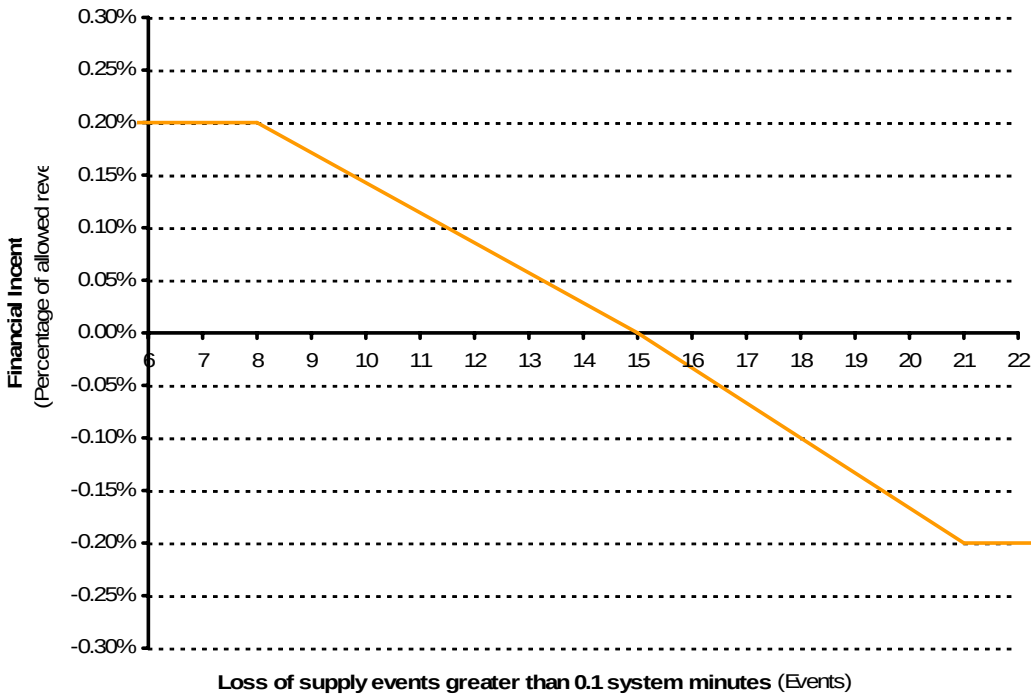

Table G.4: Loss of supply event frequency > 0.1 system minutes

							Where:				
S3	=	–0.002000					21	<	No. of events		
S3	=	–0.000333	x	No. of events	+	0.005000	15	≤	No. of events	≤	21
S3	=	–0.000286	x	No. of events	+	0.004286	8	≤	No. of events	≤	15
S3	=	0.002000							No. of events	<	8

Figure G.5: Loss of supply event frequency > 1.0 system minutes

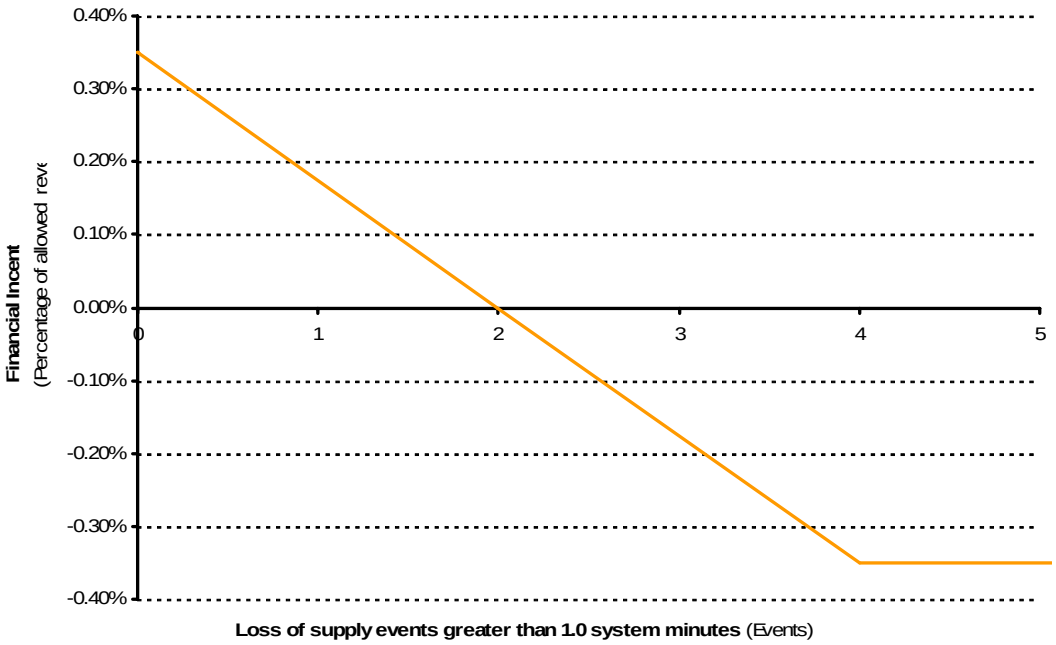

Table G.5: Loss of supply event frequency > 1.0 system minutes

							Where:				
S4	=	–0.003500					4	<	No. of events		
S4	=	–0.001750	x	No. of events	+	0.003500	2	≤	No. of events	≤	4
S4	=	–0.001750	x	No. of events	+	0.003500	0	≤	No. of events	≤	2
S4	=	0.003500							No. of events	<	0

Figure G.6: Average outage duration – transmission lines

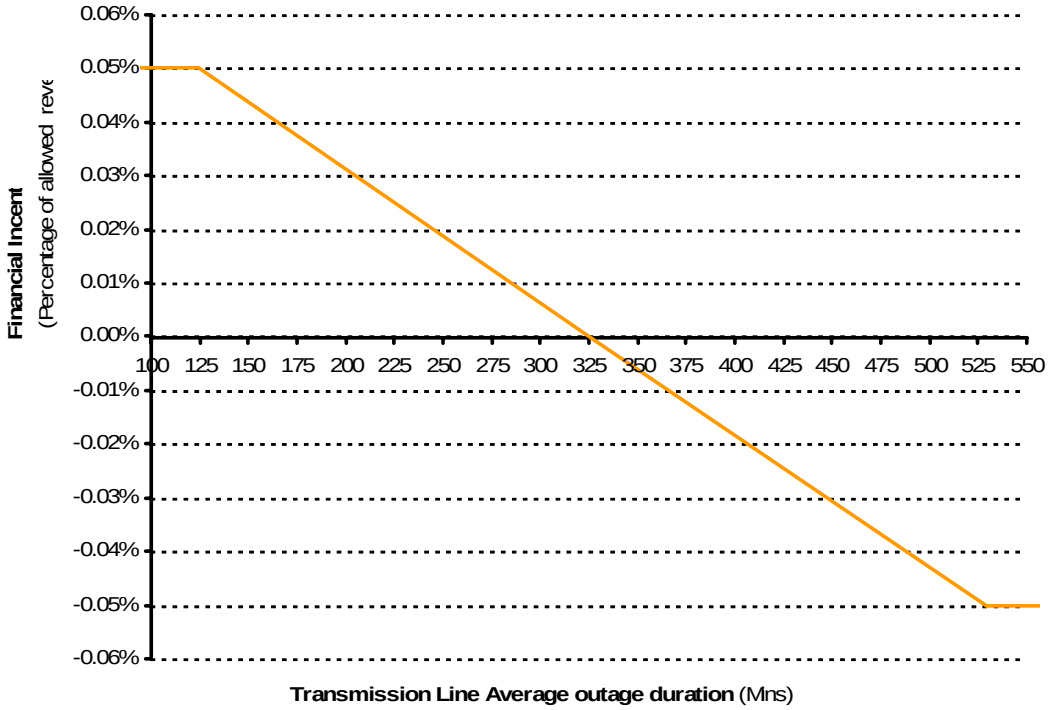

Table G.6: Average outage duration – transmission lines*

							Where:					
S5	=	–0.000500					529	<	Average outage duration			
S5	=	–0.000002	x	Average outage duration	+	0.000803	326	≤	Average outage duration	≤	529	
S5	=	–0.000002	x	Average outage duration	+	0.000807	124	≤	Average outage duration	≤	326	
S5	=	0.000500							Average outage duration	<	124	

* Please note Transend has no revenue at risk against this measure. The 5% measure presented above is purely for illustrative purposes.

Figure G.7: Average outage duration – transformers

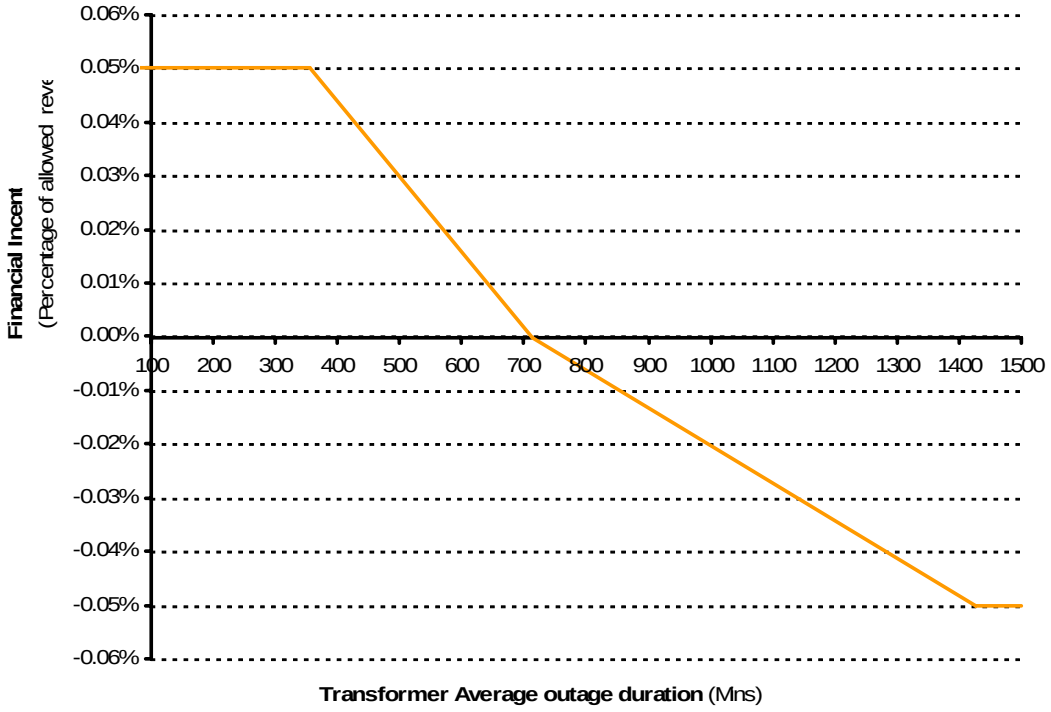

Table G.7: Average outage duration – transformers*

							Where:				
S5	=	–0.000500					1428	<	Average outage duration		
S5	=	–0.000001	x	Average outage duration	+	0.000507	712	≤	Average outage duration	≤	1428
S5	=	–0.000001	x	Average outage duration	+	0.000604	354	≤	Average outage duration	≤	712
S5	=	0.000500							Average outage duration	<	354

* Please note Transend has no revenue at risk against this measure. The 5% measure presented above is purely for illustrative purposes.

Appendix H: Transend negotiating framework for negotiated transmission services

Proposed Negotiating Framework

FINAL

UNCONTROLLED WHEN PRINTED

CONTACT

This document is the responsibility of the Customer and Asset Management Group, Transend Networks Pty Ltd, ABN 57 082 586 892.

Please contact Transend's Manager Connections with any queries or suggestions.

REVIEW DATE

This document is due for review not later than June 2011

RESPONSIBILITIES

Implementation

All Transend staff.

Audit

Periodic audits to establish conformance with this document will be conducted by Transend's Connections Department.

Compliance

All Transend staff

Document Management

Pricing Officer

MINIMUM REQUIREMENTS

The requirements set out in Transend's documents are minimum requirements that must be complied with by Transend staff and contractors, including designers and other consultants. The user is expected to implement any practices which may not be stated but which can reasonably be regarded as good practices relevant to the objective of this document without non-compliance with the specific requirement of this document. Transend expects the users to improve upon these minimum requirements where possible and to integrate these improvements into their procedures and quality assurance plans.

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1 GENERAL

1.1 PURPOSE

Clause 6A.9.5 of the National Electricity Rules (the *Rules*) requires each *Transmission Network Service Provider (TNSP)* to prepare a document (the *negotiating framework*) setting out the procedure to be followed during negotiations between that provider and any person (the *Service Applicant*) who wishes to receive a *negotiated transmission service* from the provider, as to the *terms and conditions of access* for provision of the service.

The *negotiating framework* for a *TNSP* must comply with and be consistent with:

(a) the applicable requirements of a *transmission determination* applying to the provider; and

(b) paragraph 6A.9.5(c) of the *Rules*, which sets out the minimum requirements for a *negotiating framework*.

This document sets out *Transend's negotiating framework* and has been prepared by *Transend* in accordance with its obligations under clause 6A.9.5 of the *Rules*.

All negotiations regarding *negotiated transmission services* provided by *Transend* to *Service Applicants* will be undertaken in accordance with this *negotiating framework*.

1.2 SCOPE

Negotiations referred to in this *negotiating framework* are limited to those in relation to *negotiated transmission services* during the *regulatory control period* from 1 July 2009 to 30 June 2014. *Transend* may, from time to time, enter into negotiations which do not relate to *negotiated transmission services*, in which case this *negotiating framework* does not apply.

1.3 OBJECTIVES

This *negotiating framework* sets out the procedure to be followed during negotiations between *Transend* and any person (the *Service Applicant*) who wishes to receive a *negotiated transmission service* from *Transend*, as to the *terms and conditions of access* for provision of the service.

1.4 DEFINITIONS

In this *negotiating framework* the words in italics have the meaning given to them in:

(a) this definitions section; or

(b) if not defined in this definitions section, the *Rules*.

1.4.1 Definition of a negotiated transmission service

According to the *Rules*, a *negotiated transmission service* is any of the following services:

(a) a *shared transmission service* that:

  (i) exceeds the *network* performance requirements (whether as to quality or quantity) (if any) as that *shared transmission service* is required to meet under any *jurisdictional electricity legislation*; or

  (ii) except to the extent that the *network* performance requirements which that *shared transmission service* is required to meet are prescribed under any *jurisdictional electricity legislation*, exceeds or does not meet the *network* performance requirements (whether as to quality or quantity) as are set out in schedule 5.1a or 5.1 of the *Rules;*

(b) *connection services* that are provided to serve a *Transmission Network User*, or group of *Transmission Network Users*, at a single transmission *network connection point*, other than *connection services* that are provided by one *Network Service Provider* to another *Network*

Service Provider to *connect* their *networks* where neither of the *Network Service Providers* is a *Market Network Service Provider*; or

(c) *use of system services* provided to a *Transmission Network User* and referred to in rule 5.4A(f)(3) in relation to *augmentations* or *extensions* required to be undertaken on a *transmission network* as described in rule 5.4A,

but does not include an *above-standard system shared transmission service* or a market network service.

1.4.2 Existing prescribed transmission services

Clause 11.6.11 of the *Rules* outlines transition arrangements applying to Chapter 6A in relation to existing *prescribed transmission services* as follows:

(d) References to *prescribed transmission services* in the new Chapter 6A include a service provided by an asset used in connection with, or committed to be constructed for use in connection with, a *transmission system* as at 9 February 2006:

(i) to the extent that the value of the asset is included in the regulatory asset base for that *transmission system* under an existing revenue determination in force at that time; or

(ii) if the price for that service has not been negotiated under a negotiating framework established pursuant to old clause 6.5.9,

and, but for this clause, that service would not otherwise be a *prescribed transmission service*.

(e) Where a service is a *prescribed transmission service* by virtue of the operation of this clause, that service is taken not to be a *negotiated transmission service*.

(f) For the purposes of this clause 11.6.11, an asset is, and is only, to be taken to be committed to be constructed if it satisfies the criteria which a project needs to satisfy to be a "committed project" for the purposes of the *regulatory test*.

1.4.3 Other definitions

- *GST* means a goods and services tax imposed under the *GST Act* and related legislation.
- *GST Act* means A New Tax System (Goods and Services Tax) Act 1999 (Cth).
- *Transend* means Transend Networks Pty Ltd (ABN 57 082 586 892).

1.5 REFERENCES

This *negotiating framework* should be read in conjunction with the following documents:

- *Transend's* Cost Allocation Methodology; and
- Chapters 5, 6A, 10 and 11 of the *Rules*.

2 AUTHORITY

A *Service Applicant* that initiates a negotiation under this framework must nominate a person that has authority to represent the *Service Applicant* in the negotiations and must provide *Transend* with contact details for that person. If the *Service Applicant* comprises more than one entity (for example, it is a partnership or joint venture), the nominated person must have authority to represent all of the relevant entities.

Transend will, in respect of each negotiation initiated under this framework, nominate a person or persons with authority to represent *Transend* in the negotiations and will provide the *Service Applicant* with contact details for that person or persons.

3 REQUIREMENT TO NEGOTIATE IN GOOD FAITH

Transend and the *Service Applicant* must negotiate in good faith the *terms and conditions of access* for provision of the *negotiated transmission service*.

4 CONSISTENCY WITH THE RULES

In the event of any inconsistency between this *negotiating framework* and any requirements of Chapters 4, 5 or 6A of the *Rules*, the requirements in the *Rules* will prevail.

5 COMPLIANCE WITH THE NEGOTIATING FRAMEWORK

Transend and any *Service Applicant* who is negotiating for the provision of a *negotiated transmission service* must comply with the requirements of this *negotiating framework* in accordance with its terms.

6 PERIOD COVERED BY NEGOTIATING FRAMEWORK

This proposed *negotiating framework* is to apply for the *regulatory control period* commencing on 1 July 2009 and ending on 30 June 2014.

7 PROVISION OF COMMERCIAL INFORMATION TO THE SERVICE APPLICANT

Transend must provide all such commercial information as a *Service Applicant* may reasonably require to enable that *Service Applicant* to engage in effective negotiation with *Transend* for the provision of the *negotiated transmission service*, including:

(a) the cost information described in section 8 of this *negotiating framework*;

(b) a description of the nature of the *negotiated transmission service* that is the subject of negotiation, including details of what *Transend* would provide to the *Service Applicant* as part of that service; and

(c) the terms and conditions on which *Transend* would provide the *negotiated transmission service* to the *Service Applicant*.

For the avoidance of doubt, the commercial information referred to in this section which is required to be provided to a *Service Applicant*:

(d) does not include confidential information provided to *Transend* by another person; and

(e) may be provided subject to a condition that a *Service Applicant* must not provide any part of that commercial information to any other person without the consent of *Transend*.

8 COSTS OF PROVIDING NEGOTIABLE SERVICES

(a) *Transend* will base the price for each *negotiated transmission service* on the costs incurred in providing that service, which will be determined according to *Transend's* approved *cost allocation methodology*.

(b) As part of the negotiations for the provision of a *negotiated transmission service*, *Transend* must provide the *Service Applicant* with a written statement:

  (i) identifying and informing the *Service Applicant* of the reasonable costs, and/or the increase or decrease in costs (as appropriate), of providing the *negotiated transmission service*; and

  (ii) demonstrating to the *Service Applicant* that *Transend's* charges for providing the *negotiated transmission service* reflect those costs, and/or cost increment or decrement (as appropriate).

(c) If *Transend's* costs of providing the *negotiated transmission service* change during the negotiation process, *Transend* must disclose the increase or decrease in costs to the *Service Applicant* and demonstrate that its charges have been amended accordingly.

9 PROVISION OF COMMERCIAL INFORMATION TO TRANSEND

The *Service Applicant* must provide all such commercial information as *Transend* may reasonably require to enable *Transend* to engage in effective negotiation with that *Service Applicant* for the provision of the *negotiated transmission service*.

For the avoidance of doubt, the commercial information referred to in this section which is required to be provided to *Transend*:

(a) does not include confidential information provided to a *Service Applicant* by another person; and

(b) may be provided subject to a condition that *Transend* must not provide any part of that commercial information to any other person without the consent of the *Service Applicant* which provided the information to *Transend*.

10 TIMEFRAME FOR NEGOTIATION

As noted in section 1.4.1 of this *negotiating framework*, *negotiated transmission services* comprise three types of services. Some of the *negotiated transmission services* are considered in Chapter 5 of the *Rules;* for example, section 5.3 of the *Rules* outlines the obligations of *TNSPs* and *Service Applicants* in relation to negotiated *connection services*.

The timeframe for negotiations relating to applications for *negotiated transmission services* under Chapter 5 of the *Rules* is addressed in section 10.1 and for other applications in section 10.2. However, the following points apply to all applications for *negotiated transmission services:*

(a) any timeframes referred to in this section 10 will be suspended for the duration of any dispute.

(b) *Transend* and the *Service Applicant* must use their reasonable endeavours to adhere to the timeframes referred to in this section 10.

10.1 APPLICATIONS FOR NEGOTIATED TRANSMISSION SERVICES UNDER CHAPTER 5 OF THE RULES

Where a *Service Applicant* applies for a *negotiated transmission service* under Chapter 5 of the *Rules*, the timeframes for commencing, progressing and finalising negotiations between *Transend* and the *Service Applicant* for provision of the service will be as set out in Chapter 5 of the *Rules*.

10.2 APPLICATIONS FOR NEGOTIATED TRANSMISSION SERVICES NOT UNDER CHAPTER 5 OF THE RULES

(a) *Transend* and the *Service Applicant* must use their reasonable endeavours to commence negotiations within 15 *business days* of *Transend* receiving an appropriately defined written request for a *negotiated transmission service*.

(b) If a request for a *negotiated transmission service* is not appropriately defined, *Transend* must notify the *Service Applicant* within 10 *business days* of receiving the request and advise the *Service Applicant* of the further information required.

(c) *Transend* will use its reasonable endeavours to provide the *Service Applicant* with a written estimate of the anticipated reasonable direct expenses of processing the application and a tax invoice for this amount by the commencement of negotiations.

(i) *Transend* may suspend negotiations if the *Service Applicant* fails to pay by the due date an invoice issued by *Transend* for its anticipated reasonable direct expenses of processing the application.

(ii) Such a suspension of negotiations would cease once the *Service Applicant* has paid the outstanding tax invoice.

(d) All parties to the negotiation must use their reasonable endeavours to:

(i) progress the negotiations in a manner which would enable completion; and

(ii) finalise the negotiations,

within 120 *business days* of *Transend's* receipt of an appropriately defined request for a *negotiated transmission service*, or such other period as agreed between the parties for a particular negotiation.

(e) If *Transend* is required to consult with other *Transmission Network Users* in accordance with section 14(a) of this framework, *Transend* will use its reasonable endeavours to progress and complete the consultation process at the earliest practicable date. In these circumstances *Transend* will use its reasonable endeavours to ensure any consultation process with affected *Transmission Network Users* will be completed within the timeframe set out in section 10(d).

11 DISPUTE RESOLUTION

All disputes as to the *terms and conditions of access* for provision of *negotiated transmission services* are to be dealt with in accordance with Part K of Chapter 6A of the *Rules*.

12 GST

(a) The costs, expenses and other amounts described in this *negotiating framework* are exclusive of *GST*.

(b) Subject to *Transend's* invoice being in a form which satisfies the requirements of the *GST Act* for a valid tax invoice, a *Service Applicant* in receipt of a tax invoice must pay to *Transend* at the same time and in the same manner as specified in the invoice an additional amount on account of the amount of Transend's *GST* liability in respect of the services covered by the invoice.

13 PAYMENT OF TRANSEND'S EXPENSES

(a) The *Service Applicant* is responsible for the payment of *Transend's* reasonable direct expenses incurred in processing the application to provide the *negotiated transmission service*.

(b) *Transend* will use its reasonable endeavours to provide the *Service Applicant* with a written estimate of *Transend's* anticipated reasonable direct expenses of processing the application and a tax invoice for that amount by the timeframe outlined in section 10.1 or section 10.2 of this *negotiating framework*, as appropriate. During the negotiation process, *Transend* will also use its reasonable endeavours to keep the *Service Applicant* informed of any significant changes to the estimate of reasonable direct expenses.

(c) All payments by the *Service Applicant* must be:

(i) for the amount of the tax invoice including *GST*;

(ii) electronically transferred into an account or accounts nominated by *Transend*;

(iii) transferred to the nominated account or accounts by 4.00 pm on the tenth *business day* after the date of the tax invoice or 3 *business days* after receipt of the tax invoice, whichever is the later;

(iv) without set-off or counterclaim; and

(v) without any deduction or withholding.

(d) Following the end of each calendar month during the negotiation process, *Transend* will prepare a statement of the reasonable direct expenses incurred in processing the application

for the preceding calendar month. *Transend* will use its reasonable endeavours to issue the statement to the *Service Applicant* within 10 *business days* of the end of each calendar month.

(e) When the aggregate value of the statements prepared under section 13(d) approaches 95 per cent of the aggregate value of invoices issued under section 13(b) and this section 13(e), *Transend* will review the anticipated remaining direct expenses to be incurred. If the sum of the anticipated remaining direct expenses to be incurred and the aggregate value of statements prepared exceeds the amount of payments received from the *Service Applicant* in relation to this negotiation, *Transend* will issue an invoice for the additional amount to the *Service Applicant*[1].

(f) As soon as reasonably practical after the negotiations have concluded, *Transend* must determine what reasonable direct expenses it has incurred in the processing of the application.

(i) If the reasonable direct expenses incurred exceed the aggregate value of invoices previously issued then *Transend* will issue a tax invoice for the additional amount to the *Service Applicant*.

(ii) If the reasonable direct expenses incurred are less than the aggregate value of invoices previously issued then *Transend* will refund the difference to the *Service Applicant* within 10 *business days* of *Transend* determining that a refund is due.

(g) Without derogation from any other remedy available, if the *Service Applicant* does not pay a tax invoice in the time prescribed by section 13(c)(iii) of this *negotiating framework*, the *Service Applicant* must pay interest calculated at the *bank bill rate* plus 2 percentage points per annum on the amount unpaid on a daily compounding basis until payment is received[2].

14 IMPACT ON THIRD PARTIES

(a) *Transend* must determine the potential impact on other *Transmission Network Users* of the provision of the *negotiated transmission service*; and

(b) *Transend* must notify and consult with any affected *Transmission Network Users* and ensure that the provision of the *negotiated transmission services* does not result in non-compliance with obligations in relation to other *Transmission Network Users* under the *Rules*.

15 MULTI-PARTY NEGOTIATIONS

(a) This *negotiating framework* explicitly accommodates multi-party negotiations.

(b) If necessary, negotiations can involve an agent authorised to represent a coalition of users.

16 TERMINATION OF NEGOTIATIONS

(a) The *Service Applicant* that has initiated a negotiation for *negotiated transmission services* under this *negotiating framework* may, at any time, elect to terminate the negotiation by giving *Transend* written notice of its decision to do so.

(b) *Transend* may terminate a negotiation under this framework by giving the *Service Applicant* written notice of its decision to do so where:

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[1] As noted in section 13(b) of this *negotiating framework*, *Transend* will use its reasonable endeavours to keep the *Service Applicant* informed of any significant changes to the estimate of reasonable direct expenses.

[2] In cases of late payment, interest is determined by applying a 2 percentage point premium to the *bank bill rate* as this more closely replicates the actual cost of funds for both *Transend* and the *Service Applicant*. *Transend's* reasonable direct expenses to process an application include the cost of borrowing funds in the event that the *Service Applicant* fails to pay an invoice on time.

(i) *Transend* believes, on reasonable grounds, that the *Service Applicant* is not conducting the negotiation under this *negotiating framework* in good faith;

(ii) the *Service Applicant* consistently fails to comply with the requirements of this *negotiating framework*; or

(iii) the *Service Applicant* fails to comply with an obligation in this *negotiating framework* to undertake or complete an action within a specified or agreed timeframe, and does not complete the relevant action within 20 *business days* of a written request from *Transend*.

Appendix I: Determination specifying the negotiated transmission service criteria that apply to Transend

National Electricity Objective

The *terms and conditions of access* for a *negotiated transmission service*, including the price that is to be charged for the provision of that service and any *access charges*, should promote the achievement of the *national electricity objective*.

Criteria for terms and conditions of access

Terms and conditions of access

The *terms and conditions of access* for a *negotiated transmission service* must be fair and reasonable and consistent with the safe and reliable operation of the power system in accordance with the NER.

The *terms and conditions of access* for a *negotiated transmission service* (including, in particular, any exclusions and limitations of liability and indemnities) must not be unreasonably onerous taking into account the:

allocation of risk between the TNSP and the other party

price for the *negotiated transmission service,* and

costs to the TNSP of providing the *negotiated transmission service*.

The *terms and conditions of access* for a *negotiated transmission service* must take into account the need for the service to be provided in a manner that does not adversely affect the safe and reliable operation of the power system in accordance with the NER.

Price of services

The price for a *negotiated transmission service* must reflect the costs that the TNSP has incurred or incurs in providing that service, and must be determined in accordance with the principles and policies set out in its *Cost Allocation Methodology*.

Subject to criteria 7 and 8, the price for a *negotiated transmission service* must be at least equal to the avoided cost of providing that service but no more than the cost of providing it on a stand alone basis.

If the *negotiated transmission service* is a *shared transmission service* that:

(i) exceeds any network performance requirements which it is required to meet under any relevant electricity legislation; or

(ii) exceeds the network performance requirements set out in schedule 5.1a and 5.1 of the NER

then the difference between the price for that service and the price for the *shared transmission service* which meets network performance requirements must reflect the TNSP's incremental cost of providing that service (as appropriate).

If the *negotiated transmission service* is the provision of a *shared transmission service* that does not meet or exceed the network performance requirements, the difference between the price for that service and the price for the *shared transmission service* which meets, but does not exceed, the network performance requirements should reflect the amount of the TNSP's avoided cost of providing that service (as appropriate).

The price for a *negotiated transmission service* must be the same for all *Transmission Network Users* unless there is a material difference in the costs of providing the negotiated transmission service to different *Transmission Network Users* or classes of *Transmission Network Users*.

The price for a *negotiated transmission service* must be subject to adjustment over time to the extent that the assets used to provide that service are subsequently used to provide services to another person, in which case such adjustment must reflect the extent to which the costs of that asset is being recovered through charges to that other person.

The price for a *negotiated transmission service* must be such as to enable the TNSP to recover the efficient costs of complying with all regulatory obligations associated with the provision of the *negotiated transmission service*.

Criteria for access charges

Access charges

Any *access charges* must be based on costs reasonably incurred by the TNSP in providing *Transmission Network User* access and (in the case of compensation referred to in clauses 5.4A(h) to (j) of the NER) on the revenue that is likely to be foregone and the costs that are likely to be incurred by a person referred to in clause 5.4A(h)-(j) of the NER where an event referred to in those paragraphs occurs (as appropriate).

Italicised terms used in the criteria have the same meaning as in the NER.

Appendix J: Input (labour and non-labour) cost escalators

Introduction

In recent decisions for electricity TNSPs (including Powerlink, SP AusNet and ElectraNet) the AER has allowed capex and/or opex allowances to be escalated in real terms for input cost increases.[446] This involves the disaggregation of expenditure allowances into specific inputs (e.g. labour, land and materials) which are priced in terms of a base year. These base year costs are increased or decreased for each year of the regulatory control period relative to changes in the nominal price level, which is taken into account when prices and revenues are adjusted at the aggregated level under the CPI–X control mechanism.

The methodology employed to determine the cost escalators generally combines independent forecast movements in the price of input components with 'weightings' for the relative contribution of each of the components to final equipment/project costs. This in turn generates real capex and opex forecasts for the regulatory control period. The weightings are typically specific to each regulated business given differences in composition of their respective expenditure forecasts.

The underlying objective of real cost escalations was to take account of the commodities boom and skills shortages in the engineering field in Australia. In light of these external factors, it was considered that cost escalation at CPI no longer reasonably reflected a realistic expectation of the movement in some of the equipment and labour costs faced by electricity network service providers (NSPs).[447] It was also communicated by the AER at the time of allowing real cost escalations that the regime should symmetrically allow for real cost decreases.[448] This was to allow end-users to receive the benefit of real cost reductions as well as facing the cost of real increases.

Given that there is no futures market for the procurement and installation of electrical equipment (e.g. transformers, switchgear), in previous decisions cost escalations have been estimated with reference to the expected growth in key input 'cost factors' such as:

- copper
- aluminium
- crude oil

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446 For example, see: AER, *Powerlink Queensland transmission network revenue cap 2007–08 to 2011–12: Decision*, 14 June 2007, p. 60-70; AER, *SP AusNet transmission determination 2008–09 to 2013–14: Draft decision*, 31 August 2007, p. 87-91, 316-331; AER, *ElectraNet transmission determination 2008–09 to 2012–13: Final decision*, 11 April 2008, p. 29-48.

447 NER, clause 6A.6.7(c)(3)

448 AER, *SP AusNet transmission determination 2008-09 to 2013-14 – Final Decision*, January 2008, p.80

- construction costs
- electricity, gas and water (EGW) sector labour costs
- land/easement costs
- other inputs (such as steel) were escalated at CPI.

During its revenue reset process, ElectraNet engaged the Competition Economists Group (CEG) to develop forecasts for each of the above cost factors and used them to escalate its proposed capex program. In its final decision, the AER accepted its consultant Sinclair Knight Merz's (SKM) recommendation that CEG's proposed real cost escalators for materials are reasonable, subject to a number of adjustments. [449] In particular the AER accepted SKM's recommendations that:

- London Metal Exchange (LME) forward contract prices (i.e. 27 months) provide the best estimate of the price of aluminium and copper for a relevant future date
- monthly average futures prices should be used rather than a single day price
- Consensus Economics' 5−10 year forecasts for aluminium and copper prices represent the best available long-term forecast
- CEG's proposed adjustment to the long-term Consensus Economics aluminium and copper forecasts to reflect the higher LME futures forecast prices is not reasonable
- for the purposes of interpolation, Consensus Economics' 5−10 year forecast for aluminium and copper prices should be interpreted as the mid-point of 7.5 years, rather than 10 years as proposed by CEG.

The AER has been mindful of the arguments presented and conclusions reached in its determination for ElectraNet when assessing Transend's proposal. This appendix presents the AER's assessment of the methodology and data sources for the proposed escalators. Where possible, the values of the escalators presented here will be updated at the time of the AER's final decision and determination.

Current proposal

As part of its revenue proposal, Transend has engaged CEG to develop real cost escalation forecasts for the next regulatory control period.[450] For the most part CEG has maintained its methodology used to forecast aluminium, copper, crude oil prices and construction costs based on the report it prepared for ElectraNet, including its proposed adjustments to the Consensus Economics aluminium and copper price forecasts.

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[449] AER, *ElectraNet transmission determination 2008–09 to 2012–13: Final decision*, 11 April 2008, p.29-48.

[450] CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008.

The AER considers that its conclusions from the recent ElectraNet decision are still applicable with respect to the methodology used for estimating each of these cost factors (i.e. copper, aluminium and crude oil). In most cases, CEG has not presented any new compelling evidence justifying a departure from the approach previously accepted by the AER. The AER has also calculated forecasts for this draft decision using the latest available data, and intends to update this data for its final decision.

In its latest report CEG has proposed a number of additional cost factors not previously applied to the overall cost escalation methodology, including:

- variances in prices charged by equipment manufacturers to reflect their market power (producer margins)
- the proportion of general labour costs used in the manufacture of electrical equipment (producer labour costs)
- indirect general labour costs associated with the processing of raw materials (e.g. steel).

The AER has concerns that these additional cost factors represent a departure from the AER's intention to account for the effects of the recent commodities boom and skilled labour shortages in Australia. The effect of their addition would be to offset the expected declines in commodities prices and the symmetry of the cost escalators envisaged by the AER. Moreover, they represent a move towards compensation for all input costs at a fine level of detail and go beyond the AER's general obligation to provide businesses a reasonable opportunity to recover efficient costs, and in this sense are also inconsistent with the incentive frameworks for capex and opex.

Notwithstanding these general concerns, the AER also considers that these additional proposed real cost factors do not meet the underlying objective for inclusion in forecast costs under clause 6A.6.7(c) of the NER. Specifically, given the inherent uncertainties around the existence and estimation of real movements in these cost factors, the AER does not consider that changes in addition to CPI are warranted. It is important to note that the AER accepts that such costs are likely to be included in base (unit) cost estimates. However, what is questionable is the extent to which real growth is expected and whether it can be forecast on a reasonable basis.

This appendix presents the AER's assessment of the methodology and data sources for the proposed escalators. Where noted, the values of the escalators presented here will be updated at the time of the AER's final decision and determination.

Labour cost escalators

This section discusses the real labour cost escalations proposed by Transend to apply to their forecast capex and opex allowances over the next regulatory control period. The proposed labour cost escalators fall into two categories:

- electricity, gas and water (EGW) or utility sector-specific labour cost forecasts
- general labour cost forecasts.

These two categories of labour costs are discussed separately below.

Electricity, gas and water (EGW) sector labour escalators

CEG

Transend obtained advice from CEG on forecast annual labour escalation rates for the EGW sector.[451]

CEG relied on forecasts produced by Macromonitor and Econtech to derive its labour escalators for the EGW or utility sectors in NSW and Tasmania. The labour cost escalators from Macromonitor and Econtech for Tasmania are shown in table J.1.

Table J.1: CEG's real labour cost growth rates for the EGW sector (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Macromonitor (TAS)*	2.4	3.6	2.4	0.5	2.3	4.3	4.9
Econtech (AUS)	2.0	2.8	5.6	5.0	3.9	3.4	3.1

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 7.

(a) Productivity adjusted

The Econtech national forecasts used by CEG are based on a report to the AER for the SP AusNet and VENCorp revenue resets.[452]

The report by Macromonitor was commissioned by TransGrid, Transend and the NSW DNSPs. The Macromonitor report calculates productivity adjusted or unit labour costs for the EGW sectors in NSW and Tasmania.[453]

Macromonitor noted that the actual labour cost involved with undertaking a given amount of activity is not purely determined by the rate of wages per hour, but also by the number of hours work required. Macromonitor stated that in examining the changes in an organisation's labour costs over time, a more meaningful measure than nominal wages is labour cost per unit of output, or per unit of activity. The change in this measure over time reflects both changes in wages and changes in labour productivity.[454]

Macromonitor has forecast annual productivity declines in the utility sector over the next few years which becomes positive from 2011–12. The same general trend is expected in Tasmania. Between 2007–08 and 2013–14, Macromonitor has forecast a

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451 CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008.

452 Attachment D, Econtech, *Labour cost growth forecasts*, 19 September 2007.

453 Macromonitor, *Forecasts of cost indicators for the electricity transmission sector, New South Wales & Tasmania*, February 2008.

454 Macromonitor, *Forecasts of cost indicators for the electricity transmission sector, New South Wales & Tasmania*, February 2008, p. 8.

0.9 per cent annual reduction in the Tasmanian EGW sector.[455] Macromonitor attributes the decline in productivity to a continuing upturn in the economy, together with a tight labour market and difficulties in attracting and retaining skilled staff.

CEG deflated Macromonitor's nominal labour cost escalators by its estimate of CPI to obtain the real escalators.[456]. CEG also calculated real unit labour costs by using Macromonitor's forecast average annual change in productivity growth for the period, rather than individual forecasts for each year. CEG derived real unit labour costs by subtracting average productivity growth from growth in real wages.

CEG recommended that averaging the escalation rates calculated by Econtech and Macromonitor provides an appropriate forecast of labour cost escalators for the EGW sectors in Tasmania. CEG did not provide any justification for averaging data from the two sources. The labour cost escalators recommended by CEG are shown in table J.2.

Table J.2: CEG's real wage growth for the EGW sectors in Tasmania (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Tasmania	2.2	3.2	4.0	2.7	3.1	3.9	4.0

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 8.

Econtech

The AER engaged Econtech to provide advice on wage forecasts for the EGW sectors in Tasmania.[457] Econtech's labour cost growth rates for these sectors in and nationally are shown in table J.3.

Table J.3: Econtech's real labour escalation rates for the EGW sector (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Tasmania	–3.0	2.0	2.9	2.8	2.5	2.4	1.9
Australia	–0.8	2.2	3.3	3.1	2.8	2.6	2.1

Source: Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19, September 2008, p. 25 and p. 10 – 12 in attachment D.

Econtech determined these forecasts using an updated version of the model it developed for its report to the AER in August 2007. In particular, the forecasts provided by Econtech incorporate:

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455 CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 10.

456 CEG use its own CPI forecasts to deflate Macromonitor's labour cost forecast.

457 Econtech is an economic consulting firm that specialises in economic modelling, forecasting and policy analysis. Econtech merged with KPMG in August 2008. Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008.

- a simplified, but enhanced approach to labour cost forecasting
- national accounts data from December 2007 (which was published by the Australian Bureau of Statistics (ABS) in March 2008)
- average weekly earnings data obtained by request from the ABS in August 2008
- policy measures introduced in the 2008–09 federal budget
- an extension of the forecast period from 2015–16 to 2016–17.[458]

These forecasts are broadly consistent with Econtech's national forecasts. Over the next regulatory control period, Econtech has forecast an average growth rate 2.3 per cent (real) for the Tasmanian utilities sector. In comparison, the forecast average growth rate for the utility industry in Australia is 2.6 per cent (real).

Econtech made the following observations on the utility sectors in Tasmania:

- The forecast annual wage growth for the utility sectors in Tasmania is expected to be higher than the Tasmanian all-industry average over the forecast period.
- The shortage of skilled workers in the utility sectors continues to be a significant driver of labour costs. Electrical and engineering professionals are included in the Department of Education, Employment and Workplace Relations (DEEWR) "Skill Shortage List" for Tasmania.
- A number of initiatives have been introduced to increase the supply of skilled workers. For example, the Australian Government, through its Skilling Australia Policy, will provide 450,000 new training places over the next four years. However, most of these initiatives represent a long-term solution and are therefore not expected to have a material impact in the short-term.
- The Australian Government has put in place a number of initiatives to lift permanent and temporary migration. Such initiatives have the potential to relieve skills shortages in the short-term, however, there are concerns over the ability of this additional labour to meet industry demand.
- An aging workforce in the utility industry may also put further strain on the supply of skilled labour.
- The fact that electricity, gas and water are essential services means that businesses have a greater imperative to attract and maintain skilled workers, and are more likely to absorb wage increases in order to maintain labour supply.
- The utility industry has had difficulty in retaining skilled staff due to demand booms in related industries. The utility industry employs a large proportion of electricians, electrical and other engineers which are occupations also employed extensively by the construction and mining industries.

[458] Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 4.

Econtech reviewed the methodology used by CEG to forecast labour cost growth rates in the EGW sector in Tasmania.[459] Econtech stated that CEG's approach of averaging the Macromonitor and Econtech labour cost forecasts was misguided because these forecasts were not comparable. In particular, Econtech noted:

- The report prepared by Macromonitor does not contain any description of the methodology used to forecast wages growth, which makes it difficult to evaluate the labour cost growth forecasts produced by Macromonitor. Further, Macromonitor does not use any econometric techniques to derive its forecasts.[460]

- While reasons were put forward in the Macromonitor report to explain forecasts of productivity, there was no clear methodology provided that outlined how productivity was forecast.

- Unlike the Macromonitor forecasts, the Econtech forecasts of wages growth do not remove productivity growth. Econtech's forecasts of wage growth represent the general increase in labour costs over and above inflation as well as specific compensation to labour for increases in productivity. Since Econtech's forecasts incorporate compensation for increases in productivity, they are not equivalent to the Macromonitor labour cost forecasts.[461]

- The 2007 Econtech labour forecasts adopted by CEG are based on the national economy, whereas the Macromonitor forecasts are specific for NSW and Tasmania.

AER considerations—CEG

The AER has examined the EGW wage growth forecasts put forward by CEG for Tasmania. Based on Econtech's advice the AER does not consider that the averaging methodology employed by CEG to forecast wages growth in the utility sectors for Tasmania is sufficiently robust. In particular, the AER notes Econtech's advice that the Macromonitor and Econtech forecasts are not comparable and that averaging the two forecasts is likely to provide inaccurate forecasts of labour cost escalation.

In addition to the inappropriateness of averaging data from Econtech and Macromonitor, the AER does not consider that the CEG proposed labour cost growth rates are a reasonable reflection of the likely future labour costs as they are not based on the most recent information. The AER notes Econtech's advice that since it provided forecasts of labour cost growth rates to the AER in August 2007 (which

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459 Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 38 – 42.

460 Macromonitor, *Forecasts of Cost Indicators for the Electricity Transmission Sector – Forecasting Methodology'*, 1 September 2008, p. 3.

461 Econtech's labour cost model incorporates labour productivity via the employment forecasts used in MM2 (macroeconomic model of the Australian economy). MM2 incorporates labour productivity assumptions through its own labour productivity index, PSkill. PSkill is an input into the model and not an output. MM2 also incorporates assumptions regarding the growth in labour efficiency for each industry. Labour efficiency in each industry is then used to augment PSkill.

were used by CEG), the economic climate has changed considerably, resulting in some pressure being taken off wages growth.[462] In particular, Econtech stated that:

> Projections of annual labour cost growth rates for overall state and territories have moderated in the past 12 months. The Reserve Bank of Australia (RBA) raised the official cash rate by 25 base points on four separate occasions since August 2007. The extent of the slowdown in household spending and credit expansion from within the household and business sector lead to the RBA to cut interest rates by 25 base points in September 2008. Despite this interest rate cut, the outlook for economic growth remains weak and the unemployment rate is expected to rise over the forecast period. These factors have combined to take some pressure off wages growth at the state and national level, since the last forecasts provided to the AER in 2007.[463]

The AER also does not consider it appropriate to rely on the forecasts presented by Macromonitor because there is no description of the methodology used to forecast wages growth or productivity.

For these reasons the AER does not accept CEG's proposed labour cost growth rates for Tasmania.

The AER notes Transend operates under a Enterprise Bargaining Agreements (EBA). The AER requested each NSP to provide the actual wage increases set out under their respective EBA. The wage increases for 2007–08 are shown in table J.4. The AER notes that given the EBA Transend is operating under expires in February 2009, the actual wage increases for 2008–09 are generally not available.

Table J.4: Actual wage increases under individual EBA for 2007–08 (per cent)

	Transend EBA Wage growth rate
Actual wage increase (nominal)	4.9
Actual wage increase (real)	0.4

Source: Transend[464].
Note: The AER derived the real EBA rates by using the actual CPI for 2007–08 of 4.5 per cent.

Given that the actual wage data is available for 2007–08, the AER will apply the actual wage rate provided for under the EBA. From 2008–09 onwards the AER will apply Econtech's Tasmania labour cost forecasts to the Transend opex and capex proposals.

AER conclusions—CEG

The AER's conclusions on EGW growth rates are provided in table J.5. On average, the Econtech labour cost growth forecasts are lower than the CEG forecasts for Tasmania during the next regulatory control period. This is largely because the

[462] Econtech, L*abour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 24.
[463] ibid., p. 24.
[464] Transend, Response to AER request for information no. 238, submitted 16 September 2008.

economic climate has changed considerably since the last Econtech forecasts provided to the AER in 2007, resulting in some pressure being taken off wages growth

Table J.5: AER's conclusion on Tasmania EGW real labour growth rates (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Average
AER/Transend EBA	0.4	2.0	2.9	2.8	2.5	2.4	1.9	2.5

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 8; Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*,, 19 September 2008, p. 11 in attachment D.

Note: The average is calculated for 2009–10 to 2013–14 (the next regulatory control period)

The AER considers that the application of the Econtech forecasts for wages growth in the EGW sectors for Tasmania reflect the efficient costs that a prudent operator in the circumstances of Transend would require to achieve their capex and opex objectives.

General labour escalators

CEG

CEG recommended that Transend apply Econtech's forecast for wages across the Australian economy as an appropriate estimate of general labour costs. The general labour cost forecast recommended by CEG is taken from Econtech's Australian National State and Industry Outlook (ANSIO) December 2007 report and is outlined in table J.6.

Table J.6: CEG's real general wage growth (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
General wage	1.8	1.6	2.4	1.9	1.8	2.0	2.0

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 31.

Transend has applied CEG's recommended general labour escalator to aspects of its proposed opex and capex proposals, to account for real cost increases for more generic categories of direct labour.

Transend also applied the CEG forecast for general wages to escalate specific components of their capex, to account for real cost increases for indirect labour associated with manufactured equipment.

CEG recommended that Transend apply the Econtech general wage cost to escalate equipment cost inputs (incurred by equipment manufacturers) for the next regulatory

control period.[465] CEG stated that NSPs could face higher equipment costs due to increased producers wage costs and that these costs should be recoverable under the AER's regulatory framework.

CEG produced its estimates for producer labour costs using the ABS input-output tables.[466] These tables examine the supply and use of goods and services in the Australian economy by identifying the inputs (including employee compensation) used by a particular industry relative to defined outputs. All the data in the ABS input-output tables are specific to the Australian economy.

CEG stated that it has:

> …estimated the proportion of inputs associated with labour in each relevant industry by calculating the ratio of the compensation of employees against the combined sum of this and the total value of production.[467]

CEG calculated the proportion of labour used to produce each relevant ABS output category to be 27 per cent. The categories examined were:

- primary plant and materials supply
- secondary systems and materials supply
- transformers
- aluminium conductor
- copper cable/conductor.

CEG then recommended using Econtech's Australian general wage cost forecasts to escalate the labour component of the above equipment categories over the next regulatory control period.

AER considerations—direct labour costs

CEG

The AER accepts that a general labour cost forecast is appropriate to escalate direct labour costs (i.e. other than EGW) incurred by NSPs.

As part of its report to the AER, Econtech also provided advice on general wage forecasts for all industries across Australia. A comparison of Econtech's general wage forecast with the forecasts recommend by CEG is shown in table J.7.

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465 CEG, *Escalation factors affecting expenditure forecasts*, April 2008.

466 ABS, Australian National Accounts: Input-Output Tables 2001/02, Catalogue Number 5209.0.55.001, Table 2.

467 CEG, *Escalation factors affecting expenditure forecasts – a report for Transend*, April 2008, p.30

Table J.7: CEG and Econtech's real labour escalators for general wages (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Average
CEG	1.8	1.6	2.4	1.9	1.8	2.0	2.0	2.02
Econtech	0.6	1.0	1.1	0.7	0.7	0.8	0.6	0.78

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 31; Econtech, Labour cost growth forecasts 2007/08 to 2016/17, 19 September 2008, p. 25.

Note: The average is calculated for 2009–10 to 2013–14 (the next regulatory control period)

As can be seen from table J.7 there is a material difference between the general wage forecasts provided by CEG with Econtech's general wage forecasts.

The AER notes that the general wage forecasts used by CEG were taken from Econtech reports published in 2007. Econtech stated that, since it provided forecasts of labour cost growth rates to the AER in August 2007, the economic climate has changed considerably.[468]

The AER notes that Econtech's latest ANSIO for June 2008 also predicts a decline in average earnings for general wages.[469]

Given the change in economic conditions since 2007, the AER does not consider that the general wage forecasts proposed by CEG are reasonable for the purposes of forecasting labour market wage trends for the next regulatory control period.

Accordingly, where applicable the AER will apply Econtech's latest general wage forecasts to Transend's opex and capex proposals.

AER conclusions—direct labour costs

The AER's conclusion on a general labour cost escalator is set out in table J.8.

[468] Econtech, L*abour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 5.
[469] Econtech, *Australian National State and Industry Outlook*, 22 July 2008, p. 110.

Table J.8: AER's conclusion on real general wage growth (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Average
AER	0.6	1.0	1.1	0.7	0.7	0.8	0.6	0.78

Source: Econtech, *Labour cost growth forecasts 2007/08 to 2016/17*, 19 September 2008, p. 25.

AER considerations—indirect labour costs

The AER notes that a number of NSPs have applied the Econtech labour cost escalator to equipment cost inputs. This is intended to represent the labour costs incurred by the producers of manufactured equipment that is purchased by NSPs.

The AER notes CEG's proposal to weight general labour costs at 27 per cent of the total costs of various electrical equipment. The AER considers that the introduction of a new labour component in equipment costs is inappropriate as it:

- represents a movement beyond the AER's obligation to provide regulated businesses a reasonable opportunity to recover efficient costs towards providing compensation for changes in input costs at a very fine level of detail. The AER considers it sufficient to monitor whether the cost of finished goods, as opposed to the component parts, need to be escalated above or below CPI
- is not supported by robust data.

The AER notes that some amount of producers' labour costs will already be embedded in the NSPs' base cost estimates of equipment (i.e. as at 30 June 2007). However, what is questionable is the extent to which the existing producers' labour costs embedded in base costs are expected to change in real terms over the next regulatory control period, and if a real change is expected, how to reliably measure it.

The data used by CEG assumes that Australian manufacturing conditions (as measured in the ABS input-output tables) and wage growth rates are the same as in those countries where equipment is purchased from. It also assumes that labour and other factor productivity is held constant. These issues have not been addressed by CEG to substantiate its recommended position.

AER conclusions—indirect labour costs

The AER does not accept the producer wage cost escalator proposed by CEG as it does not meet the underlying objective for inclusion in forecast costs under clause 6A.6.7(c) of the NER. On the basis of the information presented, the AER is not satisfied that expenditure associated with a real escalation of indirect labour costs is required to meet the capex and opex objectives.

Land/easement cost escalators

This section discusses the real land/easement cost escalations proposed by Transend to apply to forecast capex and/or opex allowances over the next regulatory control period.

Proposal

Transend commissioned Brothers & Newton to provide advice on forecast land value escalators in Tasmania for the next regulatory control period.[470]

Brothers & Newton's methodology for preparing land value forecasts included a review of:

- current and forecast economic conditions
- past trends in property values and the current position of each sector in the market cycle and factors which will impact on the future performance of each sector of the property market
- potential impacts associated with proposed large scale developments.[471]

Brothers & Newton noted statistical data available for property markets is limited, particularly where data is not subject to geographical segmentation. Therefore, forecasts provided by Brothers & Newton were based on general economic trends and experience. Further, its forecasts were estimates of average trends across seven broad property sectors. Brothers & Newton recommended 4.5 per cent average annual real growth across all sectors, from 2007–08 to the end of the next regulatory control period.

Brothers & Newton further noted factors which may impact on future land values:

- potential increases in industrial land values due to growth in rentals and firming investment yields, in addition to major investment activity and demand from the mining sector
- relatively low growth rates in the commercial land sector during the next 3-5 years due to limited expectations for future office developments
- stabilisation of residential and rural trends during the next 3-5 years. 472

Transend derived its final weighted average land escalators by using the proportion of proposed land and easement acquisitions for each region (South, North and North–West) based on the total land and easement acquisition for the next regulatory control period.

Table J.9 presents land movement escalation factors recommended by Brothers & Newton and the final weighted escalators as derived by Transend.

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470 Brothers & Newton, *Escalation factors for land values in Tasmania*, April 2008.
471 Brothers & Newton, *Escalation factors for land values in Tasmania*, April 2008, p. 5.
472 Brothers & Newton, *Escalation factors for land values in Tasmania*, April 2008, p. 8-9.

Table J.9: Brothers & Newton and Transend's forecast real growth in land prices for Tasmania (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Brothers & Newton	5.3	5.2	5.1	4.5	3.9	3.5	4.0
Transend weighted average	5.3	5.2	5.1	4.6	4.0	3.6	4.1
Difference	*0.0*	*0.0*	*0.0*	*0.1*	*0.1*	*0.1*	*0.1*

Source: Brothers & Newton, *Escalation factors for land values in Tasmania*, April 2008, p. 11 and Transend, Response to AER information request no. 268, submitted 16 October 2008.

AER considerations

Transend

In previous transmission determinations, the AER utilised ABS long-term historical land data to develop forecast proxies for land and easement escalation rates.[473] The AER considers the use of a long-term historical average as a reasonable forecast due to long-term data being less exposed to business cycle fluctuations.

The AER has used the Tasmanian land value data published by the ABS to calculate the historical growth rate. Brothers & Newton's land forecasts relied upon by Transend are based on geographical regions and therefore, are not directly comparable with the ABS data which are based on the rural, residential and commercial land types. As such, the AER has attempted to reconcile the information contained in Transend's capex proposal.

The AER notes that Transend's Sheffield–Burnie transmission line project accounts for approximately 94 per cent of its forecast land/easement capex. The AER therefore used this project as a proxy to reconcile Transend's real land escalators with the real average historical growth land value data as published by the ABS. The AER found the ABS data to be broadly consistent with Transend's average forecast growth rate for its land/easement escalator, for the next regulatory control period. Accordingly, the AER accepts Transend's proposed land/easement escalator.

AER conclusions

The AER's conclusions on the real land escalators for Tasmania are set out in table J.10.

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[473] AER, *Powerlink Queensland transmission network revenue cap 2007–08 to 2011–12: Draft decision*, 8 December 2006, p. 76.
AER, *SP AusNet transmission determination 2008–09 to 2013–14: Draft decision*, 31 August 2007, p. 189–190.
AER, *ElectraNet transmission determination 2008–09 to 2012–13: Final decision*, 11 April 2008, p. 34.

Table J.10: AER's conclusion on real land escalators for NSW and Tasmania (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Tasmania	5.3	5.2	5.1	4.6	4.0	3.6	4.1

Materials cost escalators

This section discusses the real materials cost escalators proposed by Transend to apply to their forecast capex and/or opex allowances over the next regulatory control period. The proposed materials cost escalators are as follows:

- copper and aluminium
- steel
- crude oil
- exchange rates (used to develop the materials cost escalators)
- producer margins
- construction costs (includes labour and materials costs).

These cost escalators are discussed separately below.

Aluminium and copper

ElectraNet transmission determination

Following the AER's draft decision which rejected ElectraNet's non-labour (materials) cost escalators, ElectraNet engaged CEG to develop forecast materials cost escalators for its capex program.

In determining escalators for aluminium and copper, CEG used London Metal Exchange (LME) actual and futures prices of these base metals for the period up to June 2009. From this point CEG determined forecasts through a straight-line interpolation between the latest available LME forecast and Consensus Economics' long-term forecast. The Consensus Economics' long-term forecast used in this calculation was adjusted by CEG to reflect the difference between the forecast for April 2010 (as implied by the 27-month LME futures price as at January 2008) and the mean Consensus Economics forecast for March 2010—an approach CEG considered to be consistent with the view that futures prices provides the most reliable forecasts of metals prices.[474]

[474] In this case, CEG adjusted Consensus Economics' long-term forecasts for aluminium and copper by 9 per cent and 18 per cent respectively.

SKM, in its final report for the AER, commented that applying an upward adjustment to Consensus Economics' long-term forecasts detracts from the economic assumptions made by forecasters and that they would have considered the latest market information (such as LME forward contracts) in their forecasts.[475] SKM consequently recommended that the upward adjustments be removed from the calculation of escalators for aluminium and copper.

In its final decision the AER accepted SKM's recommendation to not adjust Consensus Economics' long-term aluminium and copper price forecasts. It also accepted SKM's recommendations that:

- LME forward contract prices provide the best estimate of the price of aluminium and copper for a relevant future date
- a monthly average futures price be used rather than the single day futures price
- the interpolation of the Consensus Economics' long-term price forecast should be to the mid-point of 7.5 years, rather than 10 years.

For further discussion of these issues see chapter 3 of the AER's final decision for ElectraNet.[476]

CEG

Transend engaged CEG to develop aluminium and copper cost escalators.

CEG used two data sources to develop its aluminium and copper price forecasts:

- LME actual prices to March 2008, then forward contracts (3, 15 and 27 months) for short-term price forecasts out to June 2010
- Consensus Economics long-term price forecasts from July 2010 to 2017.

The Consensus Economics report provides a single mean price forecast of long-term aluminium and copper prices (among other commodities), which it developed from a survey of over 20 commodity price forecasters. As with the report it prepared for ElectraNet, for the purposes of data interpolation, CEG has defined the 'long-term' to be 10 years, being the end point of the 5 to 10 year period defined as 'long-term' by Consensus Economics.

To merge the LME forward contract price forecasts with Consensus Economics' long-term forecasts, CEG interpolated the LME forecasts as at June 2010 with an adjusted Consensus Economics' long-term forecast. As with the report it prepared for ElectraNet, CEG observed that the Consensus Economics' forecasts were lower than the LME 27-month forward contract price in the period out to June 2010 by an average of 21 per cent and 30 per cent for aluminium and copper respectively. Subsequently, CEG scaled up Consensus Economics' long-term forecast by these percentage differences.

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475 SKM, *ElectraNet Transmission Network Revised Revenue Proposal 2008-2013*, 24 April 2008

476 AER, *ElectraNet transmission determination 2008–09 to 2012–13: Final decision*, 11 April 2008.

CEG's proposed real copper and aluminium cost escalators for the 2007–14 period are presented in table J.11.

Table J.11: CEG's proposed real cost escalators for copper and aluminium (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Copper	–0.4	–3.7	–6.3	–4.2	–2.8	–3.1	–3.1
Aluminium	–5.6	3.5	–0.5	–0.2	0.3	0.0	0.0

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p.41.

AER considerations

The AER considers that a linear interpolation between the LME forecasts and the Consensus Economics' long-term forecast appears to be the most reasonable approach to merge the short-term LME data with Consensus Economics long-term forecasts. The AER does not, however, consider that an upward adjustment (21 per cent and 30 per cent for aluminium and copper respectively) to Consensus Economics' data prior to interpolation is appropriate. Interpolation between these two data sources, without adjustment of Consensus data, is the same methodology approved by the AER in its determination for ElectraNet.

In the ElectraNet revenue reset process, the AER engaged SKM to review and provide advice on CEG's methodology. SKM provided a number of reasons why Consensus Economics' long-term forecasts should not be adjusted in accordance with the CEG proposal:

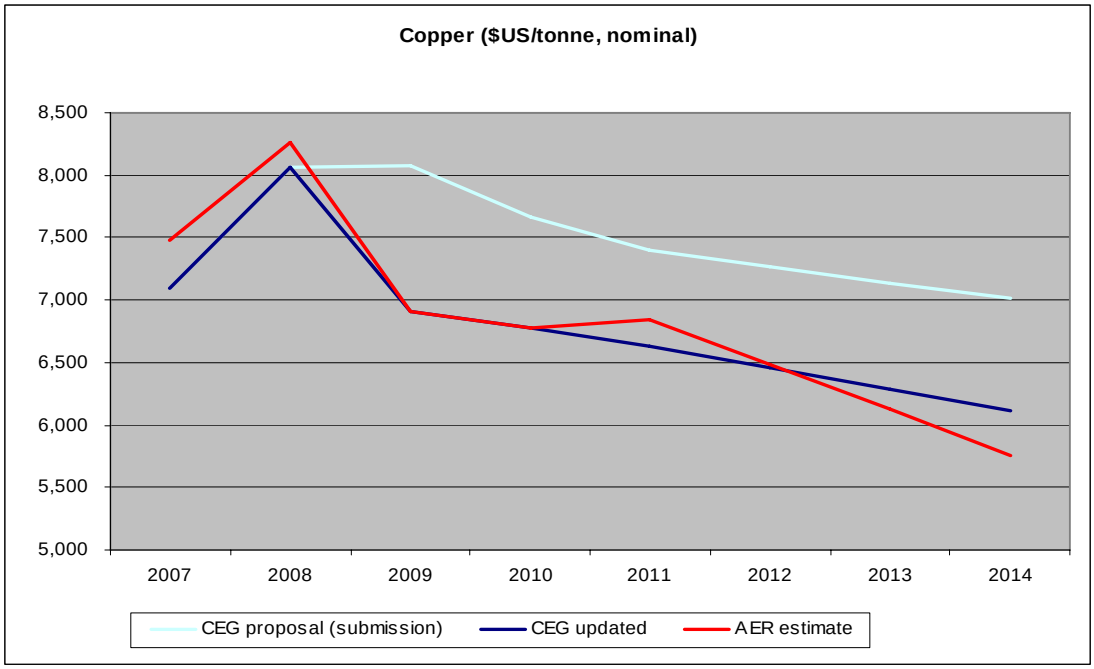
> … the assumption that the experienced forecasters developing the various predictions that constitute the long-term Consensus Economics prices, would be well aware of 27 month LME prices, and principles of linear interpolation, yet still chose to predict long-term prices at the levels presented.
>
> … CEG's adjustment, based on the difference between the LME 27 month contract price and the corresponding Consensus Forecast of the spot price 27 months out, is highly dependent on the volatility presented within the 27 month LME price. This methodology would therefore determine that the magnitude of the adjustment to the Consensus long term forecast prices would be subject to significant variations, depending on the specific date on which the 27 month LME price was sourced.477

The AER has therefore developed its own projections using LME futures prices up to 2010 and Consensus Economics' long-term (7.5 years) forecast, then interpolating between the two data sources.

477 SKM, *ElectraNet Transmission Network Revised Revenue Proposal 2008-2013*, 24 April 2008, p.38

The AER's updated (as at September 2008) estimates for copper and aluminium price forecasts are shown alongside CEG's proposed approach (based on January 2008 and updated August 2008 data) forecasts in figures J.1 and J.2.[478]

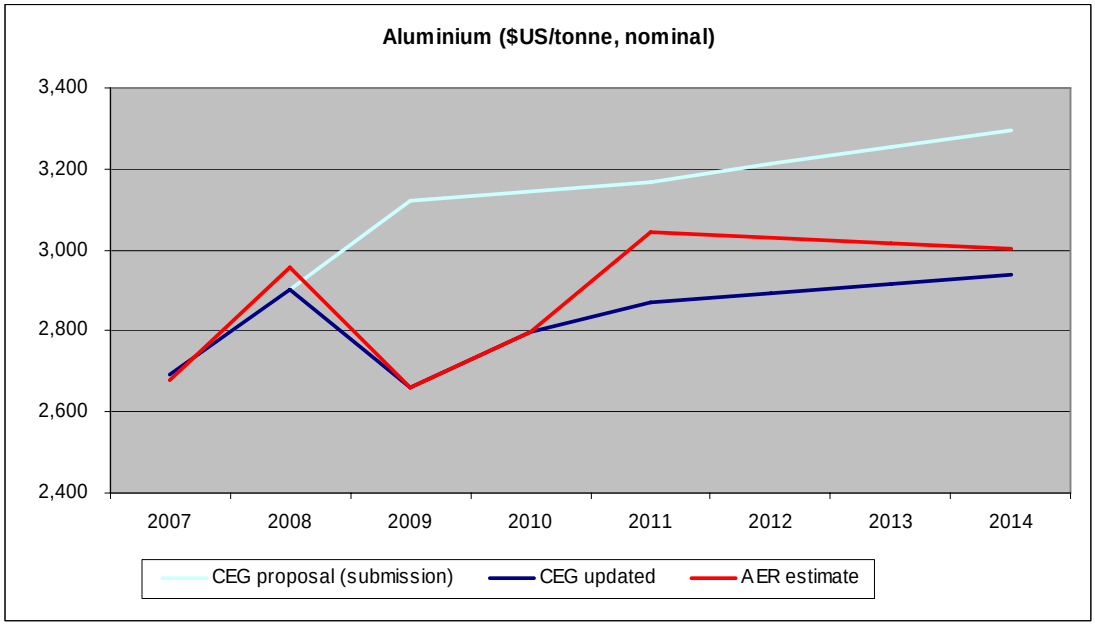
Figure J.1: AER's estimate and CEG's proposal on forecast copper price ($US/tonne, nominal)



Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, p.11-17; AER analysis.

[478] Note that figures J.1 and J.2 are in $USD prices/tonne to avoid complications associated with exchange rate movements. In $USD the individual impact of new data and the removal of the CEG adjustment can be more easily illustrated.

Figure J.2: AER's estimate and CEG's proposal on forecast aluminium price ($US/tonne, nominal)



Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, p.17-19; AER analysis.

As figures J.1 and J.2 illustrate, copper and aluminium price forecasts have decreased since CEG's proposal was made. For comparative purposes the AER has calculated the CEG forecasts using updated data. The difference between the 'AER estimate' and 'CEG updated' series over 2010–14 reflects the key difference in methodology, with the AER not escalating the Consensus Economics long-term forecast to reflect the difference between that forecast and LME futures prices.

The AER also assumes the mid-point (7.5 years) for Consensus Economics' long-term forecast, rather than the end point (10 years) as proposed by CEG.

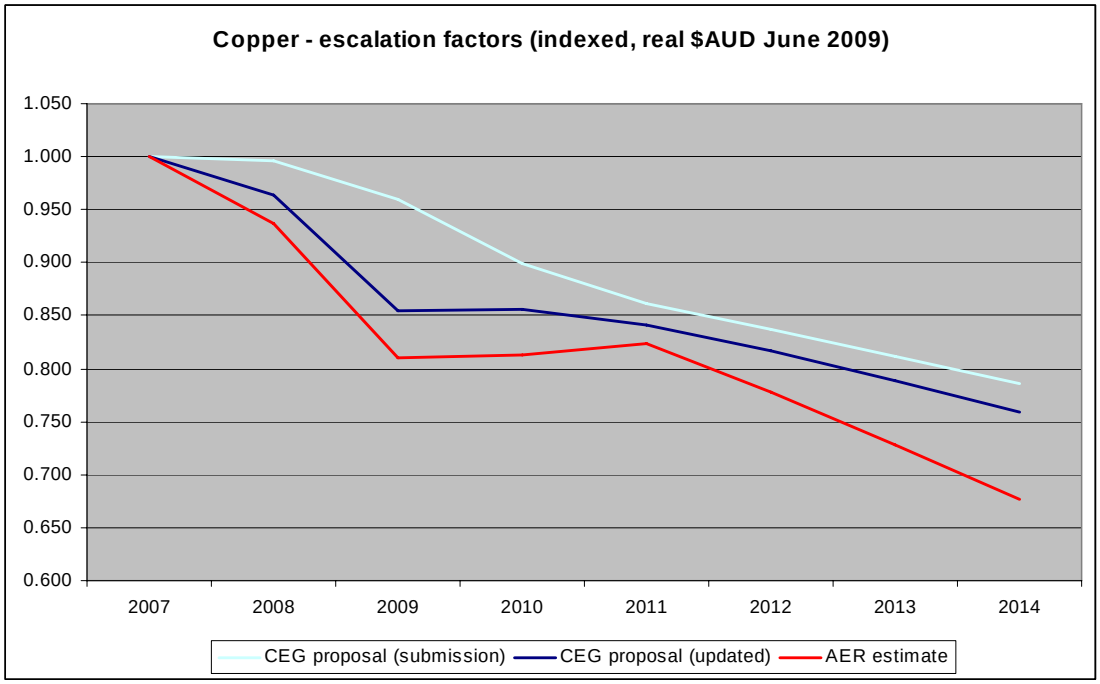
Since all aluminium and copper prices from LME and Consensus Economics were in nominal US dollar (USD) terms, all the projections were converted into nominal Australian dollars (AUD) using the following steps:

- convert nominal USD to nominal AUD using the RBA's latest actual and Econtech's forecast exchange rates[479] (see discussion of exchange rate below)
- convert nominal AUD to real AUD June 2009 using actual and forecast CPI based on the AER's methodology[480]
- convert into a real cost escalation index (with a base year of 30 June 2007).

[479] Econtech, *Australian National, State and Industry Outlook*, 22 July 2008.
[480] Reserve Bank of Australia, Statement on Monetary Policy, August 2008 and http://www.rba.gov.au/Statistics/measures_of_cpi.html.

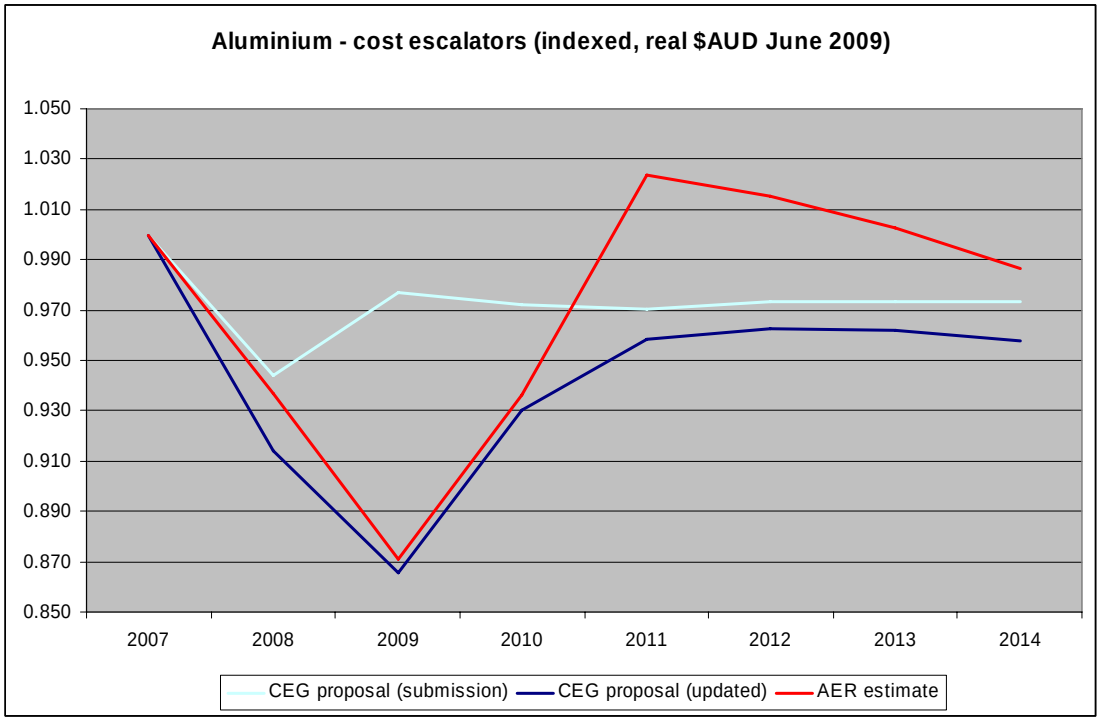
The conversion to real AUD has quite a substantial impact on the results, as shown in figures J.4 and J.5.

Figure J.4: AER's estimate and CEG's proposal on copper cost escalators (index, real $AUD/tonne June 2009, base year = 2007)



Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, p.11-17; AER analysis

Figure J.5: AER's estimate and CEG's proposal on aluminium cost escalators (index, real $AUD/tonne June 2009, base year = 2007)



Source: CEG, ***Escalation factors affecting expenditure forecasts: a report for Transend***, p.17-19; AER analysis.

In accordance with its preference to use updated data where possible and based on the methodology applied in this draft determination, the AER will incorporate updated LME and Consensus Economics data for its final determination.

AER conclusions

The AER is not satisfied that the methodology recommended by CEG and relied upon by Transend reflects a realistic expectation of input costs over the next regulatory control period.

The AER considers it is appropriate to forecast copper and aluminium prices by using LME futures prices up to 2010 and the long-term Consensus Economics forecast (7.5 years), then interpolate between the two data sources. The AER, however, determined that adjusting the long-term price of copper and aluminium by the difference between the LME 27-month forward contract price and the corresponding Consensus Economics long-term forecast is inappropriate and unnecessary.

Based on September/October 2008 data for this draft determination, the AER's conclusions on real copper and aluminium escalators for the 2007–14 period using this methodology are presented in table J.12. The AER will use updated LME and Consensus Economics data for its final determination.

Table J.12: AER's conclusions on real copper and aluminium cost escalators (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Copper	–6.3	–13.5	0.3	1.4	–5.6	–6.3	–7.0
Aluminium	–6.3	–7.0	7.5	9.3	–0.8	–1.3	–1.6

Steel

CEG

CEG stated that because there is currently no futures market for 'mill gate' steel to forecast steel prices, it has relied on Consensus Economics short and long-term price forecasts for hot rolled coil (HRC) steel traded in the US and in Europe.[481] CEG took the average of the US and European long-term forecasts over the 5 to 10 year horizon, which produced a forecast average decrease in real HRC prices of 11 per cent over next 10 years. CEG considered the long-term should be interpreted as 10 years and, based on this assumption, forecast an average annual real price reduction of 1.2 per cent for HRC steel.

CEG then used ABS input-output data to derive the cost contribution of materials and inputs used by producers that transform HRC steel into products for use by Australian NSPs. CEG looked at three types of fabricated steel products, and derived the average weighting of 'iron and steel' content as 14 per cent and 'employee compensation' as 26 per cent of fabricated steel, by cost.[482]

CEG has applied its HRC real escalator of –1.2 per cent to the iron and steel component (weighted at 14 per cent), and adopted an Econtech general wage (real) growth forecasts from December 2007 for the employee compensation component (weighted at 26 per cent). The CEG methodology assumes that all other cost components (weighted at 60 per cent) of the fabricated steel product would remain unchanged in real terms. Table J.13 sets out CEG's recommended real escalators for steel products, as derived using the weighted input components discussed above.

Table J.13: CEG's proposed real escalators for steel products (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Steel products	0.2	0.1	0.3	0.2	0.2	0.2	0.2

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p.41.

[481] Consensus Economics, Energy & metals consensus forecasts: Minerals Monitor, 28 January 2008.

[482] CEG sourced these data from ABS catalogue No 5209.0.55.001. The three types of steel products categories referenced are structural metal products, sheet metal products and fabricated metal products.

AER considerations

The AER has concerns with the derivation of CEG's fabricated steel escalator and considers the approach should be modified to be consistent with the escalators used for other base metals such as copper and aluminium. The AER's reasoning and subsequent amendments to the CEG methodology, and the resulting steel escalator, are set out below.

HRC steel component

The Consensus Economics estimates applied by CEG are derived from commodity price forecasters' long and short-term HRC steel price expectations for trading in the US and European markets. The AER accepts that CEG's reliance on US and European forecasts may not produce an ideal forecast for the cost of fabricated steel used in the production of equipment purchased by NSPs, as this may be sourced from other markets. However, in the absence of more geographically accurate forecasts, the AER considers that the averaging of the US and European long-term market forecasts results in a reasonable approximation for the future price of HRC steel that affects the costs faced by Australian NSPs. The AER will reconsider the appropriateness of using these data should an alternative source arise in the future.

The AER notes that the updated Consensus Economics data reports price expectations in Europe relative to metric tonnes whilst those in the US represent 'short tons'.[483] This difference does not appear to have been noted by CEG in its original analysis. To allow meaningful average future price movements to be derived from these two data sets, the AER has scaled the US short ton data to metric tonnes, before taking the average of both series.

The AER has obtained the most recent Consensus Economics HRC steel price forecasts[484] and has recalculated the HRC component escalator, using the methodology set out in CEG's report, but taking the long-run forecast to represent 7.5 years for the purposes of data interpolation. This is consistent with the assumption that a 5 to 10 year horizon is reflective of the long-term, of which 7.5 years is the mid point. For the period to 2007–08 the AER has obtained Bloomberg historical data on HRC steel prices in the US and Europe.

As figure J.6 illustrates, HRC steel prices have increased significantly since 2007 and are expected to peak in 2008 before declining over the next regulatory control period. Table J.14 sets out the AER's updated actual and forecast HRC steel prices.

[483] A metric tonne is equivalent to 1.1023 short tons.
[484] Consensus Economics, *Energy & metals consensus forecasts: Minerals Monitor*, 28 July 2008

Figure J.6: AER's estimate of HRC steel prices (AUD/metric tonne)

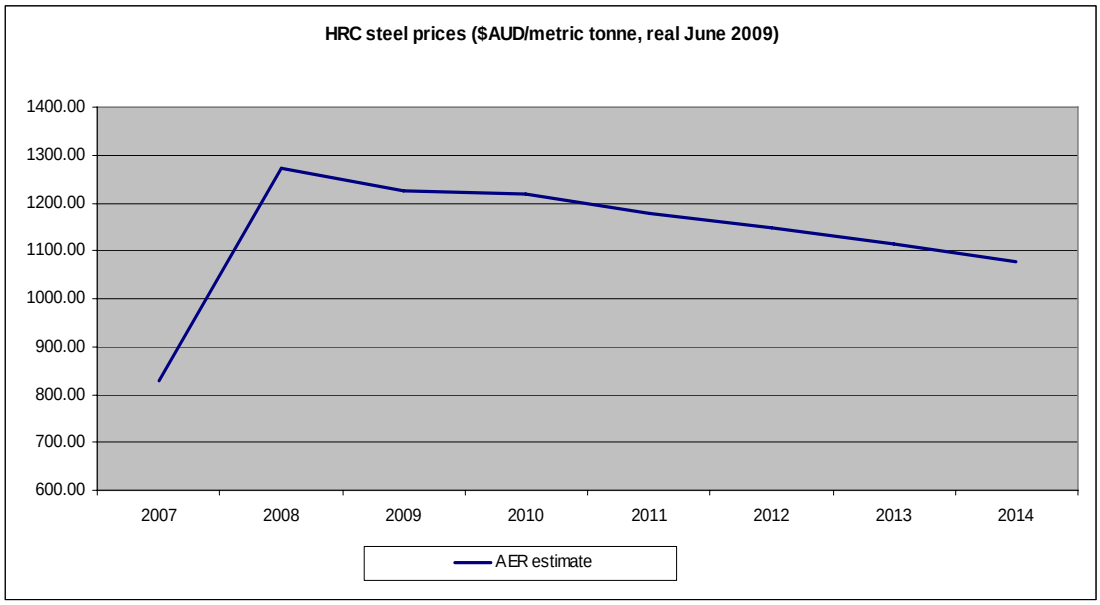


Table J.14: AER's estimate of real HRC steel prices (AUD/metric tonne)

	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
HRC prices	827.63	1273.26	1225.60	1218.79	1177.32	1147.90	1113.50	1075.70
% change	–	53.84	-3.74	–0.56	–3.40	–2.50	–3.00	–3.39

Source data: Consensus Economics, June 2008; AER analysis.
Note: Average of US and European HRC contract prices

Labour and "other" components

CEG has incorporated a labour component into its estimate of fabricated steel escalators, weighted at 26 per cent of production cost. CEG has assumed that this cost component will experience positive real growth during the next regulatory control period. The rate of this growth has been estimated using Econtech's general wage forecasts across the Australian economy.

The remaining input cost components of fabricated steel identified by CEG include profits margins and taxes. These are weighted at 60 per cent by input cost and are assumed to remain constant in real terms in the calculation of the CEG fabricated steel escalator.

CEG has used Australian ABS input-output tables to derive the proportion of labour costs in fabricated steel production in Australia. The AER's considerations on the CEG methodology for applying a producers' labour input cost component to manufactured goods are set out above in the section discussing indirect labour costs, and are also applicable in the case of steel manufacturing. The AER has principled concerns about the introduction of this type of cost escalation factor, and also notes that CEG has not substantiated that the Australian input-output and wage data presented is relevant to its claims. Accordingly the AER does not accept CEG's proposed labour cost component for steel.

CEG has developed escalators for other base metals such as copper and aluminium, and has relied on the prices of less processed inputs as proxies for copper and aluminium products used in equipment purchased by NSPs. The AER considers the same approach should be applied for fabricated steel, and has decided to use the most recent long-term Consensus Economics HRC steel forecasts as a proxy for changes in the price of fabricated steel, weighted at 100 per cent. This therefore removes the distinction between CEG's proposed input components to the fabricated steel escalator and simplifies the derivation of the escalator, which is consistent with the approach to forecasting other metals cost escalators.

AER conclusions

The AER is not satisfied that the methodology for forecasting steel prices, including recognition of indirect labour, profits and taxes in these prices, recommended by CEG and relied upon by Transend reflects a realistic expectation of input costs over the next regulatory control period.

For this draft decision the AER has obtained updated Consensus Economics HRC steel price forecasts and has recalculated the HRC component escalator taking the long-run Consensus forecast to represent 7.5 years for the purposes of data interpolation. For the period to 2007–08 the AER has obtained Bloomberg historical data on HRC steel prices in the US and Europe. For its final decision and determination the AER will consider the use of latest data under this methodology.

The AER's draft decision on Transend's proposed real steel cost escalators for the next regulatory control period is set out in table J.15.

Table J.15: AER's conclusion on real fabricated steel escalators (per cent)

	2007−08	2008−09	2009−10	2010−11	2011−12	2012−13	2013−14
AER	53.8	–3.7	–0.6	–3.4	–2.5	–3.0	–3.4

Crude oil

CEG

CEG stated that the New York Metals Exchange (NYMEX) crude oil light futures price is a reliable predictor of future crude oil prices.[485]

The escalations are calculated using:

- US Department of Energy for historical data to June 2007
- the NYMEX crude oil light futures data, converted to Australian dollars (AUD) using Reserve Bank of Australia (RBA) historical exchange rate data and the AUD/US exchange rate forecast from the Econtech 2007 ANSIO report.

[485] See Transend Revenue Proposal Appendix 15 '*Escalation factors affecting expenditure forecasts*' April 2008, p. 25.

CEG has proposed (based on data downloaded on 6 January 2008) escalation rates for crude oil set out in table J.16.

Table J.16: CEG's proposed real escalators for crude oil ($nominal)

	2006-07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
USD prices	60.00	85.30	99.40	96.90	96.50	97.00	96.30	96.70
% change		42.2	16.6	–2.5	–0.5	0.5	–0.7	0.5
AUD price	76.30	97.80	112.90	111.20	112.40	114.60	115.10	116.90
% change		28.1	15.4	–1.4	1.0	2.0	0.5	1.5

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend* April 2008, p. 25.

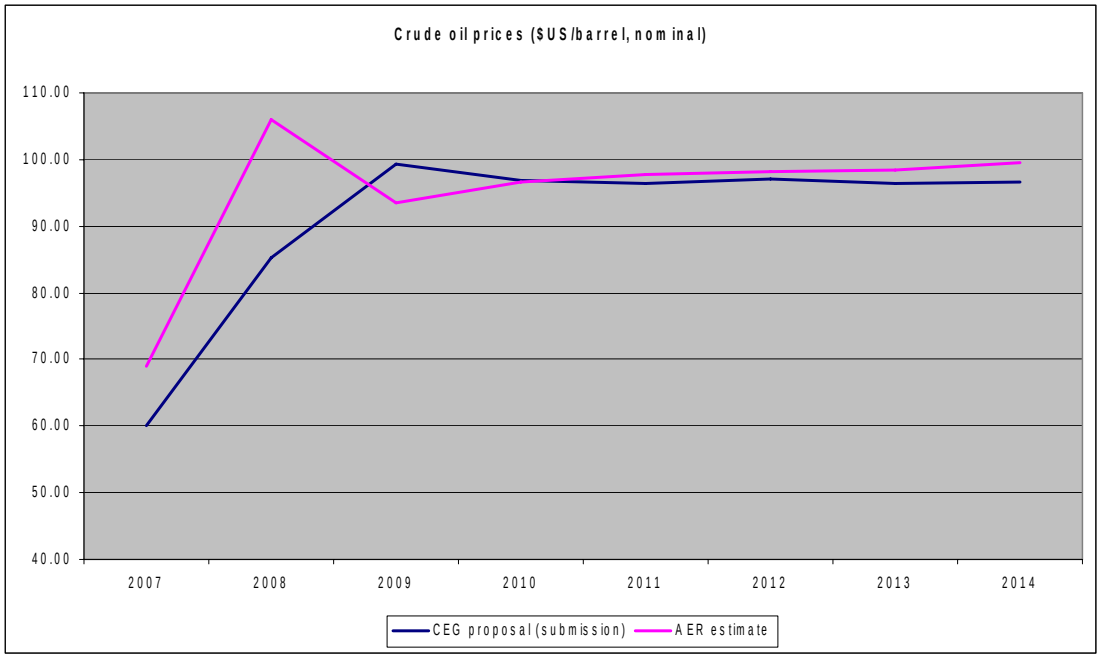
AER considerations

In its recent ElectraNet transmission determination, the AER accepted CEG's proposed data sources and considered that they can be used to provide reliable estimates of both actual and forecast crude oil price escalators. The AER remains of this view and maintains its position that the NYMEX crude oil light futures prices should be averaged over 20 trading days to remove day-to-day volatility.

The AER has taken a 20-day average of daily NYMEX crude oil light futures prices, which results in updated crude oil forecasts.[486] The AER's updated estimate of crude oil prices ($US/barrel, nominal) is presented alongside CEG's proposed estimates in figure J.7.

[486] The AER's sample period was between 14 August and 15 September 2008.

Figure J.7: AER's estimate of crude oil prices (AUD/barrel, nominal)



As figure J.7 indicates, crude oil futures prices are relatively unchanged since the CEG report.

The AER converted the NYMEX forecasts into real Australian dollars using:

- Econtech's forecast exchange rate (see discussion of exchange rate below), and
- The AER's methodology for forecast CPI (see chapter 5 - Cost of Capital).

AER conclusions

The AER accepts CEG's recommended data sources and in accordance with its preference to use the most recent data where possible, the AER's final determination will incorporate updated NYMEX data when the determination is published in April 2009.

Using data published at the time of this draft decision, the AER's conclusion on crude oil escalators is set out in table J.17.

Table J.17: AER's conclusion on real crude oil (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
AER	43.5	–13.4	1.5	1.7	0.1	–0.6	–0.1

Exchange rate

CEG

CEG proposed using Econtech's 2007 ANSIO report forecast of AUD/USD exchange rates, as set out in table J.18.

Table J.18: CEG's proposal on AUD/USD exchange rate forecast, as at 1 July

	2007−08	2008−09	2009−10	2010−11	2011−12	2012−13	2013−14
AUD per USD	0.85	0.88	0.88	0.87	0.85	0.84	0.83

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 15; Econtech, *Australian National State and Industry Outlook*, December 2007, p. 110.

AER considerations

The AUD/USD exchange rate forecasts are used to convert escalators based on futures/market prices (e.g. crude oil, steel prices etc) which are only quoted in US dollar terms.

Exchange rates are a particularly volatile economic variable, driven by numerous factors and are consequently notoriously difficult to forecast both in the short, medium and long-term. While the AER accepted the use of an Econtech exchange rate forecast in its recent ElectraNet transmission determination, it notes that the potential volatility of exchange rates brings any single source of forecast into question.

Table J.19 sets out Econtech's most recent updated June 2008 AUD/USD exchange rate forecast.

Table J.19: Econtech's AUD/USD exchange rate forecast, as at 1 July

	2007−08	2008−09	2009−10	2010−11	2011−12	2012−13	2013−14
AUD per USD	0.85	0.96	0.88	0.84	0.82	0.80	0.75

Source: Econtech, *Australian National State and Industry Outlook*, 22 June 2008, p. 110.

Events in recent months demonstrate the volatility of exchange rate movements, with the AUD/USD exchange rate peaking at US$0.98 on 16 July 2008 before falling back (by 42 per cent) towards US$0.69 on 17 October 2008. The peak in July was heavily influenced by positive sentiment towards the AUD driven by Australian/US interest rate differentials, strong commodity prices, the downturn in the US economy, housing market and US bank write-downs. The recent reduction resulted from negative sentiment on the AUD stemming from reductions in official interest rates and slowing commodity price growth.

The exchange rate forecasts proposed by CEG from Econtech use forecasts of an exchange rate at five points in time only through the next regulatory control period—that is, the exchange rate on 1 July of each year. However, irrespective of the

accuracy of the Econtech's exchange rate forecasting, the very nature of a point in time forecast, particularly in a volatile market, is not necessarily likely to be representative of the AUS/USD exchange rate faced by businesses purchasing equipment throughout the next regulatory control period.

The AER notes that there is little apparent difference between Econtech's latest forecasts and those used as part of Transend's proposal and will rely on the Econtech forecasts. As current exchange rates have moved significantly since Transend submitted its proposal the AER will take account of the actual exchange rate at the time of its final decision and determination in 2009.

AER conclusions

The AER considers that an exchange rate forecast prepared by Econtech at the time if the final decision will represent a realistic expectation of forecast exchange rates over the next regulatory control period. Using the most recent data from this source, the AER's conclusion on the AUD/USD exchange rate forecast for this draft decision is set out in table J.20. The AER will obtain updated data from this source for its final determination.

Table J.20: AER's conclusion on AUD/USD exchange rate forecast, as at 1 July

	2007−08	2008−09	2009−10	2010−11	2011−12	2012−13	2013−14
AUD per USD	0.85	0.96	0.88	0.84	0.82	0.80	0.79

Sources: Econtech, *Australian National State and Industry Outlook*, 22 June 2008, p. 110.

Producers' margin

CEG

CEG has recommended that Transend apply a producers' margin to escalate equipment cost inputs for the next regulatory control period.[487]

CEG proposes that this is a legitimate cost that NSPs could face in the current economic environment, and should be recoverable under the AER's regulatory framework. According to CEG, a producer's margin reflects the currently limited global supply of transmission and distribution equipment compared to large growth in global demand.

The CEG methodology for calculating a real forecast producer's margin is based on averaging the growth rate of forecast margins from JP Morgan and Goldman Sachs for three European producers of electricity equipment – ABB, Prysmian and Nexans. Table J.21 sets out CEG's findings on a producers' margin escalator.

CEG notes that JP Morgan's figures are based on earnings before interest and taxes (EBIT) while Goldman Sachs figures are based on earnings before interest, taxes, depreciation and amortization (EBITDA).

[487] CEG, *Escalation factors affecting expenditure forecasts*, April 2008

CEG acknowledges that given the limited data sources available to measure producers' margins:

> …it is always possible that ABB, Prysmian and Nexans are 'special cases' of equipment suppliers that, peculiar to the rest of their competitors, can expect to earn high margins in future years. However, while we cannot locate similar long term forecasts for other firms, we note that short term forecasts by Goldman Sachs has similarly robust forecasts of earnings growth across all firms in the sector.[488]

CEG also stated that it has assumed zero growth in producers' margins beyond the forecast horizon to 2011, given the absence of data.

Table J.21: CEG's proposal on real escalators for producer's margin (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
ABB Power Products (JP Morgan)	3.6	2.9	N/A	N/A	N/A	N/A	N/A
ABB Power Systems (JP Morgan)	7.5	5.8	N/A	N/A	N/A	N/A	N/A
Prysmian (JP Morgan)	18.8	9.9	6.3	7.6	N/A	N/A	N/A
ABB (Goldman Sachs)	5.1	3.0	N/A	N/A	N/A	N/A	N/A
Prysmian (Goldman Sachs)	9.9	5.4	6.0	N/A	N/A	N/A	N/A
Nexans (Goldman Sachs)	11.8	5.3	N/A	N/A	N/A	N/A	N/A
CEG's average producer's margin	9.5	5.4	6.1	7.6	0	0	0

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p.37.

AER considerations

The AER considers that the introduction of a new producers' margin escalator is inappropriate as it:

- represents a movement beyond the AER's obligation to provide regulated businesses a reasonable opportunity to recover efficient costs towards providing compensation for changes in input costs at a very fine level of detail. The AER considers it sufficient to monitor whether the cost of finished goods, as opposed to the component parts, need to be escalated above or below CPI
- is not supported by robust data.

[488] CEG, *Escalation factors affecting expenditure forecasts – a report for Transend*, April 2008, p.35

Producers' margins will already be embedded in base cost estimates (i.e. as at 30 June 2007). What is in question is the extent to which the existing producers' margins are expected to change in real terms over the forthcoming regulatory control period and, if a real change is expected, how to reliably measure it.

CEG has recommended the use of EBIT and EBITDA to measure producer's margins. The producer's margin being measured is defined as the difference between the price of a unit and the cost of producing that unit. Increases in EBIT (or EBITDA) could be the result of:

- an increase in prices, and/or
- an increase in volumes, and/or
- a decrease in costs.

This was noted by ABB (one of the equipment suppliers examined by CEG), in its latest financial report:

> EBIT and EBIT margin rose, mainly reflecting the improved cost efficiency of higher factory loadings, continuing operational improvements and a supportive pricing environment.[489]

On this basis the AER considers that it is unreasonable to use EBIT (or EBITDA) as a direct proxy for margins (or increased prices). The AER does not consider it appropriate to allow NSPs to recover costs associated with other aspects of an increase in EBIT.

The AER also notes CEG's acknowledgement that there are limited long-term forecasts of producers' margins available, and considers this to be a significant issue in forming an estimate with any degree of reliability. CEG has used six forecasts (see table 30 above). Effectively CEG is basing its forecasts on a sample of three firms. In doing so CEG has not demonstrated that these firms are representative of the entire market supplying equipment to Australian NSPs. Furthermore, as noted by PB, the forecasts of margins beyond 2009 are dependent on six data points of three companies from two different forecasters (Goldman Sachs and JP Morgan).

AER conclusions

As noted above the AER has general concerns regarding the introduction of a producer's margin escalator. Also, the data used to substantiate these costs are not robust. In the AER's view, the estimates of a producer's margin presented by CEG:

- are highly uncertain,
- are based on forecasts of few equipment suppliers, and
- contain unreasonable assumptions about the relationship between EBIT (and EBITDA) and price increases.

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[489] ABB's 2008 second quarter results, accessible at: http://www.abb.com/cawp/seitp202/b4ca86e07eeda409c125749000162bcb.aspx

The AER rejects the producers' margin escalators proposed by CEG as it does not meet the underlying objective for inclusion in forecast costs under clause 6A.6.7(c) of the NER. Specifically, the information presented by CEG is not sufficient to satisfy the AER that the associated expenditure reasonably reflects a realistic expectation of cost inputs over the next regulatory control period. The AER considers the addition of a producer's margin escalator would represent a movement beyond the AER's obligation to provide a reasonable opportunity to recover efficient costs and also represent a level of compensation for costs that is inconsistent with the general incentive framework.

The effect of the AER's decision to not apply real cost increases associated with the producer's margin escalator is to allocate the portion of costs assigned to this escalator to the "other" escalation category, which is escalated by CPI only.

Construction costs

CEG

Transend engaged CEG to forecast construction cost escalators.[490] The construction cost escalator incorporates both materials and labour costs. CEG concluded that an average of the total engineering construction cost escalators calculated by Econtech[491] and Macromonitor[492], deflated by CPI, provides an appropriate real estimate of construction costs.[493] The Econtech, Macromonitor and CEG construction cost forecasts are set out in table J.22.

Table J.22: CEG's proposal on real construction cost escalators (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14
Econtech	0.2	0.6	1.3	1.1	1.2	1.8	2.4
Macromonitor	4.3	3.5	0.5	0.3	1.0	2.1	2.8
CEG	2.3	2.1	0.9	0.7	1.1	1.9	2.6

490 CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008.

491 The Econtech forecast was obtained from the construction council forecasting website at http://www.cfc.acif.com.au/ CEG advised that the data it used was updated on 15 November 2007.

492 Macromonitor, *Australian Construction Outlook 2008*, November 2007; Macromonitor, *Forecasts of cost indicators for the electricity transmission sector, New South Wales & Tasmania*, February 2008, p. 19.

493 The total engineering construction cost forecasts used by Macromonitor and Econtech are based on the Australian Bureau of Statistics (ABS) publication, Engineering Construction Activity, Australia (ABS catalogue no. 8762.0). This publication contains estimates of engineering construction activity in Australia, which were complied from the Engineering Construction Survey. This survey measures the value of all engineering construction work undertaken in Australia. This value excludes the cost of land, repair and maintenance activity, the value of any transfers of existing assets, the value of installed machinery and equipment not integral to the structure and the expenses for relocation of utility services. However, a contract for the installation of machinery and equipment which is an integral part of a construction project is included. The type of construction projects covered by the survey include bridges, railways, pipelines, power stations, transmission/distribution electricity lines.

Source: CEG, *Escalation factors affecting expenditure forecasts: a report for NSW electricity businesses*, April 2008, p.27; CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2008, p. 26-27.

AER considerations

The Econtech engineering construction cost forecasts used by CEG were obtained from the Construction Forecasting Council's (CFC) website. The AER has obtained updated engineering construction cost forecast from this source and deflated them by CPI in order to provide real forecasts.[494] The AER notes that there is no publicly available updated data on engineering construction costs from Macromonitor. The updated Econtech forecasts for engineering construction costs are shown in table J.23.

Table J.23: Econtech's real engineering construction cost escalators (per cent, real)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Average
Updated Econtech engineering	–0.3	–1.9	0.4	1.2	1.1	1.0	1.0	0.9

Source: Construction Forecasting Council website http://www.cfc.acif.com.au/.
Note: The average is calculated for 2009–10 to 2013–14 (the next regulatory control period).
The figures provided on CFC's website take into account data and other information available up to 1 May 2008.

There is some difference between the construction cost forecasts provided by CEG and the updated Econtech construction cost forecast. Given the change in economic conditions since 2007, the AER considers that it is reasonable to adopt the updated Econtech construction cost forecasts as they reflect the most recent information and therefore are a reasonable expectation of movements in construction costs into the next regulatory control period.

Further, the AER does not consider it appropriate to rely on the forecasts presented by Macromonitor because there is little information available on the methodology used to forecast engineering construction costs.

Accordingly, the AER will apply the updated Econtech construction cost forecasts to Transend's capex proposals.

AER conclusions

The AER's conclusion on forecast construction cost escalators is set out in table J.24.

Table J.24: AER's conclusion on real construction cost escalators (per cent)

	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	Average
AER	–0.3	–1.9	0.4	1.2	1.1	1.0	1.0	0.9

[494] Econtech, *Australian National State and Industry Outlook*, 22 July 2006.

Lag in application of escalators

In its draft decision for the SP AusNet transmission determination, the AER reviewed a proposal from SKM to recognise a 1−2 year lag effect between base metals prices (i.e. copper, aluminium) and transmission equipment prices (i.e. power transformers, switchgear). Based on an analysis of the movements in base metals prices against relevant producer price indices (PPIs) published by the Australian Bureau of Statistics (ABS), the AER concluded that:

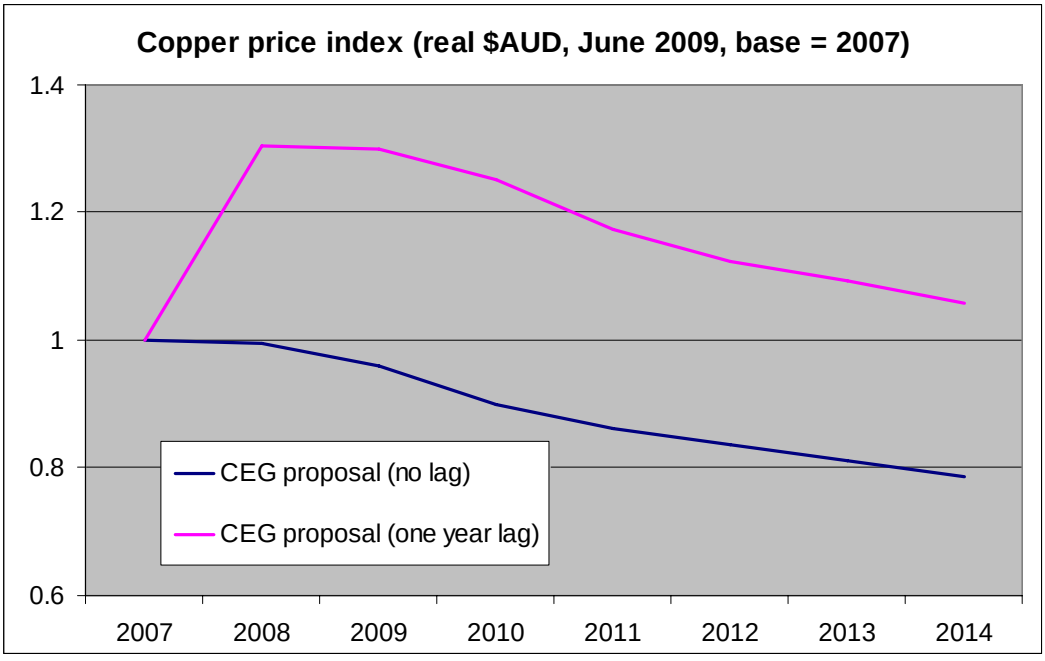
> On the balance of the available information SKM's assumption of a lag between movements in base metals prices and transmission equipment prices appears reasonable, however the AER considers that the lag is not likely to be greater than one year over the forthcoming regulatory control period.[495]

The effect of this was to 'shift' the peak in base metals prices from 2006−07 to 2007−08, on the assumption that movements in transmission equipment prices lag movements in base metals prices by twelve months.

Transend has proposed a one year lag to copper and aluminium, consistent with the AER's decision for SP AusNet. CEG also recommended applying a lag to crude oil prices.

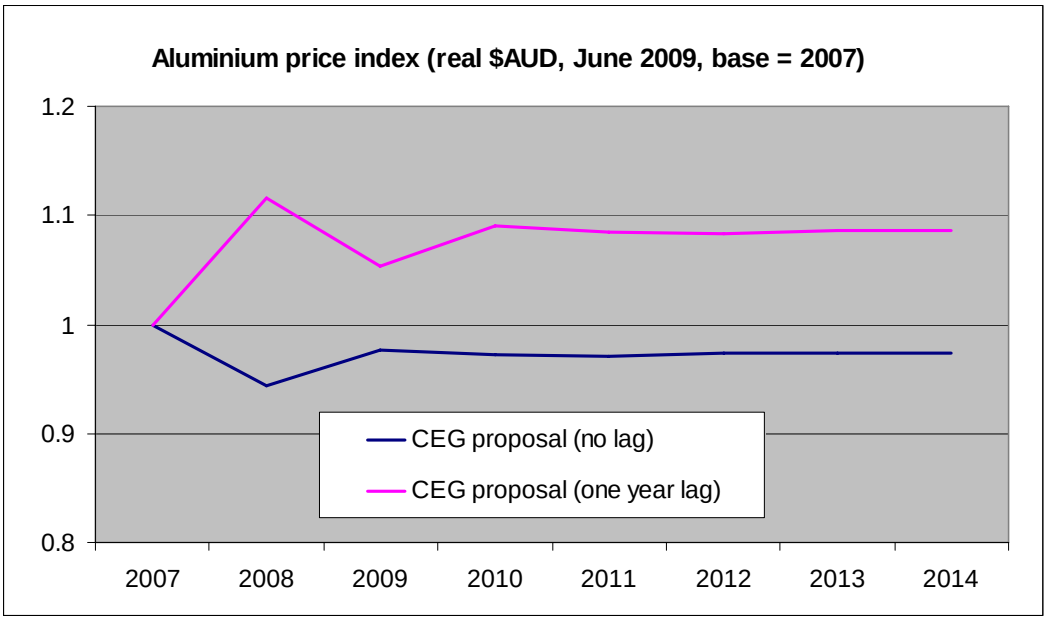
As figures J.8 and J.9 illustrate for copper and aluminium, the effect of the one year lag assumption is to increase the real escalation for these inputs applied over the 2007−14 period.

Figure J.8: CEG's proposal on one year lag in copper prices



[495] AER, *SP AusNet transmission determination 2008–09 to 2013–14: Draft decision*, 31 August 2007, p.90

Figure J.9: CEG's proposal on one year lag in aluminium prices



Source: CEG, *Escalation factors affecting expenditure forecasts: a report for Transend*, April 2009, p.40-43; AER analysis

It is noted that neither CEG nor Transend have presented any new evidence to justify a lag between movements in base metals and equipment prices. In particular, there has been no evidence presented to support a lag between movements in crude oil prices and electrical equipment prices.

Therefore, given the lack of evidence to support the proposal, the AER does not consider it reasonable to apply a lag for crude oil prices and labour costs.

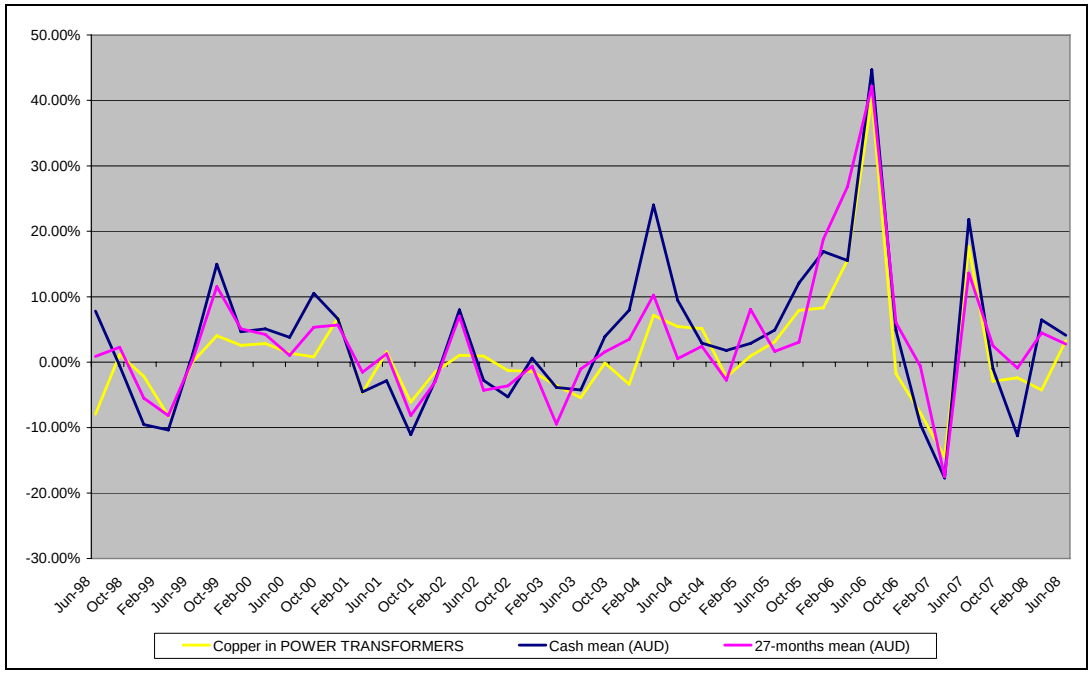
The AER has also re-examined the case for a one year lag application of base metals such as copper and aluminium escalators, using similar analysis to that presented in the SP AusNet transmission determination and taking account of further data that is now available. It is noted that at the time of the SP AusNet decision, the extent of a lag in the data was somewhat unclear, as noted by the AER:

> Overall, growth in the PPI appears to track growth in base metals prices quite closely after 2005, possibly indicating a greater flexibility built into contracts after this point in time. The data tends to suggest that any significant lag (i.e. >1 year) persistent over the period 2003-2005 may have been transitory, and has since subsided. Further, given that base metals prices are expected to return to around the long-run average over the period 2006-07 to 2013-14, the two indices may begin to track quite closely again (as in the pre-boom period 1998-2002).[496]

Figures J.10 and J.11 show the quarterly change in LME prices for copper and aluminium against ABS PPIs over the period 1998−2008.

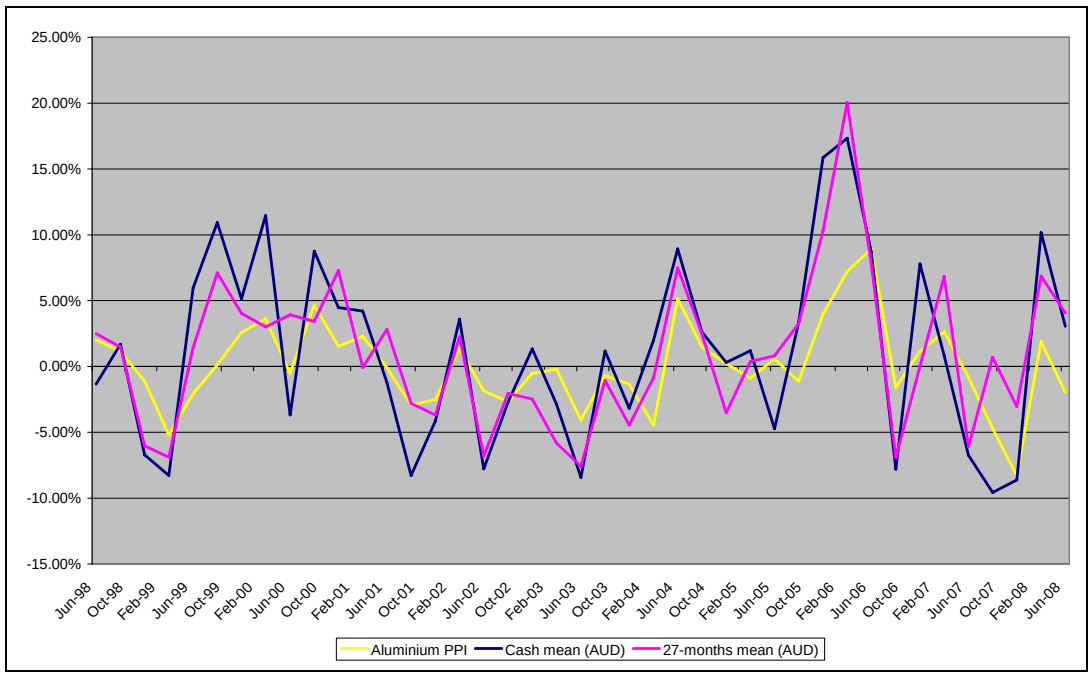
[496] AER, *SP AusNet transmission determination 2008–09 to 2013–14: Draft decision*, 31 August 2007, p.322

Figure J.10: LME and PPI copper prices – quarterly % change 1998–2007 (AUD, nominal)



Sources: LME;[497] ABS[498]

Figure J.11: LME and PPI aluminium prices – quarterly % change 1998–2007 (AUD, nominal)



497 The London Metal Exchange (LME) <www.lme.co.uk>, Average Official and Settlement Prices US$/TONNE – Copper (cash mean, 27-month futures). The LME data is converted into Australian dollars using actual USD/AUD data from the RBA.

498 ABS <www.abs.gov.au>, 6427.0 (Table 47) – Producer Price Indexes, 'Copper Materials Used in the Manufacture of Electrical Equipment (Power Transformers)', Australia.

Sources: LME;[499] ABS[500]

Although the PPIs examined are imperfect proxies for the electrical equipment purchased by network businesses, the AER considers that they provide a useful indicator of the relative growth rates at various stages of production.

Based on the data presented in figures J.10 and J.11, the AER does not consider that a lag between movements in base metals and electrical equipment prices is evident. While the two indices clearly do not have a one-to-one relationship, there is a strong correlation—both in the magnitude and timing of price increases. Any lag between movements in base metals and movements in the PPIs selected for analysis appears to be, at most, three to six months.

On this basis the AER has revised its view from the SP AusNet decision, and now considers that there is no need to recognise a lag between movements in base metals prices and electrical equipment prices. Accordingly, the AER does not agree with the application of a one year lag to copper and aluminium prices.

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499 The London Metal Exchange (LME) <www.lme.co.uk>, Average Official and Settlement Prices US$/TONNE – Aluminium (cash mean, 27-month futures). The LME data is converted into Australian dollars using actual USD/AUD data from the RBA.

500 ABS <www.abs.gov.au>, 6427.0 (Table 30) – Producer Price Indexes, 'Indexes of Metallic Materials used in the Fabricated Metal Products Industry', Australia.

Appendix K: Changes required to Transend's pricing methodology

As required by clause 6A.12.1(e) of the NER, this section sets out the changes required and matters to be addressed before Transend's proposed pricing methodology will be approved by the AER.

Transend proposed pricing methodology 1 July 2009 to 30 June 2014

K.1 4.8 Publication of Transmission Prices

Omit the paragraph in page 11, and substitute:

> For the purposes of determining the *distribution service* prices as outlined in clause 6A.24.2(b) in part J of Chapter 6A of the *Rules*, *Transend* will *publish* the prices for each of the *categories of prescribed transmission services* to apply for the following *financial year*, by 15 May each year on its website (www.transend.com.au).

K.2 7.3 Cost allocation

On page 15 (paragraph 2, line 3), replace "…outlined in clause 6A.22.3(d) of the *Rules*…" with "…outlined in clause 6A.23.2(d) of the *Rules*…".

K.3 9.2 Prescribed exit services

In page 20, replace the sentence "…in section 9.1 above will be followed to determine the price for *prescribed entry services*…" with "…in section 9.1 above will be followed to determine the price for *prescribed exit services*…"

K.4 9.3 Prescribed common transmission service prices

In page 22, omit clause (5) and replace with:

> (5) The charge calculated for *prescribed common transmission services* or the adjusted non-locational component of *prescribed TUOS services* using the *contract agreed maximum demand* price for a *billing period* in a *financial year* for each *connection point* must be calculated by multiplying the *contract agreed maximum demand* price by the maximum demand for the *connection point* in that *financial year* and then dividing this amount by the number of *billing period*s in the *financial year*.

K.5 Appendix 2

Amend the proposed methodology for the attribution of the *attributable cost share* which corresponds to the radial lines in question to conform to the requirements of clause 6A.23.2(d) of the NER.