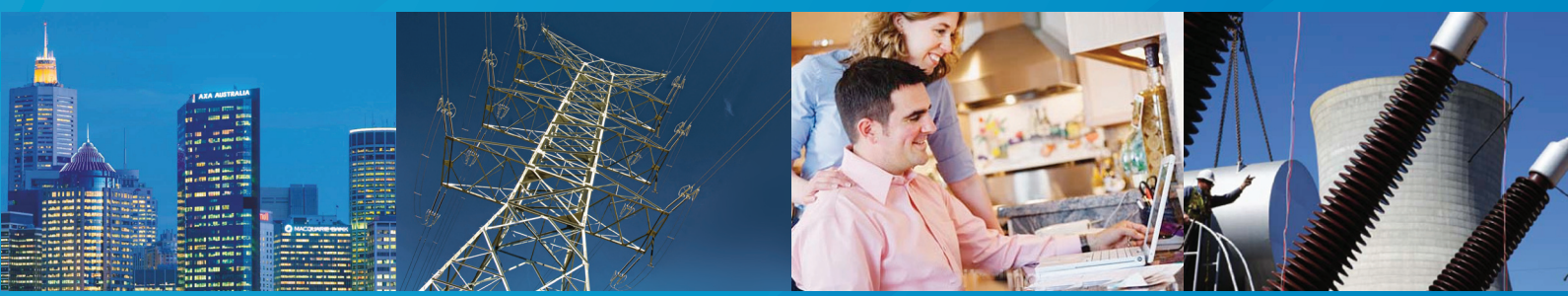
TransGrid

Meeting customer needs for transmission services



TransGrid Revised Revenue Proposal

1 July 2009 - 30 June 2014

January 2009

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Executive Summary

On the 31 May 2008, TransGrid submitted a Revenue Proposal to the Australian Energy Regulator (AER) for the regulatory control period from 1 July 2009 to 30 June 2014.

In its Revenue Proposal, TransGrid set out the revenue requirements necessary to meet the needs of its customers and to efficiently discharge its regulatory obligations. TransGrid demonstrated how it works with its customers to plan, develop and manage the network to meet customer service standards.

TransGrid also demonstrated that it provides world-class service performance, both in terms of reliability of supply and cost efficiency. This service delivery is a critical element underpinning the economic performance and growth of New South Wales, the most populous State in Australia which contains the financial hub of the country with its largest city of Sydney.

TransGrid has for many years provided highly reliable transmission services at the lowest cost to consumers in the National Electricity Market.

TransGrid's Revenue Proposal set out the justification for its future operating and capital investment requirements in light of an increasing need for network development, the challenges of managing a growing and maturing asset base and strong growth in input costs.

The AER published a Draft Decision on its transmission determination for TransGrid on 28 November 2008.

The AER's Draft Decision largely recognises TransGrid's achievements for transmission service quality and efficiency and in many respects recognises the basis of TransGrid's estimate of future operating cost and capital investment requirements. In a number of areas, however, the AER did not accept TransGrid's Revenue Proposal.

In this revised Revenue Proposal, amendments have been made so as to incorporate the substance of any changes required by, or to address matters raised in the AER's Draft Decision. Where TransGrid does not accept the changes proposed by the AER, TransGrid has provided a comprehensive response to the matters raised in the AER's Draft Decision.

TransGrid has also endeavoured to take account of the current financial conditions by moderating the forecast of cost escalators based on the latest expert advice.

Similarly, TransGrid has proposed a reasonable approach to setting the cost of capital parameters that will apply to the 2009-14 regulatory control period (noting the fact that the outcomes of the current cost of capital review will not apply to TransGrid until the 2014-19 period).

TransGrid's revised capital expenditure (capex) forecast for the 2009-14 period is $2,516 million ($2007-08). This compares to the AER's capex allowance of $2,377 million ($2007-08) in the Draft Decision.

TransGrid has incorporated the substance of the changes required by the AER's Draft Decision relating to capital expenditure in its revised Revenue Proposal with the exception of those related to:

- Dumaresq - Lismore 330kV transmission line;
- Cooma 132kV substation replacement;
- Beaconsfield West 132kV GIS replacement;
- Instrument transformer replacement program;
- The value of and the application of project cost estimating factors;
- The value of and the application of cost escalators;
- The application of the weighting of escalators over a fixed 5-year period;
- Cost estimation risk factors; and
- Contingent projects.

TransGrid has also moved one of the contingent projects, Williamsdale Stage 2, from its Revenue Proposal to the ex ante capex allowance, due to the significant progress it has achieved in resolving some of the planning and development issues associated with this project.

TransGrid's revised operating expenditure (opex) forecast for the 2009-14 period is $810 million ($2007-08), compared to the AER's opex allowance of $765 million ($2007-08) in the Draft Decision.

TransGrid has incorporated the substance of the changes required by the AER's Draft Decision relating to its opex forecasts, with the exception of those related to:

- Labour cost escalation;
- Defect maintenance for new assets;
- Self insurance costs;
- Debt raising costs; and
- Equity raising costs.

TransGrid's revised operating cost proposal will continue to see efficiency gains being implemented within the business and the operating costs of the business, relative to its increasing asset base, continue to fall over the course of the next regulatory control period.

Based on its capex and opex forecasts, TransGrid has determined its revenue requirements using the post tax building block approach outlined in the National Electricity Rules and the AER Guidelines. The revised maximum allowed revenue is $4,143 million (nominal) compared to $3,906 million in the AER's Draft Decision.

TransGrid is subject to the AER's service target performance incentive scheme, which is designed to encourage network service providers to improve or maintain their network service performance levels. The AER made a small number of minor

changes to the scheme's parameters proposed by TransGrid. TransGrid has incorporated the substance of the changes required by the Draft Decision relating to the Service Target Performance Incentive Scheme in its revised Revenue Proposal.

TransGrid has incorporated the substance of the changes required by the AER's Draft Decision in relation to its Pricing Methodology, with the exception of the specification of points in the network where costs will be allocated and prices determined, as this is considered impractical to implement.

As TransGrid's costs represent only about 6% of the total delivered price for the average energy user, the price impact of TransGrid's revised Revenue Proposal is expected to be an increase of about $4.90 per annum for a typical household in NSW.

With this modest increase, TransGrid's customers and end users in NSW and the ACT can expect to continue to benefit from the lowest cost transmission service in Australia.

1. Introduction

1.1 Background

TransGrid owns, operates, maintains and manages one of the largest high-voltage transmission networks in Australia and is the principal and coordinating electricity transmission network service provider (TNSP) in New South Wales.

On the 31 May 2008, TransGrid submitted a Revenue Proposal to the Australian Energy Regulator (AER) for the regulatory control period from 1 July 2009 to 30 June 2014. Under the National Electricity Law and the National Electricity Rules (NER), the AER is responsible for regulating the revenues of TNSPs in the National Electricity Market (NEM) by establishing revenue caps.

In making its Draft Decision on TransGrid's Revenue Proposal, the AER relied on the reports of a number of consultants the AER had engaged to review various aspects of TransGrid's proposal. These consultants included Parsons Brinckerhoff Australia Pty Ltd (PB), McLennan Magasanik Associates (MMA), Nuttall Consulting and Econtech. During the course of the review of TransGrid's Revenue Proposal, a number of minor errors were identified. Following the submission of the initial Revenue Proposal, TransGrid corrected the minor errors that had been identified and also updated its capex forecast to align with the demand forecast contained in TransGrid's Annual Planning Report 2008 which was published after the submission of the Revenue Proposal. These changes were incorporated into an updated proposal that became the subject of the AER review.

References in this document to estimates and forecasts in TransGrid's Revenue Proposal refer to the updated proposal that was subject to the AER Draft Decision.

The AER published a Draft Decision on its transmission determination for TransGrid on 28 November 2008.

The purpose of this document is to provide a revised Revenue Proposal in accordance with clause 6A.12.3 of the NER. The revised proposal includes a revised total forecast operating expenditure that reasonably reflects the prudent and efficient costs required by TransGrid to meet the operating expenditure objectives. The revised proposal also includes a revised total forecast capital expenditure that reasonably reflects the prudent and efficient costs required by TransGrid to meet the capital expenditure objectives.

The revisions made in this revised Revenue Proposal have been made so as to incorporate the substance of any changes required by, or to address matters raised in the Draft Decision.

Where TransGrid has not revised its Revenue Proposal so as to incorporate the substance of any changes required by, or to address matters raised in the Draft Decision, TransGrid has provided a reponse to the matters raised in the AER's Draft Decision.

In addition to TransGrid's Revenue Proposal (31 May 2008), TransGrid also submitted a proposed negotiating framework for negotiated transmission services

and a proposed pricing methodology for the provision of prescribed transmission services.

The AER accepted TransGrid's proposed negotiating framework, and required two changes to the proposed pricing methodology relating to the use of a demand based pricing structure and the inclusion of details relating to allocation of costs to assets providing both entry and exit services.

As permitted by clause 6A.12.3 (a) (3) a revised proposed pricing methodology has been submitted to the AER together with the revised Revenue Proposal (refer to Appendix H).

1.2 Approach to Revised Revenue Proposal

TransGrid's revised Revenue Proposal is submitted in accordance with Chapter 6A of the NER.

This revised Revenue Proposal supplements TransGrid's Revenue Proposal, as updated during the AER review process, and makes extensive reference to it and the AER's Draft Decision. Therefore, this revised Revenue Proposal should be read in conjunction with those documents.

TransGrid has carefully reviewed all of the matters raised by the AER in its Draft Decision including, in particular, where the AER has made adjustments to TransGrid's proposal. As a result of TransGrid's review, many of the changes proposed by the AER in its Draft Decision have been incorporated in the revised Revenue Proposal. It should be noted that, although TransGrid has incorporated many of the AER's adjustments, this does not necessarily mean that TransGrid agrees with the rationale provided by the AER or its consultants.

Where TransGrid has not fully adopted the AER's Draft Decision, the revised Revenue Proposal provides additional information, including expert reports, to address the matters raised by the AER and to demonstrate that the revised capital expenditure and operating expenditure forecasts meet the NER capital expenditure objectives and operating expenditure objectives respectively.

TransGrid submits this revised Revenue Proposal on the basis that the overall revised proposal, and its capital and operating expenditure forecasts in particular, reasonably reflect the efficient costs of a prudent operator and are consistent with realistic demand assumptions.

2. Opening Asset Base

2.1 Summary

TransGrid's regulatory asset base (RAB) as at 1 July 2004 is prescribed in clause S6A.2.1(c)(1) of the NER as $3,012.76 million. The AER Roll Forward Model prescribes the process to be used to determine the opening RAB for the next regulatory control period and Chapter 11 of TransGrid's Revenue Proposal set out how TransGrid has applied this methodology[1].

In its Draft Decision, the AER:

a) Accepted TransGrid's adjustments to the opening RAB of $14 million for the difference between actual and forecast capex, and $7.9 million associated with the foregone return on that difference (p. 10);

b) Accepted TransGrid's revised RAB due to an indexation error that was identified by TransGrid during the Proposal review (p. 11-12);

c) Accepted updated capex amounts for some inconsistencies with non-network assets identified by the AER during the review (p. 11-12);

d) Determined a reduction in the RAB of $8.1 million due to replaced connection services, which the AER considers would become negotiated transmission services in the 2009-2014 regulatory period under clause 11.6.11 (p. 11-12);

e) Accepted the actual capex for 2007-08, which became available after lodgement of the Revenue Proposal on 31 May 2008 (p. 11-12); and

f) Determined that TransGrid's opening RAB for the 2009-2014 regulatory period is $4,234 million (p.12).

With the exception of the removal of the assets identified in (d), TransGrid agrees with all aspects of the AER's assessment of TransGrid's opening RAB for the next regulatory control period starting 1 July 2009.

TransGrid's position with regard to the assets identified in (d) above is set out in section 2.2.

2.2 Replaced Connection Assets

AER Draft Decision

In its Draft Decision, the AER notes that:

> *"These replacement assets were committed to be constructed after 9 February 2006 and under Clause 11.6.11 they cannot be considered to provide prescribed transmission services, even though the assets they replaced provided prescribed transmission services…Therefore in*

[1] TransGrid, TransGrid Revenue Proposal 1 July 2009 - 30 June 2014, page 108.

accordance with schedule 6A.2.3 the AER has removed the amount of $8.1 million from the RAB to account for these replacement assets."[2]

TransGrid's Response

In response to a request from the AER, TransGrid noted that it had replaced various connection assets during the current regulatory control period. These replacement assets were committed to be constructed after 9 February 2006 (being the relevant date referred to in current clause 11.6.11(a) of the NER) and formed part of the following connection services:

a) Wallerawang 330kV switchyard;

b) Murray switchyard;

c) Munmorah power station switchyard; and

d) Upper Tumut switchyard.

In the AER's Draft Decision, the AER expressed the view that current clause 11.6.11 would operate to classify the services provided by these replacement assets as negotiated transmission services, even though the connection assets which were replaced by these replacement assets previously provided prescribed transmission services.

As a result, the AER's Draft Decision has excluded the value of these replacement assets from the RAB because the NER provides that only the value of assets used to provide prescribed transmission services can be included in the RAB.

At this stage, TransGrid reserves its rights to challenge the AER's interpretation concerning the operation of clause 11.6.11 in these circumstances. However, there appears to be little value in arguing the proper interpretation of clause 11.6.11 at this time when it is understood that clause 11.6.11 will be replaced in the very near future with a new provision that will correct this anomaly.

TransGrid understands that the Australian Energy Market Commission (AEMC) will issue its final Rule Determination concerning the cost allocation arrangements for transmission services (including a new clause 11.6.11) in late January 2009.

Whilst the drafting of new clause 11.6.11 has not yet been finalised, TransGrid understands that:

- These replacement assets will be 'eligible assets' for the purposes of the new clause 11.6.11 (i.e. applying the terms used in new clause 11.6.11, they are assets which replaced or will replace existing assets after 9 February 2006 and are being or will be wholly and exclusively used by TransGrid to provide connection services); and
- On and from the commencement date for new clause 11.6.11, the connection services using these eligible assets will satisfy all of the criteria which needs

[2] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 11.

to be satisfied in order to qualify as 'prescribed connection services' under new clause 11.6.11.

If the new clause 11.6.11 is published in its currently proposed form prior to the AER making its final decision for TransGrid's transmission determination, these replacement assets will be explicitly treated under clause 11.6.11 as providing prescribed transmission services (i.e. prescribed connection services) on and from the date on which the new clause 11.6.11 commences operation.

In other words, prior to the AER's final decision in relation to TransGrid's transmission determination, the cost of these replacement assets could be explicitly dealt with under the revised clause 11.6.11 in accordance with the Cost Allocation Principles, the AER's Cost Allocation Guidelines and TransGrid's Cost Allocation Methodology (i.e. the cost of these replacement assets would be directly attributable to the provision of prescribed transmission services).

2.3 Revised Opening Asset Base

TransGrid's revised opening RAB as at 1 July 2009 is $4,276 million compared to the $4,234 million in the AER's Draft Decision. TransGrid has increased the RAB by the amount of connection assets that were replaced after 9 February 2006 and were not grandfathered under the current clause 11.6.11, and has updated the inflation adjustment for 2008/09.

TransGrid notes that the AER will update the opening RAB roll forward with actual March 2009 quarter CPI before its final decision is made.

Figure 2.1: Regulatory Asset Base as at 1 July 2009 ($m, nominal)

Regulated Asset Base	2004/05	2005/06	2006/07	2007/08	2008/09
Opening RAB	3,012.8	3,103.9	3,228.8	3,397.9	3,735.3
WACC adjusted capex	134.0	154.1	221.2	331.7	581.8
Inflation adjustment	71.1	92.6	78.6	144.1	135.4
SL depreciation	-113.9	-121.7	-130.8	-138.4	-155.3
Closing RAB	3,103.9	3,228.8	3,397.9	3,735.3	4,297.1
Less: difference between actual and forecast capex for 2003/04					13.6
Less: return on difference					8.0
Opening RAB at 1 July 2009					**4,275.6**

3. Forecast Capital Expenditure

3.1 Introduction

Chapter 7 of TransGrid's Revenue Proposal sets out the methodology used to develop the capital expenditure (capex) forecast for the next regulatory control period together with the key assumptions used in determining the capex forecast.

As explained in its Revenue Proposal, TransGrid is facing a significantly higher capex requirement in the next regulatory control period largely due to the augmentation works of three large projects, namely:

- Dumaresq - Lismore 330kV transmission line;
- Bannaby - South Creek 500kV transmission line and substation; and
- Supply to the Inner Metropolitan area of Sydney including the Holroyd to Chullora cables and substations.

In addition, the increase in TransGrid's capex program is driven by:

- The age profile of the infrastructure;
- TransGrid's planning obligations to meet the n-1 licence obligations placed on the NSW distribution network service providers (DNSPs);
- The rising price of electricity transmission equipment;
- Forecast wages growth; and
- Increasing compliance costs associated with community expectations and environmental obligations.

TransGrid's capital proposal was developed using TransGrid's capital expenditure forecasting methodology. This methodology references load growth forecasts, asset management plans, risk analysis, cost estimation and escalations and covers the implementation of network and non-network solutions. The forecasting methodology used by TransGrid was seen by PB as:

> *"a systematic and appropriate process, and… that TransGrid has applied this process in determining its ex-ante capital proposal."*[3]

Key components of this methodology were reviewed in detail by PB in their report on the TransGrid Revenue Proposal and key findings are described below:

- With regard to demand forecasting, PB found:

  "the scenario planning and probabilities methodology used by TransGrid is sound, and represents a robust process that is well documented and evidenced."[4]

[3] PB, TransGrid Revenue Reset An Independent Review, page 86.
[4] Ibid, page 93.

Although PB did not review TransGrid's underlying forecasting methodology, their report did refer to a report commissioned by the AER and undertaken by McLennan Magasanik Associates, which stated that:

"overall it considers the methods and processes adopted by TransGrid to be appropriate, well-considered and reasonable."[5]

- With regard to asset management processes, PB noted that:

  "the TransGrid asset management process is consistent with good industry practice and employs condition monitoring and condition based replacement triggers to maximise the life of assets" and "asset management process and policies are very well implemented within the business"[6]

- With regard to TransGrid's cost estimating methodology, PB concluded:

  "the cost estimating database is sound and suitable for the purposes intended"[7]

The network project capital expenditure forecasting inputs were modelled in TransGrid's Capital Accumulation Model (CAM). This model captures the expenditure from all augmentation and major asset replacement projects and applies Monte Carlo techniques to calculate the portfolio risk profile. The model applies escalation and the weighted impact of planning scenarios and provides an overall risk adjusted value for the capital works program.

In relation to non-network capex, PB's opinion was that TransGrid's

"total non-network capex proposal … was in line with similar businesses… (and) is reasonable"[8]

TransGrid believes that its proposed forecast of required capital expenditure reasonably reflects the efficient costs of a prudent operator in achieving the *capital expenditure objectives* in clause 6A.6.7 (c) of the NER. Further the methodology adopted by TransGrid provides a realistic expectation of the future cost inputs required to achieve the *capital expenditure objectives*. TransGrid believes that it has provided sufficient material for the AER to be satisfied as to these matters, including on the basis of the further information and analysis provided in conjunction with this revised Revenue Proposal. Consequently, TransGrid submits that the AER should accept the forecasts even if they consider there may be other equally or more preferable outcomes.

The following section of this revised Revenue Proposal provides a summary of the AER's Draft Decision on TransGrid's capital expenditure forecast. Those areas not accepted by the AER, where TransGrid is of the opinion that the AER decision requires further consideration, are then discussed in more detail in subsequent sections. TransGrid's revised capex forecast required to meet the NER capital expenditure objectives is provided in section 3.3.11.

[5] PB, TransGrid Revenue Reset An Independent Review, page 85.
[6] Ibid, page 41.
[7] Ibid, page 62.
[8] Ibid, page 187.

3.2 Summary of AER Draft Decision

In its Draft Decision, the AER reviewed TransGrid's capex proposal against the requirements of the NER and made an assessment of TransGrid's forecast capex for the next regulatory control period and:

a) Accepted TransGrid's historical capex in the current regulatory control period as reasonable (p.25);

b) Accepted TransGrid's capital governance framework stating that it contains appropriate controls, checks, accountability, reviews and approval gateways (p. 28);

c) Assessed TransGrid's probabilistic scenario planning as robust, that it reasonably factors in economic and policy environment changes, utilises the latest available information, is an appropriate tool, that the scenarios and probabilities applied are reasonable and the methodology overall enables TransGrid to develop a capex forecast that is reflective of expected planning conditions (p. 32-33);

d) Accepted TransGrid's forecast methodology as appropriate and the demand forecasts provide a realistic expectation of demand for the next regulatory control period taking into account the most recent information available at the time and that the forecasts somewhat anticipate the world economic crisis, which began to emerge around the time the forecasts were prepared (p. 40);

e) Accepted TransGrid's Network Planning Criteria as consistent with good electricity industry practise and reflective of a prudent and efficient TNSP (p. 43);

f) Accepted TransGrid's non-network capex for business IT and for motor vehicles (p. 59);

g) Did not accept TransGrid's forecast capex of $2,626.8 million, updated to $2,549.8 million for APR 2008 and considered that the following adjustments should be made:

    i) Reduce TransGrid's proposed Dumaresq - Lismore line estimate by $36.0 million (p. 52).

    ii) Reduce TransGrid's proposed Cooma Substation replacement estimate by $19.0 million (p.54).

    iii) Reduce TransGrid's proposed Beaconsfield switch gear replacement estimate by $8.1 million (p. 56).

    iv) Reduce TransGrid's proposed Newcastle transformer replacement estimate by $10.5 million (p. 57).

    v) Reduce TransGrid's proposed Hunter Valley - Central Coast easement estimate by $4.0 million (p. 58).

    vi) Reduce TransGrid's proposed Replacement programs estimate by $5.6 million (p. 63).

h) Did not accept TransGrid's application of project factors across the unreviewed capex portfolio on the basis that having reviewed the sample of

projects PB found the application of non-standard project cost factors in four cases, and proposed a reduction of $13.0 million (p. 61-2);

i) Determined the following with regard to TransGrid's Cost Accumulation Process which resulted in a reduction of $89 million in TransGrid's proposed capex allowance:

   i) Accepted TransGrid's Base unit costs as reasonable and provide an appropriate basis to estimate the costs of its forecast capex program (p. 65).

   ii) Accepted TransGrid's S-curves as reasonable for the purposes of developing the capex profile of different projects (p.66).

   iii) Accepted TransGrid's land and easement escalator as appropriate for the purposes of estimating forecast land value growth (p. 69).

   iv) Did not accept TransGrid's producers margin and material cost escalators as appropriate for the purposes of estimating forecast electricity industry infrastructure cost growth (p. 69).

   v) Did not accept TransGrid's electricity gas and water (EGW) and general labour rates as being appropriate for the purposes of estimating forecast wages growth (p. 69).

   vi) Did not accept TransGrid's application of the weighting of escalators over a fixed 5-year period and found they should be applied on an annual basis (p. 73).

   vii) Did not accept TransGrid's cost estimation risk factor as reasonable for the purposes of developing capex estimates (p. 75).

j) Was satisfied that only nine of TransGrid's proposed contingent projects met the requirements of clause 6A.8.1 and proposed a contingent allowance of $1,216 million (p. 81 & 83); and

k) Considered the capex delivery initiatives implemented by TransGrid are likely to provide it with the potential to deliver its capex program in the next regulatory control period (p. 85).

TransGrid has incorporated all aspects of the AER's Draft Decision relating to forecast capital expenditure in its revised Revenue Proposal with the exception of those related to:

- Dumaresq - Lismore 330kV transmission line (g (i));
- Cooma 132kV substation replacement (g (ii));
- Beaconsfield West 132kV GIS replacement (g (iii));
- Instrument transformer replacement program (g (vi));
- The value of and the application of project cost factors (h);
- The value of and the application of cost escalators (i (iv) & (v));
- The application of the weighting of escalators over a fixed 5-year period (i (vi));

- Cost estimation risk factors (i (vii)); and
- Contingent projects (j).

TransGrid's response addressing each of these matters raised in the AER's Draft Decision is included in the remainder of this chapter together with a revised capex forecast and revised proposed contingent projects for inclusion in the AER's Final Decision.

TransGrid is confident that its revised capex forecast is both efficient and prudent and that it meets the NER capital expenditure objectives.

It should be noted that revised forecasts for specific projects in section 3.3.1 to 3.3.5 are base cost estimates (that is, exclusive of cost escalation and risk adjustment).

3.3 Response to Matters Raised in the AER's Draft Decision

This section presents TransGrid's response addressing matters raised in the AER's Draft Decision where TransGrid does not accept the AER's proposed changes and is providing additional information for inclusion in the AER's Final Decision.

3.3.1 Dumaresq - Lismore 330kV line

In its review of the Dumaresq - Lismore 330kV transmission line project, the AER considered that TransGrid's project documentation adequately identifies the need to re-enforce the Far North Coast sub-system to overcome voltage and thermal constraints and that this project represents prudent investment. However, the AER has reduced TransGrid's proposed capex allowance by $36.0 million as a result of its review of this project.[9] The issues raised by the AER are addressed below:

(a) Number of circuit breakers at Dumaresq

AER Draft Decision

The AER has reduced TransGrid's capex allowance by $2.6 million on the basis that it considered TransGrid had failed to reasonably justify the required number of circuit breakers proposed for Dumaresq Substation.

The PB report states:

> *"The substation works at Dumaresq require five new circuit breakers to be installed in a 'breaker-and-a-half' arrangement. In PB's view two of these circuit breakers only provide limited benefits under normal situations (but they do marginally improve operation flexibility and increase the extent of redundancy)."*[10]

While not identified in the PB review, correspondence during the review between PB and TransGrid has identified the circuit breakers to be the centre circuit breaker in the breaker and a half scheme, and the second circuit breaker for the Lismore line.

[9] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 52.
[10] PB, TransGrid Revenue Reset An Independent Review, page 120.

The AER Draft Decision states:

> *"The AER agrees with PB's findings that TransGrid has not reasonably demonstrated that all of the circuit breakers identified by TransGrid are required by a prudent and efficient TNSP in TransGrid's circumstances."*[11]

and

> *"On this basis, the AER endorses PB's recommendation to remove the associated $2.6 million from the capex allowance."*[12]

TransGrid's Response

The AER has provided no analysis to demonstrate that the proposed busbar arrangement that results from the exclusion of the circuit breakers is prudent.

TransGrid considers that at least one of the circuit breakers should be included in this revised capex allowance as it reasonably reflects the costs a prudent operator would require.

TransGrid asserts that the connection of the Lismore line through a double breaker arrangement offers greater operational flexibility and reliability and PB has acknowledged there is some improvement in both these areas. However, TransGrid is prepared to accept the AER's finding that the additional expenditure is not required in order to achieve the capital expenditure objectives.

However, TransGrid does not concur with the AER's finding that TransGrid has not reasonably demonstrated that the provision of the centre circuit breaker at Dumaresq is prudent and efficient. With respect to the AER finding:

- The arrangement represents a reduction in reliability and operational flexibility from that which presently is in place and for which this switching station has been designed and operated to date;
- The AER proposed arrangement will require the introduction of additional constraints on the flowpath to undertake maintenance that could otherwise be avoided. These constraints may potentially have a significant financial impact on market participants;
- The AER proposed arrangement will require the separation of Queensland from the remainder of the NEM for the maintenance of equipment in the centre switchbay. TransGrid believes the separation of Queensland from the remainder of the NEM may have a significant financial impact on market participants;
- The revised arrangement seems at odds with the AER's stated goal of reducing the market impact of transmission constraints; and
- The arrangement is inconsistent with good electricity industry practice for major interconnector flow paths and may be inconsistent with the AER's stated aims of reducing market impacts caused by outages.

[11] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 52.
[12] Ibid, page 223.

Refer to further information provided by TransGrid in Appendix I.

TransGrid considers that the proposed capital expenditure on the centre circuit breaker is required in order to achieve the capital expenditure objectives in clause 6A.6.7 of the Rules. In particular, the centre circuit breaker is essential for maintaining the quality, reliability and security of supply of prescribed transmission services and for maintaining the reliability and security of the transmission system through the supply of prescribed transmission services.

TransGrid has demonstrated the arrangement resulting from the removal of the centre circuit breaker at Dumaresq, as set out in the AER's Draft Decision, is inappropriate and inconsistent with good electricity industry practice. TransGrid's revised proposal includes provision for this additional circuit breaker at a cost of $1.3 million.

(b) Application of scoping cost factors on line works

AER Draft Decision

The AER noted that it shared PB's concern regarding a lack of transparency in the application of a generic 'scoping cost factor on line works' applied to line construction costs for this project. The AER has reduced the scoping cost factor from 15 per cent to 10 per cent because it considers the scope of the project is reasonably well known to TransGrid and proposes that 10 per cent more reasonably reflects the costs that would be incurred. This has resulted in a reduction of $4.0 million.

TransGrid's Response

TransGrid has conducted some further analysis of the Dumaresq - Lismore 330kV transmission line project cost estimate that demonstrates that the cost factors used reflect a realistic cost input for this revised Revenue Proposal capex allowance.

The feasibility report for the Dumaresq - Lismore 330kV transmission line project was completed in 2006 and was prepared in line with the feasibility process and estimating database that were in use at that time. TransGrid's feasibility report procedure and estimating database are regularly reviewed and updated to ensure that project scopes and estimates are appropriate for the project being investigated.

At the time of the preparation of the Dumaresq - Lismore 330kV transmission line feasibility report, the term 'Scoping Cost Factor' was used to account for scope detailing and additional costs not identified in the concept phase development of project scope and cost. The scoping cost factor used at the time is equivalent to the Ancillary Works Factor (AWF) currently used in TransGrid's feasibility process and described in the Capex Estimating Database report. Only the scoping cost factor was applied in this instance; there was no AWF applied. In reviewing the Dumaresq - Lismore 330kV transmission line project, it would appear that PB did not recognise these as equivalent terms.

The AWF is used to account for the minor project costs that are not captured by the high level scoping using major project components carried out during the concept phase of a project. This includes the costs of integrating the new project into the existing network, changes to control and protection systems, and ancillary/incidental

works that occur during the construction period, which are covered by schedule of rates allowances within the construction contract.

PB's review of TransGrid's project cost factors found that:

> *"Following a review of the additional documentation provided by TransGrid to support these factors, PB is of the opinion that the basis for deriving the standard factors applied by TransGrid is generally well documented in the Capex Estimating Database - Factors document. On the basis of our review, PB accept the underlying assumptions and historical alignment … demonstrated by TransGrid."*[13]

The particular cost factors used for the line works in the Dumaresq - Lismore 330kV transmission line project feasibility report are the same as the standard cost factors as outlined in TransGrid's report 'Capex Estimating Database - Factors'. These are the standard cost factors that have been found from assessing similar previous projects to be applicable to constructing a new line on the route of an existing line. As stated by PB, the majority of the line route for the Dumaresq - Lismore 330kV transmission line is anticipated to be constructed on the route of the existing Tenterfield - Lismore 132kV transmission line.

TransGrid's knowledge of the scope of a project at the time of a feasibility study is not fully developed due to the limited nature of the investigations undertaken. Only potential line corridors and high level scope are identified at the feasibility stage and standard cost factors are applied to account for the additional project scope that will be identified during the community engagement, environmental assessment, detailed design and project implementation.

In summary, the 'Scoping Cost Factor' used in the Dumaresq - Lismore 330kV transmission line project feasibility study is equivalent to the Ancillary Works Factor currently used in TransGrid feasibility studies. The level of 15 per cent for this factor in the Dumaresq - Lismore 330kV transmission line project feasibility report is the standard level as set out in the documentation for this type of project and is consistent with TransGrid's current process and procedure (as endorsed by PB). On this basis, it is reasonable to conclude that the cost factor applied to the estimate for these works results in a realistic cost input for this revised Revenue Proposal capex allowance.

(c) Application of escalation to project cost estimate

AER Draft Decision

The AER agreed with PB's analysis that TransGrid had applied an unreasonably high CPI adjustment of 10.1 per cent and considered 6.2 per cent was more reflective of the inflation rate that a prudent operator in TransGrid's circumstances would be expected to incur over the two year period. This has resulted in a reduction of $7.4 million.

[13] PB, TransGrid Revenue Reset An Independent Review, page 69.

TransGrid's Response

It has been recognised in recent revenue determinations (Powerlink, SP AusNet, ElectraNet and TransGrid) that:

> *"At a general level, the AER has an obligation to provide businesses with a reasonable opportunity to recover efficient costs associated with their ongoing operation. In recent decisions the AER has therefore permitted capex allowances to be escalated in real terms for input cost increases above that associated with CPI."*[14]

The application of the historic escalation factors and component weightings (as applied in the AER's Draft Decision) to the Dumaresq - Lismore 330kV transmission line project, for the period from the completion of the feasibility report to 2008, results in an escalation of approximately 14.8 per cent for the two years.

TransGrid's Revenue Proposal estimate of $166.6 million is a 10 per cent increase from the feasibility report estimate. This is higher than CPI at 6.2 per cent but lower than the figure that would be obtained by applying the escalation factors and weightings in the AER's Draft Decision. (The 10 per cent was applied at the time of the preparation of the capex forecast for TransGrid's Revenue Proposal to take account of recent project information due to the project being a committed project and thus not within the feasibility estimating process.) TransGrid is, therefore, being conservative in its revised capex allowance proposal by not applying the escalation factors and weightings in the AER's Draft Decision.

TransGrid considers it has demonstrated the escalation applied in the case of this project to be reasonable and prudent.

(d) Easement double count

AER Draft Decision

The AER has identified a double counting of a $22 million easement in the project.

TransGrid's Response

TransGrid accepts the AER finding on the double count and has made the necessary adjustment. In light of this issue TransGrid has reviewed its capex program and has confirmed that this has not occurred elsewhere.

(e) Conclusion

The AER review of TransGrid's estimating process found:

> *"… that TransGrid's base unit cost objects are reasonable and provide an appropriate basis to estimate the cost of its forecast capex program. In particular, the AER notes that the majority of costs were within 20 per cent of PB's benchmark costs, and where this did not occur the rationale provided for this difference was reasonable. Accordingly, the AER is satisfied that*

[14] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 66.

> *TransGrid's proposed base unit costs reflect a realistic expectation of the efficient cost inputs required to achieve the capex objectives, consistent with the capex criteria."* [15]

During the AER review, TransGrid presented data on the Dumaresq - Lismore 330kV transmission line project in its report, 'Capex Estimating Database - Benchmarking'. As part of the benchmarking process, TransGrid used the feasibility report scope in its current Capex Estimating Database and project cost information relating to bids it received in 2007 in relation to the Wollar - Wellington 330kV transmission line project to produce an up to date estimate.

TransGrid also obtained an independent cost estimate for the Dumaresq - Lismore 330kV transmission line project. Both the TransGrid estimate from its current Capex Estimating Database and the independent estimate are higher than the estimate included in TransGrid's Revenue Proposal.

TransGrid has concluded:

- The easement double count is adjusted for;
- One circuit breaker is to be deleted from the Revenue Proposal estimate;
- The 'Scoping Cost Factor' used for this project should not be adjusted as it is equivalent to the current standard cost factors for this type of project and its application in this case is consistent with current practice as endorsed by PB; and
- The escalation factors proposed are less than those proposed by the AER[16] in its Draft Decision and should therefore not be reduced.

Having made these adjustments, the estimate proposed in TransGrid's revised Revenue Proposal is still less than TransGrid's current project estimate and the independent estimate it obtained. TransGrid is, therefore, conservative in its revised capex allowance proposal and further reductions by the AER are unwarranted and do not allow TransGrid the opportunity to recover at least its efficient costs.

TransGrid considers it has demonstrated the Dumaresq - Lismore 330kV transmission line project estimate included in its Revenue Proposal adjusted for a one circuit breaker reduction and the easement double count to be capital expenditure that reflects the capital expenditure criteria, including reflecting costs that a prudent operator would require to achieve the capital expenditure objectives and a realistic expectation of cost inputs required to achieve the capital expenditure objectives.

The total estimate included for this project in TransGrid's revised proposal is $162.2 million with a breakup shown in Figure 3.1 below.

Figure 3.1: Dumaresq - Lismore Project Estimate ($k, 2008)

2010	2011	2012	2013	2014	Total
21,658	72,756	67,756	-	-	**162,170**

[15] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 65.
[16] Ibid, page 69.

3.3.2 Cooma 132kV substation replacement

AER Draft Decision

The AER considers TransGrid has identified a need to address the condition and related issues of the existing Cooma 132kV substation. It also recognises that factors outside of NPV assessments such as risk reductions are valid in making investment decisions but these factors should be rigorously and systematically examined particularly where they lead to selection of an option which has the highest cost.

The AER found the most efficient option to address this identified need is through refurbishment of the substation on its existing site (without busbar works). The resulting adjustment to this project results in a decrease to TransGrid's capex allowance of $19 million.[17]

In reaching this conclusion, the AER gave consideration to advice from PB including the following concerns noted by PB with regard to TransGrid's Cooma Substation business case:

- Full consideration was not given to the refurbishment of the transformers and regulators, particularly since they were regarded as aged but still serviceable;
- Provision for a 330kV substation layout was made in the remote replacement option but not in the other options. The justification for this provision was not provided by TransGrid; and
- TransGrid included a provision of $9.4 million for new control and protection in the in-situ replacement options. PB considered a more appropriate allowance for this work to be $1 million, thus the costs of the in-situ options are significantly overstated.

TransGrid's Response

TransGrid has reviewed the range of options and the costing and evaluation of the options. This process has involved an independent cost estimate of the options being obtained, following which a revised option evaluation was carried out.

Based on this process, TransGrid maintains that the selection of the 'Greenfield' rebuild of the Cooma substation at the Cooma North site is the most prudent and efficient option and has developed an updated estimate for inclusion in its revised Revenue Proposal.

In its original Revenue Proposal, TransGrid examined three options for the renewal of Cooma Substation:

1. Reconstruction of the substation at a new site ('Cooma North');
2. An in-situ project package, including replacement of the busbars; and
3. An in-situ replacement, excluding replacement of the busbars.

[17] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 54.

The level of accuracy of the initial cost estimates used in the initial project evaluation varied across the options. The Greenfield construction (Option 1) is a well understood process and this option was able to be scoped sufficiently to enable a project estimate to be derived from TransGrid's cost estimating database.

For the in-situ rebuild options (Options 2 and 3), an initial assessment of costs and risks associated with the renewal of this substation indicated that an in-situ rebuild would be complex requiring careful staging, outage management, operational constraints, longer project construction requiring more highly skilled resources and would involve significant risk during implementation in a live substation.

Detailed consideration of the scoping of a project is required before a reasonably accurate estimate of the project cost can be compiled. Pending the scoping of those options, and noting that this project was in the conceptual stage of development and had not yet advanced to project commencement status under TransGrid's capital governance process, high-level estimates were prepared by scaling components of estimates from similar projects.

These estimates were used in the development of the project evaluation for the Revenue Proposal. It is accepted that such estimates have a lower level of accuracy than estimates that have been scoped and derived from the Capex Estimating Database.

Since that time, the in-situ rebuild options have been reviewed in detail and a feasible implementation strategy developed. New estimates for the two options have now been prepared using the Capex Estimating Database such that the level of accuracy of the estimate for all the Cooma options is equivalent.

The higher estimates that result for the in-situ options reflect the cost of the complex project staging that is required with a rebuild and include some provision for site factors associated with implementation of major works within an in-service substation.

A new option ('Option 4') was also developed for the replacement of the substation on a new site close to the existing substation. This option has been identified as feasible and is slightly lower cost than construction at Cooma North. It does, however, constrain the long term development of the substation, most particularly its possible conversion to 330kV operation.

To confirm the accuracy of the revised estimates, an independent costing was obtained from engineering consultants Sinclair Knight Merz (SKM). The independent estimates were within 5 per cent of TransGrid's estimates. This is considered to be well within the level of accuracy of an estimate prepared at this stage of a project. SKM's report is included in this Revised Proposal as Appendix C.

The project evaluation documents have been revised to take account of these updated estimates and to include a sensitivity analysis.

The revised business case prepared using the updated cost estimates shows that the 'Greenfield' options (Options 1 and 4) are preferred on the basis of being the most efficient options (highest NPV). These options also result in the lowest residual risk. It is noted, however, that the difference between all options in economic (NPV) terms

is relatively small and thus other factors are important in determining the selection of the preferred option.

As the two 'Greenfield' options are very close in terms of NPV (within 4 per cent), Option 1 (Cooma North) has been selected as it better facilitates future development, eliminates line congestion around the existing Cooma Substation and minimises in the longer term the impact on the community.

With regard to the specific issues raised by PB:

- *Transformer Condition*

  The business case clearly shows that No. 1 and No. 2 transformers and the regulators should be removed as a result of their condition. Refurbishment is not considered to be feasible for these two transformers as condition monitoring results indicate that, in addition to high moisture and acidity, their insulating papers are aged to an extent that the winding and insulation systems would need to be replaced thereby making the cost of refurbishment prohibitive. These transformers were manufactured in 1960. The condition ranking of these transformers indicate that they should be replaced in the next regulatory control period.

  No. 3 Transformer is serviceable and TransGrid has already identified that No. 3 Transformer at Cooma is suitable for re-use and would be released on replacement for a subsequent project in the 2014 - 2019 regulatory control period.

- *Allowance for 330kV layout*

  The provision for a 330kV layout has been removed from the capex forecasts for all options for this project.

- *New control and protection costs*

  Costs for new control and protection in the in-situ replacement options were initially presented to the AER in the form of high-level estimates prepared by scaling components of estimates from similar projects.

  These estimates were presented in a different format to the estimates normally prepared from the Capex Estimating Database, where the control and protection costs included all associated labour, material and equipment costs involved in the replacement of the control room by a new separate building and consequentially included the replacement of all switchyard to control building secondary cabling together with associated cable trench and ducting works.

  In the estimate derived from the Capex Estimating Database, only the material cost of the relays and panels is exclusively shown under the protection and control line entry, with all labour, building and cabling costs included under separate items. The estimates for these separated items have to be added to the control and protection costs in order to allow a like for like comparison with the costs for the options prepared using the interim estimate approach.

The assessed $8.4 million 'overstatement' of protection and control costs for the in-situ replacement option(s) fails to recognise the scope of works included in the protection and control line item. The reduced amount would only cover the material costs to supply the relays and panels, and would not cover:

- The supply and installation of a new pre-fabricated demountable control building;
- The supply and installation of replacement switchyard to the new control building cabling, including associated switchyard kiosk, cable trench and duct works; and
- The significant labour costs to plan, coordinate, install and commission the new panels, relays and control system equipment in a manner that does not effect the reliability of supply.

Therefore, the recommended $8.4 million protection and control cost reduction included in the Draft Decision has been reinstated. This is also supported by the independent estimate provided by SKM.

TransGrid therefore maintains that the selection of the Greenfield rebuild of the Cooma substation at the Cooma North site is the most prudent and efficient option and submits a revised estimate as follows:

Figure 3.2: Cooma Substation Reconstruction Estimate ($k, 2008)

2010	2011	2012	2013	2014	Total
3	82	1,162	7,724	25,943	**34,914**

3.3.3 Beaconsfield West 132kV GIS replacement

AER Draft Decision

"PB was also concerned with the lack of transparency associated with the use of certain scoping factors, in particular the design cost factor (DCF) and network cost factor (NCF), and the high construction cost associated with the project. While PB accepted there were issues associated with the site that would increase its costs it considered that the justification for the doubling of these costs lacked transparency and could not be considered reflective of an efficient and prudent TNSP. PB, therefore, recommended a -$8.1 million correction for the increase in DCF and NCF factors in the Beaconsfield West project.

…Accordingly , the AER agrees with the proposed amendments put forward by PB in relation to the application of the scoping factors and has made a reduction of $8.1 million to TransGrid's capex allowance as a result of this project review."[18]

[18] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 55-56.

TransGrid's Response

TransGrid maintains that the application of non-standard cost factors is appropriate for a unique and complex project such as the Beaconsfield West Gas Insulated Switchgear (GIS) replacement (a project without precedent in TransGrid and Australia).

In preparing cost estimates for its future projects, TransGrid seeks to achieve a realistic estimate using appropriate templates and cost factors. While the use of standard templates and cost factors is pursued as far as possible, it is recognised that there will be a small number of projects which are not able to be fitted to such standard models. The estimating process and associated systems need to have the flexibility to deal with these projects.

TransGrid's substation projects typically involve new substation construction or augmentation of existing substations using air insulated equipment. The replacement of the Beaconsfield West GIS equipment requires quite a different approach to that adopted for standard projects. The application of standard cost factors to a non-standard complex project, such as Beaconsfield West GIS replacement, would not provide realistic cost inputs and would result in an underestimate of the capital expenditure required to undertake the project.

TransGrid agrees with the AER and PB that the application of other than standard cost factors to any project should be justified on a project by project basis. In the case of the Beaconsfield West 132kV GIS Replacement project TransGrid asserts that the use of non-standard factors is clearly justified.

In PB's review of the project it stated that it accepted the basic reasons for adjusting the cost factors.

> *"It is noted that the DCF and NCF factors have been doubled due to the difficulties of working at an operational site, and due to the one off nature of the work. While PB accepts these basic reasons, the basis of doubling these costs is not clear and appears arbitrary."*[19]

The doubling of the design and network cost factors when the project cost estimate was produced for the Revenue Proposal derived from a detailed analysis of the project, involving consultation with engineering consultants, GIS equipment suppliers and construction contractors.

The following specific issues were identified as having an impact on the design and project management of this project:

- It is a unique project that has not been undertaken by TransGrid or by any other TNSP previously in Australia and only rarely undertaken in the world;
- It will involve difficult, long and complex staging to allow the substation to be kept in service with contingent supply arrangements to ensure continuity of supply to customers which in this case affects a large proportion of the Sydney CBD, as well as the Eastern and Southern suburbs of Sydney;

[19] PB, TransGrid Revenue Reset An Independent Review, page 125.

- There is a need for detailed review of current building structure and condition involving appropriately qualified experts;
- There is a need for complex building design and construction practices requiring restricted access to certain areas of the site to integrate the extension into the existing building;
- It will involve the replacement and relocation of secondary system components in a live substation;
- It will involve special GIS design requirements; and
- It will pose unique challenges associated with the integration with the existing substation, substation plant and associated network connections.

In addition, TransGrid consulted a leading Australian substation construction contractor to develop an estimate of the additional construction costs that would be expected for an in-situ rebuild option. The contractor indicated the following factors associated with in-situ works would lead to increased construction costs:

- Longer time on site (increased site supervision and facilities);
- More complex project management requiring more and higher skilled people;
- Additional resources to understand and integrate to existing systems;
- Additional costs in demobilising and remobilising to meet outage requirements; and
- Requirements to work under TransGrid access authority conditions during all phases of the project to ensure staff safety resulting in higher costs (compared to a fully de-energised working environment).

The contractor also provided an indication of the relative costs of the issues outlined above.

Following this consultation and consideration of the quantum of issues identified, the standard DCF and NCF factors were doubled to cover the anticipated increased project delivery costs associated with the Beaconsfield West 132kV GIS Replacement project.

Subsequent to the AER Draft Decision, TransGrid engaged SKM to undertake an independent assessment of the cost factors used by TransGrid in estimating the cost of the Beaconsfield West 132kV GIS Replacement project. SKM found that in the case of the Beaconsfield West GIS Replacement project the use of non-standard cost factors is reasonable and that the cost factors used by TransGrid are in fact below what SKM would expect for a project of this type. The SKM report states:

> *"As the Beaconsfield West project is an in-situ GIS replacement, as opposed to an AIS substation augmentation, it is considered reasonable for TransGrid to use a non-standard cost factor allocation for the project.*

Given the nature of, and the complexities involved with the Beaconsfield West Project, SKM considers the cost factor allocation used by TransGrid to be below that typically required for undertaking such a project."[20]

In their report SKM supports the use of non-standard cost factors and finds that TransGrid has in fact been too conservative in its cost factor allocation for this project. Accordingly, it is likely that TransGrid's original cost estimates would be below the realistic costs required to achieve the capital expenditure objectives.

In the revised Revenue Proposal, TransGrid has now adopted the cost factors recommended by SKM for the Beaconsfield West 132kV GIS Replacement project, noting that SKM emphasise that the cost factors they propose are at the lower limit of what SKM considers reasonable for such a project.

The cost factors proposed by SKM and adopted by TransGrid in this Revised Proposal are:

- NCF - 15%
- DCF - 10%
- AWF - 15%
- In-situ replacement factor - 30%

Based on the recommendations of the independent assessment by SKM TransGrid has revised its cost estimate for the Beaconsfield West 132kV GIS Replacement project. The updated estimate included in its revised Revenue Proposal is efficient, prudent and reasonably reflects realistic costs required to achieve the capital expenditure objectives.

The total estimate included for this project in TransGrid's revised proposal is $43.6 million with a breakup shown in Figure 3.3 below.

Figure 3.3: Beaconsfield GIS Replacement Estimate ($k, 2008)

2010	2011	2012	2013	2014	Total
2,573	7,216	9,675	24,169	-	**43,633**

3.3.4 Williamsdale 330kV Substation Stage 2

The ACT Government has promulgated Network Service Criteria applying to TransGrid's network supplying the ACT. They are contained in the Australian Capital Territory Disallowable Instrument, Utilities Exemption 2006 No 1 under Utilities Act 2000. The criteria require TransGrid to provide two or more geographically separate connection points at 132kV for supply to the ACT by 30th June 2009.

The ACT jurisdiction's reliability criteria require TransGrid to establish a second supply point for the ACT with a capacity of at least 375MVA. Provision of the second

[20] SKM, Review of Cost Factor Allocation for the Replacement of Beaconsfield West 132kV GIS, page 6.

supply point (Williamsdale 330/132kV Substation Stage 1) has commenced to comply with the 2009 criteria.

A more onerous criteria applies from 1 July 2012 and requires TransGrid to provide a 330kV supply, independent of Canberra 330/132kV substation. Consequently additional Stage 2 works are required.

TransGrid had previously considered that due to the uncertainties associated with gaining planning and project approvals within the ACT jurisdiction for the stage 1 works at Williamsdale, the Stage 2 works should be included as a contingent project.

Since TransGrid lodged its Revenue Proposal, many of the difficulties associated with the planning and development approvals for the Stage 1 works have been resolved. Two key achievements made in late 2008 after TransGrid lodged its Revenue Proposal were acquisition of the Williamsdale site and approval by the ACT Minister for Planning that no further environmental assessment is required. TransGrid has kept the AER apprised of its progress on this matter.

TransGrid notes the comments made by the AER in its Draft Decision on this project and considers it appropriate that this project should now form part of the ex-ante capex.[21] Consequently Williamsdale Stage 2 works have now been moved from being a contingent project to being included in the ex-ante capex allowance.

An application notice will be required and is in the process of being prepared. It will contain a preliminary application of the regulatory test, based upon a feasibility study undertaken by TransGrid in December 2007. An approved Project Evaluation Summary (PES) is in place and concludes that the preferred option would require TransGrid to undertake the following works:

- Establishment of a new 330kV switching station at Wallaroo (northwest of Canberra) on the route of the Yass - Canberra 330kV transmission line no 9;
- Formation of 330kV circuits from Yass - Wallaroo and from Wallaroo - Canberra;
- Construction of a short section (approx 3 km) of 330kV line from Wallaroo to the route of the Canberra - Williamsdale 330kV line;
- Connection of the new line at Wallaroo and to the Canberra - Williamsdale 330kV line. A section of 330kV line from Canberra would be disconnected at this point; and
- Provision of an additional 375MVA 330/132kV transformer at Williamsdale.

The value of the TransGrid works is estimated at $34.7 million with a proposed commissioning date of June 2012.

TransGrid's evaluation has established the proposed project as the most efficient option to meet the ACT's requirement for a 330kV supply independent of Canberra 330/132kV Substation by 2012. TransGrid has, therefore, included an allowance for this project in this revised ex-ante capex proposal with a breakup shown in Figure 3.4 below.

[21] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 82.

Figure 3.4: Williamsdale 330kV Substation Stage 2 Estimate ($k, 2008)

2010	2011	2012	2013	2014	Total
2,946	11,672	20,098	-	-	**34,716**

3.3.5 Instrument transformers replacement program

AER Draft Decision

The AER has found that TransGrid's proposed replacement program for instrument transformers does not adequately assess the reasonable options that have been identified for asset replacement and agrees with PB's advice that there should be allowance for the replaced instrument transformers to be re-used.[22] The AER notes TransGrid's selection of the preferred option is often based on factors other than those detailed in the options comparison documentation typically resulting in additional cost or scope that has not been included in the options costing.

The AER has therefore reduced TransGrid's capex allowance by $4.4 million due to its review of this replacement program.

TransGrid's Response

TransGrid has proposed a program of replacement of instrument transformers that are displaying elevated levels of dissolved gases, which indicate various fault conditions within the instrument transformers. Through the use of condition monitoring, 105 three-phase sets of instrument transformers have already been identified as requiring replacement over the regulatory period and an additional allowance is made for up to a further 12 sets that may develop gassing and potential faults over the 5-year period.

The AER's consultant PB assessed that TransGrid had demonstrated the need for this program and that the cost efficiency and timing are reasonable.

TransGrid analysed three options for this program:

1. Replacement and disposal of all three phases of the instrument transformers;
2. Replacement of all three phases of the instrument transformers, with re-use of existing units with acceptable condition for planned and emergency replacements;
3. Replacement of all three phases of the instrument transformers, with re-use of existing units with acceptable condition for emergency replacements only.

In Appendix L of the PB report on the TransGrid Revenue Reset, the following finding is made:

> *"Instrument Transformers - the option comparison presented in the ARPE documentation identifies Option 2 (Replace three phases and re-use spare units) as a higher NPV and higher risk option than the preferred Option 3 (Replace three phases and re-use spare units for emergency replacements*

[22] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 63.

only). Whilst PB recognises that the decision has been made on the basis of the risk reduction per dollar NPV, we note that there is no cost saving or risk increase associated with TransGrid's preferred reuse option over Option 1 (Replace three phases with no re-use).

This discrepancy infers that there is no significant risk associated with the reuse of retained instrument transformers, subject to the specific condition criteria noted in the ARPE document. On this basis, PB is of the view that the wider use of retained instrument transformers, as proposed in Option 2, subject to the re-use criteria proposed for Option 3, would also represent minimal risk.

Therefore the selection of the preferred option over the highest NPV option is dependent on an inconsistent risk assessment process. On this basis, PB is of the view that the highest NPV option (Option 2) represents prudent and efficient investment."[23]

The PB report raises two issues:

a) The merits of the wider use of retained instrument transformers; and

b) An inconsistent risk assessment process.

(a) Use of retained instrument transformers

TransGrid has carried out a detailed review of the instrument transformer sets nominated for replacement, to assess the number of individual units that would be available for re-use based on the condition criteria referred to in the business case (the ARPE document referred to by PB):

- dissolved gas analysis below TransGrid's Condition Monitoring Manual caution or danger levels; and
- less than 30 years old.

The outcome of the review is that for the 105 sets nominated for replacement (which represents a total of 315 single-phase units), a total of only 19 units (6 per cent) are potentially suitable for re-use. The review however did not consider whether any of these units were affected by other issues that might also affect their medium to longer term suitability for re-use (e.g. corrosion or oil leaks). TransGrid's experience is that such physical deterioration is common with older instrument transformers and could reasonably be expected to occur in a number of these units.

This number of useful spares created by the nominated replacements is better directed towards providing emergency spares and would be insufficient to allow Option 2 to be effectively implemented.

(b) Risk Assessment

TransGrid has reviewed the costing and risk analysis of the options for this program. PB's criticism of the risk assessment suggested that TransGrid had not consistently accounted for any increased risk associated with the re-use of retained instrument transformers across both options 2 and 3.

[23] PB, TransGrid Revenue Reset Appendices An Independent Review, page A133.

It should be noted that the single risk score assigned to each option is the result of an evaluation of the residual risk across five risk categories. To fully understand the effect each option would have on the residual risk, the following analysis is provided:

- Implementation of Option 3 impacts on risk in two ways:
    - Use of older instrument transformers slightly increases the risk to safety, in that units are re-used that have a higher likelihood of failure (than a new unit) and their failure mechanism could lead to injury. This represents an increase in risk compared to Option 1; and
    - Retention of selected serviceable units from the three phase sets removed for use as emergency spares allows a rapid replacement of units identified as suspect. Hence, the likelihood of in-service failure can be reduced and the duration of any unplanned outages can be minimised. This represents a reduction in risk (particularly from a reliability perspective) compared to Option 1.
- The resultant score from these two impacts is that risk levels are slightly lower for Option 3 compared to Option 1, as the availability of retained units for emergency spares reduces the risk to reliability by enabling a quicker changeover.
- Option 2 introduces a more extensive re-use of original units and hence has the following impacts on risk:
    - Greater use of older instrument transformers further increases the risk of failure and increases the number of locations where a failure could lead to injury. This represents an increase in risk compared to Options 1 and 3; and
    - There is also an increased risk with the use of older instrument transformers in terms of cost of collateral damage resulting from any failure. This represents in an increase in risk compared to Options 1 and 3.
- Hence it is considered that Option 2 will result in an increased risk and this is reflected in the Project Evaluation.

It should be noted that older high voltage instrument transformers are of designs that incorporate large quantities of mineral oil and large external porcelain insulators and when they fail in service normally result in dangerous explosions and fire. The potential safety issue associated with this risk cannot be understated and therefore any old instrument transformer removed from service should only be considered for short term emergency use replacements.

As all new instrument transformer designs now incorporate safer and more explosion resistant features, these new units are being used to replace the old designs wherever required.

Based on the review of the potential for re-use of instrument transformers identified for replacement, and the further risk analysis of the identified options, the business case has been updated. The cost differences between Options 1 to 3 become quite small and the practical differences between Options 2 and 3 become insignificant due to the small number of single-phase units that are available.

On the basis of this updated analysis, TransGrid considers that Option 3 is the optimum solution. The capex difference between Option 2 and Option 3 is about 1 per cent and hence for economic analysis purposes the preferred solution is considered indifferent between these options. Given the improvement in residual risk, Option 3 with a total capex over 2010 - 2014 of $15.2 million is the recommended solution.

Figure 3.5: Instrument Transformer Replacement Program Estimate ($k, 2008)

2010	2011	2012	2013	2014	Total
2,386	3,103	3,293	3,183	3,220	**15,185**

3.3.6 Application of cost estimating factors

AER Draft Decision

Based on the review of the application of scoping factors to Beaconsfield West 132kV GIS and three other projects, the AER concluded that TransGrid's proposed capex allowance did not reasonably reflect the capex criteria.

The AER noted that TransGrid's capex estimating database manual allows for the standard factors to be altered if the project investigation identifies that the standard factors are not appropriate. However, as the weight of these factors can be adjusted on a discretionary basis for particular projects, the AER expressed concern that the capital estimation process lacks transparency, consistency and auditability.

The AER concluded that TransGrid's cost estimating procedure permits a systemic over estimation of capex project costings to occur and applied a $13 million reduction to TransGrid's proposed forecast capex allowance.[24]

TransGrid's Response

TransGrid rejects the implication that its cost estimating processes lead to a systemic over estimation of capex project costings.

In preparing project estimates for its projects, TransGrid needs to ensure that a realistic estimate of input costs is determined. Not all projects are able to be fitted to a standard cost estimating template and the estimating process and system need to have the flexibility to deal with non standard projects.

TransGrid has developed its cost factors from a review of historical projects. To develop a set of cost factors for a project type it is necessary for that type of project to have been undertaken previously on a number of occasions so that sufficient data is available to analyse. Some types of projects are only undertaken occasionally or have unusual requirements. For example TransGrid has not undertaken a project of the nature of the Beaconsfield West 132kV GIS replacement previously and so no data exists to allow the development of standard cost factors.

[24] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, pages 61-62.

In developing its total forecast capex required to meet the capital expenditure objectives, a prudent TNSP would not apply standard factors to a non-standard project and underestimate or overestimate the amount required to undertake the project. This would not lead to prudent and efficient investment decisions.

TransGrid agrees with the AER and PB that the application of other than standard cost factors for any project should be justified on a project by project basis.

In its Revenue Proposal, TransGrid identified that non-standard cost factors needed to be applied to only four future projects which are listed below:

- Beaconsfield West 132kV GIS Replacement;
- Holroyd - Chullora 330kV Cables;
- Holroyd 330/132kV Substation; and
- Chullora 330/132kV Substation.

TransGrid considers the use of non-standard factors for these four complex and difficult projects to be justified.

The Holroyd - Chullora 330kV Cables, Holroyd 330/132kV Substation and Chullora 330/132kV Substation projects were reviewed by PB as part of TransGrid's Revenue Proposal (including the use on non-standard cost factors) and it is noted that the AER has not proposed any adjustments for these three projects.

The Beaconsfield West 132kV GIS Replacement project is discussed in detail in section 3.3.3 of this revised Revenue Proposal and the use of non-standard cost factors for that particular project is addressed and justified in that section.

In preparing this revised Revenue Proposal, TransGrid has reviewed the use of cost factors as applied to all of the future projects (205 projects and sub projects) included in its Revenue Proposal. In this review it was found that nine projects had non-standard factors applied incorrectly in the project estimates. TransGrid had selected standard cost factors to be applied in each of the nine projects but an incorrect 'network cost factor' was included for use in the calculation and reporting for the project. This error occurred only in the projects categorised as '330kV Line Augmentation' and '132kV New Line'.

In the revised Revenue Proposal, TransGrid has reverted to standard cost factors for these projects. For six of the projects, this correction has resulted in an increase in their project cost estimates. For the other three projects, correcting the error has resulted in a small decrease in the estimate. The net result is an increase of $0.95 million in forecast capital expenditure.

TransGrid's detailed project analysis has demonstrated that the discretionary adjustment of TransGrid's standard cost factors is limited to only four projects across its entire capex program. Justification for the use of these non-standard factors has been provided in each of these cases, and the AER had previously accepted the cost estimates for three of these projects. TransGrid also sets out in this Revised Proposal why the non-standard factors used for the fourth project should also be accepted as reasonable.

TransGrid therefore considers that the cost factors and cost estimates used to prepare its Revenue Proposal reasonably reflected the costs associated with its capital program. TransGrid does not consider the reduction of $13 million based on the use of non-standard factors to be reasonable.

TransGrid's revised capex forecast therefore incorporates the correction to the inadvertent application of the incorrect network cost factor and the reinstatement of the $13 million capex the AER proposed to reduce in its Draft Decision.

3.3.7 Cost escalators

AER Draft Decision

The AER has assessed the escalators recommended by Competition Economists Group (CEG) and used by TransGrid in its Revenue Proposal. For the majority of the proposed escalators, the AER has considered that some methodological elements of the proposed forecast cost increases are inappropriate, and has considered more recently published data in making its Draft Decision.[25]

As such, the AER considers TransGrid's proposed escalators are not, with the exception of land, reasonable. It has instead proposed an alternative set of escalators that it considers more reasonably reflects the efficient costs a prudent operator in the circumstances of TransGrid would require to achieve the capex objectives, consistent with the capex criteria.

The AER has also indicated that the escalators will be updated again for the final decision and determination.

TransGrid Response

TransGrid does not accept that the forecast escalators proposed by the AER reflect the costs that a prudent TNSP operating in the circumstances of TransGrid would require to achieve the capex objectives.

TransGrid re-engaged CEG to provide advice on the appropriateness of the escalation factors used by the AER. As mentioned in TransGrid's Draft Decision and ElectraNet's Final Decision, the AER has generally accepted the framework used by CEG but rejected specific aspects of CEG's approach. In TransGrid's Draft Decision, AER has proposed updated Econtech estimates for labour and construction escalators and has generated its own estimates for material escalators on the basis of publicly available data.

CEG has reviewed TransGrid's Draft Decision with respect to cost escalators and finds the approach adopted by the AER to be generally reasonable. However, CEG identifies two major concerns with the AER approach:

[25] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, pages 68-69.

1. Inconsistency in determining the timing for escalation factors

The escalation factors employed by the AER embody different and inconsistent timing assumptions. CEG has found at least three different bases for escalation including:

- June on June escalation factors for copper, aluminium and steel;
- Calendar year on calendar year escalation factors for crude oil; and
- Financial year on financial year escalation factors for electricity, gas and water (EGW) sector labour, general labour and construction. CEG has also identified that the inflation deflators applied by the AER to EGW wages overlap each other in timing, double-counting inflation at particular times.

Issues of timing are critical in determining the escalators so that they are consistently applied in the model. The escalation factors should be used to inflate the project cost (at base value) to the mid-point of each financial year in the next regulatory period for the purpose of calculating the expected capex in each financial year. CEG notes:

> *"capex for the 2010 financial year is forecast based on the difference between the average prices prevailing in 2009/10 and the prices prevailing in the base period… This can be thought of as escalation from the base period to December 2009 – where December is the mid-point of (or representative of) the average prices paid over the entire financial year. However, strictly speaking, this will only be true if price changes and expenditure are evenly spread over the year. More exact escalation factors developed for this purpose should, therefore, project forward prices from the base period to the average prices prevailing over the financial year (centred on December)."*[26]

To resolve the timing issues that appear in the AER modelling, TransGrid has adopted CEG's recommended approach in forecasting the escalators for copper, aluminium, steel, EGW labour, general labour and construction:

- **Copper, aluminium and steel.** The objective of escalation is to estimate the average cost of expenditure over each financial year, assuming that expenditure is evenly spread over each financial year. CEG escalated the base period prices to reflect the change in price from the base period to 12 months to June of each future year. This effectively estimates the average change in price for each commodity from the base period to the relevant financial year.
- **EGW wages and construction costs.** CEG creates a single index based on both TransGrid's Enterprise Award and Econtech forecasts of real wage forecasts; and then adjust that to derive the average escalation forecasts.

[26] CEG, Escalators affecting expenditure forecasts, page 3.

2. Insufficient basis to reject Macromonitor forecasts

The AER did not accept the approach used by CEG to apply Macromonitor forecasts for the estimation of EGW labour and construction escalators. In the Draft Decision, the AER argues that:[27]

- The Macromonitor forecast is not appropriate as it fails to describe its estimation methodology;
- The Macromonitor forecast is not appropriate because they do not use econometric modelling to estimate the escalators; and
- Averaging the Econtech forecast and the Macromonitor forecast is not appropriate because the two forecasting methods are not comparable.

In light of the CEG report, TransGrid notes that the argument made by the AER is not sustainable for the following reasons:

- Detailed descriptions of the Macromonitor forecast has been provided to the AER. This includes three Macromonitor reports that describe the basis on which Macromonitor has derived its forecasts;
- Non-application of econometric modelling in the forecasting technique does not mean the forecast result is invalid:
    - There is considerable evidence set out in the CEG report[28] that econometric techniques are not superior or more reliable than professional judgement. Rather, sole reliance on mathematical models without professional opinion is more likely to lead to unreliable results.
    - Macromonitor has regarded econometric results when forming their judgement.
    - Econtech's approach also contains a combination of both mathematical modelling and some degree of professional judgement.
- Since both Econtech and Macromonitor forecasting techniques, directly or indirectly, consider econometric results and professional judgement, TransGrid is of the view that the AER does not have reasonable grounds to disregard the Macromonitor forecast; and
- Econtech and the AER do not consider which measure (Econtech forecast or Macromonitor forecast) is most appropriate to apply to EGW wages. Since productivity adjustment is an important factor in forecasting the actual costs of the businesses in the future and should be accounted for in its escalation method, it is reasonable to apply the Macromonitor forecast, which is the only forecast that is adjusted for productivity changes.

Considering the above points, there was no sustainable argument for the AER to disregard the Macromonitor forecast in its Draft Decision. However, noting that the Econtech forecast in the Draft Decision is very similar to the earlier forecast provided

[27] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, pages 252-253.
[28] CEG, Escalators affecting expenditure forecasts, pages 32-33.

by Macromonitor, and the fact that the Econtech forecasts are more recent, TransGrid considers the Econtech forecast to be reasonable.

3. Conclusion

Based on CEG's analysis, TransGrid has revised the cost escalators to apply to its revised Revenue Proposal, which are provided in Figure 3.6 below. CEG's report is provided in Appendix E. TransGrid considers that the escalation factors in the revised proposal are reasonable and reflect the costs that a prudent TNSP operating in the circumstances of TransGrid would require to achieve the capex objectives.

Figure 3.6 TransGrid Revised Proposal real escalators (%)

Component/ Year	2009/10	2010/11	2011/12	2012/13	2013/14
Land	4.1	4.1	4.1	4.1	4.1
Copper	- 4.0	7.1	5.6	- 6.0	- 6.4
Aluminium	7.6	6.6	3.5	- 0.8	- 1.1
Crude Oil	0.9	6.8	2.9	0.3	- 1.0
Steel	-8.2	2.1	- 3.8	- 4.7	- 5.0
EGW (NSW) wages	3.7	3.2	2.9	2.5	2.0
Construction costs	1.0	2.3	1.1	- 0.8	- 0.7
Wages general	1.3	1.7	1.7	1.4	0.8
Producer's margin	0	0	0	0	0

TransGrid notes that the AER has indicated that it intends to update its forecasts for wages and construction cost movements using Econtech forecasts at the time of making its final decision. TransGrid considers that to allow the Econtech assumptions to be tested for reasonableness TransGrid should be consulted in the update of the forecasts.

3.3.8 Yearly weighing of escalators

AER Draft Decision

The AER considers that using the same set of weightings for each year of its capex program is likely to distort TransGrid's cost estimates.[29] The weighting of escalation factors should reflect the year to year variability of the type of projects undertaken in each year of TransGrid's capex program.

The adjustment made by the AER to reflect the use of annual weightings in the capex allowance is $4.7m.

TransGrid Response

The future capital expenditure estimates in TransGrid's Revenue Proposal included a calculation to take into account input price variation. TransGrid employed a method, based on the method developed and accepted in previous revenue determinations, to calculate the impact of input price variations.

[29] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 72.

TransGrid used its Capital Accumulation Model, its Capex Estimating Database and advice from Competition Economists Group (CEG) for the calculation of the escalation amount.

TransGrid used a five year weighted average calculation to determine an escalation/de-escalation value for each year of its Revenue Proposal. A five year weighted average approach was taken as TransGrid's Capital Accumulation Model was designed to allow for labour, material and land cost escalators and TransGrid's Capex Estimating Database is able to report the total cost of project components for the entire project portfolio.

TransGrid's Capital Accumulation Model (CAM) is the most sophisticated model developed by a TNSP for a Revenue Proposal to date. The investment in CAM has been substantial and the level of investment consistent with the NER requirements of developing realistic forecasts of cost inputs.

The development of a model to allow the input and escalation of each individual component would add significantly to the complexity of the model. In addition, substantial modification or development of TransGrid's Capex Estimating Database (CED) would be required to capture, sort and apply s-curves to data to match the project components to the escalation factors.

TransGrid does not consider this additional complexity and functionality to be reasonable in order to develop a capex forecast that reflects the efficient and prudent costs of achieving the capital expenditure objectives.

After questions from PB, TransGrid used a number of data sources to translate the available data into a form that could be used to determine the potential impact of the annual application of the escalation factors. This process was conducted in a spreadsheet outside of both the CAM and the CED. Due to the complexity of this process and the time taken to do the work TransGrid only carried this out for the 'Median Project Spend Profile'.

Based on the 'Median Project Spend Profile', the application of annual escalation resulted in a 1.5 per cent drop in cost escalation. TransGrid considers that this small variance to the calculation in the CAM demonstrates the realistic application of estimates of cost input required to deliver the capital program.

TransGrid used a probability weighted scenario approach, consisting of 36 scenarios, to determine its forecast capital expenditure requirement. It is not practical to determine the impact of applying annual escalation to each of the scenarios, and there is no evidence to suggest that the resultant change from annual weighting of cost escalation for the median scenario would be similar across other scenarios. Given that variations will occur in each of the scenarios, TransGrid believes that the analysis it has conducted indicates that the escalation included in TransGrid's proposal reasonably reflects the costs associated with the capital program.

TransGrid considers that the method it has used is thorough and well developed and is a reasonable approach to developing a capex forecast required to achieve the capital expenditure objectives.

3.3.9 Cost estimation risk factors

AER Draft Decision

In its review of TransGrid's Cost Estimation Risk Factor the AER reiterated its finding that it has generally accepted the modelling approach applied by Evans and Peck. However, the AER's view is that the process of 'risk workshops' does not, however, lend itself to transparent assessment and has produced bias in expenditure adjustments.[30]

The AER also expressed the view it shared PB's concern that TransGrid has failed to ensure that the estimates of cost variance set at the workshops did not include costs that are captured elsewhere. That is, the AER considered there was a lack of transparency in the factors considered at the workshops that suggested there was scope for the variances to reflect costs that were captured in other cost factors, including labour and materials escalators.

The AER adopted PB's recommendation that the median (P50) risk profile should be applied rather than the mean and has reduced the allowance by $0.6 million.

The AER reduced TransGrid's risk allowance by $11.4 million to reflect what it considered to be the efficient costs that should be allowed.

TransGrid's Response

TransGrid agrees with the AER finding to use the median (P50) risk profile and has made the appropriate adjustment to the revenue allowance. Nevertheless, TransGrid considers that its original proposal was reasonable given that the amount of adjustment is largely insignificant in proportion to the total capex allowance.

TransGrid does not agree with the AER that the variance estimates include costs that were captured in other cost factors resulting in the double counting of costs in the risk allowance. TransGrid believes that there is a flaw in the logic used by the AER in reaching its decision and an error in the application of the AER's adjustment.

Details of the error are contained in a report from Evans & Peck, included as Attachment F. TransGrid's response in this section sets out that, other than for the adjustment to the use of the median (P50) risk profile, the entire risk escalation sought in TransGrid's Revenue Proposal was reasonable and thus no adjustment is warranted. Accordingly, the details of the error are not relevant to TransGrid's formation of its revised estimate and are thus not further expanded upon in this submission.

TransGrid has noted the AER's general concern in relation to the reliance upon the outcomes of the risk workshop. TransGrid has provided detailed documentation to the AER to demonstrate that the risk assessment was conducted in a transparent manner.

TransGrid engaged Evans & Peck to review the AER's Draft Decision relating to risk factors. Evans & Peck has stated that the risk workshop approach is the best

[30] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 75.

alternative when data from detailed analysis of past projects is unavailable.[31] TransGrid considers that, in the absence of this data, the outcome of the risk workshop provides the best estimates of a reasonable risk allowance.

TransGrid provided a detailed analysis of the cost differences for a sample of historic projects. Details of the risks and other issues that contributed to the cost differences were provided. The fact that all of the issues and risks that contributed to the change in cost were provided does not imply that these issues were then used to determine the risk ranges for the project components. The workshop process was conducted to disregard cost escalation and focussed on variations in physical quantities.

TransGrid considers that PB has misinterpreted the material TransGrid has provided. The PB report states:

> *"under the heading Risks Contributing to Extra Costs (i.e. cost variation risk) the following points were noted by TransGrid:*
>
> - *"General increases in contractor rates." - Yass - Wagga 132kV line rebuild*
> - *"Property increased from $420k to $1.25M due to market rates…" - Coffs Harbour 330/132kV substation,*
> - *"Market forces driving up contract costs." - Coffs Harbour 330/132kV substation;"*[32]

PB wrongly attributes these as being listed under the heading 'Risks Contributing to Extra Costs' and incorrectly assumes that these components were included in TransGrid's risk factors. In fact, in the TransGrid document they are quoting from, these are actually listed as issues under the heading 'Analysis of Costing Differences'. TransGrid agrees that these are not legitimate risk factors as they are already covered by cost escalation factors. These issues have not been included in TransGrid's risk factors but were included in the document PB quotes from in order to provide a complete analysis of the project cost differences.

PB also quotes the following issues from the same document:

- *"… the cost of the PAR increased by 25%. Could be a sign of the market forces…" - Armidale Substation*
- *"… prices increased significantly between the original estimate and the final contract placement due to significant increases in demand." - Sydney South - Cable 41 Series Reactor"*[33]

These issues are listed as risks contributing to extra cost but PB appears to have taken these comments out of context with the full text indicating a significant change in the cost estimates for these items of plant in a relatively short period of time. The changes in the cost estimates are well above increases dealt with by cost escalation. TransGrid agrees that the conjecture in the document regarding the driver behind the

[31] Evans & Peck, Response to AER/PB Comments on Regulatory Reset Capex Risk Allowance, page 1.
[32] PB, TransGrid Revenue Reset An Independent Review, page 113.
[33] Ibid, page 113.

increase in the cost estimates could be misinterpreted. The real issue here is that these items of plant are rarely purchased by TransGrid (or other utilities in Australia), and hence there is a lack of depth of data from which to develop initial estimates of the cost of these items. Hence, the risk factor needs to cover off the cost estimating risk that exists for such items of plant.

TransGrid has also provided a detailed analysis of the risk issues and the cost impact of those issues for the major components of the risk profiles. The detailed analysis showed the risk ranges, established via the risk workshop, were able to be verified by a quantitative assessment of potential quantity variations and are reasonable.

TransGrid is confident that the information provided to the AER and PB is sufficient to demonstrate that the risk assessment was conducted in a transparent manner and that the outcome is reasonable.

TransGrid considers it has demonstrated that the proposed cost estimation risk factor of $72 million is reasonable for the purpose of developing the estimated capex allowance.

3.3.10 Contingent projects

Details of TransGrid's proposed contingent projects were included in section 7.14 and Appendix J of its Revenue Proposal.

This section presents TransGrid's response addressing matters raised in the AER's Draft Decision together with revised contingent projects for inclusion in the AER's Final Decision.

AER Draft Decision

Of the 18 contingent projects included in TransGrid's Revenue Proposal the AER has concluded that nine of those projects should be considered as satisfying the requirements of clause 6A.8.1 of the NER. A contingent allowance of $1,216 million is therefore supported for inclusion in TransGrid's Decision. The nine contingent projects to be included are:

- Kemps Creek - Liverpool 330kV line - Undergrounding of all or part of the proposed connection, $108 million;
- Hunter Valley to Coast 500kV development of a double circuit 500kV line development, $270 million;
- Darlington - Balranald system upgrade 275kV, $51 million;
- Yass to Wagga 500kV double circuit transmission line, $329 million;
- Liddell - Tamworth 330kV, $163 million;
- Tamworth -Armidale 330kV line, $130 million;
- Bannaby - Yass reinforcement, $45 million;
- Cooma area, $40 million; and
- New 500/330kV substation at Richmond Vale, $80 million.

The AER considers that successful completion of the regulatory test by itself is not an appropriate trigger. With respect to three specific projects not included in the contingent allowance, the AER has made the following comments:[34]

CBD and inner metropolitan area supply

The AER considers that TransGrid may have proposed a scope of work in excess of a specific trigger in order to provide benefits for the broader transmission network.

Reactive support at seven sites

The difficulties in defining an appropriate trigger may relate to the grouping of what appear to be several smaller projects which individually may be considered efficient by the AER but which do not meet the materiality requirements for a contingent project.

Williamsdale 330kV Substation Stage 2

The AER has noted that the underlying need for the project already exists and TransGrid may wish to consider the appropriateness of this project as part of its capex allowance.

TransGrid's Response

TransGrid has reviewed the nine projects not included by the AER in its Draft Decision and of those nine projects six have been resubmitted in this proposal containing more relevant information that addresses the AER's reservations. TransGrid has decided to withdraw two of the projects from this Revised Proposal as it is considered not possible to provide the standard of documentation required at this time. The one remaining project has been moved to the ex-ante capex allowance in this proposal.

TransGrid has also provided some clarification in the wording of the triggers of four of the contingent projects that the AER had already considered as satisfying the requirements of clause 6A.8.1 of the NER. These contingent projects are resubmitted in this revised proposal.

Appendix J provides a more detailed description of these projects including project description, scope, triggers, NER compliance and indicative costs.

a) The following six contingent projects not approved by the AER in its Draft Decision have been reviewed and resubmitted in this revised proposal:

   CBD and inner metropolitan area supply

   TransGrid has more thoroughly explained the intent and scope of this project as the advancement of expenditure on the retirement of EnergyAustralia cables rather than as a new project. The advancement of this expenditure will bring the expenditure into the next regulatory period. The trigger for the project has been clarified, detailing the aged EnergyAustralia 132kV cables that may have to be retired earlier than currently planned.

[34] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 79.

Gadara/Tumut load area

TransGrid has more thoroughly explained the distinction between general load growth in the area and the expansion at a single industrial load supplied at Gadara that is known to be under consideration and the trigger for the project has been refined to include acceptance of an Offer to Connect for the load increase.

Orange 330/132 kV Substation

TransGrid has reviewed this project and has revised the scope of works to more closely reflect the works required to meet the network augmentation requirements to meet the spot load development alone. The trigger is revised to include acceptance of an Offer to Connect for the spot load increase.

Reactive support at seven sites

TransGrid has reviewed this project and addressed concerns raised as to the geographic location of the project in terms of it meeting TransGrid's reliability obligations in the main load centres of Newcastle, Sydney and Wollongong. The trigger includes the commerciality of the decision to install capacitors versus entering into network support contracts for the service in the interests of providing the lowest cost service to the customers.

QNI upgrade - line series compensation project

This is potentially a project of national significance to improve trading efficiencies in the national market. The project is dependant on ongoing assessment as regional demands and power sources evolve in each of the regions using market simulation tools. The timing is uncertain but expected to be adequately justified and required in the next regulatory period or the following one at the latest. The role of the proposed National Transmission Planner (NTP) has been introduced in framing the trigger for this project.

Victorian interconnector development

TransGrid has clarified that this project is the increase of interconnector capacity from NSW to Victoria and has emphasised that this also could potentially be a project of national significance responding to energy market changes and greenhouse reduction strategies under the evolving National Transmission Planner framework. The trigger has recognised the function of the NTP in that the NTP may issue formal advice that the project should go ahead within a timeframe.

b) The following four contingent projects although included by the AER in its Draft Decision have been revised and resubmitted in this revised proposal:

Hunter Valley - Central Coast 500kV line

TransGrid has clarified the need for the Kemps Creek 500/330kV transformer component of this project following PB's finding that it does not appear to be required to achieve the objective. TransGrid demonstrates that this aspect is an essential and integral part of the development and that the expenditure of

$30 million should be added to the proposed cost, which becomes $300 million. The trigger has been refined to recognise the network limitation that would arise as a result of the generation or load developments detailed.

Yass - Wagga 500kV double circuit line

TransGrid has made some minor changes to the trigger to reflect a technology neutral position to new generation development that might drive this augmentation and also to refine the constraint being addressed.

Bannaby - Yass reinforcement

TransGrid has made some minor changes to the trigger to reflect a technology neutral position to new generation development that might drive this augmentation

New Richmond Vale 500/330kV substation

TransGrid has made some minor wording changes to the driver for the project to include upgrade of QNI alongside generation development in NSW. The trigger has been amended to remove reference to the regulatory test and to instead more correctly describe the constraint being addressed by the project.

c) The following two projects have been reviewed and withdrawn from this revised proposal:

Voltage compensation

TransGrid has reviewed this project and has concluded that it is not possible to provide the necessary standard of definition of location and scope documentation required for classification as a contingent project. Consequently TransGrid withdraws this project from its revised proposal.

System protection scheme

TransGrid has also reviewed this project and concluded that it is not possible to provide the necessary standard of definition of location and scope documentation required for classification as a contingent project. Consequently TransGrid withdraws this project from its revised proposal.

d) The following project has been moved to the ex ante capex allowance in this revised proposal:

Williamsdale 330kV Substation Stage 2

TransGrid has given consideration to the AER's position and has included this project in its ex-ante capex allowance in this revised Revenue Proposal.

3.3.11 Capital Expenditure Summary

TransGrid's revised ex-ante capital expenditure forecast is shown in Figure 3.7.

Figure 3.7: Ex-ante Capital Expenditure (Real 2008 $million)*

Capex by Category	2009/10	2010/11	2011/12	2012/13	2013/14	Total
Augmentation	305.5	244.1	402.4	373.5	224.5	1,550.1
Property & Easements	63.4	90.7	39.6	26.3	65.2	285.1
Replacement	111.4	77.5	102.6	111.6	80.7	483.8
Security/ Compliance	11.9	9.9	13.2	5.6	1.1	41.7
Information Technology	17.6	22.7	20.3	13.1	21.2	95.0
Facilities	9.9	4.7	0	0	0	14.5
Motor Vehicles	9.2	9.2	5.9	4.5	9.8	38.7
Other	1.4	1.3	1.2	1.3	1.4	6.6
Total	**530.2**	**460.1**	**585.3**	**536.0**	**403.9**	**2,515.5**

* Risk adjusted and escalated

The comparison of the revised capex with the Revenue Proposal and the AER Draft Decision is provided in Figure 3.8 below.

Figure 3.8: Total Capital Expenditure (Real 2008 $million)*

Capex by Category	Revenue Proposal	Draft Decision	Revised Proposal
Augmentation	1,549.5	1,453.7	1,550.1
Property & Easements	292.7	280.2	285.1
Replacement	508.4	449.3	483.8
Security/ Compliance	42.1	41.1	41.7
Support the business	157.3	152.1	154.8
Total	**2,549.8**	**2,376.5**	**2,515.5**

* Risk adjusted and escalated

4. Cost of Capital

4.1 Summary

The cost of capital is one of the most important ingredients to an environment that fosters investment and forms a significant component of TransGrid's total revenue requirement.

The importance of providing a stable return on investment has been recognised in formulating the cost of capital and taxation aspects of the Rules.

The AER is required to determine the weighted average cost of capital (WACC) in accordance with clause 6A.6.2 of the NER. The NER prescribes the WACC parameters to be used with the exception of the nominal risk free rate and the debt risk premium which are to be determined in accordance with methodologies set out in clauses 6A.6.2(c) and 6A.6.2(e) respectively.

As allowed by the AER's submission guidelines and the NER[35], TransGrid nominated in confidence to the AER a commencement date and length of the period to be used in calculating the nominal risk free rate and debt risk premium. As TransGrid proposed a future period for which the rates were unknown at the time, TransGrid proposed indicative numbers for the purposes of its Revenue Proposal based on the long-term average for the nominal risk free rate and debt risk premium. Hence, for Chapter 13 of its Revenue Proposal, TransGrid proposed a nominal risk free rate of 5.7% and a debt risk premium of 1.75%.

In the draft decision, the AER:

a) Did not accept TransGrid's proposed averaging period for the calculation of the nominal risk free rate and proposed an averaging period closer to the final determination date (p.92);

b) Determined a proxy nominal risk-free rate of 5.46 per cent (effective annual compounding rate) based on the 20 day moving average for CGS yields with a 10-year maturity for the period ending 17 October 2008 (p.92);

c) Stated it will update the risk-free rate, based on the AER's proposed averaging period, at a time closer to its final determination (p.92);

d) Decided to use the fair yields estimated by Bloomberg, rather than CBA Spectrum, to determine the benchmark debt risk premium margin for TransGrid (p.93);

e) Considered that the debt risk premium should be determined with reference to the same averaging period that was adopted for determining the risk-free rate (p.94);

f) Determined a debt risk premium of 3.27 per cent (effective annual compounding rate) (p.94);

g) Stated it will update the debt risk premium based on this methodology at a time closer to its final determination (p.94);

[35] NER, clause 6A.6.2(c).

h) Did not accept TransGrid's inflation forecasts and updated the forecasts using RBA inflation expectations (p.96);

i) Stated it will update the inflation forecast to be used in the PTRM at a time closer to its final determination (p.96); and

j) Determined a nominal vanilla WACC of 9.82 per cent.

4.2 Responses to Matters Raised in the AER's Draft Decision

4.2.1 Introduction

The date at which the risk free rate, the risk margin on debt, and the inflation forecast are set should be the same in order to ensure internal consistency. TransGrid considers that the AER's initial rejection of its proposed averaging period was incorrect. Nevertheless, in its revised Revenue Proposal, TransGrid has addressed the reason the AER did not agree with the period proposed by TransGrid, being that the proposed dates were too far removed from the date of the final determination and the commencement of the next regulatory control period[36], and has proposed the 20 business day averaging period finishing on 5 September 2008, as the relevant period for determining the risk free rate from market conditions. To ensure internal consistency, it follows that the risk margin on debt and inflation forecast ought to be established with reference to the conditions prevailing at this time.

A key benefit of this choice of averaging period is to avoid the demonstrably abnormal performance of financial markets that followed soon after 5 September 2008.

An alternative approach would have been to adopt an even later date as the AER has indicated it would prefer. However, this would appear to require a number of complex adjustments to the AER's previous methodology to deliver a reasonable risk adjusted return on investment over the next regulatory control period. It is not clear whether the AER has considered how it could systematically address this issue.

TransGrid engaged the Competition Economists Group (CEG) to review and provide an expert opinion on the AER's draft decision. The following sections expand on this position, drawing on CEG's advice, by considering each of the averaging period, risk free rate, risk margin on debt, and inflation forecast in turn.

4.2.2 Rejection of TransGrid's initial proposed averaging period

AER Draft Decision

The AER stated that the NER requires the AER to determine the risk-free rate using annualised CGS yields with a maturity of 10 years.

In accordance with the NER[37] TransGrid nominated an averaging period to estimate the risk free rate commencing 14 July 2008, with a length of the period of 20 business days. The AER did not accept this period as it considered it was too far

[36] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 92.
[37] NER, clause 6A.6.2(c).

removed from the final determination date and may not provide the most relevant information[38]. The AER stated:

> *"The AER does not agree with the (averaging) 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 next regulatory control period. A period that is too far removed from the final determination date may not provide the most relevant information. This is consistent with past practice by the AER and other state regulators, and supported by the CAPM theory."*[39]

TransGrid's Response

For this revised Revenue Proposal, TransGrid considers that the AER's rejection of its initial proposed averaging period was incorrect. TransGrid considers that the averaging period it proposed commencing 14 July 2008 would have resulted in a NER estimate of the cost of equity that would have provided a cost of capital for TransGrid as measured by the return required by investors in a commercial enterprise with a similar nature and degree of non-diversifiable risks as that faced by TransGrid.

The NER gives TNSPs the right of 'first choice' in selecting the averaging period. It is TransGrid's view that, if the period nominated is consistent with the NER and the National Electricity Law objectives, then the AER cannot withhold its agreement to that period.

In rejecting TransGrid's nominated period, the AER concluded that an averaging period which is closely aligned to the date of the final determination would provide an unbiased rate of return that is consistent with the market conditions at the time of the final determination.[40] The AER therefore expressed a preference for a period that is close to the final determination date as this would provide the most relevant information.[41] It provides two reasons in support of this position:

- That this is consistent with past practice by the AER and other State regulators.

  TransGrid is not convinced that regulatory precedent is a relevant factor in the consideration of an appropriate averaging period. Nevertheless, there is substantial evidence where regulators have exercised their discretion not to mechanistically apply estimates based on the most recent data, where the particular circumstances warrant such an approach[42]; and

- That this is supported by CAPM theory.

  This is not entirely correct, as CAPM theory predicts that the cost of equity is made up of two components, the risk free rate and the market risk premium (MRP). Under the NER, the MRP is fixed at 6%. As it is only the risk free rate that is estimated during the averaging period, it cannot be presumed that

[38] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 92.
[39] Ibid, page 92.
[40] AER letter to TransGrid dated 8 July 2008, page 2.
[41] Ibid, page 2.
[42] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, pages 14-18.

adopting an averaging period proximate to the regulatory period will necessarily give rise to a more accurate estimate of the cost of equity[43].

4.2.3 Impact of global financial crisis

Since the AER rejected TransGrid's proposed averaging period, financial markets have been affected by what has become known as the 'global financial crisis'.

Initiated by the subprime mortgage collapse in August 2007, the crisis has deepened and reached its current level in September 2008 when the two largest buyers and securitisers in the US housing market ('Fannie Mae' and 'Freddie Mac') were placed into conservatorship by the Federal Housing Financial Agency (FHFA). This action was *"one of the most sweeping government interventions in private financial markets in decades"*[44]. It is also the date that is most obviously identified with the on-set of the global financial crisis.

TransGrid has formed the following conclusions, based on CEG's advice[45]:

a) The ongoing development of the global financial crisis has been associated with a historically high liquidity premium being paid for nominal government bonds across the world, which has pushed down the yield on nominal Commonwealth Government Securities (CGS) to historically unprecedented levels; and

b) The cost of equity is at a heightened level as investors are increasingly unwilling to supply equity capital. This is reflected in a 47% fall in the ASX200 stock price index as at 2nd December 2008 (compared to its 2007 peak) and declining price to earning ratios.

The International Monetary Fund has described the global financial crisis as 'the largest financial shock since the Great Depression' and it is highly likely that this crisis will still be impacting financial markets during any averaging period that is set close to the time of the AER's determination.

TransGrid is concerned that the impact of the global financial crisis on the bond market is not being fully taken into account by the AER. The following sections outline TransGrid's approach to setting a rate of return that provides a reasonable opportunity to recover at least the efficient costs of providing direct control network services.

CEG has explained that in a financial crisis there is a heightened uncertainty about the returns on both corporate debt and equity which creates a 'flight from risk' or a 'flight to safety'. As a result, investors reduce their demand for corporate debt and

[43] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, pages , pages 8-13.
[44] Lockhart, James B., III (2008-09-07). "*Statement of FHFA Director James B. Lockhart*", Federal Housing Finance Agency. Retrieved on 7 September 2008.
[45] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, pages 30-38.

equity and increase their demand for government bonds (which are low risk). This increases the price of government bonds and reduces government bond yields.[46]

CEG note that the obvious problem with adopting an averaging period when the yield on nominal CGS is at historically low levels is that the actual cost of equity is likely to be at historically high levels.[47] CEG comments that if the NER allowed the risk premium associated with equity to be updated to reflect the actual prevailing risk premium then adopting an averaging period in the midst of a financial crisis need not result in an underestimate of the cost of equity as a lower risk free rate would be offset by a higher risk premium attached to equity. As the NER does not allow this flexibility, the selection of the averaging period is critical.[48]

CEG found evidence that sampling nominal CGS yields in a current averaging period will result in an unreliable and biased estimate below the cost of equity and that using a current averaging period will result in:

- an unprecedented low nominal CGS rate (which would result in a correspondingly low compensation for the cost of equity under the NER formula);
- an unprecedented low CGS yield relative to other very low risk assets - such as State government debt;
- investors being compensated with a real (after inflation) risk free rate that is at an historically unprecedented low level; and
- investors being compensated for a real (after inflation) risk free rate below the guaranteed real return simply by buying indexed CGS.[49]

As it is generally acknowledged and accepted that the true cost of equity is at historically high levels, the use of an averaging period to determine the risk free rate that results in historically low levels of compensation for the cost of equity is a clear signal that the AER cannot rely on an assumption that a more current period provides an unbiased rate of return that is consistent with the market conditions at the time of the final determination.

Proper consideration should be given to the application of the averaging period in the current market conditions and how this should be addressed so that the cost of capital in the final determination reflects the cost of capital as measured by the return required by investors in a commercial enterprise with a similar nature and degree of non-diversifiable risk as that faced by TransGrid.

4.2.4 Averaging Period

In its Draft Decision, the AER rejected the averaging period originally proposed by TransGrid and instead proposed an averaging period closer to the final determination date.

[46] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, page 32.
[47] Ibid, page 37.
[48] Ibid, page 38.
[49] Ibid, page 29.

The averaging period is one of the critical inputs in the determination of the required rate of return for regulated electricity businesses. Under the requirements of the NER, it is the period over which CGS yields are averaged to determine the nominal risk free rate[50]. The AER in its Draft Decision stated that the same averaging period will be used for the calculation of the debt risk premium[51]. For this reason, it is critical that the AER is responsive to the economic environment during which it is making revenue determinations to ensure the NER obligations are observed.

It is important to note that it is very likely that TransGrid's revenue determination will be made during a period of economic conditions that are not typical of normal trends in the bond market.

As discussed in section 4.2.3, the economic conditions have changed substantially throughout the latter part of 2008. Setting the averaging period during the global financial crisis will result in an inaccurate estimate of the true cost of equity to TransGrid. This is because the NER locks the market risk premium and does not allow both the market risk premium and the risk free rate to be updated during the averaging period.

Hence, adopting an averaging period during the current financial crisis will result in an abnormally low estimate of the risk free rate, and:

> *"with no scope to increase the MRP to offset a biased or abnormally low proxy for the risk free rate, selecting a current period to measure the risk free rate will result in an unreliable and biased downward estimate of the cost of equity."*[52]

Accordingly, TransGrid considers that the AER's past practice of specifying the averaging period at a time close to the final determination in more stable financial market conditions based on an assumption that an averaging period close to the date of the final determination will provide an unbiased rate of return is not appropriate in circumstances where it is clear that assumption is incorrect. This is a mechanistic approach that is not responsive to the economic conditions and not consistent with the broader obligation the AER has under the NER to provide an adequate rate of return to TNSPs:

> "*The rate of return for a Transmission Network Service Provider for a regulatory control period is the cost of capital as measured by the return required by investors in a commercial enterprise with a similar nature and degree of non-diversifiable risk as that faced by the transmission business of the provider…."*[53]

For the reasons outlined in section 4.2.2 above, TransGrid does not accept the AER's rejection of TransGrid's initial proposed averaging period. Nevertheless, for this revised Revenue Proposal, TransGrid is proposing an averaging period that avoids the market distortions that are currently being experienced. Therefore, TransGrid proposes a 20 business day averaging period finishing on

[50] NER, clause 6A.6.2(c).
[51] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 94.
[52] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, page 29.
[53] NER, clause 6A.6.2(b).

5 September 2008. This period is chosen to use the most proximate date to the date of the Final Decision but avoids an averaging period having the nominal risk free rate and debt risk premium calculated in a period coinciding with the global financial crisis.

TransGrid has selected 5 September 2008 because, as discussed in section 4.2.3, this was the last business day prior to Freddie Mac and Fannie Mae being placed into conservatorship, which is the date that is most obviously identified with the on-set of the global financial crisis.

4.2.5 Risk-free rate

AER considerations

The AER stated that it will update the risk-free rate, based on the AER's proposed averaging period, at a time closer to its final determination.

TransGrid Response

TransGrid does not accept the AER's averaging period to calculate the risk free rate for the abovementioned reasons. Instead, for the revised Revenue Proposal, TransGrid has calculated a nominal risk free rate of 5.86% based on a 20 business day averaging period ending 5 September 2008.

4.2.6 Debt risk premium

AER Draft Decision

The AER stated that in previous revenue determinations, reviews had been conducted to compare the estimated average daily fair yields for corporate bonds with BBB+ credit ratings and maturity of up to 10 years from the Bloomberg and CBA Spectrum databases over a period.

The AER concluded that differences between the average yields for actual bonds were observed and that the Bloomberg data provides estimates of BBB+ rated long-term yields that are more consistent with the yields from similarly rated actual bonds. For this reason, the AER stated that it decided to use fair yields estimated by Bloomberg in preference to CBA Spectrum.

However, Bloomberg currently only produce A-rated 8 and 10 year corporate bonds and BBB 8 year corporate bonds. Hence, in the Draft Decision the AER proposed a methodology to create an equivalent BBB+ 10 year bond from these available Bloomberg bonds.

The AER indicated in the Draft Decision that the debt risk premium will be updated using the abovementioned methodology at a time closer to its final determination using the same averaging period specified for the nominal risk free rate.

TransGrid's Response

TransGrid does not accept:

- The AER's methodology of determining the BBB+ 10 year corporate bond proxy; nor
- The averaging period proposed by the AER for the calculation of the debt risk premium for the reasons given in section 4.2.5.

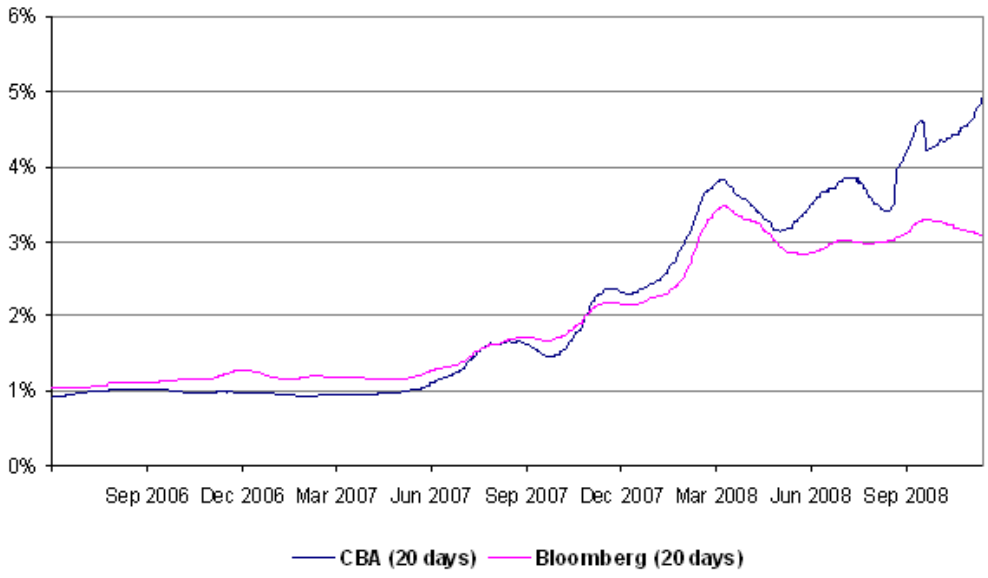
With respect to the AER's BBB+ corporate bond proxy, TransGrid is concerned that the AER's methodology for calculating the proxy is not currently accurate as the Bloomberg yield since September 2008 has deviated significantly from the yield of the 10 year BBB+ CBA Spectrum bond.

Figure 4.1 shows an overlay of the debt risk premium from January 2006 to December 2008 using:

1) The AER's BBB 10 year proxy (based on Bloomberg bonds - pink curve); and

2) BBB 10 year bonds (based on CBA Spectrum bonds - blue curve)

Figure 4.1: Bloomberg and CBA Spectrum Debt Risk Premium (20 days annualised average)



The concern to TransGrid is that in the Draft Decision, the AER stated that:

> *"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."*

and

> *"The debt risk premium will be updated by the AER based on this methodology at a time closer to its final determination."* [54]

Historically, the AER's corporate bond proxy has provided consistent estimates with those of CBA Spectrum, with a difference seldom exceeding 0.5%[55].

However, since the onset of the global financial crisis, there has been both a wide divergence in the estimates from Bloomberg and CBA Spectrum and also considerable volatility in this divergence as shown in Figure 4.1. Both these facts are a strong indication that illiquidity in the corporate bond market has lowered confidence in the estimation of fair value using either or both of these bonds.

Hence, if the debt risk premium calculated from CBA Spectrum bonds and Bloomberg bonds have been diverging since September 2008, the evidence suggests that both Bloomberg and CBA Spectrum estimates of fair value are likely to be unreliable during the financial crisis.

It is apparent from Figure 4.1 that the difference in the CBA Spectrum-based debt risk premium and the Bloomberg-based debt risk premium has historically been quite small. It is only since the onset of the financial crisis through 2008 and most significantly since September 2008, that the two curves no longer track closely and have separated substantially.

CEG has noted that the unprecedented level of disagreement between the services is symptomatic of the difficulty of implementing the requirements of the NER in terms of estimating the debt risk premium if an averaging period is chosen during current market conditions. CEG states that the level of disagreement between the Bloomberg and CBA Spectrum data services demonstrates the fact that the global financial crisis has made observing BBB+ 10 year corporate debt yields more difficult and, consequently, any averaging period that falls within this period of increased scope for disagreement is less likely to accurately measure the cost of debt for BBB+ 10 year debt than an earlier averaging period.[56]

It is this separation in the two debt risk premium curves that concerns TransGrid, as this is an indicator that the long-term behaviour of the bond market is producing unexpected and misleading economic indicators as highlighted by CEG in their report for TransGrid on the appropriate averaging period. CEG stated in their report:

> *"if a current averaging period is adopted one cannot simply use Bloomberg estimates (which are the lowest) without understanding why these estimates have departed so significantly from CBA Spectrum estimates in recent months."*[57]

It is important to note that, since NERA demonstrated three years ago that CBA Spectrum's estimation technique has a downwards biasing effect on the fair value of BBB+ long maturity bonds, CBA Spectrum is now estimating 1.55% higher yields than Bloomberg is reporting on BBB bonds. It should also be noted that, since

[54] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 94.
[55] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, page 24.
[56] Ibid, page 23.
[57] Ibid, page 24.

NERA's report, CBA Spectrum has altered its methodology as stated by the former Victorian gas and electricity regulator (ESCV):

> *"There is no evidence that the methodology applied by CBA Spectrum cannot adequately produce valid estimates due to issues associated with the current sub-prime market conditions. Significantly, the analysis conducted in the estimation of the debt risk premium (below) shows that CBA Spectrum has performed better in predicting bond yields than Bloomberg under current market conditions."*[58]

As CBA Spectrum has changed its methodology in calculating bond yields and is now providing estimates that were considered by the ESCV as better in predicting bond yields, TransGrid considers it is no longer reasonable to exclude the CBA Spectrum data.

CEG in its report[59] concluded that in adopting an averaging period during the current financial crisis that:

a) With a smaller number of bonds on issue and with less frequent trading of those bonds, the 10 year BBB+ yield has become increasingly hard to observe;

b) It cannot be assumed that Bloomberg fair yields will be appropriate; and

c) Based on the evidence in CEG's report and the ESCV's analysis, CBA Spectrum is likely to provide a more accurate estimate of true "fair value" than the AER's standard methodology relying solely on Bloomberg.

As a recommendation, CEG stated that:

> *"An alternative approach to relying solely on one or the other of these data services would be to take a simple average of the two. This would be consistent with the AER's approach to estimating future prices for raw materials (copper, aluminium, crude oil etc) for the purpose of estimating future capex costs. In this case, the AER estimates these prices by taking a simple average forecasts provided by a number of market participants (and aggregated by Consensus Economics). A similar approach to estimating fair value for 10 year BBB+ yields would ensure that some weight was given to all bonds for which there is data in each data service. It would also give equal weight to the expert opinions embodied in the estimates of fair value from each data service."*[60]

Hence, for the revised Revenue Proposal, TransGrid proposes using:

a) A 20 business day averaging period ending 5 September 2008 to calculate the debt risk premium, which is consistent with the averaging period proposed for calculating the nominal risk free rate. This decision has been made to avoid using an averaging period at a time when the market bonds used to calculate the debt risk premium are proving unreliable;

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[58] Essential Services Commission Victoria, Gas Access Arrangement Review 2008-2012 Final Decision, page 487

[59] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, page 57.

[60] Ibid, page 57.

b) A simple average of the Bloomberg BBB bond yields and the CBA Spectrum BBB+ bond yields based on CEG's recommendation above; and

c) A debt risk premium derived from the application of this averaging period and the abovementioned methodology of 3.21%.

4.2.7 Expected inflation

AER Draft Decision

In the draft decision, the AER stated that expected inflation is an implicit component of the nominal risk free rate with implications for the return on both debt and equity.

The AER referred to the regulatory requirement in the NER[61] that the post-tax revenue model (PTRM) must specify:

> *"a methodology that the AER determines is likely to result in the best estimates of expected inflation."*

The AER commented on both their historical approach and the approach taken in their most recent revenue decisions for ElectraNet and SP AusNet to calculate the expected inflation rates. It is on the latter approach that the AER stated:

> *"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 PTRM."*[62]

and

> *"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."*[63]

Although the AER commented that TransGrid's inflation forecast methodology *"is broadly similar to that applied by the AER"*[64], the AER did not accept the proposed inflation forecasts put forward by TransGrid in its Revenue Proposal due to the range of sources used to establish the forecasts.

The AER commented that TransGrid's proposed methodology *"draws on forecasts from a number of independent economic forecasters"* [65] that are inconsistent with the forecasts used by the AER in previous decisions.

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[61] NER, clause 6A.5.3(b)(1).
[62] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 95.
[63] Ibid, page 96.
[64] Ibid, page 96.
[65] Ibid, page 96.

As an alternative, the AER referenced the RBA's statement on monetary policy as a more appropriate source of objective data and *"which provides consistency and transparency in the AER process for deriving an inflation forecast."*[66]

TransGrid's Response

TransGrid does not accept the AER's revised inflation forecast methodology, as internal inconsistencies with the AER's methodology and the AER's proposed averaging period have arisen subsequent to the AER's Draft Decision due to the onset of the global financial crisis.

TransGrid would be prepared to accept the AER's use of the RBA inflation forecasts when this is applied under normal economic conditions, but not during periods where the market indicators do not provide a reliable measure of the true cost of capital. This is explained more fully below.

(a) Long term inflation forecast

The RBA's inflation policy is set to ensure that the long-term inflation forecast is within a target band of 2-3 per cent. Hence, for this reason TransGrid agrees with the AER's approach of adopting the mid-point of the RBA's target inflation band of 2.5 per cent for long term forecasts only.

(b) Short-term inflation forecast

Although the AER recognised the TransGrid's inflation forecasting methodology is *"broadly similar to that applied by the AER for its previous transmission determinations"*[67], the AER rejected TransGrid's short-term forecasts for 2008/09 and 2009/10 as these were not sourced from the RBA's Statement of Monetary Policy[68].

In its Revenue Proposal, TransGrid stated that the RBA forecasts are a "policy signalling mechanism" and "not true inflation forecasts" [69] and hence not appropriate for use as short-term inflation forecasts.

In TransGrid's view, the requirement on the AER to adopt a 'best estimate' of expected inflation must be interpreted in light of the use to which the inflation rate is used in the PTRM. Applying different inflation forecasts in the PTRM will have no impact on the capital and operating expenditure input data as these are entered and calculated in real terms. However, the use of the nominal risk free rate requires the application of a fit-for-purpose inflation forecast in order to ensure that the regulated business is provided with adequate compensation in real terms (that is, after inflation) for the cost of equity. This is a key determinant for the business's real revenue stream.

TransGrid notes that until relatively recently, the AER used the break-even inflation rate (i.e. the difference between the yield from CPI indexed CGS and nominal CGS bonds) as the inflation forecast used as an input into the PTRM. As mentioned above, the inflation rate used in PTRM is a critical input because, within this model, it

[66] Ibid, page 96.
[67] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 96.
[68] Ibid, page 96.
[69] TransGrid, TransGrid Revenue Proposal 1 July 2009-30 June 2014, page115.

effectively converts the nominal WACC into a real return on capital. It is this real return that impacts on regulated businesses as the real return is used to set the real revenues that are then indexed with actual CPI during the regulatory period.

The AER moved away from this approach as stated in the Draft Decision because:

> *"..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."*[70]

Therefore, for this reason the AER stated that it now applies the RBA's short-term inflation forecasts as providing the best estimate of expected inflation.

TransGrid only accepts the use of the RBA's short term inflation forecasts under an economic environment without significant market distortions. This matter is further addressed in the following section.

(c) Inconsistencies due to the financial crisis

Since publication of the AER's Draft Decision, there has been a significant change in the yield of nominal CGS due to the global financial crisis, which has reversed the relative bias in the yields of CGS bonds.

Specifically, the high demand for highly liquid and low risk assets has led to substantial reductions in the yield on nominal CGS that now exceeds the premium paid for inflation protection using indexed CGS. In its report, CEG stated:

> *"Our view is that this fall in the break even inflation rate has clearly been driven primarily by a massive increase in the demand for liquidity as a result of the global financial crisis (rather than a fall in expectations of the average inflation rate over the next ten years)."*[71]

This is demonstrated in the CEG report and as shown in Figure 4.2.

[70] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 95.
[71] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, page 43.

Figure 4.2: 10 year CGS yields and break-even inflation

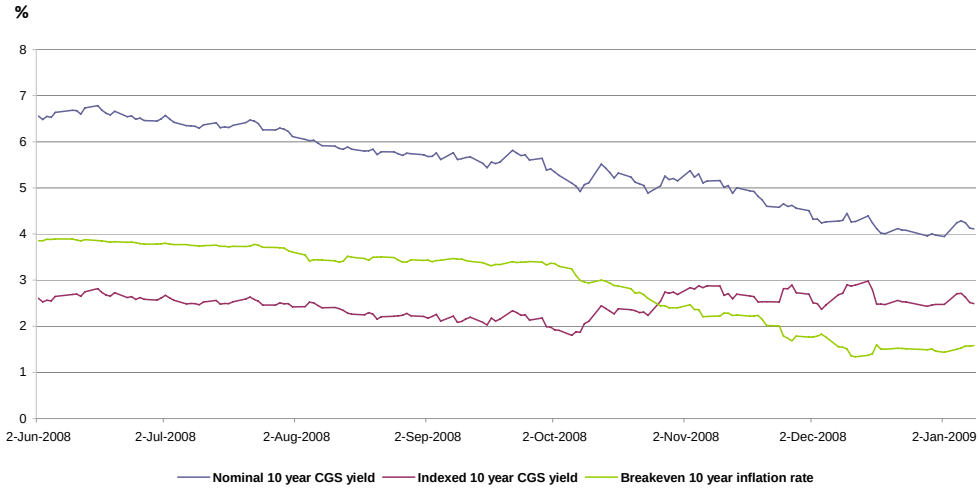


Figure 4.2 illustrates how nominal 10 year CGS yields have fallen over the last six months relative to indexed CGS yields and consequently how the 'break-even inflation' rate has fallen. From 2 June 2008 to 2 December 2008, the 10 year nominal CGS yields have fallen 2.24% while indexed bond yields have effectively remained steady (falling only 0.09%). By 2 December 2008, the break-even inflation rate had fallen to 1.77%.

Importantly, it is now apparent that the bond market-derived inflation forecast currently *understates* forecast inflation. Therefore, the circumstances in which the bond market overstated expected inflation that led to the AER's current methodology for forecasting inflation have been reversed.

This has given rise to an inconsistency with the AER's approach of selecting an averaging period after September 2008 and simultaneously using RBA short-term inflation forecasts. This inconsistency must be addressed. As stated by CEG in their report:

> *"The AER should not, in our view, simultaneously:*
>
> *a) apply the RBA's forecast of inflation, on the assumption that it is accurate; and*
>
> *b) reject the use of indexed CGS to determine the risk free rate, given the evidence that the lower break even inflation rate in the CGS market reflects abnormally low yields being paid for nominal CGS."*[72]

The consequences for TransGrid of such an approach by the AER is that the return of capital will be calculated inconsistently with the inflation forecast used in the PTRM to determine the real baseline revenue in the next regulatory period.

(d) Conclusion

For the reasons set out in this section (4.2.7), TransGrid does not accept the simultaneous application of an averaging period after 5 September 2008 and the use

[72] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, page 46.

of the RBA's short-term inflation forecast. This is discussed in more detail in section 4.2.8.

For the revised Revenue Proposal, and only on the basis that TransGrid's proposed averaging period ends on 5 September 2008, TransGrid is prepared to accept the use of the RBA's short term and long term inflation forecasts. The proposed forecast is shown in Figure 4.4.

Figure 4.4: TransGrid's inflation forecast (per cent)

	June 2010	June 2011	June 2012	June 2013	June 2014
Forecast Inflation	3.25	2.5	2.5	2.5	2.5

4.2.8 Adjustment to determine a rate of return under abnormal conditions

TransGrid considers that the AER's current practice for determining rates of return cannot be applied in an abnormal market environment, such as is currently being experienced.

The continued application of this practice leads to the following inconsistencies:

- The real risk free rate would be estimated to be below the real risk free rate on indexed bonds (which is already an unreliably low benchmark); and
- Using a forecast inflation rate that is above the break even inflation rate from the CGS bond market. This can only be justified if it is believed the nominal CGS yield is distorted by the abnormal market conditions in which case use of the yield as a proxy for the risk free rate is problematic.

The inconsistency arises from the AER's practice of adopting an averaging period close to the revenue determination while at the same time using short-term inflation forecasts from sources that are inconsistent.

It was the *"overestimate of expected inflation"* from using indexed CGS that provided the rationale for the AER to adopt the RBA's short term inflation forecasts. This change should signal that a revision of the short-term inflation forecasting methodology is required as there is now an inconsistency with the AER's practice of setting the averaging period close to the next regulatory period and the simultaneous use of RBA short-term inflation forecasts.

Following advice from CEG[73], TransGrid has given consideration to the possibility of making appropriate adjustments to the methodology used to determine an adequate rate of return. Given that the global financial crisis has led to an abnormal depression in nominal CGS yields compared to indexed CGS yields, the assumptions applied in the revenue modelling (PTRM) need to be carefully considered. Current observations of the break-even inflation rate provide an unreliable estimate of inflation.

A possible solution to this would require use of indexed CGS yields instead of nominal CGS yields to derive the risk free rate. This would require the addition of

[73] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, pages 40-47.

expected inflation (derived from RBA forecasts) in order to estimate a nominal risk free rate.

It is considered that this proposed methodology would go part way to addressing the unreliable data observations that arise within an abnormal market environment. However, TransGrid considers that the most reliable method of deriving an adequate rate of return is to adopt an averaging period that is the most proximate period concluding before the onset of the global financial crisis (that is, a period that concludes on or before 5 September 2008).

4.3 TransGrid's Conclusion

The codifying of some WACC parameters in the NER has led to a greater certainty during economic conditions that are consistent with the underlying economic conditions assumed at the time of formulating the parameters. However, in the current global financial crisis, the inflexibility of these parameters undermines the intended certainty.

CEG highlighted this problem in its report on the averaging period and stated that:

> *"Adopting an averaging period that is contaminated by the current financial crisis will likely result in an aberrant and historically unprecedentedly low estimate of the risk free rate. Under the Rules this will flow through to a correspondingly low estimate of the cost of equity. By contrast, the true prevailing cost of equity is likely to be at historically high levels."*[74]

It is clear that the AER must adopt an approach that provides an adequate rate of return to TransGrid in accordance with its obligations under the National Electricity Rules (clause 6A.6.2(b)), rather than mechanistically applying the various factors leading to the setting of this rate of return without consideration to both the relevance and appropriateness of its previous practice and its broader obligations under clause 6A.6.2(b) of the NER to provide an adequate rate of return to TransGrid.

The parameters used in calculating the cost of capital and TransGrid's proposed values are shown in the table at Figure 4.5.

[74] CEG, Rate of return and the averaging period under the National Electricity Rules and Law, page 11.

Figure 4.5: WACC parameters

Parameter	TransGrid Proposal
Nominal risk-free rate	5.86%
Inflation rate	2.58%
Debt risk premium	3.21%
Market risk premium	6%
Corporate tax rate	30%
Value of imputation credits	50%
Proportion of equity funding	40%
Proportion of debt funding	60%
Equity beta	1
Nominal vanilla WACC	**10.19%**

5. Forecast Operating Expenditure

5.1 Introduction

Chapter 8 of TransGrid's Revenue Proposal sets out the methodology followed to determine the operating expenditure (opex) forecast for the forthcoming regulatory control period together with the key inputs and assumptions used in determining the opex forecasts.

As explained in the Revenue Proposal, costs associated with maintenance forecasts, wage increases and asset growth are the main drivers contributing to the increased level of opex in the near future. TransGrid's opex forecast was developed with consideration to the following key factors:

- Asset management and maintenance requirements;
- The impact of capital expenditure on the base level of operating expenditure;
- Forecasts of increased costs due to wages growth and operating materials and expenses; and
- Impact of non-controllable (other) operating costs.

TransGrid's proposal was developed using TransGrid's model for forecasting controllable operating expenditure. This methodology references routine maintenance forecasts, defect maintenance ratios, major operating projects forecasts, labour cost escalations, assets growth factors, economy of scale factors and base year costs and adjustments. PB reviewed this model and stated that:

> *"whilst the model is complex in nature… (it) incorporates assumptions and forecasting methodologies that produce reasonable forecasts of operational expenditures."*[75]

TransGrid's opex model operates on the basis of forecasting future costs from an efficient base year. PB reviewed TransGrid's base year costs and benchmarking data provided by TransGrid and concluded:

> *"TransGrid is currently a prudent and efficient provider of transmission network services, implementing prudent maintenance policies in a cost efficient manner".*[76]

The opex model applies economy of scale factors to model the incremental opex impact of additional assets on different parts of the business. PB reviewed the modelling and application of these factors and concluded that:

> *"the efficiency of scale factors incorporated into TransGrid's opex modelling are reasonable and represent the potential gain in efficiencies TransGrid is likely to achieve."*[77]

[75] PB, TransGrid Revenue Reset An Independent Review, page 198.
[76] Ibid, page 208.
[77] Ibid, page 212.

TransGrid has included an opex/capex tradeoff in its opex model by including a reduction in forecast opex resulting from the asset replacement capital works program. PB has reviewed TransGrid's approach and noted that:

> *"this methodology is robust" and "the resultant savings appear reasonable."*[78]

TransGrid believes that its proposed forecast of required operating expenditure reasonably reflects the efficient costs of a prudent operator in achieving the *operating expenditure objectives* in clause 6A.6.6 (c) of the NER. Further, the methodology adopted by TransGrid provides a realistic expectation of the future cost inputs required to achieve the *operating expenditure objectives*. TransGrid believes that it has provided sufficient material for the AER to be satisfied as to these matters, including on the basis of the further information and analysis provided in conjunction with this revised Revenue Proposal. Consequently, TransGrid submits that the AER should accept the forecasts including in circumstances where the AER considers that there may be other equally or more preferable outcomes.

The following section of this revised Revenue Proposal provides a summary of the AER's Draft Decision on TransGrid's operating expenditure forecast. Those areas not accepted by the AER, where TransGrid is of the opinion that the AER decision requires further consideration, are then discussed in more detail in subsequent sections. TransGrid's revised operating expenditure forecast required to achieve the operating expenditure objectives is provided in section 5.3.6.

5.2 Summary of AER Draft Decision

In its Draft Decision, the AER reviewed TransGrid's opex proposal against the requirements of the NER and made an assessment of TransGrid's forecast opex for the next regulatory control period and:

a) Accepted TransGrid's methodology for forecasting its opex requirement, noting that the assumptions incorporated into the opex model are reasonable and, that adjustments to the base year are appropriate (p. 109);

b) Accepted TransGrid's proposal to use 2006-07 as a base year as reasonable and an efficient base from which to project forecast opex requirements (p. 113);

c) Accepted TransGrid's underlying forecasts for its controllable opex (p. 114);

d) Accepted TransGrid's proposed demand management allowance as prudent and reasonable (p.116);

e) Did not accept TransGrid's proposed labour cost escalation and reduced TransGrid's forecast controllable opex by $11.0 million ($2007-08) (p.119);

f) Accepted TransGrid's application of labour cost growth rates in its opex model (p. 119);

g) Accepted TransGrid's proposed approach to non-labour cost escalation (p.120);

[78] PB, TransGrid Revenue Reset An Independent Review, page 212-3.

h) Did not accept TransGrid's basis for determining the current replacement cost of the existing asset base, which is used as an input to the calculation of the asset growth ratio and substituted a replacement cost of $7.8 billion which reduced TransGrid's total forecast controllable opex by $6.1 million ($2007-08) (p. 122-3);

i) Did not accept TransGrid's defect maintenance forecast for new growth assets and removed the defect maintenance costs for those assets which reduced TransGrid's forecast controllable opex by $15.0 million ($2007-08) (p. 126);

j) Accepted TransGrid's proposed approach to incorporating efficiencies and forecast maintenance savings into its opex forecasts (p. 129);

k) Accepted TransGrid's estimate of network support payments of $45.5 million ($2007-08) for the regulatory control period without adjustment (p. 133);

l) Did not accept TransGrid's updated estimate for self insurance of $15.8 million ($2007-08) and substituted an allowance of $6.76 million ($2007-08) (p. 135-6);

m) Did not accept TransGrid's proposed allowance for debt raising costs of $22.0 million ($2007-08) and substituted an allowance of $11.2 million ($2007-08) (p. 138-39); and

n) Did not accept and removed TransGrid's proposed allowance for equity raising costs of $13.9 million ($2007-08) (p. 145).

TransGrid has implemented all aspects of the AER's Draft Decision with the exception of those related to:

- Labour cost escalation (e);
- Defect maintenance for new growth assets (i);
- Self insurance costs (l);
- Debt raising costs (m); and
- Equity raising costs (n).

5.3 Response to Matters Raised in the AER's Draft Decision

This section sets out TransGrid's response to the matters raised in the AER Draft Decision where TransGrid does not accept the amounts substituted by the AER or disputes the reasoning behind the AER decision. Additional information is included where appropriate to support TransGrid's position.

5.3.1 Labour cost escalators

AER Draft Decision

> *"Based on Econtech's advice, the AER does not consider that the averaging methodology employed by CEG to forecast wages growth in the EGW sector for NSW 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 inappropriate forecasts of labour cost escalation.

Further, 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 was used by CEG), the economic climate has changed considerably, resulting in some pressure being taken off wages growth…

…From 2008-09 the AER will adopt Econtech's forecasts for wages growth in the EGW sector in NSW for the next regulatory control period… Given that actual wage data is available for 2007-08, the AER will apply the actual wage increase provided for under TransGrid's current work place award."[79]

TransGrid Response

As outlined in section 3.3.7, TransGrid does not accept the proposed escalators proposed by the AER.

TransGrid re-engaged CEG to review the AER's approach to cost escalation and provide advice on the appropriate cost escalators to use.

CEG has reviewed the AER's Draft Decision for TransGrid with respect to cost escalators and finds the approach adopted by the AER to be generally reasonable. However, CEG identifies two major concerns with the AER approach:

- Inconsistency in the timing of escalation factors. Financial year on financial year escalation factors were applied for electricity, gas and water (EGW) sector labour, general labour and construction. However, CEG has identified that the inflation deflators applied by the AER to EGW wages overlap each other in timing, double-counting inflation at particular times.

  To resolve the timing issues that appear in the AER modelling, TransGrid has adopted CEG's recommended approach of creating a single index based on both the TransGrid's Employees Award and Econtech forecasts of real wage forecasts and then adjusting that to derive the average escalation forecasts.

- The AER did not accept the approach used by CEG to apply Macromonitor forecasts for the estimation of EGW labour and construction escalators. As outlined in section 3.3.7, there was no sustainable argument set out by the AER for it to disregard the Macromonitor forecast in its Draft Decision. However, noting that the Econtech forecast in the Draft Decision is very similar to the earlier forecast provided by Macromonitor, and the fact that the Econtech forecasts are more recent, TransGrid considers the Econtech forecast to be reasonable.

[79] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, pages 118-9.

Based on CEG's analysis, TransGrid has revised the EGW cost escalators to apply to its revised Revenue Proposal. These are shown in Figure 5.1 below. CEG's report is provided in Appendix E. TransGrid considers that the escalation factors in the revised proposal are reasonable and reflect the costs that a prudent TNSP operating in the circumstances of TransGrid would require to achieve the opex objectives.

Figure 5.1: TransGrid Labour real cost escalators (%)

Component/ Year	2009/10	2010/11	2011/12	2012/13	2013/14
EGW (NSW) wages	3.7	3.2	2.9	2.5	2.0

TransGrid notes that the AER has indicated that it intends to update its forecasts for wages and construction cost movements using Econtech forecasts at the time of making its final decision. TransGrid considers that to allow the Econtech assumptions to be tested for reasonableness TransGrid should be consulted in the update of the forecasts.

5.3.2 Defect maintenance for new assets

AER Draft Decision

> *"TransGrid provided a number of examples where new assets resulted in defect costs immediately after commissioning. For example, TransGrid referred to the cables laid in tunnels and secondary systems in the MetroGrid project. Based on PB's advice, the AER considers that the MetroGrid project is a very specific project constructed in the Sydney CBD and is not representative of the typical transmission line, cable runs and above ground oil insulated substations built in NSW. Further, secondary systems and relays comprise a small percentage of the costs of most projects and therefore any associated defects are not likely to be significant.*
>
> *TransGrid also referred to the Queensland-NSW Interconnector project commissioned in 2003. TransGrid advised that the transmission lines have required $441 000 in maintenance, with the majority ($334 000) being associated with easement and access track defect work in 2003. TransGrid advised that later expenditure has been associated with routine maintenance. The AER notes that as a proportion of the total capital costs of constructing this project, the $334 000 for easement and access track defect work is a relatively small proportion of its budget.*
>
> *The AER accepts that new assets may require some defect maintenance expenditure, however, based on the information provided the AER does not consider this to be significant.*
>
> *The AER notes that TransGrid has developed its defect ratios largely based on historical performance of its asset base. However, TransGrid's asset base will change considerably as a result of the proposed capex program for the next regulatory control period. The average annual capex program leading up to and including 2006-07 was $176 million ($2007-08). TransGrid's proposed average annual capex program for the next regulatory control period is $525*

million ($2007-08). This represents an increase of approximately 200 per cent.

Based on PB's advice, the AER considers that the defect maintenance forecast proposed by TransGrid is not reasonable because it does not factor in the significant increase in new assets proposed to be commissioned during the next regulatory control period. It agrees with the adjustment proposed by PB and will remove the defect maintenance costs for those assets which are commissioned during the next regulatory control period and will result in the efficient costs that a prudent operator in the circumstances of TransGrid would require to achieve the opex objectives, as required by clause 6A.6.6(c). Following a request from the AER, TransGrid advised that this adjustment results in a reduction of $15 million ($2007-08) to the forecast controllable opex for the next regulatory control period."[80]

TransGrid Response

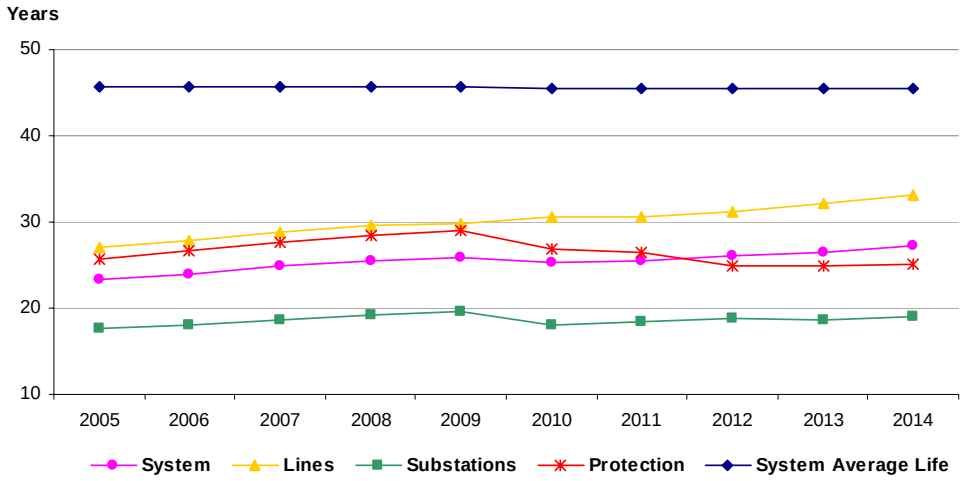
TransGrid has analysed the impact of the proposed capex program on the average age for various asset categories and the system itself, and has identified that the average age remains largely static over the course of the regulatory period. It is not considered that there is a reasonable basis for reducing the defect maintenance allowance for new assets as it is considered that:

- There is no significant change to the age mix of assets making up TransGrid's asset base;
- There is evidence that new assets can experience higher defect rates than for mid-life equipment (for example, as a result of manufacturing defects); and
- Warranties provide only limited coverage and do not cover the emergency response, fault detection and site supervision components of any equipment malfunction.

Figure 5.2 below shows the average age of various asset classes over the current and future regulatory period. This clearly shows that average age of assets is reasonably stable leading to the conclusion that there would be no expectation that defect rates would be impacted by the effect of any new assets.

[80] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 125-126.

Figure 5.2: System Average Age



With regard to the specific cases mentioned by the AER:

a) *"The AER considers that the MetroGrid project is a very specific project constructed in the Sydney CBD and is not representative of the typical transmission line, cable runs and above ground oil insulated substations built in NSW."*[81]

TransGrid provided a number of examples across a range of asset types to illustrate the real costs of defect rectification associated with new assets. It is not reasonable to select one of these examples and dismiss the costs associated with it simply because this particular example is not representative of TransGrid's more typical asset base. It is also noted that TransGrid's capex program does in fact include further 330kV cable projects and gas insulated substations.

TransGrid provided examples relating to the defects costs associated with standard equipment such as transformers and circuit breakers. These examples confirmed that, for typical asset types comprising the bulk of TransGrid's capex program, there are material costs associated with defect maintenance on new assets.

b) *"Further, secondary systems and relays comprise a small percentage of the costs of most projects and therefore any associated defects are not likely to be significant."*[82]

It is unclear what materiality threshold the AER is applying in making this judgment. Whilst secondary systems account for only 4 per cent of TransGrid's capex program for the next 5 years, the defect costs associated with these assets amount to approximately $1 million. It is unreasonable for the AER to exclude these costs merely because it considers this amount to be insignificant.

[81] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 125.
[82] Ibid.

TransGrid reiterates that these are real costs that an efficient TNSP will bear and have been included in the opex forecast as part of this revised proposal.

c) *"TransGrid also referred to the Queensland-NSW Interconnector project commissioned in 2003. TransGrid advised that the transmission lines have required $441 000 in maintenance, with the majority ($334 000) being associated with easement and access track defect work in 2003. TransGrid advised that later expenditure has been associated with routine maintenance. The AER notes that as a proportion of the total capital costs of constructing this project, the $334 000 for easement and access track defect work is a relatively small proportion of its budget. The AER accepts that new assets may require some defect maintenance expenditure, however, based on the information provided the AER does not consider this to be significant."*[83]

Again, it is unclear what materiality threshold the AER is applying in making this judgment. It is irrelevant whether the defect costs associated with a particular asset is a small proportion of the capital value of the asset. In fact, for large transmission assets, one would expect the maintenance costs to be a small percentage of the capital value. Nevertheless, it would be unreasonable to exclude such costs on this basis. The relevant issue is how significant the defect expenditure is compared to a typical asset, and TransGrid considers that a defect expenditure of $330,000 on a transmission line is significantly in excess of what could be expected on average.

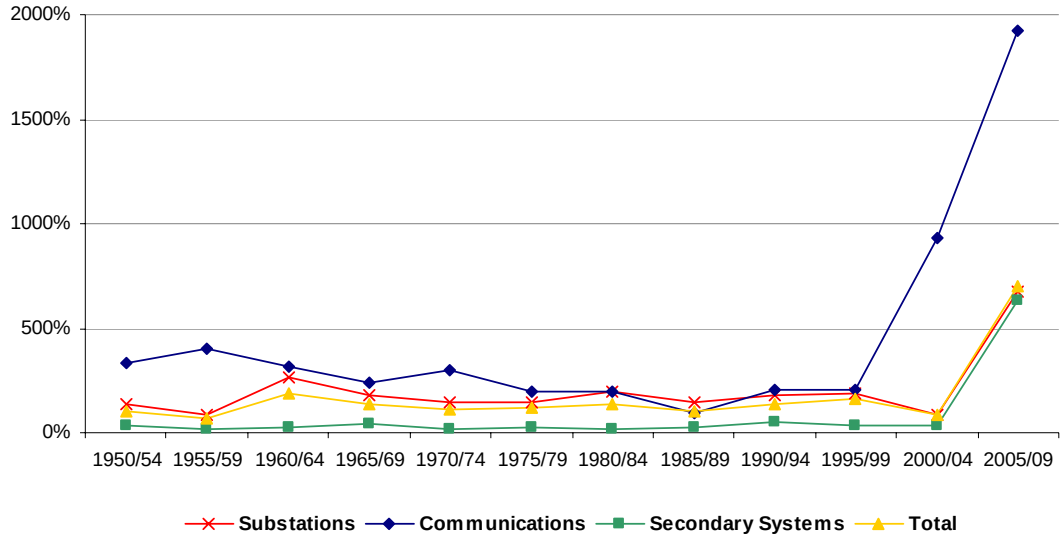
The AER's assertion that new assets will not incur significant defect maintenance expenditure is not supported by any evidence.

TransGrid has carried out an analysis of its maintenance expenditure over the period 2005 - 07 and has graphed the ratio of defect expenditure to routine maintenance expenditure against the commissioning date of its assets (Figure 5.3). The graph clearly shows that, rather than new assets showing a significant reduction in defect costs, the defect costs for newer assets are significantly higher across all the asset categories.

This data supports the reinstatement of the defect costs for new assets.

[83] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 125.

Figure 5.3: Defect Ratio vs Commissioning Date



d) *"The AER notes that TransGrid has developed its defect ratios largely based on historical performance of its asset base. However, TransGrid's asset base will change considerably as a result of the proposed capex program for the next regulatory control period. The average annual capex program leading up to and including 2006-07 was $176 million ($2007-08). TransGrid's proposed average annual capex program for the next regulatory control period is $525 million ($2007-08). This represents an increase of approximately 200 per cent."*[84]

Based on the evidence provided in section (c), the increase in new assets being commissioned in 2009-14 would be expected to lead to an increase in defect costs. There is no basis for concluding that there should be no allowance for defect maintenance of these new assets. TransGrid's approach in assuming a constant defect ratio across all its assets actually results in a conservative estimate of its opex requirements.

TransGrid engaged SKM to provide an assessment of PB's review of TransGrid's asset growth escalation. SKM's review looked at:

- The probability of defects on new equipment;
- Warranty considerations;
- Routine opex variations with new technology.

SKM concluded that:

"TransGrid's opex forecast for defect rectification of new assets is representative of the cost that will be incurred during the regulatory period and an adjustment is not warranted…

[84] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, pages 125-6.

…SKM considers on the whole that TransGrid has been prudent and efficient in modelling the costs associated with the rectification of defects on new assets."[85]

The SKM report is provided at Appendix L.

The evidence strongly supports TransGrid's position that new assets commissioned on the system will require defect maintenance within the 2009-14 period, and the level of opex required will be at least equivalent to the requirement for mid-life assets. TransGrid therefore has included these costs in its revised opex forecasts.

5.3.3 Self insurance

AER Draft decision

The AER was not satisfied with TransGrid's proposal for self insurance costs, based upon the analysis of its consultant SAHA, on the basis that the probability of certain events occurring or the costs assigned to some of those events are not reasonable. Accordingly, the AER reduced TransGrid's self insurance provision from $15.8 million to $6.8 million.

TransGrid's Response

TransGrid noted that the AER accepted risks where there was substantial historical data to support its claim. However it rejected a majority of the proposed risks on the basis there is insufficient data to support the quantification, or on the basis the event has not occurred in the business since its inception.

Figure 5.4 (over page) sets out TransGrid's response to AER's Draft Decision on self-insurance.

[85] SKM, Considerations on PB's Review of TransGrid's Operating Expenditure, page 9.

Figure 5.4: TransGrid Revised Proposal for Self Insurance

Self Insurance Risk	AER Draft Decision ($)	TransGrid Response	TransGrid Revised Proposal ($)
Fraud risk	72,500	AER accepted Revenue	72,500
Insurer's credit risk	27,000	AER accepted Revenue	27,000
Counterparty credit risk	47,500	AER accepted Revenue	47,500
Environmental contamination	0	Revised estimate submitted	1,000,000
Bomb threat/hoax, terrorism	26,000	TransGrid original estimate re-submitted	117,500
Earthquake	730,000	TransGrid original estimate re-submitted	825,000
Bushfires	15,000	TransGrid original estimate re-submitted	1,335,000
Risk of non-terrorist impact of planes & helicopters	640,000	AER accepted Revenue Proposal	640,000
Poles and towers	1,900,000	Revised estimates submitted	3,387,500
Key assets	3,300,000	TransGrid original estimate re-submitted	3,360,000
Key staff	0	TransGrid accepts Draft Decision	0
Contractual risk	0	TransGrid original estimate re-submitted	57,500
General public liability	0	TransGrid original estimate re-submitted	62,500
Failure to supply	0	TransGrid original estimate re-submitted	95,000
TOTAL	**6,758,000**		**11,027,000**

TransGrid submits that the AER has made a number of errors in relation to its treatment of self insurance costs. In particular, the AER has:

- Misunderstood the nature of expected values and how they are calculated;
- Not shown that the self insurance claims (supported by actuarial verification) are not reasonable; and
- When rejecting TransGrid's calculation of risk exposure, have not provided their own estimate of costs where probabilities of events are non-zero.

The AER have assessed TransGrid's self insurance estimate to satisfy the objective that the costs *"reasonably reflect the efficient costs that a prudent operator in the circumstances of TransGrid would require to achieve the opex objectives"*[86].

TransGrid contends that 'reasonably reflects' should be a function of whether a 'reasonable practitioner,' faced with a similar situation, would adopt a similar approach to undertaking such a quantification. Actuaries, Insurers and Risk

[86] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 283.

Managers use similar approaches to SAHA's to quantify low probability, high consequence events. They, like SAHA, leverage all available relevant data (internal and external to the firm), along with their reasonable judgement, to provide a best estimate of the probability and consequence for that event.

In determining risks associated with low probability events, insurance and risk practitioners use the broadest relevant data set and do not limit their valuation only to risks that have affected the company previously, which appears to be a key assumption of the AER's argument.

In their report accompanying this revised proposal (Appendix K), SAHA have noted that the AER's approach of disallowing a quantification or not undertaking a quantification just because there is not a 'perfect' data set to support that quantification, or because that risk has never affected that specific entity before, is not an approach that actuaries would adopt. The self insurance estimates provided for TransGrid by SAHA were subject to detailed actuarial review. In its Draft Decision, the AER has not provided evidence that an actuarial review of the AER position on self-insurance was undertaken.

The approach undertaken by SAHA is consistent with the approach that insurers take to quantifying low probability, high consequence events, for the purposes of developing insurance premiums for such events. The absence of a 'perfect data set' would not automatically preclude them from estimating a cost to them of bearing this risk, which in turn would form the basis for their proposed insurance premium. It is noted that if this were the case, it would be virtually impossible to get insurance for any low probability, high consequence event.

Those risks that have been quantified using a longer data set are more certain than those with less than perfect data sets. The reviewed risks with better data sets are likely to exhibit less volatility in results around the mean (which is represented by SAHA's estimate). However, that does not mean that the quantifications that relied on 'less perfect' data sets are incorrect, rather the range of actual outcomes around the mean is likely to be higher. SAHA's assumptions reflect independent, unbiased estimates of the probability and consequence of each risk, and therefore the actual outcomes are just as likely to be above the forecast as below. Thus the expected cost is reasonably represented by the SAHA quantification.

Based on the SAHA advice and the AER Draft Decision, TransGrid has re-evaluated its self insurance requirements. In terms of environmental contamination, TransGrid has recognised these issues and the financial response of the organisation to addressing them are likely to develop over a period of time. While it is reasonable to expect that TransGrid may be subject to these costs in the future, some of these costs are likely to be subject to a time lag before being incurred by the business. TransGrid has therefore applied a discount factor to the anticipated costs to reflect the effect of this time lag.

Similarly, in terms of key person risk, TransGrid is prepared to manage its exposure to this risk within its overall opex allowance without seeking specific coverage under the self insurance allowance.

TransGrid's revised self insurance requirement for 2009/10 to 2013/14 is provided in Figure 5.5.

Figure 5.5: Self Insurance Estimate ($million, 2008)

2010	2011	2012	2013	2014	TOTAL
2.2	2.2	2.2	2.2	2.2	**11.0**

5.3.4 Debt raising

AER Draft Decision

> *"The AER uses private debt raising (issuance) costs as a proxy to set an allowance for public debt issuance costs because these costs are not observable in the Australian market. The AER considers that private placement underwriting costs, which forms part of debt issuance costs, are a reasonable proxy for public issuance underwriting costs...*
>
> *Overall, the AER is using a publicly available estimate of the debt risk premium on the chosen benchmark firm combined with a publicly available estimate of the debt issuance costs on this benchmark firm. The AER considers these estimates for the debt risk premium and debt issuance costs are the best estimates of the cost of raising public debt currently available. As such, 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 AER applies the benchmark BBB+ credit rating with 60:40 debt to equity ratio as specified in clause 6A.6.2 of the NER. 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 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. The proposed underpricing premium is therefore inconsistent with the assumed BBB+ benchmark…*
>
> *…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, or that the current method used to calculate these costs is under compensating regulated firms. "*[87]

TransGrid's Response

TransGrid does not accept that the Draft Decision debt raising costs reflect the costs that a prudent TNSP operating under the circumstances of TransGrid would require to achieve the opex objectives.

TransGrid is concerned that the AER has not had sufficient regard to the evidence provided for indirect debt raising costs in its Revenue Proposal. Additionally,

[87] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, pages 137-8.

TransGrid considers that the AER did not set out the basis and rationale for the decision, including the provision of details of the qualitative and quantitative methodologies it applied for the purposes of its decision and the reasons for making it. It would appear that the AER has adopted an approach it 'prefers' in relation to debt raising costs, rather than assessing TransGrid's proposal in accordance with the National Electricity Rules.

TransGrid set out compelling evidence in relation to indirect debt raising costs in its Revenue Proposal and as such considered these costs as reflective of the costs a prudent TNSP operating under the circumstances of TransGrid would require to achieve the opex objectives.

TransGrid has engaged CEG to review the AER's Draft Decision with regard to debt and equity raising costs. Based on CEG's advice (Appendix N), TransGrid considers that AER's use of private placements of debt as a proxy for estimating direct debt raising costs is fundamentally flawed. The best and most direct way of estimating the costs of issuing public debt is obtained from analysis of data of public debt issuance, not by using the cost of issuing private debt data. The AER's preference for the use of this proxy is puzzling given the existence of more relevant data.

TransGrid maintains that the cost of issuing public debt should be obtained from the analysis of public debt issuance data and this approach is maintained in this Revised Revenue Proposal.

The AER's rejection of the data which was used by CEG in support of TransGrid's Revenue Proposal is not sustainable in that:

- The AER claims that the sample used by CEG is not relevant as it relates to US firms not Australian firms. However, the private placement data that the AER is relying on also samples data from US firms. Hence, the AER's argument is contradictory and results in the displacement of more accurate and relevant data for less suitable data;
- In addition, it should be noted that due to the market depth in the US, the use of US data will produce a conservative estimate of the cost of issuing debt. CEG stated that "*the depth of US financial markets is such that the costs of raising debt in the US is almost certainly lower than the cost of raising debt in Australia*"[88]. As such, TransGrid contends that the use of US-based data for the cost of issuing public debt is a good proxy for a regulated transmission business;
- The AER also questions the relevance of the data as the sample does not include regulated utilities, stating that "*there is no evidence that the average debt issuance costs of the average US public debt issue is representative of the debt issuance costs of a stable regulated business in Australia. This is even more clearly the case with all regulated firms excluded from the sample used*"[89]. However, the data the AER is relying on also does not include regulated utilities. Further, such data is not publicly available;

[88] CEG, Debt and equity raising costs, page 43.
[89] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 138.

- The private debt market has ceased to exist in the wake of the global financial crisis, so it is difficult to see how this could be claimed to provide the best estimates of the cost of raising public debt; and
- The AER stated that, "*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"*[90] and "…*The AER considers these estimates (of) …debt issuance costs are the best estimates of the cost of raising public debt currently available."*[91] However, the study by Livingston and Zhou estimated both direct and indirect debt raising costs. If the AER is to rely on Livingston and Zhou as providing a justification for adopting its proxy of public debt costs, then the AER should be consistent in adopting the complete model.

TransGrid also considers that the AER approach to indirect (underpricing) costs of raising debt is flawed. There is a significant body of empirical evidence demonstrating that underpricing is a cost to businesses raising debt, and that to ensure the success of a debt issue, it needs to be issued at a discount to the price it subsequently trades.

CEG advise that there is evidence that underpricing costs increase as the level of a firm's credit rating decreases, and that it would be reasonable to expect that BBB+ debt will have a higher level of underpricing than the average for investment grade.

Direct and indirect costs are equivalent and both contribute to the total costs of raising capital. There is a delicate balance between direct and indirect cost. Lower underwriting fees (direct cost) on private placement debt would be offset by higher underpricing (higher interest rates or indirect costs), and vice versa. The direct and indirect costs are interdependent, hence direct costs should not be set without consideration to the indirect costs.

Tony Carlton has provided support to the view that indirect costs are incurred by businesses in raising debt and that the economic rationale for the presence of underpricing is strong.[92] He concludes that the CEG estimate of 3 bppa for these costs is reasonable (refer to Appendix P).

Based on the further supporting evidence provided by CEG, TransGrid considers the cost of raising debt of 15.5 bppa as proposed in its Revenue Proposal reflects the costs that a prudent TNSP operating under the circumstances of TransGrid would require to achieve the opex objectives.

TransGrid has therefore determined an amount of $21.7 million debt raising costs is required (based on a notional debt component of TransGrid's opening RAB of $4,276 million).

Figure 5.6: Debt Raising Costs ($million, 2008)

2010	2011	2012	2013	2014	TOTAL
3.7	4.0	4.3	4.7	5.0	**21.7**

[90] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 137.
[91] Ibid, page 137.
[92] Tony Carlton, Indirect Costs of Equity and Debt Raising for TransGrid, page 38-40.

5.3.5 Equity raising

AER Draft Decision

The AER accepts underpricing can occur for both initial public offerings and seasoned equity offerings. However it does not agree that indirect costs need to be included in the benchmark equity raising costs because it considers:

- it is inconsistent with the benchmark regulatory framework applied to determine the WACC; and
- the efficient benchmark NSP should be able to raise capital without incurring underpricing costs.

The AER noted that when ACG's recommended dividend yield assumption is applied to the cash flow analysis using the correct depreciation measure the payout ratio is unsustainable at well over 100 per cent of net profit after tax, which it considers an unreasonable set of assumptions.

Accordingly, the AER amended the benchmark cash flow analysis to rely on the assumptions of a given dividend payout ratio rather than a given dividend yield. When this was applied it indicated TransGrid would be able to fund its capex program over the next regulatory control period with retained cash flows hence would not require additional equity finance.

TransGrid's Response

TransGrid does not accept that the Draft Decision equity raising costs reflect the costs that a prudent TNSP operating under the circumstances of TransGrid would require to achieve the opex objectives.

Similarly to debt raising costs, TransGrid is concerned that the AER has not had sufficient regard to the evidence provided in relation to equity raising costs in TransGrid's Revenue Proposal in making its Draft Decision.

The AER's Draft Decision is that it is not satisfied that there is a need to take account of the indirect cost of raising equity under the benchmark regulatory framework.[93] This Draft Decision is based on assumptions that the efficient benchmark firm should be able to raise new capital through a rights issue to existing shareholders and that the efficient benchmark firm already includes full compensation for all investor risk that requires compensation under the CAPM and an underpricing allowance is not required.[94]

The AER provides no theoretical or empirical basis for the assumption that the efficient benchmark firm should be able to raise new capital with a rights issue without requiring compensation for any underpricing. Nor does the AER provide a sound theoretical or empirical basis for the assumption that the allowed WACC is sufficient to induce new investment that further compensation is unnecessary and inconsistent with the assumptions of the benchmark regulatory framework, in particular that established under Chapter 6A of the Rules.

[93] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 142.
[94] Ibid, page 142.

TransGrid has engaged CEG to review the AER's Draft Decision with regard to debt and equity raising costs. Based on CEG's advice (refer to Appendix N), the following issues are raised:

a) The AER has suggested that the underwriting fees should be adjusted by the fair value of the option component. TransGrid agrees with this principle. However, whilst the AER has made the assumption that this would lead to a reduction in the fair value of the option component of the underwriting fee, TransGrid asserts that:

   - The value of any overpricing in equity issues should be removed from the direct underwriting costs; and
   - The value of underpricing in equity issues should be added to the direct underwriting costs.

   As the CEG report provides evidence that underpricing is the norm in equity issues, the value of this underpricing (between 2.5 per cent and 6.5 per cent depending on the study) represents a material indirect cost.

b) The AER has argued that an allowance for underpricing is inconsistent with the application of the Capital Asset Pricing Model (CAPM). In effect, the AER is arguing that CAPM assumes that all investors have homogenous expectations. TransGrid does not consider that this argument is sustainable. The CEG report provides reasons why the adoption of all the (stylised) assumptions of the CAPM is not economically defensible and is inconsistent with the NER.

c) The AER argues that rights issues are the most common practice for Seasoned Equity Offerings (SEOs). However, the finance literature indicates that rights issues actually comprise a small percentage of SEOs. This is supported by evidence provided by CEG[95] and other finance experts[96] [97] that TransGrid has engaged who all conclude that placements are overwhelmingly the preferred method of SEOs.

d) The AER has argued that there is no requirement to compensate a firm for underpricing as equity can be raised through a rights issue. TransGrid considers that there are indirect costs associated with rights issues, and CEG's report outlines that while the costs that are borne by shareholders in a rights issue are less transparent, these costs are similar or higher than the costs that an underwriter would bear. There is no basis to conclude that costs of raising equity through a rights issue is lower than through placement, and no basis for assuming that a rights issue will eliminate the indirect costs of raising equity. Further support for CEG's position is provided from Tony Carlton (Appendix P, pages 10-11, 18-21) and Professor Bruce Grundy (Appendix Q, pages 5-9).

e) TransGrid considers there is an error in the methodology used in the AER's cash flow analysis. The ACG methodology adopted by the AER assumes that the business is not paying any principal on its debt and this implicitly

[95] CEG, Debt and equity raising costs, pages 15-17.
[96] Professor Bruce D Grundy, A Note on the Costs of Equity Financing, pages 5-9.
[97] Tony Carlton, Indirect Costs of Equity and Debt Raising for TransGrid, pages 10-18.

requires that the gearing of the business rise above 60 per cent over the regulatory control period.

In order to maintain a consistent 60 per cent gearing assumption, the benchmark cash-flow analysis must include the assumption that cash outflow of 60 per cent of regulatory return of capital (that is depreciation of the RAB) is used to pay back principal on existing debt.

f) The AER states that the application of ACG's recommended dividend yield assumption to the cash flow analysis results in an unsustainable payout ratio. However, as outlined in CEG's report, ACG's recommended dividend yield of 8.6 per cent is less than the nominal post tax cost of equity of 11.46 per cent and is therefore sustainable in the long run.

g) CEG has provided an analysis of the AER's application of the pecking order theory of capital raising. The AER has appeared to assume that reinvestment of retained earnings is costless until the dividend yield falls to 3.5 per cent. However, on the advice of CEG, TransGrid considers it is inconsistent with the pecking order theory to fail to recognise the marginal costs of retained earnings. By doing this, the AER is underestimating the cost of raising equity.

The AER's assumption of a 70 per cent payout ratio appears to be an overly conservative assumption which results in a dividend yield of less than 3 per cent, given that ACG had previously recommended a dividend yield of 8.6 per cent. Tony Carlton (Appendix P, page 34) proposes an alternative assumption for dividend payments in determining external funding requirements. This assumes a dividend policy of distributing 100 per cent of imputation credits via franked dividends.

Based on the advice of the experts that TransGrid has engaged for this issue, TransGrid considers that a dividend yield policy of 8.6 percent is sustainable as long as it is less than the estimated cost of equity. That is, equity holders expect to receive their returns on the equity invested in the form of dividends.

In its Draft Decision, the AER calculated a nominal post tax return on equity for TransGrid of 11.46 per cent. The cost of capital proposed in this revised Revenue Proposal results in a nominal post tax return on equity of 11.86 per cent which is the return that equity holders would expect in the long run.

TransGrid notes that the application of the AER's cash flow modelling with a dividend payout ratio of 70 per cent based on our revised PTRM inputs equates to a dividend yield that is significantly below the return on equity that an equity investor would expect.

If the AER chooses to apply a dividend payout policy in its final determination, the AER should recognise that the policy must support the economic value outcomes and timing assumptions of the PTRM.

As a general principle, if the AER assumes that lower than expected dividends are paid in response to high capex, there must necessarily be a period of higher than expected dividends to achieve the long term average returns to equity holders.

Noting the above inconsistencies with the AER's approach, TransGrid has adopted the 70 per cent payout ratio in its revised Revenue Proposal which, based on the

expert reports, may underestimate the external equity requirements. TransGrid has also corrected the AER cash flow analysis and has determined an amount in relation to the paying down of the principal on its debt to maintain a 60 per cent gearing. This results in an estimate of $180.6 million equity required. Applying an equity raising cost of 7.6 per cent (based on costs of benchmark seasoned equity offerings) results in a requirement for equity raising costs of $13.6 million.

By comparison, the approach recommended by Tony Carlton, where the dividend policy is set to distribute 100 per cent of imputation credits, would result in an estimate of equity raising costs significantly higher than TransGrid's estimate. Nevertheless, TransGrid has based its estimate on a methodology more closely aligned with the AER's approach, but considers there is merit in further review of the alternate approach.

TransGrid therefore considers that its estimate of equity raising costs reasonably reflects the costs that a prudent operator in TransGrid's circumstances would require to achieve the operating expenditure objectives.

Figure 5.7: Benchmark capex funding requirements ($m, nominal)

	2009/10	2010/11	2011/12	2012/13	2013/14	Total
Capital expenditure funding	575.9	505.1	680.5	630.4	485.1	2,877.0
Debt funding component	345.5	303.1	408.3	378.3	291.0	1,726.2
Equity funding component	230.3	202.1	272.2	252.2	194.0	1,150.8
Less: Retained cash flows	161.4	178.8	194.1	208.8	227.2	970.2
Additional equity requirement	**68.9**	**23.3**	**78.1**	**43.4**	**-33.1**	**180.6**

Figure 5.8: Equity Raising Costs ($million, 2008)

2010	2011	2012	2013	2014	Total
1.1	1.9	3.0	3.8	3.8	**13.6**

5.3.6 Operating Expenditure Summary

TransGrid's revised controllable operating expenditure forecast is shown in Figure 5.9 below.

Figure 5.9: Controllable operating expenditure (Real 2008 $million)

Opex by Category	2009/10	2010/11	2011/12	2012/13	2013/14	Total
Maintenance	57.6	64.7	66.4	72.8	73.5	335.1
Maintenance Support & Asset Management	12.1	12.7	13.0	13.5	13.9	65.2
Operations	8.7	9.1	9.4	9.7	10.1	47.1
Grid Planning	4.0	4.2	4.4	4.5	4.7	21.8
Taxes and Insurance	9.2	9.6	10.0	10.4	10.7	49.9
Property Management	6.5	6.7	6.8	7.0	7.2	34.1
Corporate & Regulatory Management	11.3	11.6	12.4	13.7	14.4	63.4
Business Management	19.2	19.8	20.3	20.8	21.2	101.2
Total Controllable Opex	**128.5**	**138.4**	**142.7**	**152.5**	**155.7**	**717.8**

TransGrid's revised total operating expenditure forecast is provided in Figure 5.10 below.

Figure 5.10: Total operating expenditure (Real 2008 $million)

Opex by Category	2009/10	2010/11	2011/12	2012/13	2013/14	Total
Controllable Opex	128.5	138.4	142.7	152.5	155.7	717.8
Debt Raising	3.7	4.0	4.3	4.7	5.0	21.7
Equity Raising	1.1	1.9	3.0	3.8	3.8	13.6
Self-insurance	2.2	2.2	2.2	2.2	2.2	11.0
Network Support	21.5	6.0	6.0	6.0	6.0	45.5
Total Regulatory Opex	**157.1**	**152.5**	**158.2**	**169.1**	**172.7**	**809.6**

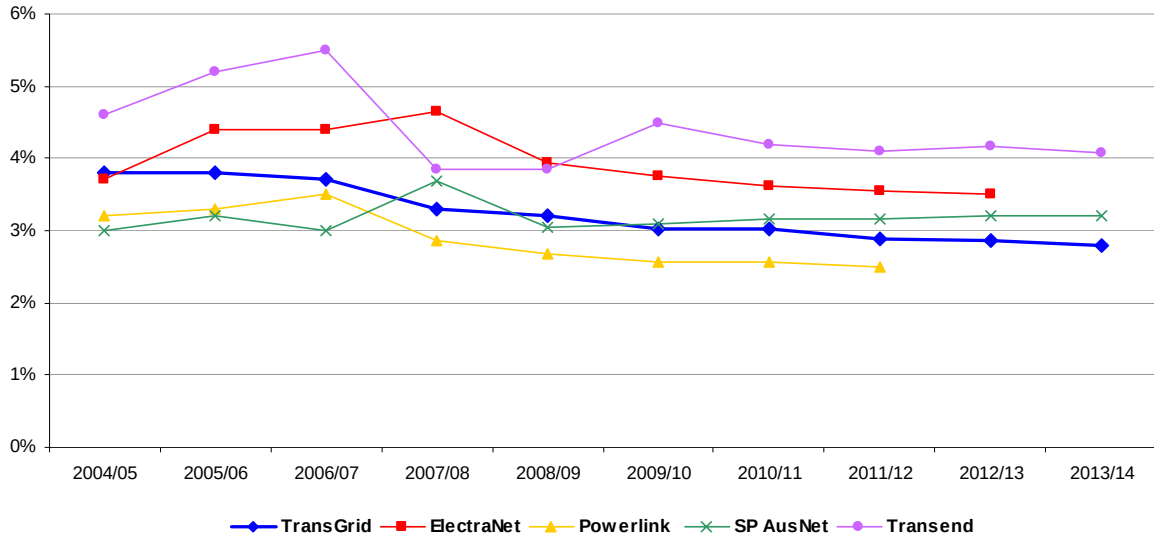
The comparison of the revised opex proposal with the original Revenue Proposal and the AER Draft Decision is provided in Figure 5.11 below.

Figure 5.11: Total operating expenditure (Real 2008 $million)

Opex by Category	Revenue Proposal	Draft Decision	Revised Proposal
Controllable Opex	735.0	701.3	717.8
Debt Raising	22.0	11.2	21.7
Equity Raising	13.9	0.0	13.6
Self-insurance	15.8	6.8	11.0
Network Support	45.5	45.5	45.5
Total Regulatory Opex	**832.3**	**764.8**	**809.6**

Figure 5.12 below provides a comparison of Australian TNSPs in terms of operating costs as a proportion of the Regulated Asset Base (RAB). This graph demonstrates that, with this revised Revenue Proposal, TransGrid continues to be one of the most efficient TNSPs in Australia.

Figure 5.12: Opex / RAB



Source: AER regulatory reports and decisions (including draft decision for Transend). TransGrid's figures are from its revised Revenue Proposal.

6. Efficiency benefit sharing

6.1 Summary

This chapter deals with both the efficiency carry forward mechanism (ECFM) for the current regulatory period and the efficiency benefit sharing scheme (EBSS) that is to apply to TransGrid for the next regulatory control period.

TransGrid will receive any benefits/penalties for efficiency gains/losses made during the current regulatory period in the next regulatory control period.

The Efficiency Benefit Sharing Scheme that will apply to TransGrid in the 2009/10 to 2013/14 regulatory period is set out in the AER's guideline dated September 2007[98]. The EBSS scheme evolved from the ECFM and operates in a similar manner[99]. The scheme was established to provide a continuous incentive to TNSPs to reward efficiency and penalise inefficiency through managing actual opex compared to the forecast controllable opex.

The AER did not receive any submissions relating to TransGrid's ECFM or EBSS.

In its Draft Decision, the AER:

a) Considered that TransGrid's approach to calculating efficiency gains/losses under the ECFM is not appropriate because it treats inflation as an efficiency gain (p.151);

b) Determined a total opex efficiency allowance of $8.9 million ($2008-09) over the next regulatory control period (p.152);

c) Determined an efficiency loss of -$3.9 million to be carried forward in the final year of the current regulatory period (p.152);

d) Will apply an error correction mechanism at the next revenue reset for the 2014-19 regulatory control period to account for any difference between actual opex in 2008-09 and TransGrid's forecast (p.152);

e) Considered TransGrid's proposal for a growth adjustment to only be applied if actual demand is outside the range of scenarios modelled in developing its Revenue Proposal is reasonable (p.153-154); and

f) Considered it appropriate to exclude the following opex cost categories from the operation of EBSS (p.155);

    - Debt raising costs;
    - Self insurance costs;
    - Insurance costs;
    - Superannuation costs relating to defined benefit and retirement schemes; and

[98] AER, Electricity transmission network service providers - Efficiency benefit sharing scheme - Final, September 2007.
[99] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 148.

- Non-network alternatives.

TransGrid has implemented all aspects of the AER's Draft Decision in its Revised Revenue Proposal with the exception of the methodology for applying a growth adjustment for actual demand.

6.2 Response to Matters Raised in the AER's Draft Decision

6.2.1 EBSS demand growth adjustment

AER Draft Decision

Forecast opex is to be adjusted for variances between actual and forecast demand growth to prevent a TNSP from being rewarded or penalised for changes that are beyond the control of the TNSP.

In the Revenue Proposal, TransGrid stated that the capex program takes into account a range of load growth scenarios, which is reflected in the opex forecast through the impact of maintenance of new assets. TransGrid's Revenue Proposal stated:

> *"TransGrid considers that for the purpose of calculating the carryover into the 2014/19 regulatory control period a growth adjustment is only required if actual demand is outside the range of scenarios modelled in developing the proposal."*[100]

The AER considered that this approach is reasonable and stated that:

> *"In the event that actual demand growth is outside the range of scenarios modelled in the development of TransGrid's approved forecast capex (for the purposes of the EBSS) forecast opex will be adjusted based on the same models (opex and capex) used to develop TransGrid's approved forecast opex to incorporate the impact of actual demand growth on the commissioning of new assets."*[101]

For clarification, the AER stated that opex will be adjusted if demand growth is greater than the high growth, or less than the low growth as outlined in Figure 6.1.

Figure 6.1: Forecast demand used by AER (MW) for EBSS

	2009/10	2010/11	2011/12	2012/13	2013/14
Low	14,150	14,410	14,790	15,040	15,270
High	14,450	14,850	15,410	15,850	16,290

Source: AER Draft Decision, section 6.5.3, Table 6.4, p.154.

TransGrid's Response

TransGrid does not accept the AER's conclusions for the EBSS demand growth adjustment.

[100] TransGrid, TransGrid Revenue Proposal 1 July 2009 - 30 June 2014, page 118.
[101] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 154.

The low and high demand spread referenced by the AER as the limits to trigger an adjustment of opex and the EBSS allowance are inappropriate.[102] These demand forecasts were referenced from TransGrid's 2008 NSW Annual Planning Report[103] using 50 per cent Probability of Exceedence (PoE). These loads, however, are not representative of the demand range modelled in the scenarios and used in forecasting TransGrid's capex program.

The load growth scenarios used in forecasting the capital expenditure allowance for 2009-14 would more accurately be based on the New South Wales summer 10 per cent PoE and winter 90 per cent PoE native maximum demand projections. These forecasts are provided annually to NEMMCO by TransGrid and are published in NEMMCO's Statement of Opportunities.[104]

The native demand refers to the actual demand delivered into the distribution networks and to transmission connected customers. The electrical power supplied and met by both scheduled and significant non-scheduled generating units.

TransGrid proposes that the following forecast demands in Figure 6.2 be used instead.

Figure 6.2: TransGrid's Recommended forecast demand growth (MW) for EBSS

	2009/10	2010/11	2011/12	2012/13	2013/14
Low	13,940	14,080	14,310	14,410	14,510
High	15,730	16,180	16,810	17,320	17,860

As stated in its Revenue Proposal, TransGrid has offered to work with the AER to determine an appropriate load growth adjustment. [105]

[102] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 154.
[103] TransGrid, NSW Annual planning report 2008, page 23.
[104] NEMMCO, Statement of Opportunities for the National Electricity Market, October 2008.
[105] TransGrid, TransGrid Revenue Proposal 1 July 2009 - 30 June 2014, page 118.

7. Depreciation

7.1 Summary

TransGrid's Revenue Proposal presented its assessment of the allowable depreciation on prescribed service assets during the next regulatory control period.

The Revenue Proposal explained that TransGrid complies with the Australian Accounting Standards Board requirements governing depreciation and has assigned a regulatory life to well-recognised categories of assets that equates to the asset's expected economic life.[106]

Clause 6A.6.3 of the Rules requires that the depreciation schedules nominated must use a profile that reflects the nature of the category of assets over the economic life of the category of assets. TransGrid depreciated each asset category in the RAB on a straight-line basis over its economic life. In accordance with the requirements of clause 6A.6.3, TransGrid followed standard practice by assigning a regulatory life to each category of assets that equates to its expected economic or technical life.

TransGrid's Revenue Proposal presented new standard asset lives for replacement assets that better reflects the expected economic or technical life of these assets.

TransGrid notes that clause 6A.6.3(a)(2) of the Rules requires that the AER must accept TransGrid's proposed depreciation schedules for each asset or category of assets provided that they conform to the requirements set out in clause 6A.6.3(b) of the Rules. TransGrid is confident that its revised depreciation schedules meet the necessary Rule requirements.

In its Draft Decision, the AER:

a) Reviewed the remaining asset lives for past capital expenditure and found they have been appropriately rolled forward for the start of the next regulatory period (p.159);

b) Accepted the standard asset lives for forecast non-network asset classes in TransGrid's proposal (p.160);

c) Accepted the TransGrid's standard asset lives for forecast new network asset classes (p.160);

d) Did not accept the standard asset lives proposed for the forecast replacement asset category, nor the need to split the augmentation and replacement categories (p.160); and

e) Agreed with the implementation of TransGrid's proposed method for moving to the partially as-incurred approach to recognising capex for the next regulatory control period (p.161).

TransGrid accepts points (a)-(c) and point (e) from the AER's Draft Decision, but does not agree with the AER's conclusions and non-acceptance of different standard asset lives outlined in point (d).

[106] TransGrid, TransGrid Revenue Proposal 1 July 2009 - 30 June 2014, page 110.

7.2 Response to matters raised in the AER's Draft Decision

The Draft Decision requires TransGrid to remove the distinction between augmentation and replacement capital expenditure lives and to use the standard lives proposed for augmentation capital expenditure.

TransGrid engaged NERA Economic Consulting (NERA) to assess whether the proposed depreciation schedules for forecast capital expenditure conform to the requirements of the NER. The NERA report is included in Appendix O of this revised Revenue Proposal and lays out the rationale underpinning TransGrid's reasons and approach in separating augmentation and replacement asset classes and assigning different asset lives to each of these classes.

7.2.1 Standard asset lives and remaining asset lives

(a) Nomination of asset categories.

AER Considerations

In its Draft Decision, the AER was not satisfied with TransGrid's approach in having different asset lives for the replacement and augmentation categories of assets. The AER noted:

> *"….that the proposed approach of standard lives being reduced to the average remaining lives for assets grouped into a replacement category is inconsistent with the treatment by other network service providers of standard lives for replacement assets."*[107]

The AER also added:

> *"The AER is not satisfied with the need to split the standard asset lives between augmentation and replacement asset categories and has decided not to accept the standard asset lives proposed for the replacement asset category of asset classes."*[108]

TransGrid's Response

TransGrid does not accept the AER's decision to reject the proposed asset categories and standard asset lives.

The NER[109] allows for the TNSP's Revenue Proposal to nominate depreciation schedules for each asset or category of assets.

The intention for TNSPs to nominate asset categories was stated by the AEMC when the transmission revenue principles were developed:

> *"Commission also considers that the discretion to propose depreciation schedules appropriately lies with TNSPs rather than the regulator, as it is the*

[107] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 160.
[108] Ibid page 160.
[109] NER, clause 6A.6.3(a)(2)(i).

> *TNSPs that have the best knowledge of the condition and the likely utilisation of their assets."*[110]

The AER did not provide any reasons in its decision to not accept TransGrid's proposed split in asset categories. The AER should assess the proposed asset categories for augmentation assets and replacement assets based on the NER and in light of the AEMC's principles.

The AER is obligated to assess TransGrid's proposed depreciation schedules against the requirements of clause 6A.6.3 of the NER.

Under this clause, the proposed depreciation schedules must comply with the following principles:

- Clause 6A.6.3(b)(1): each asset (or category of assets) is to be depreciated over its economic life;
- Clause 6A.6.3(b)(1): the profile of the depreciation must reflect the nature of the assets or category of assets; and
- Clause 6A.6.3(b)(2): each asset is to be depreciated only once.

Even though the categories proposed by TransGrid differ from those of other network service providers, as stated above, the AER is required to assess the proposed depreciation schedules against the requirements in the NER and not against the depreciation schedules nominated by other network service providers, or the AER's own 'preference'. TransGrid's proposed asset categories clearly comply with the NER principles set out above and accordingly should be accepted by the AER.

(b) Economic and Technical Asset Lives

AER Considerations

In the Draft Decision, the AER stated that:

> *"Regulatory practice has been to assign a regulatory life (standard or remaining) to each category of assets that equals its expected economic or technical life. Generally, the regulatory, economic and technical lives of an asset coincide."*[111]

TransGrid's Response

TransGrid does not agree with this statement, as regulatory practice is not part of the assessment requirements in the NER and specifically there is no NER requirement that the regulatory life should reflect the technical life of an asset. In its report[112], NERA provided a number of examples to support this position.

[110] AEMC, National Electricity Amendment (Economic Regulation of Transmission Services Rule) 2006 No.18, 16 November 2006, page 79.
[111] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 157.
[112] NERA, Depreciation of Replacement Assets - A Report to the AER on behalf of TransGrid, page 7.

TransGrid considers that for electricity transmission assets differences between the useful life of an asset and an asset's technical life are common. With the exception of large substation assets (see section (c) below), it is often more efficient for assets that are bundled together to be replaced at the same time. As a consequence, the economic life of some assets will be less than their technical life.

TransGrid therefore maintains that its approach to specifying separate asset categories for replacement assets with different asset lives appropriately reflects the useful lives of these assets.

(c) Replacement of Large Substation Assets

AER Considerations

The AER stated that:

> *"…for the replacement of large assets (e.g. transformers or switchgear) in a substation, it would be expected that the economic life of the replaced asset would be equal to a new development. Even if the remaining life of the substation was less than the technical life of a replaced transformer, the transformer would not be scrapped when the substation was redeveloped. Instead it would be placed back into service or used as a spare. Similar situations would be expected to occur with other significant assets."*[113]

TransGrid's Response

TransGrid maintains that its approach in calculating the standard lives for the replacement category appropriately determines the useful life that can be obtained from asset classes in the replacement asset category. Accordingly, TransGrid does not accept the AER's decision to reject the replacement category of assets and the proposed standards lives.

In its Draft Decision, the AER put forward the argument that it would be unreasonable for some large substation assets, such as transformers and switchgear to be scrapped when the substation reaches the end of its remaining economic life. Instead of being scrapped, the AER argued that these large assets would likely be kept or refurbished and continue to provide transmission services either as a spare or installed in a new location. As these assets would be expected to be refurbished and re-located, the economic life of these assets would not be limited by the remaining life of the larger asset class (i.e. substation) in which it was located. Consequently, the economic life of these assets should be equal to a new development.

TransGrid accepts the AER's statement that:

"In general, for the replacement of large assets (e.g. transformer or switchgear) in a substation, it would be expected that the economic life of the replaced asset would be equal to a new development."[114]

However, apart from transformers and reactors, TransGrid does not relocate other aged (typically 20-40 year old) plant such as switchgear from one location to another

[113] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 160.
[114] Ibid, page 160.

as this is not generally a cost effective and economical option. TransGrid is not aware of relocation of aged plant being a generally accepted practice within the electricity transmission industry and does not consider this to be a practice that a prudent TNSP would engage in.

In TransGrid's experience, it is not generally possible to relocate switchgear close to the end of its useful life, as the technology and equipment designs have changed over time making the assets incompatible at the new site. Instead, it is generally more efficient to replace switchgear with new assets. Transformers and reactors are the exception due to the replacement cost making refurbishment and/or relocation of the asset economically feasible.

Hence for the revised Revenue Proposal, TransGrid accepts that refurbished transformers and reactors should not be included in the weighted average calculation of the standard asset life for the replacement substation class. This is in-line with the draft proposal, where the AER stated:

> *"TransGrid's proposed replacement forecast capex will therefore need to be reallocated to the augmentation category of asset classes for the purpose of calculating regulatory depreciation in the PTRM."*[115]

TransGrid has identified the replacement transformers in the 2009/10 to 2013/14 period that will be refurbished and either relocated or kept as a spare. These transformers have been reclassified from the replacement category to the augmentation category and will be depreciated over the same economic life as new developments. These projects are:

- Project 5619 - Yass No.3 Transformer; and
- Project 6177 - Narrabri Transformers

There are no reactors that are proposed to be relocated in the 2009/10 to 2013/14 regulatory period.

Hence for the revised Revenue Proposal, TransGrid resubmits the two asset categories and the standard asset lives for these categories from the original Revenue Proposal.

7.2.2 Standard Asset Lives

TransGrid considers that the proposed depreciation schedule in the Revenue Proposal conforms to the NER requirements and resubmits these asset categories and standard asset lives for the revised Revenue Proposal. This is shown in Figure 7.1.

[115] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 160.

Figure 7.1: TransGrid's Standard Asset Lives for Augmentation and Replacement Assets

Asset Category	Asset life
Asset Lives Applicable to New Assets (Augmentation)	
Transmission lines and cables	50 years
Substations	40 years
Secondary Systems	35 years
Communications	35 years
Business IT	4 years
Support the business - minor plant	8 years
Motor vehicles & mobile plant	8 years
Asset Lives Applicable to Replacement Assets	
Transmission lines and cables	26 years
Substations	30 years
Secondary Systems	30 years
Communications	12 years

7.2.3 Revised Proposal

TransGrid's forecast depreciation for this revised Revenue Proposal has been calculated using the AER's post-tax revenue model and is set out in Figure 7.2 below.

Figure 7.2: Forecast Depreciation ($m, nominal)

Depreciation	2009/10	2010/11	2011/12	2012/13	2013/14
Straight-line depreciation	181.6	196.5	200.8	228.0	252.8
Inflation on opening RAB	110.1	123.1	134.2	150.0	164.3
Regulatory depreciation	71.5	73.4	66.6	78.0	88.6

8. Service Target Performance Incentive Scheme

8.1 Summary

Chapter 10 of TransGrid's Revenue Proposal sets out the proposed performance targets, caps, collars and weightings for each of the parameters that apply to it under both the service component of the Service Target Performance Incentive Scheme and the market impact component of the scheme.

TransGrid proposed targets for the availability measures and average outage duration based on historical averages adjusted to take into account the level of capital works proposed for the next regulatory control period.

For loss of supply events, the proposed targets, caps and collars and the x and y thresholds were based on the provisions of the scheme and developed in accordance with a methodology recommended by consultants, SAHA International.

TransGrid also proposed the target for the new Market Impact of Transmission Congestion (MITC) parameter in accordance with the provisions of the scheme.

In its Draft Decision, the AER made an assessment of TransGrid's proposed parameter definitions and associated values for the next regulatory control period and:

a) Was satisfied that TransGrid's data collection and reporting processes are appropriate (p.168);

b) Accepted TransGrid's revised performance targets for transmission circuit availability (p. 173);

c) Accepted TransGrid's proposed performance targets for the loss of supply event frequency parameter (p. 173);

d) Did not accept TransGrid's proposed performance target for the average outage duration parameter of 790 minutes and substituted a target of 824 minutes (p. 173);

e) Accepted TransGrid's methodology for setting the collar values for the transmission circuit availability and average outage duration parameters (p. 175);

f) Did not accept TransGrid's proposed collar values for the transmission circuit availability parameters (p. 176) and substituted collar values of 99.05 per cent for transmission line availability, 97.26 per cent for transformer availability and 98.65 per cent for reactive plant availability (p. 181);

g) Accepted the approach recommended by SAHA for setting the caps and collars for the loss of supply event frequency parameters (p. 176-7);

h) Accepted TransGrid's proposed collar values for the loss of supply event frequency parameters (p. 177);

i) Did not accept TransGrid's proposed collar value for the average outage duration parameter (p. 177) and substituted a collar value of 999 minutes (p. 181);

j) Accepted TransGrid's methodology for setting the cap values for the transmission circuit availability and average outage duration parameters (p. 177);

k) Accepted TransGrid's revised cap values for the transmission circuit availability parameters (p. 177);

l) Accepted TransGrid's proposed cap values for the loss of supply event frequency parameters (p. 177);

m) Did not accept TransGrid's proposed cap value for the average outage duration parameter (p. 177) and substituted a cap value of 649 minutes (p. 181);

n) Accepted TransGrid's proposed weightings for the service component parameters (p. 179);

o) Rejected TransGrid's proposed MITC performance target of 2858 dispatch intervals and substituted a target of 2857 dispatch intervals (p. 181).

As summarised in sections 8.2 and 8.3, TransGrid has implemented all of the AER's Draft Decision relating to the Service Target Performance Incentive Scheme in its revised Revenue Proposal.

8.2 Revised Service Target Performance Incentive

TransGrid has adopted all of the targets, caps, collars and weightings recommended by the AER for the service component of the Service Target Performance Incentive Scheme which are set out in Figure 8.1.

Figure 8.1: Service component targets, caps, collars and weightings for 2009/10 to 2013/14

Parameter	Collar	Target	Cap	Weighting
Transmission Circuit Availability (%)				*MAR (%)*
Transmission Line Availability	99.05	99.26	99.36	0.20
Transformer Availability	97.26	98.55	98.84	0.15
Reactive Plant Availability	98.65	99.12	99.33	0.10
Loss of Supply Event Frequency (No.)				*MAR (%)*
Loss of Supply >0.05 System Minutes	7	4	2	0.25
Loss of Supply >0.25 System Minutes	2	1	0	0.10
Average Outage Restoration Time (Minutes)				*MAR (%)*
Total	**999**	**824**	**649**	**0.20**

8.3 Revised Market Impact of Transmission Congestion Incentive

TransGrid has adopted the target, cap and weighting recommended by the AER for the market impact component of the Service Target Performance Incentive Scheme, which are set out in Figure 8.2.

Figure 8.2: Market impact component target, cap and weighting for 2009/10 to 2013/14

Parameter	Target	Cap	Weighting
	Number of dispatch intervals with a marginal value greater than $10/MWh		*MAR (%)*
Market Impact Performance Component	2857	0	2.00

9. Maximum Allowed Revenue

9.1 Introduction

This chapter sets out TransGrid's calculation of the maximum allowed revenue (MAR) for the provision of prescribed transmission services for each year of the next regulatory control period based on the post tax building block approach outlined in Chapter 15 of the Rules, the AER Guidelines and the PTRM. The revenue building block components included in TransGrid's Revenue Proposal have been updated in line with this revised Revenue Proposal.

The building block formula to be applied in each year of the revenue control period is:

MAR = return on capital + return of capital + Opex + Tax

= (WACC x RAB) + D + Opex + Tax

Where:

MAR = Maximum allowable revenue

WACC = post tax nominal weighted average cost of capital

RAB = Regulatory Asset Base

D = Economic depreciation (nominal depreciation - indexation of the RAB)

Opex = Operating and maintenance expenditure + efficiency guide path payments

Tax = Regulated business corporate tax allowance

The annual building block revenue is then smoothed with an X factor in accordance with the requirements of clause 6A.6.8 of the Rules. A brief summary of each of the building blocks, the unsmoothed building block revenue requirement and smoothed revenue requirement is outlined in this chapter.

9.2 Regulatory Asset Base

In line with the changes made in Chapters 4 and 7, the movements in the regulatory asset base for the regulatory control period 2009/10 to 2013/14 are shown in Figure 9.1.

Figure 9.1: TransGrid Roll Forward of Regulatory Asset Base ($m, nominal)

Regulatory Asset Base	2009/10	2010/11	2011/12	2012/13	2013/14
Opening RAB	4,275.5	4,779.9	5,211.6	5,825.5	6,378.0
Net capex	575.9	505.1	680.5	630.4	485.1
Inflation of opening RAB	110.1	123.1	134.2	150.0	164.2
Straight-line depreciation	-181.6	-196.5	-200.8	-228.0	-252.8
Closing RAB	**4,779.9**	**5,211.6**	**5,825.5**	**6,378.0**	**6,774.4**

9.3 Return on Capital

For the purposes of TransGrid's revised Revenue Proposal the return on capital has been determined using the post tax nominal vanilla WACC of 10.19 per cent. The return on capital for the 2009/10 to 2013/14 period is shown in Figure 9.2.

Figure 9.2: TransGrid Return on Capital ($m, nominal)

Return on Capital	2009/10	2010/11	2011/12	2012/13	2013/14
Return on capital	435.5	486.9	530.9	593.4	649.7

9.4 Depreciation

The depreciation for the 2009/10 to 2013/14 period is shown in Figure 9.3.

Figure 9.3: TransGrid Depreciation ($m, nominal)

Depreciation	2009/10	2010/11	2011/12	2012/13	2013/14
Straight-line depreciation	181.6	196.5	200.8	228.0	252.8
Inflation on opening RAB	110.1	123.1	134.2	150.0	164.2
Regulatory depreciation	71.5	73.4	66.6	78.0	88.6
Tax depreciation	138.4	156.6	173.1	194.3	212.0

9.5 Operating Expenditure

The revised opex forecast is summarised in Chapter 5 of this revised Revenue Proposal. The total opex including the efficiency benefit carry forward for the 2009/10 to 2013/14 period is given in Figure 9.4.

Figure 9.4: TransGrid Operating Expenditure ($m, nominal)

Operating Expenditure	2009/10	2010/11	2011/12	2012/13	2013/14
Controllable opex	138.3	152.8	161.5	177.0	185.4
Other opex	37.3	21.0	24.2	22.7	18.1
Total opex	175.6	173.8	185.7	199.7	203.5

9.6 Maximum Allowed Revenue

TransGrid calculated its revenue requirement using the AER's PTRM. The annual building block revenue requirement increases from $706.6 million in 2009/10 to $973.3 million in 2013/14. Figure 9.5 shows the annual building block calculations.

Figure 9.5: TransGrid Building Block Revenue Requirement ($m, nominal)

Unsmoothed Revenue	2009/10	2010/11	2011/12	2012/13	2013/14
Return on capital	435.5	486.9	530.9	593.4	649.7
Regulatory depreciation	71.5	73.4	66.6	78.0	88.6
Operating expenses	175.6	173.8	185.7	199.7	203.5
Net tax allowance	48.0	50.7	49.7	56.5	63.2
Less Value of Franking Credits	-24.0	-25.3	-24.8	-28.3	-31.6
Unsmoothed revenue requirement	**706.6**	**759.4**	**808.1**	**899.4**	**973.3**

Using the same approach as the AER in its Draft Decision, TransGrid has determined the X-factor as -5.26 per cent with the first year MAR equal to the annual building block amount. TransGrid's Maximum Allowable Revenue is shown in Figure 9.6.

Figure 9.6: TransGrid Maximum Allowed Revenue ($m, nominal)

	2009/10	2010/11	2011/12	2012/13	2013/14
Draft Decision MAR smoothed	678.4	726.3	777.5	832.4	891.1
Draft Decision X factor		-4.39	-4.39	-4.39	-4.39
Revised Proposal MAR unsmoothed	706.6	759.4	808.1	899.4	973.3
Revised Proposal MAR smoothed	706.6	763.0	823.8	889.5	960.4
Revised Proposal X factor		-5.26%	-5.26%	-5.26%	-5.26%

9.7 Average Price Path

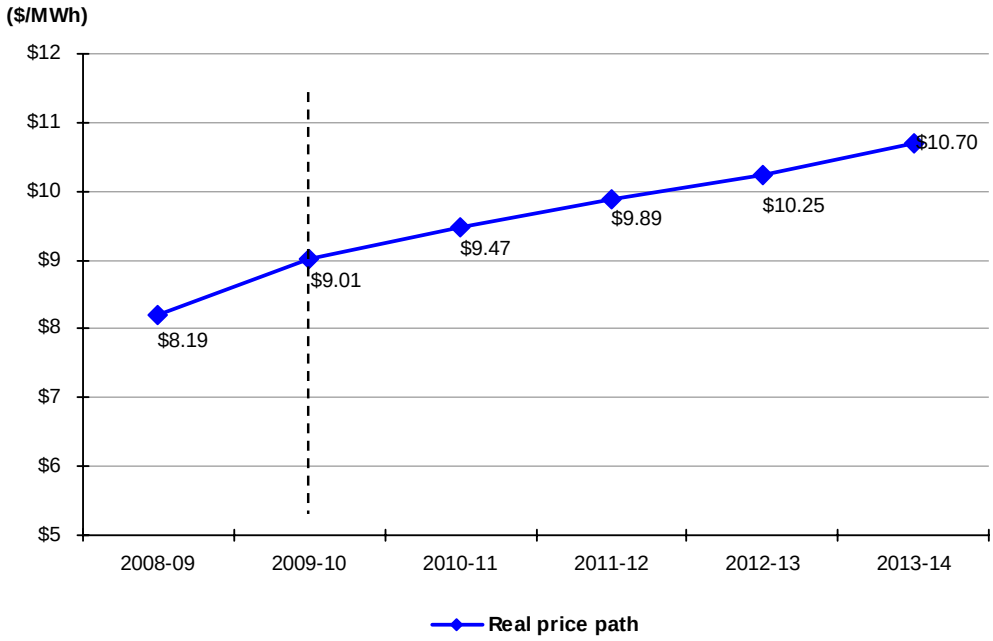
TransGrid's Revised Proposal will result in an average real annual increase in TransGrid's charges of 4.4 per cent a year. The average price path is shown in Figure 9.7.

Figure 9.7: Average Price Path ($2008, real)

	2009/10	2010/11	2011/12	2012/13	2013/14
Smoothed Revenue Requirements ($m)	656.8	691.4	727.7	766.0	806.3
Energy (MWh)	72,880,000	73,010,000	73,600,000	74,760,000	75,330,000
Average transmission price ($/MWh)	$ 9.01	$ 9.47	$ 9.89	$ 10.25	$ 10.70

TransGrid proposed average transmission prices are set out in Figure 9.8.

Figure 9.8: Average Price Path ($2008, real)

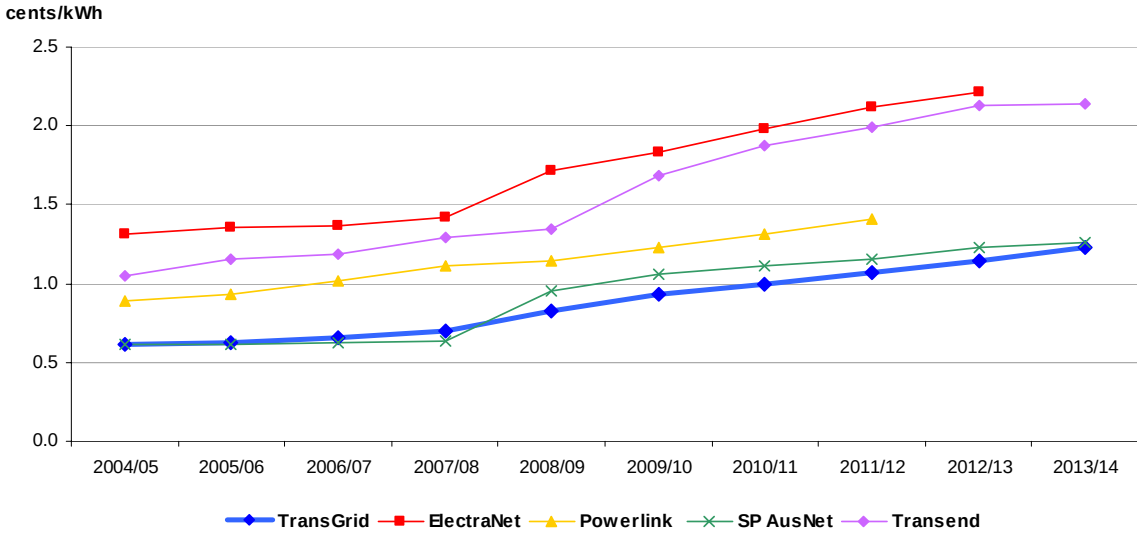


9.8 Cost to Consumers

As TransGrid's costs represent only about 6 per cent of the total delivered price for the average energy user, the impact on the price to consumers is estimated to be about $4.90 a year for a typical household in NSW.

With this modest increase TransGrid's customers, and end users in NSW and the ACT, will continue to benefit from the lowest cost transmission service in Australia as shown in Figure 9.9.

Figure 9.9: Cost to Consumers



Source: Statement of Opportunities 2008, AER decisions (including draft decision for Transend). TransGrid's figures are from its revised Revenue Proposal.

10. Negotiating framework

10.1 Summary

Clause 6A.9.5 of the NER requires a TNSP to prepare a negotiating framework setting out the procedure to be followed during negotiations between that provider and any person who wishes to receive a Negotiated Transmission Service.

The rules for Negotiated Transmission Services are in Chapter 6A Part D of the NER.

10.2 Response to Issues and AER Considerations in the Draft Decision

AER Draft Decision

The AER received no submissions on TransGrid's proposed negotiating framework.

The AER considered that:

1. TransGrid had prepared the proposed negotiating framework in accordance with the requirements of clause 6A.9.5;
2. the operation of the framework is specified in accordance with clause 6A.9.5;
3. TransGrid's negotiating framework will apply for the duration of the regulatory control period 2009/10 to 2013/14; and
4. TransGrid's negotiating framework as submitted is compliant with clause 6A.9.5 (c).

As required by clause 6A.14.3(f) of the NER, the AER approved TransGrid's negotiating framework for the next regulatory control period.

TransGrid's Response

TransGrid accepts the AER's Draft Decision.

11. Negotiated transmission service criteria

11.1 Summary

The NER require the AER to include negotiated transmission service criteria as part of a TNSP's revenue determination[116]. TNSPs are not required to provide this criteria as part of a Revenue Proposal.

11.2 Issues and AER Considerations in the Draft Decision

AER Draft Decision

The AER did not receive any submissions on TransGrid's negotiated transmission service criteria.

The AER made some general comments concerning the regime for the regulation of negotiated transmission services. The AER stated:

1. The regulation of negotiated transmission services is intended to be less intrusive than that applying to prescribed transmission services;

2. The AER considers there will be fewer market failure concerns with negotiated transmission services;

3. Users of negotiated transmission services are likely to be large and well resourced, enabling them to negotiate effectively.[117]

The AER noted that:

> *"no submissions were received on the proposed criteria for TransGrid and therefore considers that the draft negotiated transmission service criteria released for consultation in June 2008 should remain unamended."*[118]

TransGrid's Response

TransGrid accepts the AER's Draft Decision.

[116] NER, clause 6A.9.4.
[117] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 198.
[118] Ibid, page 198.

12. Pricing methodology

12.1 Summary

TransGrid submitted its proposed pricing methodology with its Revenue Proposal on 31 May 2008 in compliance with the NER and the AER's guidelines.

With respect to TransGrid's role as co-ordinating TNSP and the allocation of the aggregate annual revenue requirement (AARR) and price setting, the AER concluded that:

a) The proposed approach to calculating the AARR and the allocation of the AARR to categories of prescribed transmission services complies with the NER and the guidelines (p.204);

b) TransGrid's approach to the allocation of costs to connection assets that provided both prescribed exit and prescribed entry services was satisfactory and should be included in the final approved pricing methodology (p.204);

c) The allocation of the annual service revenue requirement (ASRR) to transmission network connection points complies with the NER and guideline requirements (p.205-6);

d) The proposed approach to calculating prescribed entry and prescribed exit service prices complies with the NER and the guidelines (p.208);

e) The proposed postage stamp pricing structures comply with the pricing principles of the NER and the information requirements of the guidelines (p.208);

f) The proposed locational price structure was not approved by the AER (p.209). TransGrid is required to propose an alternative locational pricing structure which is consistent with clause 6A.23.4(e) of the NER and does not include a measure of energy (p.212);

g) It would be beneficial for TransGrid to specify the points in the transmission network where costs will be allocated and prices determined in its proposed pricing methodology (p.212); and

h) The information provided by TransGrid regarding its proposal to billing arrangements; prudential requirements; prudent discounts; monitoring of compliance with and record keeping on its approved pricing methodology; and the differences between its current pricing methodology and its proposed pricing methodology are sufficient to satisfy the requirements of the guidelines (p.212).

TransGrid has accepted all aspects of the AER Draft Decision, with the exception of item (g). The revised Pricing Methodology is provided at Appendix H.

12.2 Response to Matters Raised in the AER's Draft Decision

12.2.1 Price structures - Location of Connection Points

AER Draft Decision

In response to a submission from the EUAA, the AER noted that TransGrid did not state the points in the transmission network where costs will be allocated and prices calculated. The AER stated that

> *"while neither the pricing principles nor the guidelines require a statement outlining the point in the network where costs will be calculated and prices determined, the AER considers TransGrid could, in order to remove any doubt, confirm the location of this point.*[119]*"*

TransGrid's Response

TransGrid does not accept the AER's suggestion to include a list of connection points in the pricing methodology for the following reasons:

- The locations where transmission prices are determined are published annually on the TransGrid website in compliance with clause 6A.24.2 of the NER; and
- To have these locations included in the pricing methodology would be an additional administrative burden for both the AER and TransGrid whenever there is a change to the billable connection points.

TransGrid further notes that there is no current requirement in the NER or guidelines for this provision of information.

12.2.2 Price structures - Locational prices

AER Draft Decision

The AER did not approve TransGrid's proposed locational pricing structure.

The AER noted that TransGrid had submitted an alternative locational structure allowed for under clause 2.2(d) of the guidelines, which was assessed and found non-compliant against the NER[120], guidelines[121] and the AEMC's rule determination concerning the locational price structure principles[122].

The Draft Decision outlines the reason behind the AER's non-approval of TransGrid's proposed alternative locational pricing structure.

TransGrid's Response

TransGrid has submitted a revised pricing methodology (Appendix H) that includes a locational price structure in agreement with the guidelines. This should not be

[119] AER, Draft Decision TransGrid transmission determination 2009-10 to 2013-14, page 210.
[120] NER clause 6A.23.4(e).
[121] AER, Pricing Methodology Guidelines, clause 2.2(e).
[122] Ibid, page 209, reference 418.

construed to imply that TransGrid agrees with the AER's interpretation of the Rules on this matter.

TransGrid's alternative price structure was submitted to minimise the impact of a price structure change on NSW transmission customers. In addition, in TransGrid's view, the methodology originally proposed by TransGrid complies with the requirements of the Rules and provides a more appropriate signal of transmission congestion to customers. Nevertheless, TransGrid has submitted a revised pricing methodology that includes the default locational price structure outlined in the guidelines.

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D. Sinclair Knight Merz – Review of Cost Factor Allocation for the Replacement of Beaconsfield West 132kV GIS

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F. Evans & Peck – Response to AER / PB Comments on Regulatory Reset Capex Risk Allowance

G. Forecast Capital Project Description - Williamsdale Stage 2 Project

H. Proposed Pricing Methodology 1 July 2009 to 30 June 2014

I. Dumaresq Circuit Breakers

J. Revised Submission on Proposed Contingent Projects January 2009

K. SAHA - Response to the AER's Draft Decision - Self Insurance (**CONFIDENTIAL**)

L. Sinclair Knight Merz – Considerations on PB's Review of TransGrid's Operating Expenditure

M. Competition Economists Group – Rate of return and the averaging period under the National Electricity Rules and Law

N. Competition Economists Group - Debt and equity raising costs – A response to the AER 2008 draft decisions for electricity distribution and transmission

O. NERA – Depreciation of Replacement Assets. A report to the AER on behalf of TransGrid

P. T Carlton, Macquarie University - Indirect Costs of Equity and Debt Raising

Q. Professor B.D. Grundy, University of Melbourne - A Note on the Costs of Equity Financing

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T. Revised AER Schedule