Supplementary Draft Decision

NSW and ACT Transmission
TransGrid Network Revenue Cap
Forward Capital Expenditure
2004/05-2008/09

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File No:
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Contents

Glossary

ACCC	Australian Competition and Consumer Commission
Capex	Capital Expenditure
CAPM	Capital Asset Pricing Model
Code	National Electricity Code
CPI	Consumer Price Index
CCTV	Closed Circuit Television
CT	Current Transformer
DJV	Directlink Joint Venture
Discussion Paper On DRP	Review of the Draft Statement of Principles for the Regulation of Transmission Revenues –Discussion Paper 2003
DNSP	Distribution Network Service Provider (Distributor)
DRP	Draft Regulatory Principles (for the Regulation of Transmission Revenues)
DSM	Demand Side Management
ESC	Essential Services Commission
EUAA	Energy Users' Association of Australia
Historic Capex	Historic Capital Expenditure
IPART	Independent Pricing and Regulatory Tribunal
kV	Kilovolt
MAR	Maximum Allowed Revenue
MVA	Mega Volt Ampere
MW	Mega Watt
NECA	National Electricity Code Administrator
NEM	National Electricity Market

NEMMCO	National Electricity Market Management Company
NPV	Net Present Value
NSW	New South Wales
Opex	Operating and Maintenance Expenditure
PB Associates	Parsons Brinckerhoff Associates
PoE	Probability of Exceedence
PTRM	Post Tax Revenue Model
QNI	Queensland – New South Wales Interconnector
Regulatory Principles	Statement of Principles for the Regulation of Transmission Revenues
SCADA	System Control And Data Acquisition
SCST	Single Circuit Steel Tower
SKM	Sinclair Knight Merz Pty Ltd
SMHEA	Snowy Mountain Hydro-Electric Authority
SNI	Snowy-New South Wales Interconnector
SRP	Statement of Regulatory Principles – see *Regulatory Principles*
SVC	Static Var Compensator
TNSP	Transmission Network Service Provider
TUOS	Transmission Use of System
VENCorp	Victorian Energy Networks Corporation
WACC	Weighted Average Cost of Capital

1. Executive Summary

1.1 Introduction

This document is the ACCC's Supplementary Draft Decision on TransGrid's Network Revenue Cap in relation to Forward Capital Expenditure for the period 1 July 2004 to 30 June 2009.

TransGrid is one of two Transmission Network service Providers (TNSP) in New South Wales. It is the biggest TNSP in the National Electricity Market (NEM) and its central location between Victoria and Queensland means that its network plays a key role in facilitating wholesale competition in the NEM.

This Revenue Cap Decision deals only with forward capital expenditure. In the conduct of this review the ACCC has needed to clarify the detail of the existing regulatory framework. In parallel with the conduct of this review, the ACCC has been developing the ex-ante regulatory regime to strengthen efficiency and service incentives. The details of the regime are set out below.

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

- Section 1.2 explains the process of this review;
- Section 1.3 describes the New Regulatory Framework and explains how the ACCC has implemented its duties under this framework;
- Section 1.4 describes the ACCC's consideration of TransGrid's Application;
- Section 1.5 sets out the ACCC's Decision on TransGrid's Capital Governance Standards;
- Section 1.6 sets out the ACCC's Decision on Replacement Capex;
- Section 1.7 sets out the ACCC's Decision on Small Augmentation Capex;
- Section 1.8 sets out the ACCC's Decision on Excluded Projects;
- Section 1.9 sets out the ACCC's Decision on Property and Easements; and
- Section 1.10 sets out the ACCC's Decision on Support the Business Capex.

1.2 Process of this Review

On 26 September 2003, TransGrid submitted its Application in relation to the re-set of TransGrid's revenue cap under clause 6.2.4(b) of the Code for the period 1 July 2004 to 30 June 2009, for the ACCC's consideration. The Application outlined TransGrid's views on key elements of the building block and revenue cap setting processes. The Application is available on the ACCC's website.

Following the introduction of the new ex-ante regulatory regime, TransGrid requested an extension of time in order to reformulate and resubmit its forward capex Application. The ACCC agreed to this request.

On 19 November 2004 TransGrid submitted its revised future capex Application. The ACCC engaged PB Associates to examine TransGrid's future capex Application. PB

Associates' final report was released on 24 January 2005 and is available on the ACCC's website. There were several submissions in response to this report which have been considered by the ACCC.

The result of this process is the Supplementary Draft Decision incorporating an assessment of TransGrid's forecast capex under the ex-ante approach. A final decision will incorporate this as well as the ACCC's findings on the other parts of TransGrid's Application unaffected by the future capex application will be produced following the consideration of submissions on the Supplementary Draft Decision.

1.3 New Regulatory Framework

The new capex regulatory framework involves the ACCC setting a firm cap on investment at the start of the regulatory period, and enabling a TNSP to decide which investments it will make within this allowance, subject to service level considerations

The objective of the ex-ante allowance is to establish certainty and provide incentives for efficient investment. This requires the allowance to be reasonably aligned with efficient costs over the period, and requires an analysis of a TNSP's proposed investment program at the beginning of each regulatory period.

The ex-ante cap will be expressed as a profile of spending for each year of the regulatory period. The profile of spending will be used, along with the opening RAB, to determine a TNSP's annual depreciation and return on investment over the regulatory period. This information together with other inputs such as opex, the opening RAB and the WACC will then be used to calculate the TNSP's allowed revenues for each year of the regulatory period.

At the end of the regulatory control period the closing RAB will be set equal to the depreciated value of the actual investment undertaken during the regulatory period, regardless of whether this closing RAB is larger or smaller than the closing RAB calculated on the basis of the target investment allowance. The effect of this arrangement is that if a TNSP spends less than its expenditure target during the regulatory period, it retains the benefit of that underspend (both return on and of capital) for the remainder of the regulatory period. Conversely, if it exceeds its expenditure target during the regulatory period it suffers a loss on that overspend (both return on and of capital) for the remainder of that regulatory period.

In principle, although TransGrid has submitted a suite of projects in its forward capex application, there is no requirement that it spends the allowance allocated to it over the regulatory period on those particular projects, subject to service level standards set under the NEC and other relevant legislation.

Excluded projects

A major element of the capex incentive is an allowance for significant but uncertain investment which is permitted to be excluded from the main ex-ante capex allowance.

Projects should generally only be excluded from the ex ante capex allowance to the extent that not doing this would lead to inefficient under-investment, declining service quality or excessive windfall gains or losses.

Projects will be treated as excluded projects if the expected error presented by the inclusion of that project in the main allowance, quantified in terms of the revenue required to cover depreciation and the return on investment in that project, is equal to more than 10 per cent of the revenue required to cover depreciation and return on investment of all projects included in the calculation of the main ex-ante capex allowance, or would lead to a significant error in the ex-ante allowance, and to the extent that the drivers underlying the excluded project have not already been catered for in the main ex-ante cap.

Once the trigger(s) for an excluded project have been met, the project would then become the subject of a further 'mini' ex-ante cap, commencing once the regulatory test assessment for that investment has been completed and investment in that project begins. Like investment under the 'ex-ante' cap, at the end of the five years of the excluded project incentive period, the depreciated value of the actual expenditure on the excluded project that complies with the requirements of the Code will be included in the RAB.

Revenue Cap Re-opener

To take account of events that could significantly alter the allowed efficient investment level, the ACCC will allow the revenue cap to be re-opened during the regulatory control period. Only TNSPs may propose that the revenue cap be re-opened. There is no limitation as to the nature of the event that could give rise to a re-opening of the cap.

In relation to tax pass-through events only, the ACCC has agreed to consider passing through the cost of such an event without reopening other aspects of the decision. This is the only pass-through event that is proposed to apply to TransGrid.

1.4 ACCC Consideration of TransGrid's Application

An important feature of TransGrid's Application and the ACCC's Supplementary Draft Decision is the rise in expenditure on small augmentation projects. In addition to the cost of these projects themselves, the associated costs of property and easements have also been included.

This marks a shift in TransGrid's spending profile from a few larger high expenditure projects in the previous regulatory period (such as MetroGrid) to a broader based expenditure profile. The new profile is driven by several factors:

- wide-spread high levels of load growth in New South Wales which has required the expansion of TransGrid's network;
- DNSP requests to upgrade the network; and

- requests from large customers to improve network connection.

The rise in small augmentation projects is in contrast to the lessor number of likely large augmentation projects (many of which are in the excluded category), and the relatively stable levels of expenditure for replacement capex and "support the business" capex.

A comparison of: TransGrid's allowance for the last regulatory period, TransGrid's expenditure application for this regulatory period, and the ACCC determination for this regulatory period, by category of expenditure, is shown in Figure 1.4.1. This chart does not show overall expenditure, because expenditure on large augmentation projects has not been included in order to provide comparable data.

Figure 1.4.1 Comparison of TransGrid's expenditure application by category of expenditure and the ACCC's determination

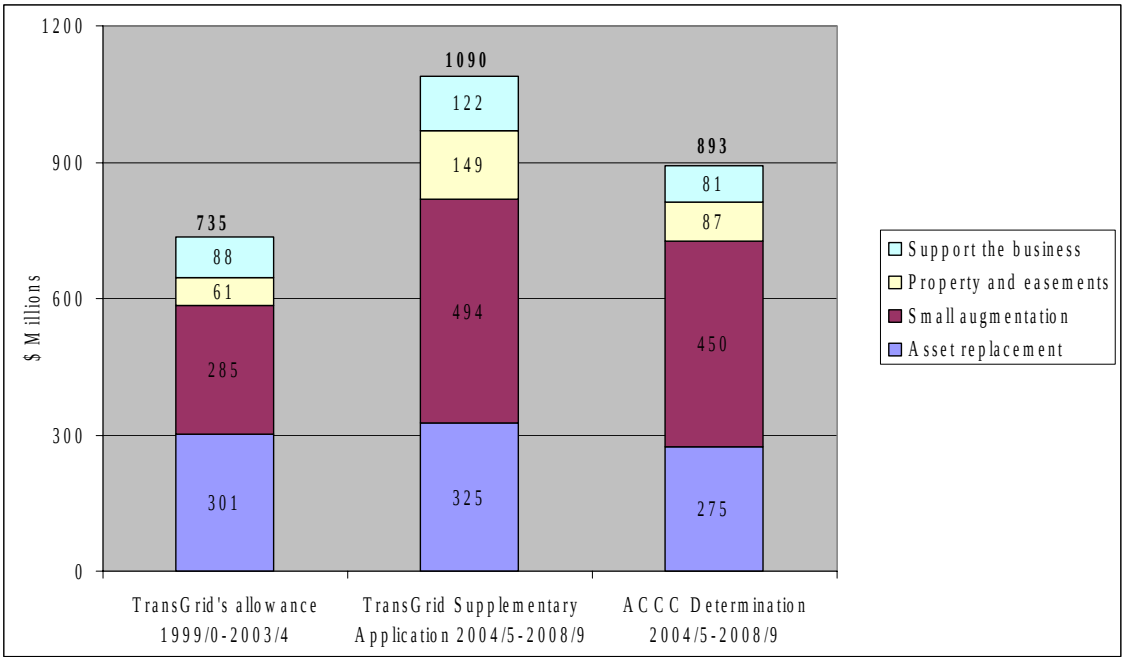
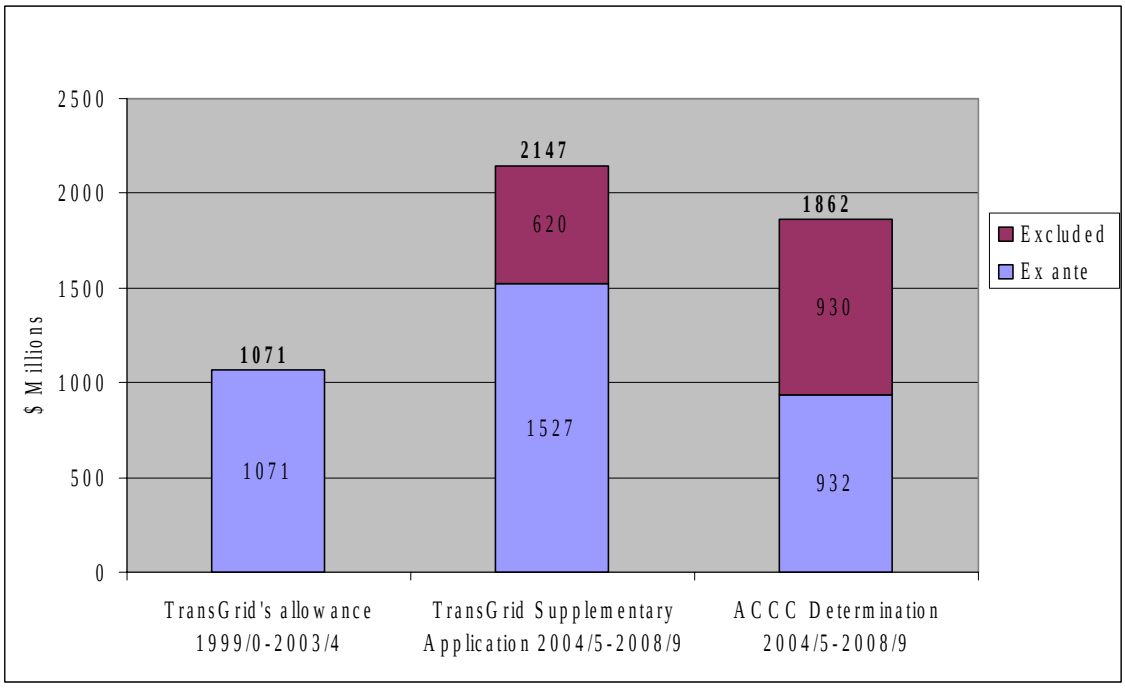


Figure 1.4.2 shows a comparison of: TransGrid's overall allowance for the last regulatory period; TransGrid's overall expenditure application broken down by excluded projects and ex ante components for this regulatory period; and the ACCC's Supplementary Draft Decision for this regulatory period.

Figure 1.4.2 Comparison of TransGrid's overall expenditure application and the ACCC's determination



As shown in Figure 1.4.2 TransGrid applied for an overall expenditure allowance of $2.147 billion for this regulatory period, and the ACCC has determined an expenditure allowance of $1.862 billion. This is an overall reduction of $285 million for the current regulatory period.

Of these totals, TransGrid applied for $1.527 billion of ex ante expenditure, and the ACCC has provided TransGrid with an ex ante capital allowance of $931.7 million. This compares with TransGrid's expenditure of $1,071 billion ($2004) over the first regulatory period (after the ACCC's ex-post adjustments).

Most of the ACCC's reduction of TransGrid's ex ante application involves the shifting of projects into the excluded category. The ACCC has classified $930 million of projects as excluded projects compared to TransGrid's application of $620 million. The $930 million is available to TransGrid should the need for these funds arise during the regulatory period. The ACCC has estimated that approximately $300-400 million worth of excluded projects could eventuate in the current regulatory period if TransGrid can demonstrate that the need for the projects has arisen. If this were the case, the ex-ante allowance plus this excluded amount would be approximately $1.3 billion.

The ACCC's capital expenditure determination will result in a real 3.57 per cent increase in prices in the first year of the regulatory period and no average price change

in the subsequent years of the regulatory period. This compares to TransGrid's proposed price increase in the first year of 3.57 per cent and an average price increase of around 1.5 per cent in subsequent years.

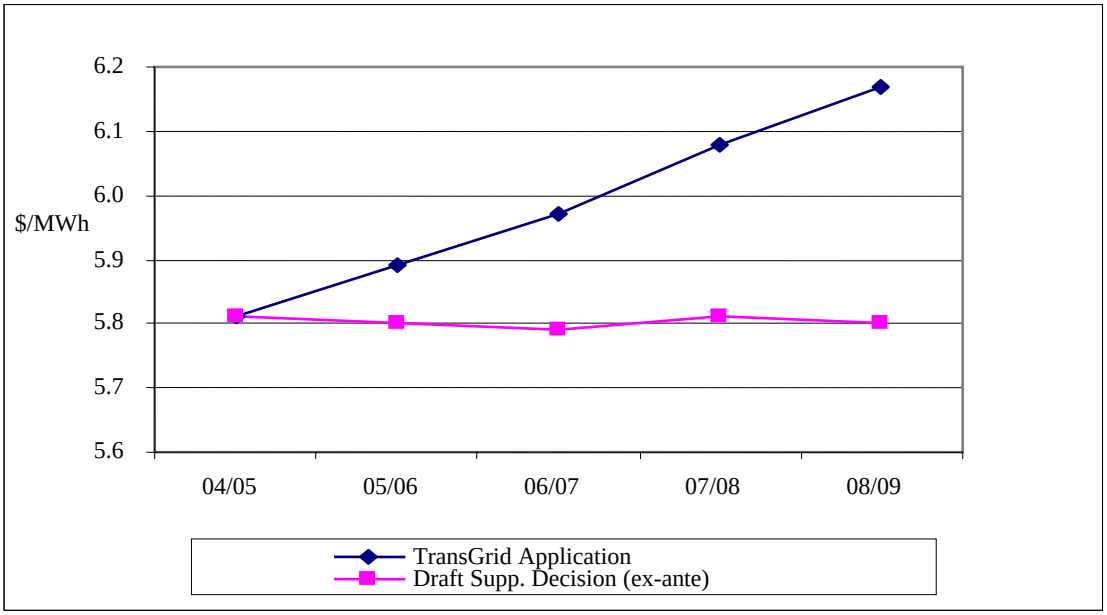
A comparison of the impact on transmission prices, arising from TransGrid's ex ante capex application and the ACCC's determination is shown in the table below. The table takes as its starting point the Commission's Draft Decision numbers and thus the price rises only reflect the ex ante future capex component of TransGrid's application.

Table 1.4.1 Impact on Transmission prices (constant $2004/MWh)

	04/05	05/06	06/07	07/08	08/09
TransGrid Supp. Application	3.57	1.30	1.43	1.88	1.45
ACCC Supp. Draft Decision	3.57	-0.25	-0.12	0.32	-0.11

Figure 1.4.3 below compares real transmission prices resulting from TransGrid's revised application and the ACCC's Supplementary Draft Decision.

Figure 1.4.3 Transmission prices (constant $2004/MWh)



1.5 ACCC Decision on TransGrid's Capital Governance Arrangements

The ACCC has found the capital expenditure governance arrangements applied by TransGrid in determining the needs, optimal alternatives and efficient estimates for costs to be generally sound. It is expected that the ex-ante regulatory regime will encourage TransGrid to continue to develop its capital expenditure governance arrangements, as effective expenditure approval procedures will improve its ability to respond to efficiency incentives.

1.6 ACCC Decision on Replacement Capital Expenditure

Replacement capital expenditure refers to all classes of expenditure required to maintain the existing network infrastructure. Expenditure on asset replacement projects accounted for $326 million (before adjustments) of TransGrid's original $1.527 billion ex-ante application.

The ACCC has considered TransGrid's Application and has determined a capital allocation as detailed in the Table 1.6.1.

Table 1.6.1 ACCC Decision: Asset Replacement Capex

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	66.09	73.99	67.37	57.39	60.79	325.64
ACCC Supp. Draft Decision	62,80	53.30	54.06	49.91	55.19	275.26

1.7 ACCC Decision on Small Augmentation Capital Expenditure

The ACCC has allowed $449.6 million for small augmentation expenditure. This is a reduction of $44.1 million compared to TransGrid's Application. This compares to small augmentation expenditure of $284.8 million over the last regulatory period, after adjusting for large projects (such as MetroGrid).

Table 1.7.1 and Figure 1.7.2 show the ACCC's Supplementary Draft Decision in relation to TransGrid's Application for small augmentation capital expenditure.

Table 1.7.1 ACCC Decision: Small Augmentation Capex

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	50.17	71.10	112.94	170.78	88.76	493.75
ACCC Supp. Draft Decision	51.61	71.06	104.28	149.65	73.00	449.60

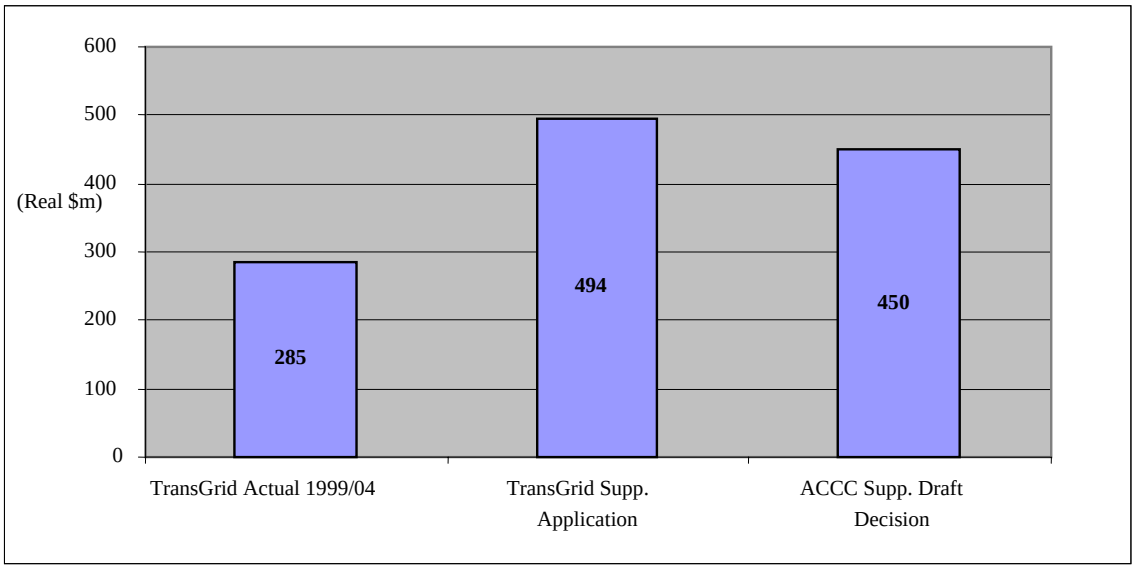
The increased allowance in the ex-ante cap provided by the ACCC recognises that TransGrid will require a greater level of small augmentation expenditure compared to the previous regulatory period to maintain network reliability within existing obligations. TransGrid's proposed augmentation program marks a shift in TransGrid's spending profile from a few large high expenditure projects in the previous regulatory period (such as MetroGrid) to a broader based expenditure profile. The new profile is driven by several factors:

- Wide-spread high levels of load growth in New South Wales which has required the expansion of TransGrid's network. Technical studies obtained during this assessment, indicate that peak demand has been steadily increasing over the last

ten years. Additional reliability investment will improve TransGrid's network capacity relative to forecast demand growth over the regulatory period;

- DNSP requests to upgrade the network; and
- Requests from large customers to augment network connection.

Figure 1.7.2 TransGrid Small Augmentation Expenditure ($million 2004)



1.8 ACCC Decision on Excluded Projects

The ACCC has made provision for excluded projects. Indicative costings of projects deemed as excluded by the ACCC total $930 million over the regulatory period compared to TransGrid's application of $630 million. The ACCC has shifted projects from the ex ante allowance to the excluded category to provide a level of certainty that TransGrid will not be under-funded for projects during the regulatory period. This was balanced against the possibility that leaving in more excluded projects increases the chances of the gaming of the regime. TransGrid's proposed excluded projects are listed in Table 1.8.1 below.

Table 1.8.1 TransGrid Application for Excluded Projects (for 2005-09)

Project	Total Cost ($million 2004)
Easements and Land	136
Newcastle and Lower North Coast Supply	98
Bannaby-Sydney 500kV Development	125
Kemps-Sydney South Development	3
Mason Park 330/132kV GIS Substation	129
Series Compensation at Dumaresq	80
Yass-Wagga 330kV SC TL	49
Total	**630**

The ACCC has decided to retain all these projects as excluded except for the Kemps Creek to Sydney South project which is disallowed. The ACCC has included the Western 500kV project, which TransGrid proposed for the ex ante allowance, in the excluded category.

The ACCC accepts the following project groupings which are different to those presented by TransGrid and has decided that these projects should be excluded. Projects have been grouped together as a means of addressing specific limitations or events at defined elements in the network that would justify greater investment than already provided in the ex ante cap. Project costings have been provided in the table below, but it should be noted they are indicative only. These groupings appear to the ACCC to present an optimal solution, combining both engineering rigour regarding the linking of the projects and the need for a manageable administrative process. Investment already provided for in the ex ante cap has been taken into account in defining any additional investment required to respond to specific triggers.

Table 1.8.2 ACCC Determined Excluded Project Groups

Excluded Projects	**Total Costs ($million 2004)**
Royalla project (Stage 1)	8
Holroyd complex and Mason Park 330/132 kV GIS substation	193
Corridor augmentation Newcastle-Sydney-Wollongong corridor	420
QNI Upgrade and Yass-Wagga transmission line	129
Easements and land	180
Total	**930**

Project expenditure for these excluded projects will be determined at the time of the excluded project assessment.

The ACCC has considered the need for triggers for these excluded projects and has adopted the trigger events identified in Appendix E to be reasonable. The ACCC will use these trigger definitions to assess whether an excluded event has occurred following an application by TransGrid during the regulatory period.

1.9 ACCC Decision on Property and Easements Capital Expenditure

The ACCC has decided to adjust TransGrid's proposed property investment from $148.74 million to $86.60 million over this regulatory period. This figure is the result of adjustments which total $62.14 million, in addition to changes to the cost allocation profiles for new projects and deferral of some projects based on a balance of proposed arrangements and historical experience. It is important to note that the majority of the adjustment is due to investment being moved into the excluded category, rather than being disallowed. The relevant adjustments are detailed in Table 1.9.1 below.

Table 1.9.1 ACCC Decision: Property and Easements Capex

Capex ($m 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	18.65	50.06	21.34	36.98	21.72	148.74
ACCC Supp. Draft Decision	18.37	29.65	12.10	14.08	12.41	86.60

1.10 ACCC Decision on Support the Business Capital Expenditure

The following table sets out the ACCC's decision of an efficient amount of Support the Business capital expenditure, broken down by category of expenditure. TransGrid's overall Support the Business expenditure application was for $121.7 million and the ACCC has determined that $81.36 million is an efficient amount of capital expenditure for the regulatory period. The largest areas of expenditure reduction relate to:

- Information technology: the ACCC determined an expenditure reduction of $12.10 million over the regulatory period mainly relating to inefficiencies and over allocation of expenditure; and
- Motor vehicles and plant: the ACCC considers it appropriate to only allow for net motor vehicle and mobile plant expenditure and therefore disallowed capital expenditure for both private use vehicles and the disposal value of vehicles.

Table 1.10.1 ACCC Decision: Support the Business Capex

Capex ($million 2004)	TransGrid Supp. Application	ACCC Supp. Draft Decision
Information technology	73.00	60.90
Motor vehicles and plant	39.50	16.63
Miscellaneous assets	9.20	7.80
Total support the business	121.70	85.33
Deduction for contestable business segment		3.97
Total		81.36

1.11 Compendium of Decisions

The ACCC will detail its determination in respect of TransGrid's complete Application (past capex, future capex, operating and maintenance expenditure, depreciation, tax, service standards and the weighted cost of capital to be applied) in its Final Decision which will be a compendium of this Supplementary Draft Decision and a revised version of the Draft Decision of April 2004.

2. Introduction

TransGrid is a state-owned corporation of the New South Wales government with over 12,400 kilometres of high voltage transmission line, 81 substations and switching stations with a total asset value of approximately $3 billion as at 30 June 2004.

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

In June 1999, the NSW Government applied for and was granted a derogation from the Code which had the effect of delaying the date on which TransGrid would be subject to regulation by the ACCC under the ACCC's Revenue Cap framework. The derogation meant that TransGrid was permitted to earn revenues in accordance with pre-existing prices for the period between 1 July 1999 and 31 January 2000. From 1 February 2000 to 30 June 2004, TransGrid earned revenues in accordance with the ACCC's 1999/00 – 2003/04 Revenue Cap Decision.

TransGrid and Energy Australia ('EA' -a distribution company that owns some transmission assets within NSW) were the first transmission networks to have their Maximum Allowable Revenues (MAR) determined by the ACCC and so are the first of the "second round" MAR determinations by the ACCC.

In parallel with the conduct of this review, the ACCC has developed important elements of the regulatory regime to strengthen efficiency and service incentives. These include the introduction of an ex ante cap for capital expenditure; the refinement of an efficiency incentive mechanism for operating and maintenance expenditure (opex); and the development of service standard incentives. The details of this framework are contained in the Statement of Regulatory Principles Final Decision released by the ACCC in December 2004.

The timetable for TransGrid's revenue cap was placed on the ACCC's website but was revised to account for TransGrid's request to the ACCC of 12 March 2004 to extend this timetable in order to allow TransGrid more time to prepare its forward capex submission in response to the development of the regulatory framework under the SRP.

This Chapter sets out:

- the Code requirements in relation to the form of regulation to be applied to each TNSP's revenue (section 2.1):
- a brief summary of the revised Statement of Regulatory Principles (section 2.2);
- the review and public consultation process followed by the ACCC in reaching its Decision (section 2.3);
- the structure of this document (section 2.4); and
- an overview of TransGrid's network (section 2.5).

2.1 Code Requirements

The core obligations of the ACCC in relation to the form of regulation to be applied to each TNSP's revenue are set out in clauses 6.2.2 to 6.2.5 of the Code. These provisions provide that the regulatory regime to be administered by the ACCC must achieve a number of objectives including achieving outcomes that are: efficient and cost effective; are incentive-based that share efficiency gains between network users and owners and provide a reasonable rate of return to network owners; foster efficient investment, operation, maintenance and use of network assets; recognise pre-existing government policies on asset values, revenue paths and prices; promote competition; and are reasonably accountable, transparent and consistent over time.

The Code requires the ACCC to implement a revenue cap with a CPI-X incentive mechanism and a regulatory control period of no less than five years.

Other than these broad requirements the Code grants the ACCC the flexibility to use alternative methodologies provided that they are consistent with the Code's objectives and principles.

Application of the SRP to TransGrid

Although the format of this decision is largely consistent with the framework specified in the SRP, parts of the framework for the assessment of TransGrid's Application were agreed with TransGrid prior to the release of the SRP and therefore differ from the SRP.

2.2 Statement of Regulatory Principles

With the release of the Statement of Regulatory Principles, the ACCC has sought to improve efficiency incentives by:

- moving to an ex ante investment regulatory incentive;
- providing a mechanism for assessing uncertain but significant projects (excluded projects);
- allowing the regulatory period to be re-opened if unexpected events have a material impact on TNSP costs (the Revenue Cap Re-opener);
- improving the transparency of TNSP cost and service performance; and
- establishing an efficiency carry forward mechanism and limited pass-through mechanism for opex.

Ex Ante Allowance

The new capex regulatory framework involves the ACCC setting a firm cap on investment at the start of the regulatory period, and enabling a TNSP to decide which investments it will make within this allowance, subject to service level considerations

The objective of the ex ante allowance is to provide certainty and incentives for efficient investment. This requires the allowance to be reasonably aligned with efficient costs over the period, and requires an analysis of a TNSP's proposed investment program at the beginning of each regulatory period.

The ex ante cap will be expressed as a profile of spending for each year of the regulatory period. The profile of spending will be used, along with the opening RAB, to determine a TNSP's annual depreciation and return on investment over the regulatory period. This information together with other inputs such as opex, the opening RAB and the WACC will then be used to calculate the TNSP's allowed revenues for each year of the regulatory period.

At the end of the regulatory control period the closing RAB will be set equal to the depreciated value of the actual investment undertaken during the regulatory period, regardless of whether this closing RAB is larger or smaller than the closing RAB calculated on the basis of the target investment allowance. The effect of this arrangement is that if a TNSP spends less than its expenditure target during the regulatory period, it retains the benefit of that underspend (both return on and of capital) for the remainder of the regulatory period. Conversely, if it exceeds its expenditure target during the regulatory period it suffers a loss on that overspend (both return on and of capital) for the remainder of that regulatory period.

Although TransGrid has submitted a suite of projects in its forward capex Application, there is no requirement that it spend the allowance allocated to it over the regulatory period on those particular projects, subject to service level standards set under the NEC and other relevant legislation. However, the ACCC will require TransGrid to report on its actual level of expenditure at the end of the current regulatory period broken down into asset classes specified by the ACCC.

Excluded Projects

The second element of the capex incentive is an allowance for significant but uncertain investment which is permitted to be excluded from the main ex ante capex allowance. A key consideration underlying the approach to the design of the capex incentive is that projects should generally only be excluded from the ex ante capex allowance to the extent that not doing this would lead to inefficient under-investment, declining service quality or excessive windfall gains or losses.

Projects will be treated as excluded projects if the expected error presented by the inclusion of that project in the main allowance quantified in terms of the revenue required to cover depreciation and the return on investment in that project, is equal to more than 10 per cent of the revenue required to cover depreciation and return on investment of all projects included in the calculation of the main ex ante capex allowance, or would lead to a significant error in the ex ante allowance, and to the extent that the drivers underlying the excluded project have not already been catered for in the main ex-ante cap.

Once the trigger(s) for an excluded project has been met, the project would then become the subject of a further 'mini' ex-ante cap, commencing once the regulatory test assessment for that investment has been completed and investment in that project begins. Like investment under the 'ex-ante' cap, at the end of the five years of the excluded project incentive period, the depreciated value of the actual expenditure on the excluded project will be included in the RAB.

Revenue Cap Re-opener

To take account of events that could significantly alter the allowed efficient investment level, the ACCC may choose to assess a 're-opener' proposal on application from a TNSP. Only a TNSP can initiate such a proposal.

If a TNSP requests that its revenue stream be re-opened in the middle of a revenue control period, the ACCC will conduct such an assessment, and 'roll-in' its findings in relation to that re-assessment at the beginning of the next revenue control period. The 'roll-in' will be NPV-neutral to the TNSP.

There is no limitation as to the nature of the event that could give rise to a re-assessment of the cap. The ACCC will consider both events that are adverse and favourable to the TNSP in its re-assessment.

Re-assessing the revenue cap will be conditional on:

- the TNSP being materially adversely affected by the event;
- the event being beyond the TNSP's control;
- the event not having been contemplated at the time the revenue control decision was made; and
- the benefits of revoking the revenue control outweighing the detriment to the TNSP's customers of revoking the revenue control.

2.3 Process issues

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

- On 26 September 2003, TransGrid submitted its Application in relation to the re-set of TransGrid's revenue cap under clause 6.2.4(b) of the Code for the period 1 July 2004 to 30 June 2009, for the ACCC's consideration. The Application outlined TransGrid's views on key elements of the building block and revenue cap setting processes. The Application is available on the ACCC's website.

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

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

- During the course of the review a consultant from PB Associates was retained to assist in the development of a better informed assessment of the efficiency of TransGrid's historic and proposed future investments. Mountain Associates and Dr Darryl Biggar were also engaged as internal consultants to assist the ACCC on a number of aspects of the Review.

- The ACCC conducted discussions on future capex with TransGrid on historic capex between 3-6 February 2004 and 10-12 February 2004 .

- On 12 March 2004 TransGrid requested an extension of time in order to reformulate and resubmit its forward capex Application. The ACCC agreed to this request.

- On 14 April 2004, the ACCC released GHD's Final Report on TransGrid's Application: The ACCC received several submissions on GHD's Report which have been taken into consideration by the ACCC, and are available on the ACCC's website.

- The ACCC made its Draft Decision on all aspects of TransGrid's revenue cap, excluding the future capex component, on 28 April 2004. The ACCC received a number of submissions on its Draft Decision from interested parties which will be taken into consideration in the Final Decision.

- On 18 June 2004 the ACCC held a Public Forum on its Draft Decision on TransGrid's Revenue Cap for the period 2004-2009.

- On 19 November 2004 TransGrid submitted its Supplementary future capex Application.

- In November 2004, the ACCC engaged PB Associates to examine TransGrid's Supplementary future capex Application. PB Associates' final report was released in January 2005 and is available on the ACCC's website.

2.4 Structure

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

- Chapter 3 outlines the ACCC's considerations in relation to TransGrid's governance framework;
- Chapter 4 outlines the ACCC's considerations in relation to TransGrid's replacement capital expenditure;
- Chapter 5 outlines the ACCC's considerations in relation to TransGrid's small augmentations program;
- Chapter 6 outlines the ACCC's considerations in relation to TransGrid's excluded projects submission;
- Chapter 7 outlines the ACCC's considerations in relation to TransGrid's property and easements program;
- Chapter 8 outlines the ACCC's considerations in relation to TransGrid's support the business capital expenditure; and
- Chapter 9 deals with miscellaneous issues.

2.5 Overview of TransGrid's network

TransGrid operates more than 12,400 kilometres of transmission circuits as well as 81 terminal substations in NSW and the ACT. TransGrid's network spans an area that extends from the Queensland to Victorian borders and 400 kilometres inland from the east coast extending along the Murray River and up to Broken Hill. Figure 2.6.1 illustrates TransGrid's network and highlights the major load centres in NSW and Figure 2.6.2 illustrates TransGrid's network in the metropolitan areas.

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

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

Figure 2.5.1 Coverage of TransGrid's Network

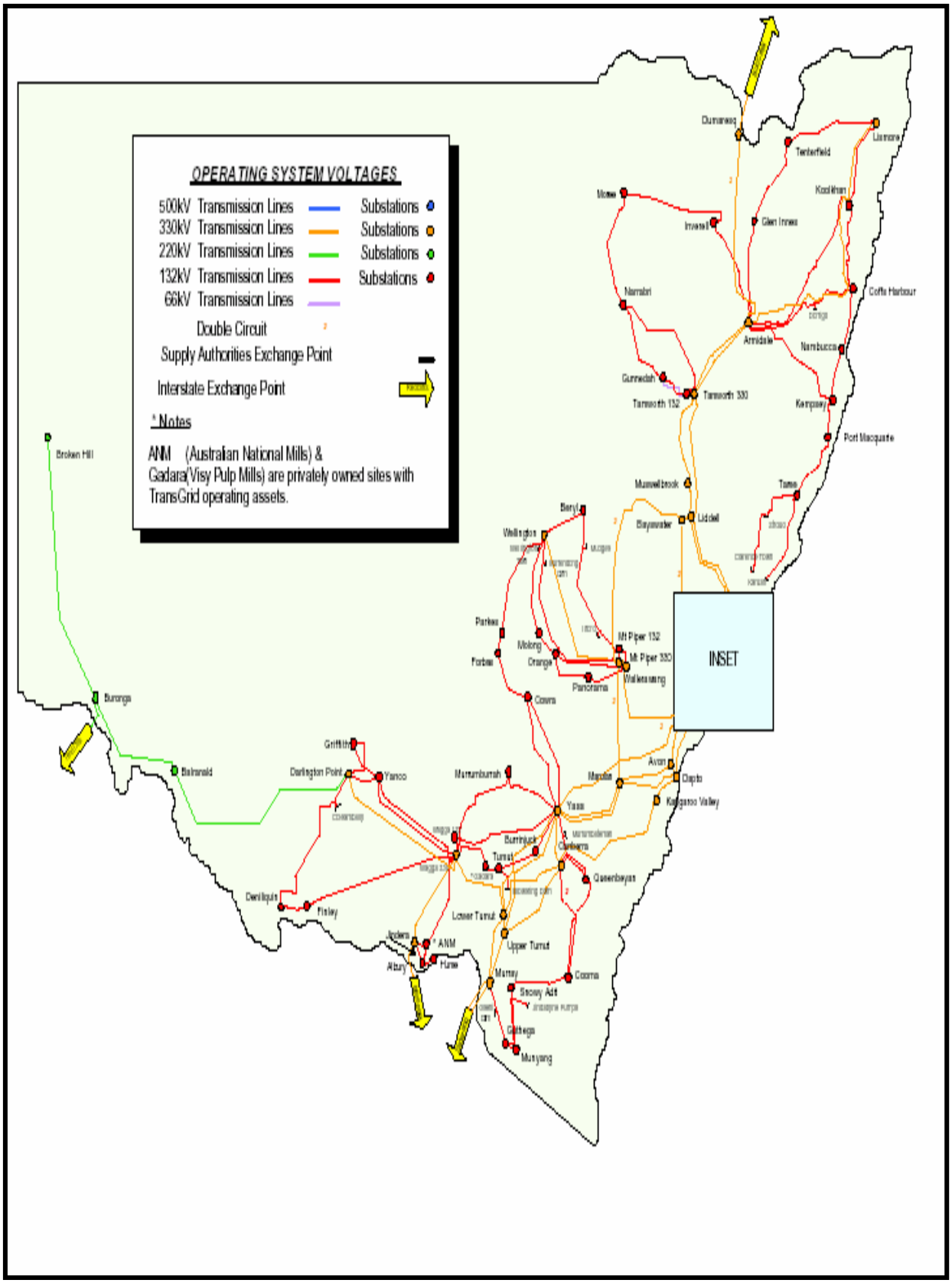
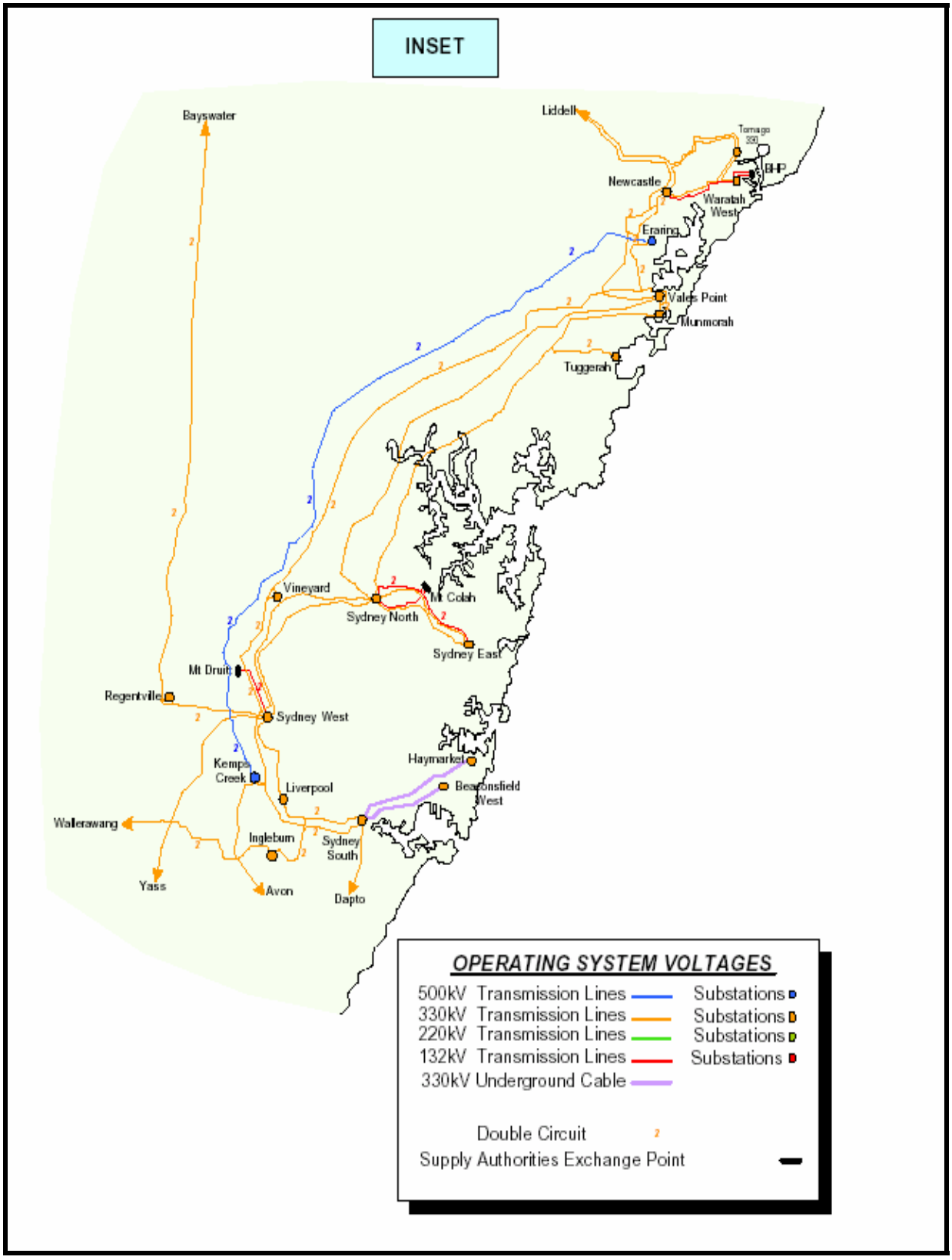


Figure 2.5.2 TransGrid's Network in Metropolitan Areas



3. TransGrid's Capital Expenditure Governance Framework

3.1 Capital Expenditure Governance

In managing an electricity transmission business a sound overall capital expenditure governance framework is an essential element of ensuring efficient and effective capital investment, as it assists with resource allocation and business prioritisation.

New processes adopted by TransGrid for identifying and costing projects in its current Application appear to have significantly improved the quality of data available to the business and supporting information for assessment of the proposed capital expenditure.

3.2 TransGrid's Capital Expenditure Governance Framework

The high level of capital investment in electricity transmission businesses makes it important to optimise the timing and whole-of-life costs of investments, while having regard to network demands and availability. TransGrid has developed a process for identifying, evaluating, prioritising and approving capital investments across all areas of the business. TransGrid's Capital Expenditure Review and Approval Process revolves around six work streams which enable the identification and scoping of capital projects. The output of these work streams are rolled into a master database to enable consolidation and sorting of forecast capital expenditure requirements.

TransGrid states that five per cent of its total revenues in 2003/04 were derived from non-monopoly services such as overseas consultancies and contract line construction and maintenance works. The ACCC is excluding these revenues (and costs) from this Decision as they are ring-fenced from TransGrid's monopoly network services.

3.3 PB Associates' Recommendations

PB Associates has undertaken a review of TransGrid's capital governance arrangements, and the ability of TransGrid to establish optimal investment plans. This review has informed PB Associates' considerations of the overall efficiency of TransGrid's proposed capex program. While the review's primary focus was on efficient commercial outcomes, PB Associates also considered service, safety and environmental requirements in its capital program recommendations.

PB Associates has found that the capital governance framework developed by TransGrid for capex identification, assessment and approval provides a sound basis for future capital investment. PB Associates has noted that TransGrid has accelerated its internal capital expenditure approval process in some areas to accommodate tight timeframes. This has led to some instances of inconsistency in project requirements and costing. However, PB Associates does not believe these deficiencies are symptomatic of problems in the capital governance arrangements moving forward, but were peculiar to

this review. PB Associates believes future iterations of the regulatory review process should see further improvements in the capital investment process and increase TransGrid's ability to articulate a capital investment program in future regulatory periods, and remedy the issues arising in this review relating to the accelerated planning and estimating processes.

PB Associates has concluded that the approach adopted by TransGrid in proposing its future capex spending program has been effective and that the organisation is developing a growing awareness of the need to thoroughly and rigorously demonstrate its capital requirements.

3.4 ACCC Considerations

The ACCC has found the capital governance arrangements applied by TransGrid in determining the needs, optimal alternatives and efficient estimates for costs to be generally sound. It is expected that the ex ante regulatory regime will encourage TransGrid to continue to develop its capital governance arrangements, as effective expenditure approval procedures will improve its ability to respond to efficiency incentives.

The ACCC notes that TransGrid has had to accelerate the identification and costing of projects and has had limited time to implement practices designed to accommodate the introduction of the ex ante regulatory regime. The tight timeframe has also meant that the full range of alternative project evaluations may not have been thoroughly explored in certain cases. Formalising the accelerated planning approach and ensuring systematic project evaluation for regulatory consideration (internal and external) should provide an improved capital investment process in the future.

In instances where projects have been duplicated or omitted, the ACCC considers that refinements in the capital governance arrangements will be necessary to ensure congruence between business groups in the future. However, the ACCC acknowledges these issues appeared to result from a rapid preparation of the Application, and were not indicative of endemic problems with TransGrid's capital investment process.

The ACCC also considers that TransGrid's adoption of a working group structure for consideration of capital investments will, in the future, provide a solid base upon which optimal project selections may be made.

4. Replacement Capital Expenditure

Replacement capital expenditure refers to all classes of expenditure required to maintain the existing network infrastructure. TransGrid has applied for a replacement capex expenditure of $326 million. The ACCC has allowed TransGrid $275 million for asset replacement capital expenditure in this Decision. TransGrid's expenditure in this category was $301 million for the previous regulatory period.

Replacement strategies

There are many drivers of expenditure in this category. There are compliance issues related to statutory and regulatory requirements that drive spending. In addition, environmental considerations and future network developments and augmentations may impact on the management of existing assets and timelines for replacement. Further, new asset technologies and information system technologies also impact on asset replacement expenditure. This type of expenditure is also driven by the need to replace assets due to wear and tear, lack of replacement parts or de-support from parts manufacturers.

4.1 TransGrid Supplementary Application

TransGrid's replacement capex application is summarised in Table 4.1.1 and discussed in detail below. TransGrid divided its asset replacement submission into five categories.

Table 4.1.1 TransGrid's Application: Asset Replacement Capex

Asset Replacement Category	Cost ($million 2004)
Minor Projects	154.90
Committed Asset Replacement Projects	18.75
Major and Combined Projects	104.90
Regional Depots Projects	39.28
Regulatory Projects	7.80
Total	325.63

4.2 Minor Projects

Minor projects are replacement projects relating to a class of asset across multiple locations. Examples of these projects are the replacement of specific circuit breakers types identified under asset management strategies. Individual plant replacement projects are subdivided into work streams. Individual projects may subsequently be aggregated into packages of work to facilitate efficient project delivery.

TransGrid's Minor Projects application amounted to $154.9 million, a figure approaching 50 per cent of all proposed replacement projects. TransGrid's proposed Minor Projects were broken down into the following components:

- **Substation Projects ($68.6 million)** There are numerous small projects in this category that all relate to substation maintenance and building. Within this category, current-transformer replacement projects accounted for $25.9 million, transformer replacements accounted for $14.9 million and circuit-breaker replacements at $11.7 million.

- **Mains Projects ($19.8 million)** TransGrid included 8 classes of works under the Mains Projects category, totalling $19.8 million. This included cable-related projects, allowance for a fault-locator project, foundation replacement for towers, insulators, laser-profiling, marker balls, restoration and replacement of wood poles.

- **Protection and Metering Projects ($1.9 million)** TransGrid included 4 classes of works under the Protection and Metering Projects category: metering, differential metering, distance relays and fault recorders.

- **Communications Projects ($10 million)** TransGrid included 8 classes of works under the Communications Projects category, relating to communications projects across TransGrid's network, and the maintenance of independent communications channels across that network.

- **Security Projects ($54.6 million)** TransGrid has included $54.6 million in its application in relation to security projects. This amount relates to upgrading of security fencing at all TransGrid sites, the installation of CCTV at critical sites, and additional security measures at some sites. In response to national guidelines for the protection of electricity networks recently developed by the state and federal governments, TransGrid has assessed the risk for all its sites and has risk ranked all the sites into separate bands of risk criticality.

4.3 Committed Asset Replacement Projects

TransGrid's application in this category amounts to $18.75 million. Included under this category are costs to complete the following projects:

- TransGrid submits that the need for the Yass substation rebuild was established in the last regulatory period but approximately half the expenditure on this project will be incurred in the current regulatory period.
- TransGrid's $1 million QNI clean-up program relates to felled wood associated with the clearing of QNI-related easements.
- The Sydney SVC project was commissioned during September 2004. The allowance in the current regulatory period relates to an outstanding contractor payment and other costs.

4.4 Major and Combined Projects

TransGrid has included the category of Major and Combined projects within its Application. These are larger projects structured to address multiple asset replacement issues at a single site, or projects generally requiring significant engineering design and procurement input. TransGrid's Major and Combined Projects application was then broken down into the following components:

- **reactor and transformer replacements ($4.6 million)** TransGrid has included an estimate of $2.2 million for the replacement of the cable 41 shunt reactor and $2.4 million for the replacement of another reactor within its capital budget application.

- **Transmission lines 875 and 990 – Reconstruction** In relation to the 875 Tamworth – Narrabri line, TransGrid has included $4.8 million as the cost of maintaining this line. In relation to the 990 Yass – Wagga line, the reconstruction of this line at 330kV has been included in the TransGrid Application under the Excluded Projects section, at a cost of $10 million.

- **Taree substation – Control Room Replacement ($8.1 million)** According to TransGrid's application, the secondary equipment in the control room has now reached the end of its useful life. A new control room will also ensure compliance with stricter environmental standards and ensure a long and reliable service life of microprocessor based secondary systems.

- **protection system upgrades ($5.7 million)** This category includes 113 individual projects to replace older style protection relays that have reached the end of their service life and are currently experiencing faults that impact on system availability.

- **Canberra substation tunnel board replacement ($1.4 million)** This covers the replacement of a large number of relays and the tunnel board at the Canberra substation. Replacement of the board is expected to reduce design, manufacturing, installation and commissioning times and costs and also substantially reduce the possibility of inadvertently tripping as a result of staff working behind live in-service panels.

- **Queanbeyan substation replacement ($13.8 million)** This covers the replacement of the Queanbeyan substation, most of the elements of which are due for replacement under the relevant asset management strategies.

4.5 Regional Depot Projects

These investments relate to construction projects at regional works depots. Overall, TransGrid proposed a budget of $38.3 million for this class of projects, with $25.7 million of that budget devoted to developing the Wallgrove depot, and the remainder split among the other five projects.

- **development of new headquarters at Wallgrove.** The relocation of the head office staff from Sydney to Wallgrove is no longer proceeding. TransGrid proposes that the remainder of the works program allocated to the Wallgrove site is for a staged facility upgrade in order to provide better staff facilities, and additional security for system control and IT functions that are now located on the site.

- **redevelopment of the regional depot at Orange**. The Orange depot was built using large amounts of corrugated asbestos. TransGrid has chosen to build new depot facilities on a part of the site, demolish the existing depot and sell part of the land that is no longer required.

- **augmentation of the regional depot at Newcastle**. TransGrid proposes to re-develop this facility as a major regional centre, in conjunction with the downgrading and re-development of the Tamworth depot.

- **redevelopment of the Tamworth regional centre depot**. TransGrid proposes to downgrade the Tamworth Regional Centre to depot status, and shift staff and some depot facilities to other sites.

- **refurbishment of parts of the Wagga Regional Centre**. TransGrid has amended the projects applicable to the Wagga Regional Centre to include projects to remodel various office projects. These projects total $715,000.

- **modifications to the Yass Regional Centre**. TransGrid included in its estimates an amount of $600,000 for development of the Wagga Oil Laboratory, and also included a sum for the refurbishment of the Upper Tumut switching station.

4.6 Regulatory Projects

Regulatory projects are those which are driven by regulatory imperatives, such as new environmental or security standards. TransGrid proposed a Regulatory Projects budget of $7.78 million over the current regulatory period. The main projects in this category were:

- **replace Vales Point transformers:** The Environmental Protection Agency has served TransGrid with a notice requiring the abatement of noise from these

transformers. TransGrid has investigated various options and has applied to replace the transformer with quieter models.

- **PCB Chemical Control:** TransGrid has been served with a General Chemical Control Order to dispose of equipment contaminated with PCB waste. TransGrid has applied for funding to pay for the PCB waste removal.

- **Mine Subsidence:** TransGrid requires funding to strengthen the footings of towers built over disused mines.

TransGrid also included a claim for $3 million for anticipated, but undefined future regulatory projects. This allowance equates to around 60 per cent of known project estimated costs for this category.

4.7 PB Associates' Recommendations

PB Associates' Recommendations regarding TransGrid's asset replacement application are as follows.

Minor Projects

- **Substation Projects:** In most categories of substation expenditure, PB Associates has reviewed the programs submitted by TransGrid and agrees that allowances for these projects be included within TransGrid's capital program. In relation to disconnection equipment at Vales Point, PB Associates suggests a more limited program of replacement and refurbishment of units in service. PB Associates has accordingly reduced the cost estimate for that project by $240,000.

  In relation to circuit breaker and instrument replacement projects, PB Associates concluded there are considerable opportunities for economies of scale within these projects; and bundling like projects would result in installation time savings. PB Associates has therefore imposed efficiency factor reductions on TransGrid's budget of $25.9 million.

- **Mains Projects:** PB Associates supports the inclusion of a budget for the majority of projects in this category. However, in relation to the Laser Profiling project, PB Associates considers this project to be of a more operational nature as it relates primarily to maintenance functions and has not recommended an allowance for this project.

- **Pole replacements.** PB Associates recommends that where steel sleeves have been used, replacements of poles on these lines be included in the capital works program.

- **Protection and Metering Projects:** PB Associates reviewed TransGrid's application for protection and metering projects and has recommended the

inclusion of these projects in TransGrid's capital works program at a value substantially in accordance with that proposed by TransGrid.

- **Communications Projects:** PB Associates has discussed the above range of communications projects with TransGrid and recommends that allowances for all these projects be included within the capital works program, at slightly below the cost estimates submitted by TransGrid.

- **Security Projects:** PB Associates has been instructed to treat all security information as mandated in the Commonwealth Protective Security Manual (2000) and therefore has not detailed individual projects in its recommendations. However, PB Associates has confirmed that all the security-related projects included in the capital works program are in accordance with the National Guidelines, with the majority of quoted costs based on supplier costs obtained via a competitive tendering process. Accordingly PB Associates recommends that the total estimated expenditure for security projects be included in the current capital works program.

Table 4.7.1 PB Associates' Recommendation: Minor Projects

Capex ($million 2004)	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**	**Total**
TransGrid Supp. Application	35.69	37.03	29.38	24.17	28.59	154.86
PB Associates' Recommendation	34.98	36.32	28.74	23.74	27.62	151.40

Committed Asset Replacement Projects

PB Associates has recommended that all the capex funding applied for, and relating to the Yass substation rebuild, QNI cleanup and Sydney West SVC be included in the capital works program in the current regulatory period.

Table 4.7.2 PB Associates' Recommendation: Committed Asset Replacement

Capex ($million 2004)	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**	**Total**
TransGrid Supp. Application	17.95	0.80	0.0	0.0	0.0	18.75
PB Associates' Recommendation	17.95	0.80	0.0	0.0	0.0	18.75

Major and Combined Projects

Reactor and Transformer Replacement

For reactor replacement projects, PB Associates has reviewed both programs of replacement and test results on the current equipment and has recommended the inclusion of both programs within the capital works program. PB Associates has recommended that all TransGrid's proposals in relation to transformer replacement be included within the capex budget, with the exception of the following projects:

- **Glen Innes No. 2** PB Associates does not recommend that this transformer be replaced but that the bushings be replaced as planned and that the condition of the transformer continue to be monitored.

- **Port Macquarie No. 1** Based on the condition and age of the transformer PB Associates recommends that the transformer be scrapped as there would be little benefit obtained from any life extension works. PB Associates further recommends that the asset replacement estimate be contributed to the upgrade project which is scheduled for commissioning by April 2007.

- **Sydney West No. 3** PB Associates has reviewed the condition report for these transformers and recommends that due to age and condition, the No.3 transformer be replaced, two component transformers be scrapped and the third component transformer be retained as a spare.

- **Sydney West No. 4** PB Associates acknowledges that the component transformers are approaching the end of their service lives but is of the opinion that there does not appear to be any indications of imminent failure. Accordingly, PB Associates recommends that these transformers be scheduled for replacement in 2010 and that the component transformer recovered during the replacement of Sydney West No.3 transformer be kept as a spare.

Transmission Lines 875 and 990 – Reconstruction: PB Associates has recommended that the Tamworth-Narrabri line be re-constructed at 132kV as soon as practicable and hence has removed the expenditure included by TransGrid in this category for maintenance works on the line, and has included $18.3 million plus $8 million in easement costs in its capital recommendation to cover reconstruction costs. Reconstructing the line also saves $0.193 million by delaying the need to install an extra capacitor bank at Narrabri.

In relation to the Yass–Wagga line, PB Associates recommends that the maintenance works be scheduled on a priority basis and that the expenditure be included in the current regulatory program.

Taree Control Room Replacement: PB Associates recommends that the project be included in the current capital works program but notes that the estimate prepared incorporates a 30 per cent scoping factor and not the 10 per cent which might usually be associated with this type of project. Therefore the estimate for this project, adjusting for the scoping factor change, is $6.85 million.

Protection System Upgrades: PB Associates recommends that these individual projects be included in the current capital works program, but has noted that the estimate for a typical relay replacement program is $46,300 (NSW Treasury costings) whereas $50,000 has been estimated for the majority of the projects in the application.

Additionally, PB Associates has made a further reduction in the recommended budget as it believes that bundling similar projects should result in at least a 20 per cent saving

in comparison to an average of 7.8 per cent reduction in the total estimate for the typical project estimate provided. Hence PB Associates has applied a 15 per cent efficiency factor to the entire protection system upgrade program estimate provided by TransGrid.

Canberra Substation Tunnel Board Replacement: PB Associates recommends that the project be included in the current capital works program, as many of the relays at the substation are nearing the end of their useful life and a complete relay replacement by installing a new tunnel board is warranted.

Queanbeyan Substation Replacement: PB Associates considers the option to rebuild the substation as the most feasible of all the alternatives considered by TransGrid. PB Associates assesses that the new design proposed for the rebuilt substation will address the relevant environmental, operational, health and safety and security issues. PB Associates has recommended that this project be included in the capital works program.

Table 4.7.3 PB Associates' Recommendation: Major and Combined Projects

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	10.79	20.29	22.11	23.38	28.37	104.90
PB Associates' Recommendation	8.46	10.90	20.51	19.09	25.94	84.90

Regional Depot Projects

Regarding regional depot projects, PB Associates' findings are as follows:

- **Wallgrove:** Subject to the removal of contingency sums for several projects to be carried out at Wallgrove, PB Associates has recommended that the majority of the remaining works be included in the capex allowance.

- **Orange Regional Depot:** PB Associates has recommended that the costs of these projects be included in the capex allocation, net of the proceeds forecast by TransGrid from the sale of the land surplus to requirements, and after deduction of contingencies included in TransGrid's business case for the redevelopment of the site.

- **Newcastle Regional Depot:** PB Associates supports TransGrid's re-development of the Newcastle facilities based on their age and condition, and has accordingly recommended that these works be included in the capex allowance, net of contingency allowances factored into TransGrid's modelled costs of carrying out these projects.

- **Tamworth Regional Centre:** PB Associates recommends that the cost of the redevelopment of the site be included in the capex allowance, net of sale proceeds and after deducting contingency allowances included by TransGrid in its budget for site re-development.

- **Wagga Regional Centre:** PB Associates recommends that these projects be included within TransGrid's current capital works program.

- **Yass Regional Centre:** PB Associates considers that the project to replace the air-conditioning plant at the Yass depot is reasonable, and has recommended that an allowance for this project be included in the capex budget, but has recommended that the Yass Water Storage project not be included on the grounds that it is not NPV-positive.

Table 4.7.4 PB Associates' Recommendation: Regional Depot Projects

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	0.69	13.76	14.15	8.34	2.34	39.28
PB Associates' Recommendation	0.45	3.24	3.19	7.07	1.64	15.60

Regulatory Projects

PB Associates has assessed the options that TransGrid has considered in addressing the Vales Point transformers noise pollution issue and agrees with TransGrid's proposed project timeframe and costings.

In relation to the request for an allowance to replace PCB-contaminated equipment, and for mines-subsidence related works to strengthen the foundations of towers established over old mining sites, PB Associates has assessed TransGrid's costing for these projects to be appropriate.

In relation to future regulatory projects, PB Associates has suggested that an allowance of $1 million be included in the capital works program to cover future uncertain regulatory projects, based on an allowance of approximately 20 per cent of TransGrid's current known regulatory project estimated costs.

Table 4.7.5 PB Associates' Recommendation: Regulatory Projects

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	0.96	2.11	1.72	1.50	1.5	7.80
PB Associates' Recommendation	1.16	2.23	1.81	0.20	0.20	5.60

4.8 Submissions in response to PB Associates' Report

TransGrid has responded in detail to detailed technical assessments by PB Associates of TransGrid's replacement projects. These submissions are available on the ACCC's website.

The EUAA questions the basis for the proposed increase in TransGrid's replacement capex budget from TransGrid's original Application. The EUAA is also critical of PB Associates' terms of reference, arguing that while PB Associates has hinted at significant reductions in TransGrid's opex due to an increased replacement program, PB Associates has not been required to quantify these savings.

4.9 ACCC Considerations

The ACCC understands that TransGrid has a well developed asset management strategy with individual maintenance strategies for each category and class of electrical equipment. This strategy is underpinned by a well populated data base (integrated with a works management system) which contains equipment manufacturing details, service information, condition data, inspection reports and maintenance records. The ACCC further notes the development of both the five year network plan and the more recently developed thirty year network plan to underpin future reviews. The ACCC understands that this process is continually reviewed and improved by various asset management working groups.

The ACCC has determined an allowance of $275.26 million for replacement capital expenditure. In reaching this decision the ACCC has considered a number of issues which are discussed below:

Minor Projects: In relation to circuit breaker and instrument transformer replacements the ACCC has adjusted TransGrid's application downwards to reflect economies of scale and time saving efficiencies. An adjustment for time saving efficiencies has also been made to TransGrid's protection system upgrade (relay replacement) program in a similar manner.

Regional Depot Projects: Where TransGrid has included contingency allowances for depot projects, the ACCC has eliminated these allowances from TransGrid's capital expenditure determination.

Security Projects: TransGrid's proposed expenditure associated with upgrading the physical security of its network assets represents a significant 'step change' in expenditure as it is an upgrade to existing security measures for all of TransGrid's substations. TransGrid's Network Security Plan indicates that TransGrid has adopted a risk based approach to asset security, with expenditure per substation varying depending on the level of 'risk'. The ACCC considers that this is an appropriate means of determining expenditure and that TransGrid's costings are reasonable.

Regulatory Projects: In relation to the contingency for future regulatory projects that have yet to be identified, the ACCC considers that TransGrid has not appropriately justified its requested allowance for costs falling into this category based on historical patterns of expenditure on projects. The ACCC has not included the contingency allowance. If future regulatory projects arise that TransGrid considers have a materially adverse effect on its capex program, then TransGrid can use the re-opener mechanism to apply for a further allowance in respect of these costs. Accordingly, the contingency allowance proposed by TransGrid has been removed.

4.10 ACCC Decision: Asset Replacement Capital Expenditure

The table below documents the ACCC's determination in respect of future asset replacement projects.

Table 4.10.1 ACCC Decision: Asset Replacement Capex

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	66.09	73.99	67.37	57.39	60.79	325.64
ACCC Supp. Draft Decision	62.80	53.30	54.06	49.91	55.19	275.26

5. Small Augmentations

5.1 TransGrid Supplementary Application

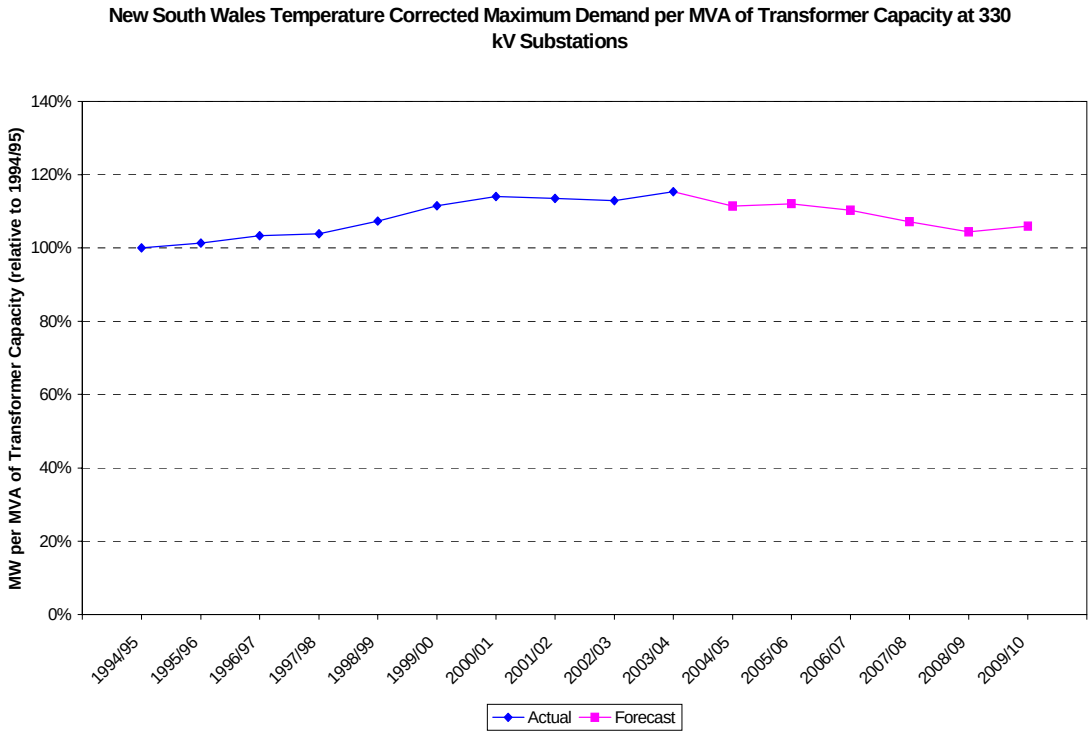
TransGrid has proposed a significant small augmentation capital program of $493.8 million to address network reliability over the current regulatory period. These investments are primarily jurisdictional and Code obligations in relation to reliability of supply.

TransGrid's proposed augmentation program marks a shift in TransGrid's spending profile from a few large high expenditure projects in the previous regulatory period (such as MetroGrid) to a broader based expenditure profile. The new profile is driven by several factors:

- wide-spread high levels of load growth in New South Wales which have required the expansion of TransGrid's network. Technical studies obtained during this assessment, indicates that peak demand has been steadily increasing over the last ten years. Additional reliability investment will improve TransGrid's network capacity relative to forecast demand growth over the regulatory period;
- DNSP requests to upgrade the network; and
- requests from large customers to augment network connection.

TransGrid provided an overview of the peak capacity of the network that indicates that peak demand (as measured by demand per unit of MVA of transformer capacity) has been steadily increasing over the last ten years. This overview also indicates that additional reliability investments will improve TransGrid's network capacity relative to forecast demand growth over the regulatory period. Figure 5.1.1 below illustrates this trend.

Figure 5.1.1 TransGrid Demand per MVA of Transformer Capacity



TransGrid's Application proposes fifty-seven small augmentation projects, and expenditure requirements for projects that have been committed from the last regulatory period. These projects are listed in Appendix A.

In determining its investment program TransGrid has indicated that it has applied a continuous N-1 planning criteria. However, in some cases TransGrid has indicated that the timing of investments to meet the N-1 criteria has been deferred depending on the costs of the network investment. Specifically, TransGrid has indicated that its network planning will allow some load at risk if: the cost of the upgrade is considered high; and/or the risk exposure is considered to be small; and/or the cost of supply interruptions is considered to be low.

TransGrid's Application includes proposed expenditure on:

- new transmission lines;
- new substations;
- reactive plant (capacitor banks);
- transformers; and
- committed projects (projects initiated in the last regulatory period).

Table 5.1.1 below shows TransGrid's small augmentation capital application by category of expenditure

Table 5.1.1 TransGrid's small augmentation capex by category

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
New transmission lines	0.64	2.87	13.11	23.06	28.48	68.16
Substations	3.52	11.61	44.34	67.80	26.68	153.94
Reactive plant	3.42	18.17	14.52	5.94	3.85	45.90
Transformers	1.89	15.85	9.35	19.20	20.56	66.85
Committed projects	40.70	22.33	23.97	46.52	2.17	135.69
Total small augmentation	50.17	70.83	105.29	162.52	81.74	470.55

This table excludes complex and compliance related expenditure.

Compliance related augmentation capital expenditure

TransGrid's Application proposes capital expenditure of $23 million over this regulatory period for the augmentation of communication systems for security purposes and supervisory, control and data acquisition (SCADA). Approximately 67 per cent of TransGrid's proposed expenditure relates specifically to upgrading communications systems to enable compliance with the NEMMCO Power System Data Communications Standard. Other proposed expenditures are to upgrade facilities in line with existing Code requirements and standards.

Complex augmentation expenditure

Mid North Coast: Armidale – Kempsey 132kV line, Coffs Harbour – Kempsey 132kV line and Port Macquarie's 330kV substation

TransGrid proposes a complex of projects for the supply of the mid north coast. The existing mid north coast region (Coffs Harbour to Port Macquarie) is supplied from a number of 132kV circuits from Armidale with 132kV links to Lismore in the north and a very weak 132kV connection to Newcastle in the south via Taree and Stroud.

TransGrid states that the 132kV system is heavily loaded and the scope to continue to reinforce it with 132kV developments is limited. TransGrid expects that unacceptably low voltages and overloading of some network elements will occur in the medium term on outage of key elements of the network. TransGrid considers that the establishment of a 330kV supply to the area will be necessary to cater for the growing loads.

TransGrid anticipates that this could entail:

- operating both circuits of the Coffs Harbour-Nambucca-Kempsey 132kV double circuit line at 132kV, which would necessitate conversion of existing Country Energy 66kV substations to 132kV or establishment of new 132kV substations;
- construction of a 330kV line between the Armidale and Kempsey areas. This may require reconstruction of parts of the existing Armidale – Kempsey 132kV line; and
- construction of a 330/132kV substation near Port Macquarie supplied from Armidale via the Armidale – Kempsey 330kV line and a new section of 330kV line between Kempsey and Port Macquarie.

TransGrid has costed these projects at $61 million over 5 years and has included them in the ex-ante cap.

Kempsey Port Macquarie Line

TransGrid expects that above average load growth in the Port Macquarie area will continue. It forecasts that from winter 2004 onwards periods of risk will emerge, during which the capacity of this system to meet agreed reliability standards may be exceeded.

To date, this contingency has been managed by the installation of capacitors in the area. Four banks of capacitors, totalling 39MVar have been installed at Port Macquarie and five banks totalling 52MVar have been installed at Taree. TransGrid argues that the installation of additional capacitors will be of marginal benefit as the reactive loads at each location are already more than fully compensated. Port Macquarie 132/33 kV Substation is supplied by 132kV lines from Kempsey and Taree. The capacity of this system is limited by unacceptably low voltages at Port Macquarie on outage of the line from Kempsey.

5.2 PB Associates' assessment process

PB Associates reviewed the need, timing and costs of TransGrid's proposed investment program. PB Associates has assessed the planning studies[1] providing estimates of available capacity and peak demand growth for each specific project (where relevant) to assess the need and timing of the proposed investment. In some cases, where there were no planning studies available, PB Associates has indicated that 'engineering' judgement was applied to assess the appropriateness and timing of specific investments.

5.3 PB Associates' Recommendations

PB Associates considers that the overall proposed small augmentation program is soundly based given its review of TransGrid's planning studies. However, PB

[1] In relation to specific projects, PB Associates indicates that TransGrid's planning studies reflect expected peak demand growth estimated from DNSP peak demand at the relevant bulk supply point on the transmission network.

Associates has recommended that a number of projects not be included in TransGrid's proposed investment program or reallocated to asset replacement expenditure.

In particular, PB Associates has recommended that specific investments be removed from TransGrid's proposed capital program, where:

- demand forecasts indicate that network capacity is adequate over the current regulatory period;
- an investment provides greater than N-1 network reliability; or
- proposed capital works will not be undertaken until the next regulatory period.

These projects identified by PB Associates are described below.

New transmissions lines

The transmission line projects not recommended by PB Associates are:

Upgrade 966 Armidale-Koolkhan Line: PB Associates believes that this project, estimated to cost $10.9 million, may be deferred past the present regulatory period due to the operation of Directlink, should it be possible to negotiate a network support payment.

Cable 41 Series Reactor Replacement: PB Associates has removed expenditure of $4.8 million as this has already been included in TransGrid's proposed asset replacement program.

Reconstruction of 875 at 132kV: PB Associates does not recommend the inclusion of an amount for maintenance of this line ($4.8 million plus $0.193 million for the installation of an associated capacitor bank at Narrabri) in the capital works program as an allowance is included in the asset replacement program of $26 million for re-construction of the 875 line at 132 kV.

Reactive plant

The reactive plant projects not recommended by PB Associates are:

Nambucca 66kV Capacitor Bank: PB Associates considers that this investment is consistent with a reliability standard in excess of the regulatory N-1 reliability and has accordingly recommended that this project estimated to cost $1.2 million, should not be included in TransGrid's capital program.

Tamworth Reactors Stage 2: TransGrid has proposed that this investment would provide 'black start' capabilities to progressively restore supply to the Hunter Valley, and western and central coast power stations from Queensland. This would facilitate a more rapid restoration of supply to NSW and in particular to the north of Sydney.

PB Associates notes that NEMMCO is responsible for the provision of black start generation in New South Wales and under existing arrangements has contracted two

sources of black start generation in the south of the State. PB Associates therefore recommends that this investment not be included in TransGrid's capital program.

132 kV Narrabri Capacitor Bank: PB Associates considers that planning studies indicate that this investment of $0.645 million can be deferred until the next regulatory period, assuming the Tamworth-Gunnedah line is reconstructed to 132kV.

New substations

The new substation projects not recommended by PB Associates are:

- **Finely 132kV Transformer Capacity Limits:** PB Associates recommends that the second transformer upgrade estimated to cost $4.4 million should be deferred until the next regulatory period as construction of the new 132kV line to Mulwala is not scheduled until 2010.

- **Sydney East, Sydney North and Sydney West Duplicate Breakers:** PB Associates considers that this project, estimated to cost $5.5 million, involves increasing reliability standards above the statutory requirement of N-1, and therefore recommends that it should not be included.

- **Cowra Transformer Replacement:** PB Associates recommends that this project, which involves the replacement of the existing two 30MVA 132/66kV transformers at the Cowra substation with 60MVA units and estimated to cost $1.1 million, be deferred to the next regulatory period.

- **Dapto Substation, additional 375MVA Transformer:** PB Associates recommends that this project, estimated to cost $7.2 million, be excluded from the proposed capital program as it also involves increasing reliability standards above N-1.

- **Kempsey 132kV Transformer Limitation:** PB Associates recommends that, based on load forecasts, this project estimated to cost $4.0 million, be deferred until the next regulatory period.

- **Koolkhan 132kV Transformer Augmentation:** PB Associates recommends that, based on load forecasts, this project, estimated to cost $0.325 million, be deferred until the next regulatory period.

- **MetroGrid:** PB Associates has not included $17.7 million of proposed expenditure as this project is subject to separate discussions with the ACCC.

PB Associates also recommends that an allowance for the following projects that were omitted from TransGrid's Application be included in the capital program:

- **Cooma Capacitor Bank:** PB Associates has assessed the need to install a 132kV 10MVAr capacitor bank at the Cooma substation to support voltage in the area. PB Associates reviewed TransGrid's planning studies and recommends the

inclusion of this project and expenditure of $0.9 million in TransGrid's capital program.

- **Deniliquin Capacitor Bank:** PB Associates has assessed the need to install a 132kV 10MVAr capacitor bank for the Deniliquin substation. PB Associates recommend the inclusion of the project and expenditure of $1.4 million in TransGrid's capital program

Compliance related expenditure

In relation to compliance expenditure, PB Associates reviewed the Standard requirements and considers that the proposed projects cover areas where TransGrid is not reasonably able to meet reliability requirements under the NEC and applicable standards. PB Associates recommends the following three adjustments which have the effect of reducing TransGrid's proposed expenditure from $23.0 million to $18.2 million:

- a 10 per cent engineering factor has been removed as this was already included in the base cost estimates;
- an additional allowance of $0.5 million per year was included as the costs of minor communications expenditures had been overlooked in TransGrid's Application; and
- $5.5 million for the Lismore to Dumaresq line has been removed pending negotiations with PowerLink to link communications from Brisbane to QNI.

The table below shows TransGrid's Application and PB Associates' recommended forecast for compliance related small augmentation expenditure.

Table 5.3.1 PB Associates' Recommendation: Compliance related augmentation capex

Capex ($ million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	0.00	0.28	7.65	8.29	7.01	23.23
PB Associates' Recommendation	0.50	0.75	7.21	3.34	6.36	18.15

Complex augmentation expenditure

PB Associates considers that TransGrid has adequately demonstrated the need for the Mid North Coast developments as part of the long term plan for supply to the mid north coast. However, it does not consider that the timing of this project is sufficiently certain and believes that there appears to be a reasonable likelihood that the project or parts thereof could be deferred.

To calculate a reasonable probability weighted capital expenditure to be allowed in the ex-ante cap for the mid north coast project, PB Associates has assumed that the project could be deferred for up to two years with an equal probability.

The following tables summarise TransGrid's application's capital expenditure and the PB Associates' recommendations.

Table 5.3.2 PB Associates' Recommendation: Mid North Coast reinforcement

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	0.00	0.00	6.00	23.00	32.00	61.00
PB Associates' Recommendation	0.00	0.15	2.04	9.07	18.83	30.08

PB Associates' Assessment of Prudent Costs

PB Associates reviewed TransGrid's processes for estimating the costs of augmentation projects. TransGrid's application project construction costs were determined by averaging unit costs over a sample of past projects. TransGrid applied an additional 'scoping factor' of 10 per cent to these costs to account for historical differences between forecast and actual costs. PB Associates believes that the estimates provided by TransGrid excluding the scoping factor provide a proxy for efficient construction costs. This results in a 6.8 per cent reduction in the costs allocated by PB Associates to substation and transmission line projects compared to TransGrid's application.

In addition, PB Associates compared TransGrid's unit costs to the standard replacement costs contained in the "NSW Treasury, Valuation of Network Assets, 2004" (the Guideline). PB Associates concluded that TransGrid's proposed substation costs are on average 6.5 per cent higher and transmission line costs are 17 per cent higher than the NSW Treasury Replacement costs, respectively. PB Associates concludes that it is therefore reasonable to assume that the prudent costs of transmission lines and substations are 6.8 per cent lower than TransGrid's proposed costs.

The table below shows TransGrid's Application and PB Associates' recommendation for forecast capex for total small augmentation expenditure.

Table 5.3.2 PB Associates' Recommendation: Small Augmentation Capex

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	50.17	71.10	112.94	170.78	88.76	493.75
PB Associates' Recommendation	51.61	71.06	104.28	149.65	73.00	449.60

5.4 Submissions in response to PB Associates' Report

TransGrid Submission

TransGrid has responded in detail to detailed technical assessments by PB Associates of TransGrid's augmentation projects. These submissions have been considered by the ACCC and are available on the ACCC's website.

PB Associates has provided detailed comments on TransGrid's response covering TransGrid's proposed small augmentations program which are available on the ACCC website. These have also been considered by the ACCC.

TransGrid has raised the following issue and requests relating to the 'efficiency factor' applied to certain categories of small augmentation:

- TransGrid believes that PB Associates primarily relied on the NSW Treasury Valuation of Network Assets, 2004 and the use of this is not appropriate in assessing TransGrid's cost estimates.

TransGrid has made a range of requests including that:

- the ACCC justify why TransGrid's scoping factor and costs estimates are not likely to be efficient;
- the ACCC outline reasons why it has not accepted the assessments of TransGrid's historical costs previously carried out by other regulators and the NSW Treasury;
- the ACCC outline reasons why the Meritec report, supporting the efficiency of TransGrid's cost data, was not cited and considered by PB Associates.

EUAA Submission

The EUAA has raised concerns regarding the increase in TransGrid's overall capital expenditure application. This increase has largely been driven by the rise in TransGrid's expenditure application for small augmentation projects and the associated costs of property and easements.

The EUAA contends that TransGrid's original Application is a 25 per cent increase from the actual amount spent in the previous regulatory period, and that its supplementary Application represents a 48 per cent increase from the original Application. The EUAA states that in real terms this is an 85 per cent increase over TransGrid's actual spend in the first regulatory period, and questions the justification for this increase.

The EUAA also contends that TransGrid's capital expenditure program is back end loaded, with a substantial proportion of the expenditure forecast in the last two years. The EUAA raises two concerns with this approach by TransGrid as it:

- sets up the potential for TransGrid to base the next regulatory period's capex request on the high expenditure of the last two years.
- enables TransGrid to benefit from the return of and return on capital in the first three years due to smoothing arrangements.

The EUAA suggests that to address this the ACCC should consider allowing the sharing of gains from the capex underspend in the following regulatory period with customers, partially compensating the TNSP for prudent overspending on projects that were not envisaged during the regulatory review.

Mr Robert Needham Submission

Mr Robert Needham has provided the ACCC with submissions outlining concerns he has regarding the Wollar-Wellington 330kV transmission line project. He believes the project is unnecessary for the following reasons:

- the probability of outage or failure of the relevant transmission lines is very low;
- other problems on the Country Energy distribution system are more worthy of attention than the Wollar-Wellington line, and that these should be addressed first; and
- TransGrid has not adequately undertaken NPV calculations to establish the cost of alternatives to the Wollar-Wellington project.

5.5 ACCC Considerations

The ACCC is mindful of TransGrid's jurisdictional and NEC obligations to maintain existing reliability standards. It is within this framework that the ACCC has made decisions on the appropriateness of TransGrid's proposed augmentation investment program.

The ACCC is satisfied that TransGrid has demonstrated a need for its proposed investment program. However, where projects can either be deferred or provide a higher level of reliability than required, the ACCC considers that these projects should not be included in the ex-ante allowance.

In addition, the ACCC considers the estimates of prudent costs should, to the greatest extent possible, be market tested or independent of TransGrid's actual costs. The assessment undertaken of TransGrid's costs is consistent with this approach through the removal of TransGrid's scoping factor.

In response to TransGrid's submission to the PB Associates Report, the ACCC has reviewed PB Associates' cost estimation process and finds no basis for the conclusion that PB Associates relied primarily on the NSW Treasury Guideline. An examination of the PB Associates' Report indicates that TransGrid's proposed costs were reduced to remove a scoping factor, which is unrelated to the Treasury Guideline. Specifically, this scoping factor is based on TransGrid's past historical costs and is not directly relevant

to the Treasury Guideline. The ACCC understands that PB Associates' use of the Treasury Guideline is to simply provide further information to assess whether the cost estimates determined by PB Associates are comparable to other sources of information.

The ACCC understands that as part of its cost estimation process, TransGrid determined project construction costs by averaging unit costs over a sample of past projects. In addition, TransGrid applied a further scoping factor of 10 per cent to these sample costs to account for historical differences between forecast and historical costs. However, the ACCC expects that for TransGrid's overall capital program there should not be a systematic underestimate of costs. Specifically, any underestimation or overestimation of projects costs should on average cancel each other out. As a result, to incorporate a further scoping factor is likely to result in an upward bias to the total cost of TransGrid's capital program.

The ACCC understands that PB Associates' cost estimation process relies on TransGrid's historical costs to derive estimated costs. To the extent that TransGrid's historical costs are consistent with previous assessments of Transgrid's costs, this has already been taken into account in forming a view regarding TransGrid's estimated costs.

The ACCC understands that the Meritec report was reviewed by PB Associates as part of their assessment of TransGrid's estimated costs.

Other matters

Issues considered by the ACCC are discussed in more detail below.

- **Upgrade 966 Armidale-Koolkhan Line**

In its application, TransGrid identified two planned developments for supporting supply to the Lismore area:

- Install two 10 MVAr 66 kV capacitors at each of Koolkhan and Nambucca 132/66 kV substations (2005/06); and
- Uprate the 966 Armidale – Koolkhan 132 kV line.

Both of these projects were also listed in TransGrid's major project list.

In PB Associates' report on the TransGrid application, PB Associates noted that the upgrade of line 966 is required by 2004-05 but will be deferred until 2006-07 by the installation of additional capacitors at Koolkhan. PB Associates also noted that the upgrade of line 966 is scheduled for commissioning on 1 October 2007. However, PB Associates went on to conclude that the project may be deferred until the next regulatory period due to the operation of Directlink, should it be possible to negotiate a network support payment

In TransGrid's response to the PB Associates' Report, TransGrid stated that it should not be presumed that Directlink will convert to regulated status. In the event that

Directlink does not convert, TransGrid states that provision should be made for either network support payments or the completion of the uprating works.

The ACCC is currently considering an application from the Directlink Joint Venture (DJV) to convert its 180MW HVDC light transmission line from a market network service to a prescribed (regulated) service. As part of its assessment of the conversion application, the ACCC is assessing the benefits of the DJV, including any benefits associated with the deferral of network investments.

In its 14 January 2005 submission on the DJV's conversion application, TransGrid advised the ACCC that based on some planned works on existing transmission lines and the installation of capacitor banks, it does not anticipate requiring network support for the mid north coast until after the winter of 2007.[2] Further, TransGrid stated that it would be undertaking rehabilitation and uprating works for line 966. It is not clear what proportion of the work relates to rehabilitation and further advice will be sought from TransGrid on this issue.

On 8 February 2005, the DJV noted PB Associates' opinion that Directlink can defer the upgrading of line 966 and has subsequently included the deferral benefit in its revised calculations.[3] The DJV has stated that the upgrade of line 966 is being deferred by Directlink from 2003-04.

On the basis of this material, the ACCC has included an allowance in TransGrid's capital program for additional capacitors at the Koolkhan substation. However, owing to the uncertainty regarding the future upgrading of line 966, the ACCC has decided not to include the capital cost of the project from the cap at this time pending further advice from TransGrid.

- **Mid North Coast: Armidale –Kempsey 132kV line, Coffs Harbour-Kempsey 132kV line and Port Macquarie's 330kV substation**

TransGrid proposes a complex of projects which include:

- Building two lines that are designed for operation at 330kV between Kempsey and Port Macquarie and between Armidale and Kempsey;
- Upgrading a 66kV circuit for operation at 132kV and some associated substation works; and
- The construction of a 330/132kV substation near Port Macquarie.

TransGrid has costed this project at $61 million over the current regulatory period, and has included it in its ex-ante cap application.

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2 TransGrid, *Submission to PB Associates Report on DJV Revised Conversion Application*, 14 January 2005, p 1.

3 Directlink Joint Venture, *Letter to ACCC - Attachment 1, BRW Draft Explanation to Review Costs and Deferment Benefits*, 8 February 2005, p.2.

The ACCC's assessment of TransGrid's capital program for the mid north coast also has important implications for its assessment of the Directlink interconnector. The ACCC is currently considering an application from the DJV to convert its 180MW HVDC light transmission line from a market network service to a prescribed (regulated) service. As part of its assessment of the conversion application, the ACCC is assessing the proposed benefits of the DJV, including any benefits associated with the deferral of network investments.

The DJV's advisor Burns and Roe Worley (BRW) has indicated that its network modelling has been based on the assumption that the 330kV augmentation to Port Macquarie would be commissioned in 2008/09. BRW states that limited studies undertaken to assess the benefits of Directlink indicate that it may be able to provide some degree of support to improving the voltage conditions at Port Macquarie prior to the 330kV developments at Coffs Harbour and Port Macquarie. This claim is currently unsupported by evidence from BRW. In subsequent advice, PB Associates does not consider Directlink is able to support Port Macquarie prior to the construction of a Kempsey to Port Macquarie line. However, PB Associates considers there is a possibility that Directlink may have some impact on the timing of other projects in the complex.

PB Associates has indicated that following commissioning of the 330kV Coffs Harbour substation due to be commissioned in 2006/07, if it is possible to implement a control scheme, some of the contingent overloads and low voltages south of Coffs Harbour may be managed for a short time via dispatch of generation from Lismore or through Directlink. BRW has subsequently relied on PB Associates' comments to assume that Directlink can provide a two-year deferment of the whole 330kV Port Macquarie augmentation complex. Consequently, the DJV has included this deferral benefit in its revised calculations even though it has not carried out detailed modelling of this condition or an assessment of the technical feasibility of the necessary voltage control scheme.[4] However, PB Associates has concluded that it is not certain as to whether this scheme could be implemented. TransGrid also believes that it is not certain that this control scheme can be effectively implemented.[5] Further, the detailed analysis of potential deferral periods for the various component projects of the complex has not been undertaken by either party.

The ACCC considers that the analysis undertaken by PB Associates on the mid north coast supply area has important implications for the DJV's conversion application. At this stage it is not clear to the ACCC whether Directlink is able to defer some of this network investment. However, the ACCC does not consider the timing of TransGrid's

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4 Directlink Joint Venture, *Letter to ACCC - Attachment 1, BRW Draft Explanation to Review Costs and Deferment Benefits*, 8 February 2005, p3.

5 TransGrid, Response to PB Associates Review of TransGrid's 2005 to 2009 Capital Expenditure Needs, Attachment 4: Detailed TransGrid Responses to Specific Sections of the Report, February 2005.

projects to be sufficiently certain due to the range of factors identified by PB Associates, including the impact of Directlink with a control scheme. Based on this uncertainty, the ACCC has therefore not included the full value of TransGrid's proposed investment program in this regulatory period, and has only included an allowance of $31 million.

Tamworth Reactor Stage 2

TransGrid provided further advice to the ACCC indicating that this reactor is required when the system is restarted (a 'black start') following a system failure. TransGrid advises that following an incident, the transmission network will be lightly loaded due to the small level of load initially being served. TransGrid believes that the combination of the geographic separation of generation and load and the lightly loaded nature of the network may result in voltage rising above appropriate limits.

The ACCC is not aware of NEMMCO altering its requirements in relation to 'black start' capabilities and is not aware of any requirements on transmission networks to manage voltage levels following a black start incident. Consequently, the ACCC determines that an allowance should not be included in the proposed capital program.

MetroGrid

TransGrid's Application has proposed additional expenditure for MetroGrid related to the final contract payment and for remedial works instigated following project completion. In accordance with the ACCC's Draft Decision, an incentive arrangement will be applied to ensure that TransGrid manages these costs. In particular, only 84 per cent of remaining expenditure incurred on this project will be included in TransGrid's asset base. As this expenditure has already been incurred, the ACCC has only included 84 per cent of this expenditure in TransGrid's capital program. TransGrid applied for $17.8 million (including property related costs) and as a result the ACCC has only included $14.9 million in TransGrid's capital program.

Customer Contributions

TransGrid has proposed some projects where demand from a customer has led to the need for network augmentation. In circumstances where network investment is required to accommodate the connection of a customer or increased demand, the cost of this investment needs to be borne by this customer in accordance with the requirements of the NEC. The costs to be funded by existing customers are reflected in the capital costs included in the revenue cap, whereas, the cost attributed to an individual customer is funded directly by the customer. TransGrid has advised that it adopts a 'shallow' connection charge as part of recovering the costs between the affected customer and existing customers in accordance with the requirements of the NEC.

The ACCC considers that it is important to ensure that TNSPs adopt a consistent policy in terms of the recovery of connection costs over time and among TNSPs to ensure an appropriate allocation of costs between existing customers in the network. As part of future reviews, the ACCC will require the gross amount of proposed capital expenditure and the amount of capital contributions to be provided as part of TNSP applications.

Compliance related small augmentation expenditure

The ACCC notes that the proposed projects cover compliance costs associated with meeting mandatory requirements under the NEC. The ACCC considers that as these obligations are mandatory, this expenditure is necessary to meet the requirements of the NEMMCO Power Systems Communications Standard and existing standards.

5.6 ACCC Decision: Small Augmentation Capital Expenditure

Table 5.6.1 below shows the ACCC's Decision on an efficient amount of small augmentation capital expenditure for TransGrid.

Table 5.6.1 ACCC Decision: Small Augmentation Capex

Capex ($million 2004)	04/05	05/06	06/07	07/08	080/9	Total
TransGrid Supp. Application	50.17	71.10	112.94	170.78	88.76	493.75
ACCC Supp. Draft Decision	51.61	71.06	104.28	149.65	73.00	449.60

The ACCC has allowed $449.6 million for small augmentation expenditure. This is a reduction of $44.1 million compared to TransGrid's Application. This compares to small augmentation expenditure of $284.8 million over the last regulatory period, after adjusting for large projects such as MetroGrid. This difference is illustrated in Figure 5.6.1 below.

TransGrid's Application and ACCC staff's recommendations include a substantial rise in expenditure on small augmentation projects. In addition to the cost of these projects themselves, associated cost of property and easements have also been included.

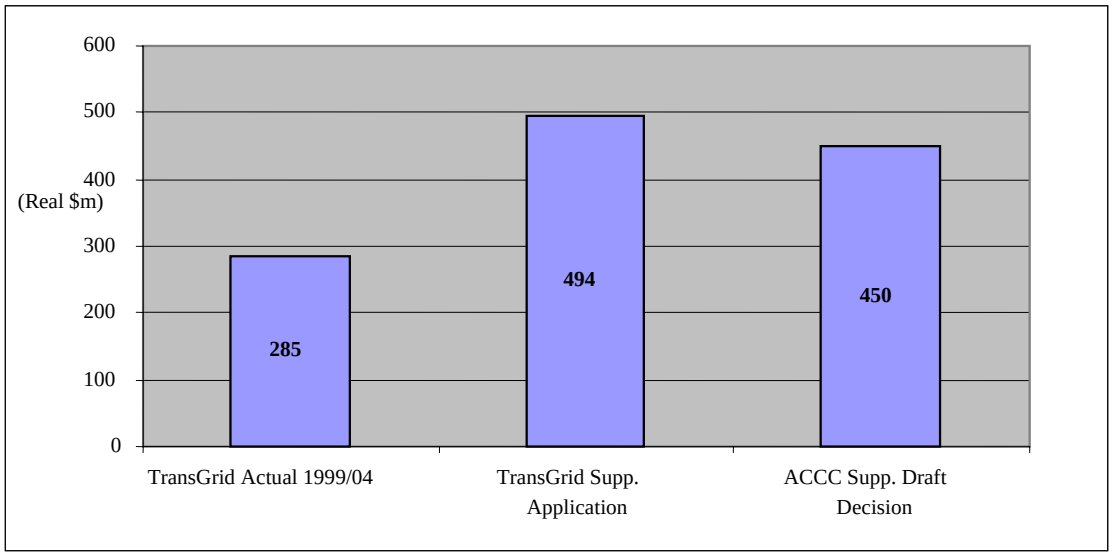
This marks a shift in TransGrid's spending profile from a few larger high expenditure projects in the previous regulatory period (such as MetroGrid) to a broader based expenditure profile. The new profile is driven by several factors:

- wide-spread high levels of load growth in New South Wales which has required the expansion of TransGrid's network. Technical studies obtained during this assessment indicate that peak demand has been steadily increasing over the last ten years. Additional reliability investment will improve TransGrid's network capacity relative to forecast demand growth over the regulatory period.

- DNSP requests to upgrade the network; and
- requests from large customers to improve network connection.

The rise in small augmentation projects is in contrast to the lesser number of likely large augmentation projects (many of which are in the excluded category), and the relatively constant levels of expenditure for replacement capex and "support the business" capex.

Figure 5.6.1 TransGrid small augmentation expenditure ($million 2004)



6. Excluded Projects

6.1 Introduction

This chapter sets out the ACCC's decision on excluded projects. This decision does not entail approval of specific expenditure or projects during the 2004 to 2009 regulatory period. However, it does establish the basis upon which the ACCC will consider requests for approval of additional expenditure during the regulatory period. As such, the detail of this decision on excluded projects forms an important element of TransGrid's revenue control.

The chapter begins by setting out the key regulatory principles underlying the ACCC's approach to excluded projects, as set out in the SRP. It then summarises the key issues arising in the application of the excluded project arrangements to TransGrid. The last three sections then examine each of these issues in turn covering TransGrid's application, the recommendations of the ACCC's consultants PB Associates and Mountain Associates, and comments from interested parties. Finally the ACCC's decision on each issue is set out.

6.2 Principles underlying the ACCC's approach to excluded projects

The ACCC's December 2004 Statement of Regulatory Principles provided for the exclusion of specific projects from the "ex-ante" capex allowance. The justification in the SRP for excluding significant but uncertain investments from the main ex ante capex allowance is that this would improve the accuracy of the allowance and hence ensure that it remains reasonably aligned with efficient costs and "by separately providing for such large but uncertain projects, TNSPs will be able to efficiently invest in those projects with the knowledge that they will be able to recover efficiently incurred costs through regulated charges."

In considering these arrangements, the ACCC was mindful of the additional complexity that the provision for excluded projects would create but considered that on balance the benefit of additional certainty and closer alignment of the expenditure allowance with efficient costs would exceed the cost of the additional administrative complexity.

To provide a basis for deciding which, if any, projects should be excluded, the SRP suggested a rule (the 10 percent rule) that related the maximum possible error in the ex-ante cap that would arise from provision for any specific project, to the total capital expenditure allowance. The 10 per cent rule was suggested as an indicator and TNSPs can apply to the ACCC for other specific projects to be excluded, but it will be at the ACCC's discretion as to whether these will be considered to be excluded projects.

The remaining key elements of the excluded project incentive design can be summarised as follows:

- The decision on the allowed investment on excluded projects should occur during a regulatory period once the probability of the project and its expected costs become known with greater certainty, but before investment is committed.

- The ACCC will establish a target annual expenditure level for each excluded project. This will be converted into an excluded project revenue requirement based on the depreciation of the expenditure over its life, and taking account of the WACC that applies during the regulatory period in which the investment on the excluded project is made.

- The five year incentive period for excluded projects will be deemed to start from the time that investment in the project is first committed, or such other date as determined as part of the incentive. This would mean, for example, that an excluded project incentive could be established in the fourth year of the regulatory period. Such an excluded project incentive would run for five years (that is the fourth and fifth year of the current control, and the next three years of the next regulatory period).

Appendix G to the SRP Background paper set out the process for the implementation of the excluded project arrangements. The first task in this process is to identify which projects, if any, should be excluded from the main ex ante capex cap. This should be with reference to the 10 per cent rule and consideration of whether there are special circumstances that justify excluding a project that would otherwise fail to satisfy the rule.

For projects that are excluded from the main ex ante allowance, an appropriate specification of those projects should be developed, including a description of their main investment drivers and the inter-relationship between investment in excluded projects and investment in the main ex-ante allowance.

The process established in Appendix C then sets out the basis on which excluded project events would be invoked, how the ACCC would establish an incentive and how TNSP revenue would be adjusted as a result of excluded project incentives.

The application of the excluded project arrangements to TransGrid

TransGrid and EnergyAustralia are the first two TNSPs to whom the excluded project arrangements have applied. The sequence of events leading up to the ACCC's decision on excluded projects for TransGrid has been, in chronological order:

- The submission of TransGrid's Application which identified the projects that it wanted to be excluded;

- The review of TransGrid's Application by PB Associates;

- A further written submission by TransGrid and meeting with ACCC staff, in response to PB Associates report. The focus of this submission and meeting was on the process for establishing an excluded project incentive; and the funding of this excluded investment;

- The commissioning by the ACCC of a joint Mountain Associates/ PB Associates report building on PB Associates' report and TransGrid's application and subsequent submissions, to refine the definition of excluded projects and define their triggers;

- The consideration of TransGrid's formal response to PB Associates' report, and consideration of other submissions on PB Associates' report.

In the process of working through the treatment of excluded projects, there have been many related issues for consideration. In the rest of this chapter these issues and the ACCC's decision on them are organised under three headings. The structuring of issues in this way derives from the implementation process set out in Appendix G of the SRP:

Definition of excluded projects: This describes the specific projects, or collection of possible projects, that are identified as excluded from the ex-ante cap and hence eligible for subsequent consideration as excluded projects during the regulatory period. Projects which are not identified here will not be eligible for consideration as excluded projects;

Triggers for excluded projects: This describes the circumstances that would need to arise in order for TransGrid to reasonably invoke an excluded project event and hence initiate the process for the establishment of a regulatory incentive for excluded investment;

Process to be followed to set excluded project incentives: This describes the steps that the ACCC will follow in establishing excluded project incentives, and the basis on which TransGrid will be remunerated for expenditure on excluded projects.

6.3 Definition of excluded projects

TransGrid Supplementary Application and response to PB Associates Report

TransGrid proposed six excluded projects:

- A new 500 kV line between the Hunter Valley area and the Newcastle area (and possibly including a new 500/330kV substation) costing $98 million in the 2004 to 2009 regulatory period;

- A new 500 kV line between Bannaby and Sydney (and possibly the redevelopment of 500/330 kV transformation at Sydney West) costing $125 million in the 2004 to 2009 regulatory period;

- The establishment of the Mason Park 330/132kV GIS substation costing $129 million in the 2004-2009 regulatory period;

- Series compensation on lines from Dumeresq to Bulli Creek and from Dumeresq to Armidale whose main purpose would be to increase the capacity of the QNI interconnector costing $80 million in the 2004 to 2009 regulatory period;

- A new 330 kV line from Yass to Wagga whose main purpose would be to increase VIC/Snowy/NSW interconnector capacity costing $49 million in the 2004 to 2009 regulatory period.

- Investment in augmenting the capacity of the existing Kemps Creek to Sydney 330 kV line costing $3 million in the 2004 to 2009 regulatory period.

The total estimated cost of these projects in the 2004 to 2009 regulatory period is $620 million.

TransGrid's justification for these projects as excluded projects is based on its view that these are uncertain but significant projects, even though the possible expenditure on these projects during this regulatory period is likely to be small. For example, for the Kemps Creek to Sydney project, TransGrid estimated a total cost of $3 million would accrue during the current regulatory period.

None of these possible investments, taken on their own and based on the incidence of expenditure in the 2004 to 2009 regulatory period, are likely to satisfy the 10 per cent indicator.

It should also be noted that many of these projects are mutually exclusive. For example, the construction of a 500 kV line between the Hunter Valley and Newcastle could substitute the 500 kV line between Bannaby and Sydney. Similarly, investment augmenting interconnector capacity on QNI could substitute investment augmenting interconnector capacity from Victoria/Snowy. For this reason, the total cost of all excluded projects $620 million is not a meaningful estimate of the likely expenditure on excluded projects during the regulatory period.

TransGrid response to PB Associates' Report

TransGrid raised a number of issues in response to PB Associates' report relating to the definition of excluded projects. Specifically, TransGrid considered that:

- The standard for inclusion of major projects expenditure in the ex-ante expenditure cap appears to be that the transmission business must be able to show, at the time of the revenue cap determination, that the project meets the requirements of the regulatory test;

- A very large proportion of the likely augmentation capital expenditure has been classified as excluded;

- With such a large number of excluded projects classified as excluded, there will be increased regulatory intervention and monitoring.

TransGrid proposed that the simplest appropriate approach to dealing with uncertainty on the possible investments in the 500 kV ring supplying Sydney would be to include at least one major network element of the 500kV ring in the ex-ante capital expenditure profile, on the basis that there is a high probability that at least one element will proceed during the regulatory period. Since TransGrid estimate that each element will cost $190 million, it therefore proposes that this amount should be provided in the ex-ante cap. With this funding provided TransGrid then suggested that "it is difficult to imagine that TransGrid would trigger an excluded project under most circumstances if a substantive provision has already been included in the ex-ante cap".[6]

PB Associates' Recommendations on the definition of excluded projects

PB Associates agreed with TransGrid that the six projects that TransGrid considered should be excluded. However PB suggested that three additional projects should also be excluded. These three projects are:

- The Royalla 330 kV sub-station (stage 1)
- The Holroyd 330 kV switching station and 330 kV cable
- The upgrade of the western system to 500 kV

The basis of PB Associates' recommendation on the exclusion of the first two of these projects is the high degree of uncertainty that these projects would be needed at all during the regulatory period.

The basis of PB Associates' recommendation on the exclusion of the upgrade of the western system to 500kV merits detailed attention since PB Associates' observations on this are relevant to the exclusion of this project as well as the other two 500 kV projects that TransGrid had already proposed should be excluded. Together these projects account for the bulk of possible excluded investment.

With respect to the upgrade of the western system to 500 kV, PB Associates evaluated this project in the context of the suite of possible augmentations that would enhance the capacity of the network serving load in the Newcastle-Sydney area. Here PB Associates noted that the main limitations relate to:

- thermal constraints on either of the 330 kV transmission lines from the Hunter Valley to Newcastle/Tomago, contingent on the outage of the other line; and

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[6] TransGrid, 14 February 2004. 'PB Associates Final Report on TransGrid's Forward Capital Expenditure Requirements 2004/05 to 2008/9 – TransGrid Response'.Page 6.

- a reactive power deficiency limitation in the Sydney area at times of high transfers into Sydney, particularly following the loss of a Bayswater to Regentville 330kV circuit or the loss of a Wallerawang to Ingleburn 330kVcircuit.

PB Associates noted that "Based upon studies performed by TransGrid for the medium growth backgrounds, the upgrade of the Western 330kV lines to 500kV only gives a temporary relief to the violations. Further augmentation of the network would be required in 2009/10. TransGrid is proposing the preferred options to be either a new 500kV line forming the northern section of the 500kV ring (Bayswater to Eraring) operating initially at 330kV, or a new 500kV line forming the southern section of the 500kV ring (Bannaby to Sydney)."

PB Associates agreed with TransGrid's view that augmentation of the capacity to Sydney/Newcastle was justified. However PB Associates considered that the timing of the need appears to be driven by the base assumption that additional generation is only sufficient to meet the minimum reserve requirement.

PB Associates then observed that "the 2004 SOO also indicated a number of significant 'advanced and publicly announced' generation projects in NSW. Based upon this, and the market incentive of locating in a potentially 'constrained on' location … PB Associates considers that there may be a greater incentive to locate in the central coast region than accounted for in the TransGrid backgrounds, and possibly in advance of the 2009/10 date …[assumed]… in the TransGrid backgrounds. Based upon this there appears to be reasonable possibility that the major 500kV projects could be deferred."

Finally, PB Associates noted that the main issue to relieve both constraints is to increase the transfer paths to the Sydney/Newcastle load areas. The initial Western 500kV upgrade project does not achieve this; although it does help to balance the transfer, giving a brief respite. As all medium growth backgrounds indicated the requirement for a new major line requirement one year after the Western 500kV upgrade, PB Associates requested additional studies examining the impact of either a new 330kV connection from the Hunter Valley to the Coast, or from Bannaby/Marulan to Sydney (operating at 330kV but constructed at 500kV). These studies indicated the Hunter Valley to coast option provided improved relief over the Western 500kV upgrade. This option may also provide opportunities of more optimally staging the 500kV development dependent on generation/interconnection developments.

On the basis of this analysis, PB Associates recommended that it would be appropriate to exclude all major network developments associated with the thermal and voltage limitations described above. This covered the upgrade of the western 500 kV system as well as the 500 kV Bannaby to Sydney, and Hunter Valley to Newcastle projects.

Mountain Associates/PB Associates' Recommendations on the definition of excluded projects

The Mountain Associates/PB Associates report began by noting that in many cases projects were nominated for exclusion because there was significant uncertainty on the need for, design or cost of the project which suggests that attempting to precisely define an excluded project at the time of the revenue control decision is likely to be fruitless in most cases.

Instead, the Mountain Associates/PB Associates report suggested that the focus should be on defining the circumstances (or triggers) that would give rise to the range of possible excluded projects and that, consistent with the SRP, these triggers should not relate to "systemic" investment drivers such as demand growth or changes in input costs or statutory requirements. Instead, the triggers should focus on specific limitations or events at defined elements in the network that would justify greater investment than had been provided in setting the ex-ante cap.

Applying this logic, the Mountain Associates/PB Associates report re-examined all the excluded projects recommended in PB Associates' initial report and in TransGrid's application. Following this re-examination, the Mountain Associates/PB Associates report recommended that only projects triggered by the specific voltage and thermal limitations affecting transfer capacity to Sydney/Newcastle should be excluded; and two interconnector-based augmentations justified against a cost/benefit criterion, should also be allowed.

The Mountain Associates/PB Associates report considered that all other projects that had been proposed as excluded by TransGrid and/or initially recommended as excluded by PB Associates, should not be excluded projects.

The basis of the Mountain Associates/PB Associates report rejection of the other excluded projects is as follows:

Holroyd complex and Mason Park 330/132 kV GIS substation: The Mountain Associates/PB Associates report identified three distinct triggers that could justify different projects. From this it was concluded that Holroyd 330 kV can not be justified as a stand-alone project. However if the Masons Park development is required as a solution to limitation 3 then part of the Holroyd 330 kV project may be justifiable. However studies provided by TransGrid indicate Limitation 3 to occur initially in 2008/09. Mountain Associates/PB Associates concluded that it is reasonable to expect that following joint planning with Energy Australia, a smaller scale augmentation probably on Energy Australia's 132 kV network would be justified prior to a far more significant project such as the Mason Park development by TransGrid. As such the report considered the probability of the Mason Park development (and associated need for the Holroyd 330 kV works) or a similar scale TransGrid project, to be low during this regulatory period. On this basis, the report considered that it would be reasonable to suggest that no provision be made for any excluded expenditure in the Holroyd/Mason Park area during the regulatory period.

Kemps Creek to Sydney South project: The excluded expenditure in the application relating to this project for the coming regulatory period is $3 million, plus $188 million in the next period, including $115 million for easements so that a new transmission line can be constructed. However, the Mountain Associates/PB Associates report notes that in its application, TransGrid suggests that there are a number of alternative means to achieve the necessary reinforcement including the application of high temperature conductors and the development of switching stations where lines running south of Kemps Creek intersect with the Wallerawang-Sydney South/Ingleburn double circuit. Therefore Mountain Associates/PB Associates concluded that there is a low probability that the acquisition of easements between Kemps Creek and Sydney South, can be justified during this regulatory period. Hence the case to separately account for the Kemps Creek to Sydney South easement augmentation as an excluded project, is weak.

Royalla project:[7] The Mountain Associates/PB Associates report considers that this should not be an excluded project, on the basis of consistent treatment with other projects that may be deferred due to changes in the application of planning standards. Rather, if it becomes clear that expenditure on the Royalla project becomes necessary during the regulatory period, then the Mountain Associates/PB Associates report suggests that this would justify reopening the revenue control as provided for under the proposed Code changes currently proposed by the ACCC. The logic underlying the Mountain Associates/PB Associates report's conclusion that the Royalla project should not be an excluded project is as follows:

- The need for the Royalla project is contingent on a decision by the relevant authorities to alter the planning standard to be applied to Canberra.

- However, there are likely to be other circumstances where changes in the application of planning standards would impact the need for investment from what was expected when the revenue control was established. For example, from time to time TransGrid and the relevant electricity distributors agree changes to the expected amount of energy/load at risk at distributor supply points. This is typically accompanied by co-operation in the switching of load or network control in the event of critical contingencies. In this way, TransGrid is able to economically defer expenditure. There are likely to be several instances where TransGrid may be able to defer expenditure through such co-operation with distributors.

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[7] The "Royalla project" relates to works specifically designed to improve the security of supplies to Canberra. Included in the Royalla project are the following proposed investments:

- Advancing the establishment of the Royalla 132 kV switching station;
- Construction of a Royalla- Gilmore 132 kV line;
- Development of a 330/132 kV substation at Royalla;
- Establishment of Bungendore 330/132 kV substation;
- Construction of a Bungendore-Royalla 330 kV line.

- In determining the ex-ante allowance, provision has been made for the expenditure on the basis of no change in the planning standards or their application. To the extent that the application of planning standards can be advantageously engineered, TransGrid would obtain the benefit of such expenditure deferral during the regulatory period, and the benefit will be passed to consumers at the end of the regulatory period.

- If the Royalla project is to be treated as an excluded project on the basis of potential changes in the application of planning standards, then it could be argued that changes in expected expenditure attributable to all such changes in the application of planning standards, throughout TransGrid's network, should be classified as excluded expenditure.

Comments from interested parties on the definition of excluded projects

Transend and Powerlink both commented specifically on PB Associates' recommendations on excluded projects. The Energy Users Association of Australia commented on TransGrid's application

Transend considered that PB Associates had developed its own approach and criteria for determining the quantum of excluded projects, and that this approach is inconsistent with the SRP. Transend is concerned that regulatory practice is already diverging from the SRP and that unhelpful precedents will be set. Transend urged the ACCC to ensure that the TransGrid review follows the SRP and that any divergence is fully explained.

Powerlink voiced similar concerns to Transend on excluded projects. Powerlink pointed in particular to the SRP's 10 per cent indicator, and considered that PB Associates is making recommendations inconsistent with the intent of the SRP. In particular, Powerlink considers that as applied by PB Associates it appears that the TNSP must have completed full analysis of options, including full investigation and comparison with non-network solutions, in order for a major project to be recommended for inclusion in the ex-ante cap. The level of detail and analysis suggested is essentially equivalent to conducting a regulatory test evaluation and consultation process for a large network asset.

Powerlink is also concerned that if the same approach is applied to TNSPs in their next round of revenue determinations then a very large number of projects will fall into the excluded projects regime. The involvement of the ACCC in determining the allowance of such a large number of excluded projects will necessarily result in delays and hence impede the timely delivery of reliability.

The Energy Users Association of Australia considered that TransGrid's application had failed to comply with the ex-ante regime's arrangements by including uncertain generation and interconnection-related projects under the ex-ante allowance rather than as excluded projects.

TransGrid has a number of criticisms in relation to PB Associates' recommendations on the appropriate level of the capex allowance for TransGrid in the current regulatory period:

- TransGrid states that no provision is included within the ex-ante expenditure targets for pre-approval expenditure on excluded projects, even though it is 'clear' that some expenditure on excluded projects will be required during the period.

- TransGrid contends that for major project expenditure, the ACCC requires that these projects be supported by regulatory test assessments, to warrant their inclusion within the ex-ante cap.

- TransGrid also contends that PB Associates has, unjustifiably, re-categorised a large proportion of TransGrid's proposed augmentation expenditure as excluded.

As a result of the above TransGrid also claims that the PB Associates' recommendations could be substantially inconsistent with both the Code and the requirements of the SRP. TransGrid proposes a range of solutions to overcome individual instances of these problems.

The EUAA highlights its concern that the new ex-ante regulatory regime will allow TNSPs to engaging in strategic gaming. Specifically the EUAA is concerned that the ex-ante regime:

- creates a potential incentive for the TNSP to inflate the likely cost of capex given that in both the allowed and excluded project cases, the TNSP will retain the returns on any underspend for the 5 year regulatory period; and
- creates an incentive for TNSPs to underspend in the initial years and back-end load capital expenditure.

6.4 ACCC Considerations – Definition of Excluded Projects

The ACCC is mindful that the excluded project category should not be perceived to be a mechanism to collect all significant projects for which there is a very low likelihood of proceeding. The category is primarily designed to account for uncertainty regarding timing and cost of projects not as a form of insurance against any unforseen future events.

In addition, as noted in the SRP, for many projects there is likely to be an inevitable overlap between expenditure covered in the ex-ante cap and expenditure on the excluded projects. A greater number of excluded projects is likely to exacerbate the problem of overlap. This will weaken efficiency incentives and lead to additional regulatory intrusion and administrative overhead.

Further, if TransGrid is required to revert to the ACCC for consent for every major investment, the ACCC would progressively become the defacto network planner, at

least in respect of all significant network investments. The ACCC does not consider that this would be the best way to achieve the desired outcome of an incentive-based regulatory framework with accountability for the delivery of efficient investment left to TNSPs.

Therefore the ACCC is minded to reduce the number of excluded projects proposed by TransGrid and expanded upon in PB Associates' report. There are three ways to reduce the number of projects in the excluded category:

- The first would be to make an allowance for that project in the calculation of the ex-ante target. The necessary calculation would be an "expected value" calculation taking account of the probability of the project proceeding and the cost of the project. To determine a sufficiently accurate ex-ante allowance it is necessary to have adequate information and analysis to inform decisions on probabilities and costs. If such information is not available then the calculation of the expected value is less likely to be an accurate estimate of efficient costs. In this case, the benefit of reducing the number of excluded projects needs to be weighed against the disbenefit of an ex-ante allowance that is less likely to track efficient costs.

- The second way would be to take the project out of the excluded projects category and make no adjustment to the ex-ante target. The ACCC considers that this is an appropriate approach if that project is highly unlikely to proceed during the regulatory period. In this case, if it becomes clear during the regulatory period that expenditure on that project is necessary, it would then be up to the TNSP to decide whether to apply to re-open the revenue control. Obviously this is a decision that would not be taken lightly: while re-opening could result in increased revenue to compensate for expenditure on that unforecast project, re-opening would also hold the prospect of off-setting adjustments for the gains not attributable to management-induced efficiency improvement.

- A further reduction in the number of separately identified excluded projects can be achieved by aggregating the excluded projects that would be triggered by a common driver. This is the approach adopted in the Mountain Associates/PB Associates report. The rest of this section sets out and justifies the ACCC's decision on the definition of excluded projects in TransGrid revenue control based on the categorisation of these projects adopted in the Mountain Associates/PB Associates report.

Projects to augment capacity to the Newcastle/Sydney/Wollongong corridor

This covers investment in three projects:

- A new 500 kV line between the Hunter Valley area and the Newcastle area and possibly including a new 500/330kV substation costing $98 million in the 2004 to 2009 regulatory period;

- A new 500 kV line between Bannaby and Sydney and possibly the redevelopment of 500/330 kV transformation at Sydney West costing $125 million in the 2004 to 2009 regulatory period;

- The upgrade of the western system to 500 kV.

The first two of these projects were proposed as excluded by TransGrid and the last project PB Associates recommended should be excluded while TransGrid had proposed that it be included in the ex-ante cap.

As noted earlier, all of these projects are driven by either a thermal limit on a specific line, or a voltage limitation in Sydney that could arise during the coming regulatory period.

In its analysis of this expenditure, PB Associates concluded that the need for augmentation of capacity to the Newcastle-Sydney-Wollongong (N-S-W) corridor was appropriately identified but that there appeared to be a reasonable probability that the 500 kV projects could be deferred".

With respect to the western 500 kV upgrade, PB noted that the main issue to relieve both constraints is to increase the transfer paths to the Sydney/Newcastle load areas. The initial Western 500kV upgrade project does not achieve this, although it does help to balance the transfer, giving a brief respite.

PB Associates then asked TransGrid to perform additional power system studies examining the impact of either a new 330kV connection from the Hunter Valley to the Coast, or from Bannaby/Marulan to Sydney (operating at 330kV but constructed at 500kV). These studies indicated the Hunter Valley to coast option provided improved relief over the Western 500kV upgrade. This option may also provide opportunities of more optimally staging the 500kV development dependent on generation/interconnection developments. The ACCC understands that either of these two projects suggested by PB Associates is likely to be significantly less expensive than the solutions that TransGrid had proposed.

PB Associates also called into question TransGrid's underlying assumption that new generation is only developed to meet minimum reserve requirements only results in significant new generation connecting by 2009/10. PB Associates noted that this effectively results in the ability to relieve network violations by generation dispatch patterns becoming increasing limited as the regulatory period advances and that this tended to force network augmentation into being the only feasible solution to relieve violations near the end of the regulatory period.

Finally PB Associates noted that the new generation development location and size may well be partly driven by the forecast network limitations, and commercial benefit that may exist in placing the generation in appropriate location to leverage this benefit. This impact does not appear to have been examined in the TransGrid background development.

Rather than adopting a probabilistic approach to the assessment of the investment needed to respond to likely future limitation in supply to the N-S-W corridor, TransGrid settled on one set of assumptions and determined the investment that it considered optimal given those assumptions.

PB Associates called into question both the underlying assumptions and TransGrid's calculation of the optimal investment based on those assumptions. In its response to PB Associates' report, the ACCC considers that TransGrid has not refuted PB Associates conclusions on either of these two issues.

The ACCC is therefore led to conclude that it would be inappropriate to include the full cost of the western 500 kV upgrade in the ex-ante cap, as TransGrid had proposed.

It may nevertheless be possible to determine a probabilistic ex-ante allowance for the western 500 kV upgrade as well as any other investment needed to respond to the expected thermal and voltage limitations. However, as noted earlier, the decision to do this would require the ACCC to weigh the benefit of reducing the number of excluded projects against the disbenefit of an ex-ante allowance that is less likely to track efficient costs.

In response to PB Associates' report, TransGrid has proposed what it considers to be the simplest most appropriate approach which is to make an allowance for one the three elements of the 500kV ring on the basis that there is a high probability of at least one element proceeding.

However, TransGrid has provided no evidence of why there is a high probability of any one element proceeding and it did not address any of the fundamental issues raised by PB Associates on the timing of the need for this augmentation. Accordingly the ACCC does not consider that TransGrid's proposed approach provides a suitable way forward.

For the ACCC to determine an ex-ante allowance in this case, it would need to make decisions on the probabilities of various outcomes and then an assessment of the range of possible investments needed to respond to those outcomes. At this point, TransGrid has not developed a base of information on probabilities or investment options that would allow the ACCC to confidently make such judgements on TransGrid's behalf.

Therefore the ACCC considers that all major investments related to augmentation of capacity to the N-S-W corridor should remain excluded. This would cover the projects identified above, as well as any variation of these projects motivated by the same investment drivers, that have not yet been considered.[8]

[8] It should be noted that in section 6.5 the small augmentations (mainly capacitor banks) that could affect the transfer capacity to the N-S-W corridor and that have been included in the calculation of the ex-ante cap, are identified.

Regarding PB Associates' definition of excluded projects, Powerlink suggests that as applied by PB Associates it appears that the TNSP must have completed full analysis of options, including full investigation and comparison with non-network solutions, in order for a major project to be recommended for inclusion in the ex-ante cap.

The ACCC believes that the SRP sets out the ACCC's expectation that TNSPs would apply a probabilistic analysis to deal with the inevitable uncertainties that it will face in determining future capex requirements. Probabilistic assessment is a well accepted technique to enhance decision-making under uncertainty. TransGrid has not applied such probabilistic techniques in determining its likely expenditure requirements.

Furthermore in considering different solutions, PB Associates noted that TransGrid appears to have only performed a preliminary assessment of the options lacking more detailed economic analysis. Furthermore, TransGrid had not included non-network solutions as part of its consideration of investment options.

The ACCC does not expect that TransGrid should have completed the equivalent of a regulatory test evaluation before the ACCC would consider inclusion of a project in the ex-ante cap. The level of detail and depth of analysis required before a project will be included in the calculation of the ex-ante cap will depend on the quantum of the necessary investment. PB Associates noted that TransGrid is proposing around $0.5 billion between 2008 and 2010 in network investment to improve the supply paths to the Sydney load centre. In this case, the ACCC considers that a more comprehensive analysis including a probabilistic evaluation of all plausible alternatives including non-network solutions would be necessary before the ACCC could confidently make provision for this expenditure as part of the ex-ante cap.

Projects to augment interconnector capacity

The two projects covered under this heading are:

- Series compensation on lines from Dumeresq to Bulli Creek and from Dumeresq to Armidale whose main purpose would be to increase the capacity of the QNI interconnector costing $80 million in the 2004 to 2009 regulatory period;

- A new 330 kV line from Yass to Wagga whose main purpose would be to increase VIC/Snowy/NSW interconnector capacity costing $49 million in the 2004 to 2009 regulatory period.

TransGrid proposed that both of these projects should be excluded projects. The Mountain Associates/PB Associates report concluded that at this point neither of these projects appears to have a high probability of proceeding during the coming regulatory period. The report however considered that both of these projects were significant investments and, if they were to proceed during the coming regulatory period, could potentially lead to significant windfall losses to TransGrid unless they were recognised as excluded projects.

The ACCC has no reason to disagree with this conclusion and notes in addition that both of these investments would need to be justified on the basis of net-benefit considerations. For these reasons, the ACCC proposes to accept TransGrid's proposal for inclusion of these projects within the excluded project category.

Holroyd complex and Mason Park 330/132 kV GIS substation

The "Holroyd complex" describes the development of a 132 kV switching station at Holroyd, and the subsequent development into a 330/132 kV transformation. The "Mason Park 330/132 kV GIS substation" project includes the later construction of 330 kV cables linking the new Holroyd substation with a yet to be established 330/132 kV GIS substation at Mason Park.

TransGrid proposed that the expenditure on both of these projects should be included in the ex-ante allowance. However PB Associates found that it appeared that further joint planning with IE (Integral Energy) and EA (Energy Australia) may well result in the possible deferment of the needs from the 330/132kV transformer overloads. PB Associates further states that the IE requirement for the 132 kV switching station at Holroyd to improve its supplies to Parramatta also appears to be at a preliminary stage of joint planning and that PB Associates considers that the prudency of the construction of this stage of the project would have to be justified with respect to the likely date for the 330 kV works and other options available to IE.

With regard to the need for the investment PB Associates further concluded that there would appear to be significant commercial incentives for DSM or suitably located embedded generation in the Parramatta and inner Sydney area. Although large scale generation plants are unlikely to be able to sited in these areas, it does not appear unreasonable to assume that smaller plants (<50 MW) may be feasible in certain urban industrial locations. A plant of this size may defer the Holroyd works ($60 million) by up to 2 years. Due to the above factors, PB Associates considered it more appropriate to exclude both the Holroyd complex and Mason Park 330/132kV GIS substation developments as it considered the uncertainty of the timing of the need and the optimal solution to be significant.

With regard to the specification of the optimal solution, PB Associates concluded that it was important to note that dependant on the joint planning, the actual network developments and staging may be significantly different from the two projects detailed in the TransGrid application, particularly the Mason Park project.

The Mountain Associates/PB Associates report investigated the Holroyd complex and Mason Park 330/132 kV GIS substation further, from the perspective of the drivers of this investment. The report concluded that Holroyd 330 kV can not be justified as a stand-alone project, however if the Masons Park development is required as a solution to limitation 3 then part of the Holroyd 330 kV project may be justifiable.

It is noted however that the studies provided by TransGrid indicate Limitation 3 to occur initially in 2008/09. From this, the Mountain Associates/PB Associates report concluded that it was reasonable to expect that following joint planning with Energy

Australia, a smaller scale augmentation probably on Energy Australia's 132 kV network would by justified prior to a far more significant project such as the Mason Park development by TransGrid. The Mountain Associates/PB Associates report considered that the probability of the Mason Park development (and associated need for the Holroyd 330 kV works or a similar scale TransGrid project, to be low during this regulatory period.

Therefore the Mountain Associates/PB Associates report concluded that it would be reasonable to suggest that no provision be made for any excluded expenditure in the Holroyd/Mason Park area during the regulatory period.

In summary, the treatment of the Holroyd/Mason Park investment could be:

- included in the ex-ante cap based on the full cost of these projects, according to TransGrid;

- be taken out of the ex-ante cap and identified as an excluded project because it is highly uncertain, according to the PB Associates report; and

- not be identified as an excluded project nor taken into account in setting the ex-ante cap because it is highly uncertain, according to the Mountain Associates/PB Associates report.

The analysis underlying the PB Associates and Mountain Associates/PB Associates reports' conclusion that investment in these projects is highly unlikely during this regulatory period, has been reviewed by TransGrid. The ACCC considers that TransGrid has not refuted this analysis and the conclusion it leads to. Accordingly, the ACCC considers that the cost of these projects should not be included in the determination of the ex-ante allowance, but rather be identified as excluded projects.

Kemps Creek to Sydney South project

The excluded expenditure in TransGrid's application relating to this project for the coming regulatory period is $3 million, plus $188 million in the next period, including $115 million for easements so that a new transmission line can be constructed.

PB Associates notes that the Kemps to Sydney South project is not strictly related to the transfer limitation discussed in the section on augmentation to the Newcastle-Sydney-Wollongong corridor. However, the specific project and timing is related to generation developments and the major developments of the Western ring and any new lines to the south of Sydney.

PB Associates concludes that depending on the location of new generation and Sydney demand growth, an additional 330kV supply from Kemps to Sydney would be required by around 2011/12. Although, the need for this new 330kV line relates to limitations in the southern Sydney 330kV system, the solution and timing relate to the developments of generation around Sydney and the impact of these on the developments of the transmission network in this area.

The Mountain Associates/PB Associates report concluded that there is a low probability that the acquisition of easements between Kemps Creek and Sydney South can be justified during this regulatory period and hence the case to separately account for the Kemps Creek to Sydney South easement augmentation as an excluded project, is weak.

On the basis of the information provided by TransGrid, it is not clear that an additional 330 kV supply will be necessary by 2011/12. TransGrid had suggested that even if it was, only $3 million was estimated to fall during this regulatory period. The relevant consideration for the ACCC is whether to allow this project to be counted as an excluded project, with the attendant difficulties that this brings, or whether not to count this project as an excluded project at all.

TransGrid's proposal suggests that the maximum error that would arise if the project goes ahead, but is not provided for in the excluded project list, is $3 million. This is well outside the 10 per cent error indicator. Accordingly, the ACCC considers that this project should not be identified as an excluded project.

If during the regulatory period it becomes clear that an additional supply from Kemps Creek to Sydney South is an essential and economic investment, then TransGrid would be free to apply to the ACCC to re-open the revenue control to obtain compensation for this project.

Royalla project

The "Royalla project" referred to here relates to works specifically designed to improve the security of supplies to Canberra. Included in the Royalla project are the following proposed investments:

- Advancing the establishment of the Royalla 132 kV switching station;
- Construction of a Royalla- Gilmore 132 kV line;
- Development of a 330/132 kV substation at Royalla;
- Establishment of Bungendore 330/132 kV substation;
- Construction of a Bungendore-Royalla 330 kV line.

The first issue for consideration by the ACCC is whether the additional projects identified above should be provided for in the ex-ante control. TransGrid had included these projects in its calculation of the ex-ante target, on the basis that there is a 100 per cent probability that the planning standards will be changed and hence requiring them to undertake the necessary investment. However PB Associates had excluded all expenditure other than the cost of establishing the Royalla 132 kV switching station. This switching station can be justified on the basis of voltage supply problems in Cooma, which is unrelated to the security of supply to Canberra.

However, it is not clear that the planning standards to be applied to Canberra will change during the coming regulatory period. The ACCC understands that these standards have been the subject of debate over several years. In view of this uncertainty,

the ACCC would expect that if an allowance is to be made in the ex-ante cap for this investment then it should take account of the probabilities of changes to the planning standard. Like the upgrading of the western 500 kV network, the ACCC is not in a position to determine these probabilities with any more certainty than TransGrid. Since TransGrid has not been able to establish these probabilities, this leaves little option but to ensure that expenditure on this project is not included in the calculation of the ex-ante allowance.

On balance therefore, the ACCC considers that the Royalla project described above (excluding the 132 kV switching station) should be an excluded project.

6.5 Triggers for excluded projects

TransGrid's Application

TransGrid only suggested triggers for the Bannaby to Sydney 500 kV development, and the Hunter Valley to Coast 500 kV development. For the remaining 500kV projects, no triggers were identified.

For the Bannaby to Sydney and Hunter Valley to Sydney, only high level triggers were suggested. For example, with respect to the Hunter Valley to coast, the proposed triggers included "development of a major power station" near Bayswater or further north towards Gunnedah/Narrabri; and "major interconnection" development with Queensland; or "major load" development in the Newcastle area. Similarly for the Bannaby area to Sydney 500 kV development, the triggers are identified to be development of a "major power station" near Mt Piper and possibly Ulan/Rylstone; "major interconnection" with Snowy/Victoria; and "increased system reactive deficiencies".

The ACCC does not consider these triggers sufficiently descriptive or precisely defined to be useful for the purpose of assessing whether an excluded project should be developed.

PB Associates' Recommendations - Triggers

PB Associates did not explicitly define the triggers for the excluded projects that it had suggested. Instead, PB Associates produced factors that it considered should be the basis for demonstrating the prudency of excluded projects. However, in its analysis of all significant expenditure items, PB Associates developed a detailed understanding of the factors that would determine whether expenditure could be justified.

Mountain Associates/PB Associates' Recommendations – Triggers

The Mountain Associates/PB Associates report built on the analysis of investment drivers contained in PB Associates' report. It refined and developed these into "triggers" and then oriented the suite of possible excluded projects around these

triggers. This approach focuses on the investment triggers, rather than on the numerous investment alternatives that may arise in response to those triggers.

The Mountain Associates/PB Associates report also drew on PB Associates' report to define explicitly those investments that had been included in the ex-ante cap that could affect the need for or cost of excluded projects. As set out in the SRP, the definition of these linked investments is an essential element of the excluded project regulatory regime, and is needed to prevent the double counting of costs if excluded projects do proceed during the regulatory period.

6.6 ACCC Considerations - Triggers

The definition of the triggers for excluded projects, and the projects that are related to excluded projects but have been included in the ex-ante cap, is in Appendix E. Also included in Appendix E are the projects that have been included in the ex-ante cap that could affect the need for or cost of excluded projects

7. Property and Easements

TNSPs acquire property and rights over property to facilitate transmission network augmentations. The costs and challenges associated with land and easement acquisitions lead transmission businesses to conduct rigorous project evaluations and make prudent route selections before the need to accommodate load requirements arises.

This chapter sets out TransGrid's proposed property expenditure, PB Associates' recommendations on TransGrid's program, TransGrid's response to PB Associates' Report and the ACCC's considerations in determining an appropriate level of expenditure for property and easements.

7.1 TransGrid Supplementary Application

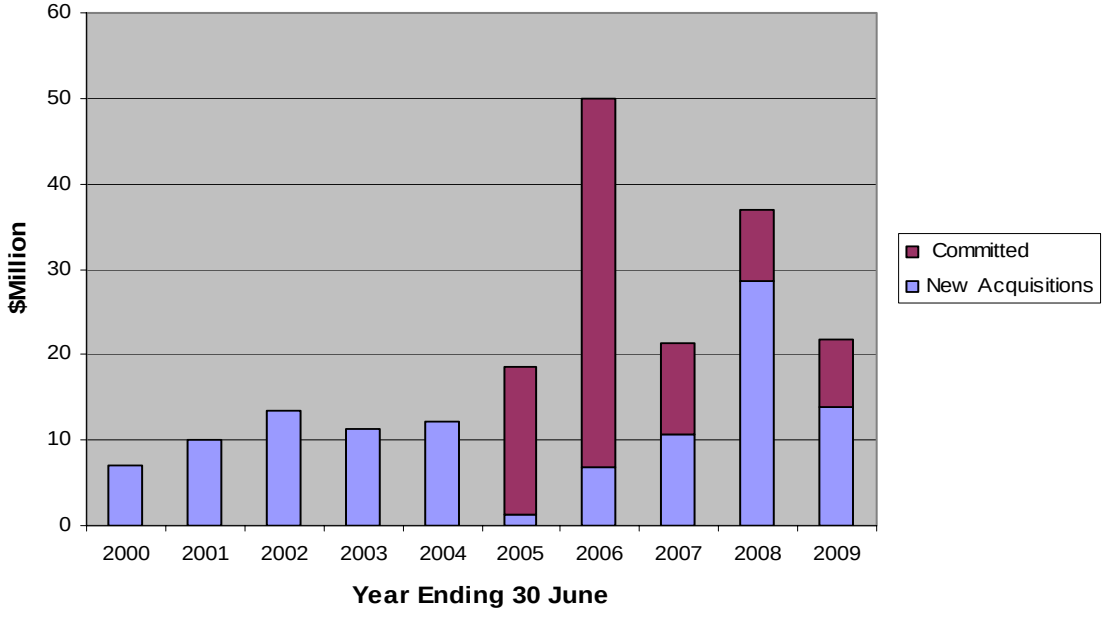
TransGrid has proposed a total of $149 million over the regulatory period for expenditure on property acquisitions and surveys. This consists of Committed and On-going Works ($87 million) and new Augmentation Projects ($61 million). TransGrid's projections for property expenditure are presented in Table 7.1.1 below.

Table 7.1.1 TransGrid's Property Capex Projections

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
New Acquisitions	1.32	6.79	10.58	28.69	13.98	61.36
Committed	17.33	43.27	10.76	8.29	7.74	87.38
Total Property	18.65	50.06	21.34	36.98	21.72	148.74

The proposed expenditure on property acquisitions and surveys is a significant increase from past levels of expenditure. This is illustrated in the chart below.

Figure 7.1.1 TransGrid's Property Capex History and Projections ($2004)



TransGrid states that the substantial increase in proposed new acquisitions and easements reflects the following factors:

- **Substantial augmentation program.** TransGrid has proposed a substantial rise in augmentation expenditure, particularly small augmentation expenditure, which has required a corresponding increase in property and easement acquisitions.

- **Strategy of pre-emption.** TransGrid has adopted a new business practice where property-related costs are incurred early in the life cycle of a project. TransGrid hopes that the earlier management of property costs will improve the management of these costs. This has shifted some property costs forward, contributing to higher property costs for this regulatory period relative to the previous period.

- **Outstanding easements.** TransGrid is planning to formalise relationships for property interests throughout the state where gaps in easements and land holdings exist at an estimated cost of $33.10 million. This represents 38 per cent of committed expenditure in the proposed property program. TransGrid has received legal advice stating that it may face future legal and cost implications if these outstanding easement gaps are not resolved.

- **Wallgrove substation land.** TransGrid has included $18.77 million in its capital expenditure program for the purchase of land to the west of the existing Wallgrove substation. TransGrid believes this land is under considerable development pressure and has potential for a range of commercial uses. Although no specific augmentation projects have been planned for this site, TransGrid has stated that the land will be required for new lines and expansion of this substation.

7.2 PB Associates' Recommendations

PB Associates has undertaken a detailed review of specific easement acquisitions which form the bulk of uncommitted property expenditures. The objective of the review was to gain greater insight into the formulation and accuracy of cost estimates.

PB Associates has concluded that the procedures applied by TransGrid in formulating these estimates and the basis for underlying cost assumptions are generally reasonable. In most cases the costs and experiences of past projects have been applied to projected works. Considerable external contracting services are also applied for with legal and property services costs based on competitive tendering.

PB Associates has recommended a number of adjustments to TransGrid's property and easements expenditure:

- PB Associates recommends that property expenditure related to projects deemed excluded be treated as excluded expenditure and have therefore not included in the following property costs in the ex-ante proposed works program.

Table 7.2.1 PB Associates' Recommended Excluded Property Expenditure

Capex ($million 2004)	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**	**Total**
Easement acquisitions-						
Royalla 132kV SS - Line Outlets	0.00	0.00	0.05	0.00	0.00	0.05
Royalla – Gilmore	0.73	1.47	0.00	0.00	0.00	2.20
Sydney West to Reedy Creek 330kV	0.00	0.00	7.00	0.00	0.00	7.00
Armidale to Kempsey 330kV Line	0.00	0.00	0.00	17.00	0.00	17.00
Kempsey to Port Macquarie 330kV Line	0.00	0.00	0.00	0.00	13.80	13.80
Total						40.50
Site acquisitions						
Royalla 132kV Switching Station	0.45	0.00	0.00	0.00	0.00	0.45
Bayswater 500kV Substation	0.14	0.00	0.00	0.00	0.00	0.14
Macksville 132kV Substation	0.00	0.40	0.00	0.00	0.00	0.40
Raleigh 132kV Substation	0.00	0.40	0.00	0.00	0.00	0.40
Sawtell 132kV Substation	0.00	0.40	0.00	0.00	0.00	0.40
Mt Piper 500kV Substation	0.00	0.32	0.00	0.00	0.00	0.32
Bannaby 500kV substation	0.00	0.47	0.00	0.00	0.00	0.47
Port Macquarie 330kV Substation	0.00	0.00	1.20	0.00	0.00	1.20
Bungendore 330kV Substation	0.00	0.00	0.00	0.00	0.18	0.18
Total						3.96

- PB Associates has considered TransGrid's "options fee" approach which is intended to facilitate better easement negotiations. While PB Associates has found that the cost estimates are based on a reasonable methodology and that TransGrid has incorporated savings flowing from the option fee approach, PB Associates has assessed the expenditure profile offered by TransGrid as unlikely to eventuate. PB Associates has recommended adjustments to the profile to reflect this.
- PB Associates has found that TransGrid's costing methodology used to determine the expenditure required to address outstanding easements is reasonable, and recommends that $33.1 million of this expenditure be incorporated into the ex-ante capex program for this regulatory period.
- PB Associates has recommended that $18.74 million for the purchase of land to the west of the existing Wallgrove substation be removed from the allowable capital program pending more detailed assessments of the need for this site.
- PB Associates has recommended allowing $3.3 million for the Bonville Golf Course litigation, which is the sum of all known and certain costs as reported by TransGrid.

- PB Associates has recommended a revised profile of expenditure that reflects the fact that some property expenditure will be deferred, and will have the effect of moving some expenditure into the subsequent regulatory period.

These adjustments are reflected in PB Associates' recommended property expenditure for TransGrid as set out below.

Table 7.2.2 PB Associates' Recommendation: Property Capex

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	18.65	50.06	21.34	36.98	21.72	148.74
PB Associates' Recommendation	17.71	29.44	12.05	14.08	12.41	85.69

7.3 TransGrid's response to PB Associates' Report

TransGrid has expressed concern in regards to PB Associates' recommendation to shift certain property costs into the excluded projects category, and has sought a list of the property components which lie within Excluded Projects.

7.4 ACCC Considerations

The ACCC considers that TransGrid's proposed property expenditure program should be $86.6 million for the regulatory period of 2005-2009. Following is a discussion of the ACCC's reasoning for the main elements of its decision on TransGrid's proposed property capex.

The ACCC accepts as a fundamental driver of property costs that TransGrid has a substantial program of small augmentation allowed in this Decision, and that this program accounts for a substantial portion of TransGrid's property and easement expenditure.

In keeping with its decision to define several projects as excluded projects, the ACCC has shifted $43.51 million of property costs into the excluded category, as they relate to excluded projects. These components of the property program have not been removed from the capex altogether, but will be available to TransGrid should the proposed excluded projects eventuate. Property expenditure in this category includes:

- easement acquisitions worth $40 million over the period; and
- site acquisitions worth $3.51 million over the period.

The ACCC has decided not to provide an allowance for the acquisition of the site west of the Wallgrove substation and has removed $18.74 million from TransGrid's ex ante property expenditure. The ACCC acknowledges the site is a possible hub for future transmission supply and a possible augmentation alternative for future load growth.

However, options over the land or integrated planning using other network or non-network solutions may satisfy TransGrid's property requirements.

The ACCC has reduced allowed costs for Bonville Golf Course litigation from $6.6 million to $3.3 million which represents the best known estimate of this cost. TransGrid had previously allowed $6.6 million for legal and related costs in its 2004/05 property cost estimate, but is currently only liable for approximately $2 million in costs and compensation and $1.3 million in interest.

The ACCC is satisfied that TransGrid will be required to incur costs during the regulatory period to resolve outstanding easements and has determined that TransGrid should be allowed $33.1 million for this.

7.5 ACCC Decision: Property and Easements Capital Expenditure

The ACCC has decided to adjust TransGrid's proposed property investment from $148.7 million to $86.6 million over this regulatory period. This figure is the result of adjustments which total $62.1 million, in addition to changes to the cost allocation profiles for new projects and the deferral of some projects based on a balance of proposed arrangements and historical experience. It is important to note that the majority of the adjustment is due to investment being moved into the excluded category, rather than being disallowed. The relevant adjustments are detailed in the table below.

Table 7.5.1 ACCC Decision: Property and Easements Capex

Capex ($m 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	18.65	50.06	21.34	36.98	21.72	148.74
ACCC Supp. Draft Decision	18.37	29.65	12.10	14.08	12.41	86.60

A comparison with TransGrid's spending on property in the first regulatory period ($61.46 million) reveals that the ACCC's allowance ($86.6 million) represents an increase designed to support TransGrid's augmentation program.

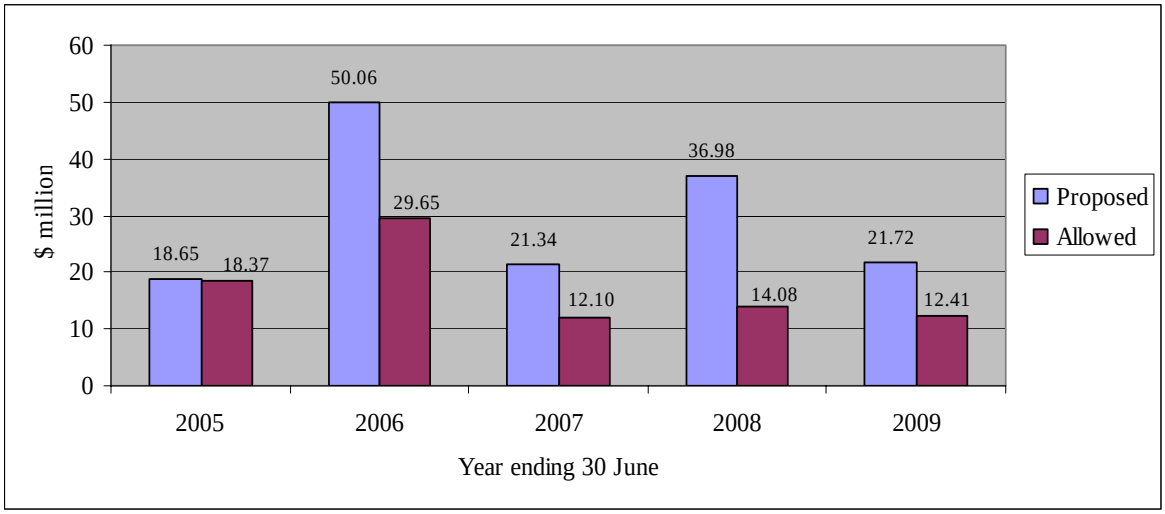
Table 7.5.2 Property Comparison: Previous Regulatory Period

Capex ($million 2004)	99/00	00/01	01/02	02/03	03/04	Total
ACCC 1999-2004 capex forecast*	6.58	7.57	5.93	7.54	3.88	31.50
TransGrid 1999-2004 actual capex **	6.52	12.14	15.36	12.35	14.39	61.46
ACCC Draft Decision allowed capex	6.52	12.14	15.36	12.35	14.39	61.46

*Derived from 'easements' in 1999-2004 ACCC Capex decision
**Derived from TransGrid Finance

The Figure below illustrates the adjustments that have been applied by the ACCC for each year of the regulatory period for the ex ante cap.

Figure 7.5.1 Comparison between proposed and allowed property expenditure ($2004)



The ACCC's allowance for property expenditure for TransGrid is divided into easements, sites and committed property in the table below.

Table 7.5.3 ACCC Decision: Property and Easement Capex Profile

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
Easement Acquisitions	3.96	3.96	0.83	4.57	4.57	17.88
Site Acquisitions	0.45	1.11	1.11	1.22	0.11	4.00
Committed Property	13.96	24.58	10.16	8.29	7.74	64.72
Total	18.37	29.65	12.10	14.08	12.41	86.60

8. Support the Business Capital Expenditure

The support the business component of TransGrid's Application comprises non-network functions that are integral to TransGrid's non-contestable business. It includes:

- Information Technology (IT) applications and infrastructure which support TransGrid's business processes and are accessed from a large number of TransGrid sites across NSW;
- Motor vehicles and mobile plant which are used to service TransGrid's assets which are dispersed across NSW; and
- Miscellaneous assets which include a range of office equipment.

Business Support capital expenditures are recorded separately in TransGrid's accounts. Business support costs such as labour, materials and expenses that are associated with specific capital projects are capitalised against those projects. Investments in IT, motor vehicles, plant, and office equipment are recorded separately because they are usually depreciated at a different rate to the project to which they have been assigned.

8.1 TransGrid Supplementary Application

TransGrid has submitted capital expenditure projections for business support requirements which total $121.7 million over the 5 year period. Included in these projections are costs relating to:

- information technology ($73m);
- motor vehicles and mobile plant ($39.5m); and
- miscellaneous assets, office equipment and state records security upgrade ($9.2m).

Information Technology

TransGrid is forecasting a capital expenditure IT program of approximately $73 million for the next regulatory period. This compares with capital expenditure during the previous period of $58.77 million. This increase in expenditure is partially explained by two major projects in this regulatory period: SCADA upgrade ($5.2 million), and Corporate development planning systems ($1.5 million). These projects are collectively referred to as 'different scope' and are part of the cyclical upgrade and replacement category of IT expenditure. The cyclical upgrade and replacement covers routine upgrading of TransGrid's IT systems and infrastructure and is discussed in further detail below.

Table 8.1.1 provides an overview of the historical and forecast IT expenditure broken down by category. This is followed by a discussion of the major categories of IT expenditure.

Table 8.1.1 IT Expenditure Comparison: Previous Regulatory Period

Capex ($million 2004)	Previous Reg. Period	Current Reg. Period
Cyclical replacement	47.7	51.7
Different scope	-	6.7
Total cyclical replacement	47.7	58.4
Business performance improvement	7.8	14.6
Total	55.5	73.0

Cyclical Upgrade and Replacement: This expenditure keeps the IT systems and infrastructure running and preserves the benefits of automation of the organisation's business processes. The major categories of cyclical system upgrade and replacement, and the associated capital expenditure application for the regulatory period are shown in the table below and discussed in the following section.

Table 8.1.2 Cyclical Upgrade and Replacement Expenditure

Upgrade/Replacement	Cost ($million 2004)
Applications	15.7
Infrastructure	18.7
Corporate data network	5.9
Desktop hardware and software	12.9
SCADA	5.2
Total	58.4

- **Applications:** TransGrid states that all of their systems will require an upgrade in the five year regulatory period, and that some systems will require two upgrades. In its costing for this category TransGrid has included the estimates for the upgrades of software including external services, staff costs and testing for implementation.

- **Infrastructure**: This section covers the cost of replacement of the IT infrastructure that supports TransGrid's IT systems. This category includes servers, firewalls and remote access systems. TransGrid notes that while in some cases the cost of this infrastructure has fallen over time, these cost reductions are outweighed by the growth in data and processing requirement of the new systems and the organisation. TransGrid notes that the management cost of this has been absorbed by its IT operating costs.

- **Corporate Data Network:** This category covers all of TransGrid's hardware and desktop application software. TransGrid has included an allowance for the cyclical replacement of desktop and laptop personal computers and printers in this budget. It has also factored in the costs of upgrading the Microsoft windows

operating systems and all desktop productivity tools such as Office, Project and Visio. TransGrid states that its corporate data network assists it to connect from TransGrid data centres to over 60 TransGrid sites across NSW. TransGrid submits that this equipment will require replacement in the next regulatory period.

- **Desktop Hardware and Software:** This category covers all desktop hardware and software. It includes the cyclical replacement of desktop and laptop personal computers and printers. TransGrid advises that it has included the cost of upgrading the Microsoft Windows operating systems and all desktop productivity tools such as Office, Project and Visio.

- **SCADA:** TransGrid states that a real time control system was purchased during the last regulatory period under a turnkey contract and that the SCADA applications will be upgraded and hardware replaced in the next regulatory period.

Performance Improvement Projects: TransGrid believes there are opportunities to improve business performance through further application of IT to its business. TransGrid considers that due to the high level of uncertainty in the IT industry, including uncertainty relating to the future development of new systems and the rapid obsolescence of existing software and associated support, an estimated 20 per cent of additional capital expenditure will be required for investments in business improvement-related IT projects. This totals $14.6 million over the current regulatory period.

Motor Vehicles and Mobile Plant

TransGrid states that in order to service its widely dispersed assets, a range of motor vehicles is required. TransGrid has adopted a strategy of purchasing and reselling these assets. TransGrid's policy for the disposal of sedans/station wagons and light commercials is to dispose of them at the end of two years. In its submission TransGrid has separately identified capital expenditure for plant and motor vehicles. TransGrid also requires specialised mobile plant vehicles such as cranes and bucket trucks. Where specialised plant vehicles are not readily available from plant hire companies, TransGrid purchases the required vehicles.

TransGrid has applied for gross motor vehicle and mobile plant expenditure of $39.5 million for the current regulatory period. TransGrid acknowledges that an adjustment of about $25 million to the Commission's Post Tax Revenue Model is required to reflect the expected disposal value of these assets during the regulatory period.

Miscellaneous Assets, Office Equipment

TransGrid has requested a capital expenditure allowance for miscellaneous assets and office equipment of $9.2 million over the regulatory period. TransGrid has based its projections on existing equipment ages and anticipated replacement schedules which are based on historical expenditures. Any additional requirements are determined by section, division or regional needs and are subject to TransGrid's purchasing policy for

small assets and the appropriate approvals process. Historical and projected expenditures are shown below.

Figure 8.1.1 TransGrid Historical and Projected Expenditure on Miscellaneous Assets, Office Equipment

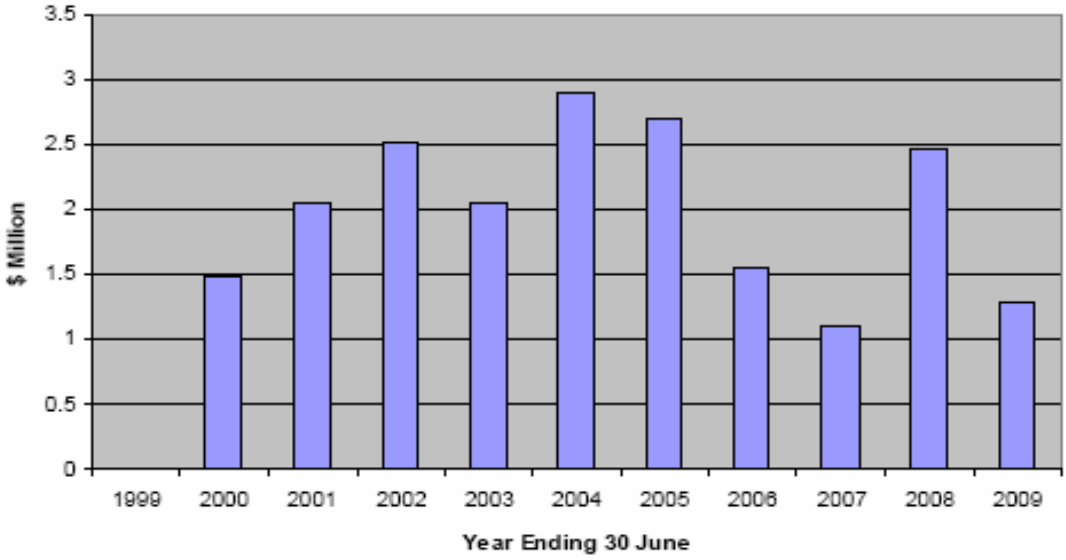


Figure 8.1.1 shows a downward trend in TransGrid's anticipated expenditure, except in 2008, when TransGrid anticipates that expenditure will rise significantly. The profile for projected expenditures is linked to detailed schedules for equipment replacements and also includes $1.4 million for a state records security upgrade.

Ring Fencing of External Business

TransGrid states that it derives approximately $20 million per annum from external business services. These services include contestable contracting and utility consulting services. Like all regulated utility businesses in the NEM, TransGrid is required to comply with ring fencing arrangements that are designed to prevent the use of monopoly market power and revenue to support competitive business operations.

TransGrid acknowledges that some proportion of capital expenditure associated with the support the business category of expenditure should be allocated to the contestable segment of its business. This is because the contestable segment of its business uses many of the support functions of the regulated business including: motor vehicles and plant; administrative equipment (miscellaneous assets), and Information Technology.

8.2 PB Associates' Recommendations

PB Associates has reviewed TransGrid's support the business capital expenditure proposals and has made recommendations on each category of support the business expenditure. The following summarises PB Associates' recommendations.

IT Expenditure

In its assessment of TransGrid's IT operations, PB Associates has identified some inefficiencies and suggests some areas where expenditure could be reduced. PB Associates suggests, however, that it would not necessarily be prudent for TransGrid to adopt an aggressive stance in relation to the early adoption of IT systems and IT cost cutting.

PB Associates also identified a number of instances where specific projects were either not adequately provided for or had been duplicated. PB Associates attributes this to the split of expenditure between replacement and business improvement categories resulting in some projects being included as both replacement and improvement, or not being included in either section.

PB Associates has recommended that TransGrid's overall IT expenditure proposal be reduced by a total of $12.10 million due to a $5.30 million reduction from the IT replacement category and a $6.8 million reduction from the IT business performance category. PB Associates therefore propose an overall IT expenditure program for the current regulatory period of $59.17 million.

Table 8.2.1 shows TransGrid's overall IT capital expenditure proposal and PB Associates' recommended IT capital expenditure program.

Table 8.2.1 PB Associates' Recommendation: IT Capex

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	14.60	14.60	14.60	14.60	14.60	73.00
PB Associates' Recommendation	9.38	11.80	13.14	11.69	13.16	59.17

*Note: PB Associates has rounded TransGrid's IT expenditure application down by $1.73 million from $73.00 million to $71.27 million over the regulatory period. The ACCC has corrected for this difference.

PB Associates has made specific comments on TransGrid's IT capital expenditure application in relation to cyclical upgrades and replacement and business performance improvement. These comments are below.

Cyclical Upgrades and Replacements: PB Associates has reviewed TransGrid's proposed IT replacement schedule and found that assets that should be replaced after three years are programmed to be replaced after two years. Based on this PB Associates considers that it is likely that one-third of IT replacement would fall outside of the regulatory period (in year 6) and has adjusted its capital expenditure recommendation accordingly.

PB Associates has reviewed the unit costs for items that can be benchmarked in the public domain (such as standard office software and hardware). Based on this review PB Associates considers that there are some areas where the costs put forward by TransGrid are below a market price and other areas where the costs put forward by

TransGrid are higher than the current market average. PB Associates has adjusted the capital forecast expenditure accordingly.

PB Associates has accepted that the combined number of laptops and desktops required to be replaced in the forecast period is 1000, as stated in TransGrid's capital expenditure Application to the ACCC. PB Associates has not accepted the revised estimate of 1,353 put forward by TransGrid in its Supplementary Capital Expenditure Application as TransGrid has not provided any supporting evidence for this variation.

Business Performance Improvement

PB Associates has reviewed TransGrid's current business performance improvement estimates and the basis of the 20 per cent estimate. PB Associates agreed that general IT developments are likely to lead to opportunities for effective IT investments by TransGrid. There are two factors which PB Associates believes count against allowing TransGrid its full application amount in the current regulatory period:

- Historical expenditures are well below the levels estimated by TransGrid for future business improvement projections. Historical figures for business improvement indicate an amount of around $1.65 million per annum compared to the projected level of $2.9 million per annum.
- Business improvement investments are intended to provide tangible benefits for the organisation. TransGrid undertakes a project evaluation process for IT investments that includes net benefit studies which largely underpin the prioritisation and selection of projects. On this basis the benefits of business improvement expenditures should generally exceed costs in order for them to be approved internally.

Although adjustments have been recommended in this review for certain aspects of the TransGrid IT proposal, PB Associates has not found material deficiencies in the costing of proposed business improvement projects.

However, PB Associates does not believe TransGrid has adequately justified the 20 per cent estimation of business improvement expenditure requirements. As is the case for other aspects of this review, PB Associates has focussed on assessing the identified need and efficiency of proposed IT investments. Although it is recognised that developments in IT may lead to the identification of new opportunities to enhance existing systems during the regulatory period, it is not, in most cases, possible to identify those areas or describe those systems as necessary at this time. It is therefore the view of PB Associates that the recommended capital expenditure for IT business improvement investments should be linked to historical levels. PB Associates therefore recommends a figure of $7.8 million for the current regulatory period.

Motor Vehicle and Mobile Plant

PB Associates has reviewed the approach adopted by TransGrid in determining motor vehicle and plant expenditures over the regulatory period, and found it to be based on robust asset information and a sound process for vehicle turnover.

PB Associates notes that there is an increase in average net capital investment in 2005 followed by declining amounts. Although vehicle numbers in all classes are projected to remain constant over the period, capital expenditure levels rise to $9.5 million in 2005 and fall to $7.1 million in 2009. PB Associates assessed that this is due to the replacement of a number of the mobile plant vehicles which have reached the end of their economic life. Although plant numbers do not change, the purchase costs incurred during 2004/05 are substantially above average. PB Associates was provided with plant records showing the age of these vehicles and the cost of their replacement which support the proposed expenditure program.

PB Associates notes that TransGrid has included motor vehicles relating to salary contracts which were 100 per cent private use. PB Associates considers that it is not appropriate that they be included in the regulated asset base. PB Associates therefore recommends that $0.6 million per annum associated with private motor vehicles be removed from the recommended expenditure level.

PB Associates total recommended 5 year capital expenditure program is $36.6 million. This is shown in the table below.

Table 8.2.2 PB Associates' Recommendation: Vehicle and Mobile Plant Capex

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
TransGrid Supp. Application	9.51	8.22	7.34	7.42	7.31	39.50
PB Associates' Recommendation (adjusted for private use vehicle)	0.60	0.60	0.60	0.60	0.60	36.62
Disposal value	4.86	4.14	3.65	3.69	3.53	19.87
Net capital expenditure	4.05	3.48	3.09	3.13	3.00	16.75

*Note: PB Associates has rounded up TransGrid's motor vehicle and plant expenditure application by $0.12 million to $39.62 million over the regulatory period. The ACCC has corrected for this difference.

Miscellaneous Assets, Office Equipment

PB Associates has reviewed the detailed schedules for equipment purchases and believes that the process for identification of anticipated expenditures and the levels proposed are reasonable. PB Associates notes that expenditure for the state records upgrade has been included in both the IT and miscellaneous assets sections. PB Associates recommends that expenditure associated with the state records upgrade, $1.4 million, be removed from the miscellaneous assets projections.

The table below provides a comparison of TransGrid's miscellaneous assets and office equipment expenditure proposal and PB Associates recommended capital expenditure program.

Table 8.2.3 PB Associates' Recommendation: Miscellaneous Assets and Office Equipment Capex

Capex ($million 2004)	Total
TransGrid Supp. Application	9.2
PB Associates' Recommendation	7.7

*Note: PB Associates has rounded down TransGrid's miscellaneous asset and records expenditure application by $0.09 million to $9.11 over the regulatory period. The ACCC has corrected for this difference.

Ring Fencing of External Business

PB Associates recommends that some proportion of capital expenditure be attributed to the contestable segment of TransGrid's business. PB Associates considered a number of potential approaches including proportion of:

- Total revenues (2.9 per cent)
- Total operating expenditures (1.7 per cent)
- Labour hours (2.7 per cent)
- Labour dollars (2.7 per cent)

PB Associates supports TransGrid's view that using total operating expenditure (1.7 per cent) would be a reasonable basis for the allocation. However, PB Associates notes that the above calculations are based on adjusted figures which exclude a one off project for Energy Australia which substantially distorts the calculation. When 2002/03 and 2003/04 Annual Report figures are used, the following proportions are derived:

- Total revenues (2.4 per cent 2002/03, 4.4 per cent 2003/04); and
- Total operating expenditures (3.3 per cent 2002/03, 6.0 per cent 2003/04).

PB Associates suggests therefore that total revenues are a reasonable basis for the allocation and that 2002/03 proportions represent a more accurate representation of future external business operations.

The table below shows the level of support the business capital expenditures recommended by PB Associates after adjusting for the 2.4 per cent allocation to the external business.

Table 8.2.4 PB Associates' Recommended Support the Business Capex Profile

Capex ($million 2004)	04/05	05/06	06/07	07/08	08/09	Total
Information technology	9.15	11.52	12.82	11.41	12.84	57.75
Motor vehicles and plant	8.70	7.44	6.58	6.66	6.37	35.74
Miscellaneous assets	2.63	1.52	1.07	1.04	1.26	7.52
Total support the business	20.48	20.48	20.48	19.11	20.48	101.02

8.3 Submissions in response to PB Associates' Report

Issues raised in submissions that relate to business support expenditure are summarised below.

TransGrid has reviewed PB Associates' Report on TransGrid's support the business capital expenditure proposals and asserts that PB Associates has misquoted the cost of moving to a single Enterprise Resource Planning (ERP) platform. PB Associates considered that the move to a single ERP platform will require expenditure approximately equivalent to the cyclical replacement of the current system ($6.8 million).

TransGrid states, however, that its documentation on the cost estimation of moving to a single ERP, suggests expenditure of $10-$15 million is required. The estimates submitted to the ACCC did not provide funding for the ERP replacement as the strategy was not finalised at that stage. TransGrid states that the amount of funding recommended in the PB Associates report would not allow TransGrid to fund this project during the current regulatory period.

The EUAA commented on the increase in TransGrid's business support expenditure application in its supplementary Application (November 2004) compared to its original Application (September 2003).

The EUAA notes that TransGrid's business support expenditure application increased 11 per cent in real terms from $107 million in September 2003 (or $109.6 million in June 2003 dollars) to $122 million in November 2004. The EUAA has questioned whether TransGrid's business has expanded to the extent that justifies this 11 percent increase in business support expenditure.

8.4 ACCC Considerations

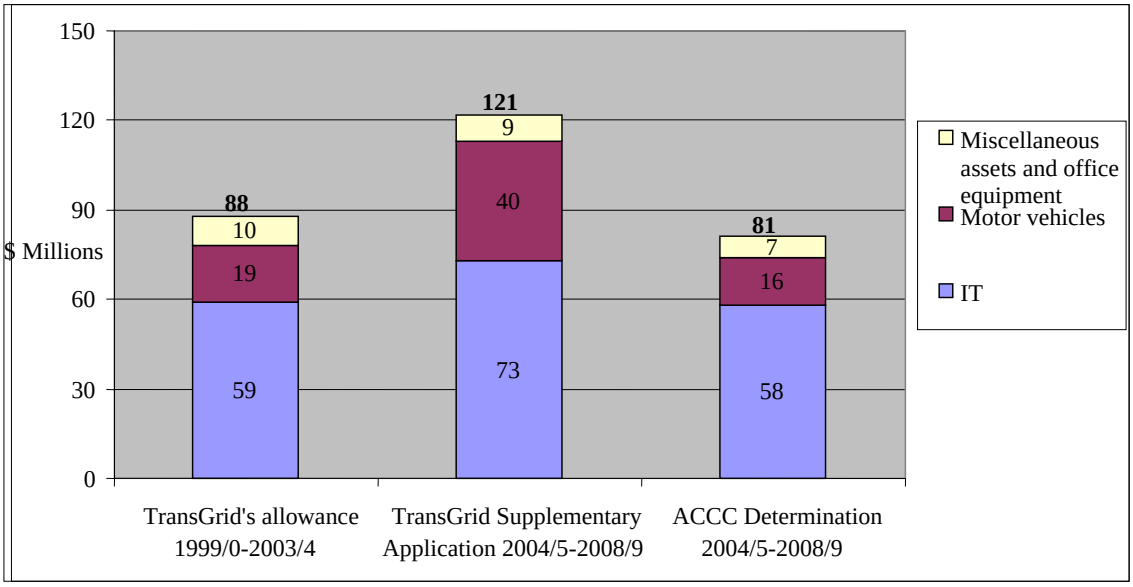
The ACCC's expenditure determination for the support the business category is broadly the same as TransGrid's spending in the last regulatory period.

The capital expenditure allowance for the support the business category in the last regulatory period was $88.13 million ($2004) (before adjustment to reflect the proportion of capital expenditure to be allocated to the contestable segment of TransGrid's business). This is broadly in line with the ACCC's Supplementary Draft Decision of $81.36 million for the current regulatory period. This similarity is largely explained by the relatively small change in expenditure determined by the ACCC for motor vehicles, mobile plant, and IT.

At a broader level the reason why there is not a large change in business support expenditure, despite a large increase in augmentation expenditure, is because the support the business category is not related directly to augmentation. Support the business is a non-network function which delivers economies of scale to TransGrid as its network grows. Further, changes to the support the business category are likely to be incrementally introduced to maintain high level business processes.

A comparison of: TransGrid's business support expenditure application for this regulatory period, the ACCC's determination for this regulatory period, and TransGrid's allowance for the last regulatory period are shown in the chart below.

Figure 8.4.1 Comparison of business support expenditure



In reaching its Supplementary Draft Decision on TransGrid's proposed support the business capital expenditure program, the ACCC has considered a number of issues which are discussed below.

IT expenditure

In relation to IT expenditure the ACCC considers that TransGrid's capital expenditure should be adjusted to reflect:

- That TransGrid has over-allocated expenditure for replacement of IT assets. The ACCC considers that one third of assets listed for three year replacement are not likely to fall within this regulatory period.
- TransGrid's proposed unit costs for software and hardware differ from the benchmark costing for these products in the public domain.
- The number of laptops and desktops to be replaced in this regulatory period is the number stated in TransGrid's original application. This is because TransGrid has not provided any supporting evidence for the increase in the number requested in their supplementary application.
- Expenditure on IT business improvement investment should be more closely linked to historical levels. The ACCC notes that historical expenditure is well below the levels estimated by TransGrid for future business improvement projections without adequate explanation for why increased expenditure is required. The ACCC considers that the net efficiency improvement benefits arising from business performance improvement expenditure should largely outweigh the associated costs.

For these reasons the ACCC has determined a downward adjustment of TransGrid's IT expenditure program of $12.1 million over the five year regulatory period. The ACCC therefore considers that TransGrid's overall IT expenditure program for this regulatory period should be $60.9 million.

Table 8.4.1 ACCC Decision: IT Capex

Capex ($million 2004)	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**	**Total**
TransGrid Supp. Application	14.60	14.60	14.60	14.60	14.60	73.00
ACCC Supp. Draft Decision	12.38	12.38	12.38	12.38	12.38	60.90

In response to TransGrid's submission to the PB Associates' Report, the ACCC has reviewed PB Associates' cost estimation for the move to a single Enterprise Resource Planning (ERP) platform and finds no basis for the conclusion that PB Associates misquoted the cost of moving to a single ERP platform.

The ACCC understands that PB Associates considers that the continuation of the dual ERP platform is not optimal, however, no information has been provided to PB Associates or the ACCC to allow an assessment of the costs and benefits of a move to a single ERP platform. On this basis PB Associates has allowed for the ongoing cyclical replacement of the dual ERP platform, and has not recommended any expenditure reductions to TransGrid's request to move to a single ERP. PB Associates accepts TransGrid's position that moving to a single ERP platform may require greater expenditure than the simple replacement of the dual ERP platform.

The ACCC has allowed for the ongoing cyclical replacement of the dual ERP platform. This is included within the ACCC's decision on overall IT expenditure.

Motor Vehicles and Mobile Plant

The ACCC considers that TransGrid's motor vehicle expenditure application is reasonable. However the ACCC considers it appropriate to only allow for net motor vehicle and mobile plant expenditure. This is the gross capital expenditure, adjusted for both private use vehicles and the disposal value of vehicles. The ACCC therefore determines that an allowance of $16.63 million should be included in TransGrid's motor vehicle expenditure program for the regulatory period.

Table 8.4.2 ACCC Decision: Motor Vehicle and Mobile Plant Capex

Capex ($million 2004)	Total
TransGrid Supp. Application	39.50
ACCC Supp. Draft Decision	16.63

Miscellaneous Assets, Office Equipment

The ACCC supports the agreement between PB Associates and TransGrid to remove $1.4 million relating to the state records upgrade from its miscellaneous asset and office equipment projections. The ACCC therefore considers that TransGrid's overall miscellaneous asset and office equipment capital expenditure program for this regulatory period should be $7.8 million.

Ring Fencing of External Business

The ACCC determines that an average of 2002/03 and 2003/04 operating expenditure figures should be used to calculate the proportion of capital expenditure to be allocated to the contestable segment of TransGrid's business. This is because taking an average provides a more accurate representation of likely future external business operations, which may include large projects that significantly effect total operating expenditure. An average of total operating expenditures over these years is 4.65 per cent.

The ACCC therefore considers that TransGrid's overall support the business capital expenditure after adjusting for the 4.65 per cent should be $81.36 million over the regulatory period.

Table 8.4.3 ACCC Decision: Support the Business Capex Profile

Capex ($million 2004)	Recommended expenditure program
Information technology	60.90
Motor vehicles and plant	16.63
Miscellaneous assets	7.80
Total support the business	85.33
Deduction for contestable segment	3.97
Net support the business expenditure	81.36

The ACCC also considers that contestable service costs from the previous regulatory period for support the business should be removed from the regulated asset base. The ACCC intends to apply this method of cost allocation, discussed above, to business support expenditure from the previous regulatory period.

8.5 ACCC Decision: Support the Business Capital Expenditure

The table below shows the ACCC's Supplementary Draft Decision on an efficient amount of Support the Business capital expenditure, broken down by category.

Table 8.5.1 ACCC Decision: Support the Business Capex

Capex ($million 2004)	**TransGrid Supp. Application**	**ACCC Supp. Draft Decision**
Information technology	73.00	60.90
Motor vehicles and plant	39.50	16.63
Miscellaneous assets	9.20	7.80
Deduction for contestable segment		3.97
Total	121.70	81.36

9. Miscellaneous Issues

This section deals with issues that are not covered in other chapters in this decision, and issues that have arisen from the PB Associates' report in respect of material that has previously been the subject of comment in the TransGrid Draft Decision, and issues that have arisen in relation to TransGrid's application following the release of the SRP.

9.1 TransGrid Proposals on Indexation

TransGrid indicated in its Application that its capital expenditure allowance over the forthcoming regulatory period should be adjusted by indices other than the consumer price index. In particular, TransGrid has suggested that its maximum allowed revenue should be indexed to cost drivers that will affect the ex-ante cap in predetermined ways such as movements in construction price indexes.

TransGrid has indicated that there is likely to be an increase in real construction costs over the regulatory period based on increased demand for equipment combined with a limited supply of contractors for the provision and installation of equipment. TransGrid and its advisors used historical annual building construction prices as a proxy for forecasting electrical equipment construction costs to demonstrate that this is expected to be a material issue. Notwithstanding that building construction prices only partly reflect the input prices of TNSPs, the ACCC considers that TransGrid should have factored in any anticipated real cost increases as part of its proposed capital program if it considered this to be a material risk.[9]

In addition the ACCC is not convinced of the materiality of the problem claimed by TransGrid: many of the components used by TransGrid in its construction are imported and therefore local demand is largely irrelevant; and contractor costs are generally a small proportion of the overall cost of projects which means that increases in their margins would not lead to significant changes in construction costs.

In general, the ACCC considers that there are a number of problems associated with the escalation of input costs via a weighted average index of TransGrid's 'actual' input costs. These include:

- Dilution of the incentive for TNSPs to minimise costs if the revenue cap is adjusted for a TNSPs or industry-wide, actual cost changes[10];

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9 It should be noted that in the Statement of Regulatory Principles, the ACCC indicated that it would consider proposals from TNSPs which provides TNSPs with reasonable protection against variation in efficient costs due to changes in underlying parameters (SRP 5.7 Capex incentive mechanism and Appendix E Capex-possible construction of a dynamically adjusting cap).

10 The adoption of an industry-wide cost index should strengthen the incentive arrangements of the regulatory regime. However given the size of the industry, TransGrid's costs may have a disproportionate influence in movements of an industry-wide index.

- Identifying and applying an index of prices that accurately reflects changes to TransGrid's input costs;
- Potential strategic behaviour by TNSPs through rebalancing the composition of the index through allocation of expenditure to capital with the highest price increases;
- Increased complexity of the regulatory regime with potentially some costs such as operating costs escalated by forecasts and capital costs escalated by a specific index; and
- Lack of evidence to demonstrate that the reliance on forecasts of input cost changes systematically under-compensates the TNSPs.

The ACCC also considers that CPI is a commonly used and widely accepted measure of inflation that has been employed by the ACCC in its previous revenue cap determinations. The continued use of CPI by the ACCC will help achieve reasonable certainty and consistency over time in the outcomes of the ACCC's regulatory processes. This objective is less likely to be achieved if the ACCC begins tailoring indices for each regulated entity.

TransGrid has also suggested that the ACCC's approach to assessing forward looking operating expenditure is consistent with TransGrid's proposals to adopt specific indices for components of capital expenditure. The ACCC has forecast some components of TransGrid's operating and maintenance costs to increase in real terms at different rates relative to other categories.

The ACCC has forecast TransGrid's labour costs to increase in real terms based on historical increases in the wage cost index published by the ABS. The ACCC has used this index to forecast real labour cost increases for the electricity, water and gas industry over the regulatory period. The ACCC considers the wage cost index has the advantages of being directly applicable to the input costs of the TNSPs and is independently derived by the ABS. The ACCC will adjust the forecast of real wage costs by the CPI over the regulatory period, not by the wage cost index or any other relevant index. As such, the use of the historic wage cost index as a method of forecasting an element of forward looking operating costs is not consistent with TransGrid's proposal that their capital expenditure allowance be adjusted by a construction cost index or any other relevant index during the regulatory period.

The ACCC has indicated in the Statement of Regulatory Principles that it would consider proposals from TNSPs to mitigate forecasting error. Specifically, a TNSP may propose a capital expenditure allowance that is contingent on specified variables. The ACCC maintains that this is the appropriate framework for addressing potential forecast errors as part of revenue cap determinations.

9.2 TransGrid's Application on Depreciation and Incentives

TransGrid has argued[11] that the interpretation of the SRP with respect to the calculation of TransGrid's depreciation allowance during the current regulatory period is unclear, and that on one reading of the arrangement the SRP imposes an inappropriately high-powered incentive regime to TNSPs to avoid investment in short-lived assets, where that investment is at levels over the level set under the ex-ante cap.

This is because under the SRP a TNSP would lose actual depreciation on any investment in excess of the ex-ante allowance. Recovery of depreciation on assets with a shorter depreciable life will be limited by that shorter depreciable life.

The ACCC has considered TransGrid's position. While the model outlined in the SRP does favour investment in long-lived assets if a TNSP overspends their capital allowance, the ACCC considers that this bias against short-lived assets is small and would not have a material impact on a TNSP's investment decisions.

By not allowing a TNSP to recover the full depreciation on any overspend, the ACCC considers that the incentives to minimise costs are appropriately strengthened, and will lead to appropriate investment outcomes. As mentioned earlier in this decision, the ACCC will require TransGrid to report on its actual level of expenditure at the end of the current regulatory period broken down into asset classes specified by the ACCC, to enable the appropriate adjustments to occur.

9.3 Pooled Contingency

TransGrid has included a contingency fund of $93 million (7 per cent of proposed capex) in its Application to deal with uncertainty regarding costs for major augmentation projects. Under the ex-ante regulatory approach, there are limited opportunities to recover unforeseen expenditures unless they are incorporated into the cost of Excluded Projects and approved by the ACCC or large enough to justify the use of the re-opener provisions.

PB Associates has recommended disallowing the whole of this contingency fund. PB Associates believes that there is sufficient scope within the allowed expenditure to provide for unforeseen variations in project costs.

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[11] NERA 'ACCC's Proposed Treatment of Depreciation' 24 January 2005.

In its Response to PB Associates' Review, TransGrid has submitted that:

- unforeseen project costs are a normal and unavoidable aspect of completing projects and that it is expected that unforeseen costs will be incurred in progressing projects to completion. TransGrid states that it is good industry practice to provide for a significant level of uncertainty on costs and that there must be reasonable provisions for uncertainty under an ex-ante regime;
- PB Associates has not provided any allowance for uncertainty in the expenditure it has recommended;
- there is little opportunity for cost savings arising from developments in the markets for equipment and installation services; and
- returns must be provided for any efficient investment on a prospective basis as required by the Code.

The ACCC has considered PB Associate's Report on the contingency funds and also TransGrid's submission on PB Associate's Report. The ACCC's conclusions are as follows.

Unforeseen costs
The ACCC agrees that unforeseen costs are a common occurrence when undertaking projects and that it is good industry practice to provide for such uncertainty. However, the ACCC believes that such cost uncertainty has been incorporated into the forward allowance for TransGrid given that this allowance was based on historical costs which reflect typical levels of unforeseen expenditures required of TransGrid in the past. Although PB Associates has not provided an explicit allowance for uncertainty in its recommended capex allowance, the ACCC considers that the use of historical costs as a basis for capex incorporates the necessary flexibility to provide for cost uncertainty.

Cost savings
TransGrid asserts that there is little opportunity for consistent cost savings in this regulatory period and that there will be a tightening in the markets which constitute the main sources of goods and services for its capex budget. However, TransGrid has not clearly demonstrated that it is likely to incur significant real cost increases beyond the flexibility factored into individual project costings by PB Associates.

Symmetry of contingencies
In assessing TransGrid's submission on contingencies, the ACCC has been mindful of the nature of cost contingencies and how these are incorporated into the ex ante regime. The ACCC considers that cost contingencies may be either positive or negative with unexpected variations sometimes benefiting a TNSP. On average these will not lead to sustained windfall gains or losses to a TNSP. This fact is reflected in the ex ante regime which allows a TNSP to spend funds as it wishes within the cap amount, covering cost overruns in projects with funds obtained from cost underruns in other projects. These features of contingencies and of the regime lead the ACCC to believe that TransGrid will be appropriately compensated for its project expenditure.

Providing returns

The ACCC believes that given the above, the disallowing of the contingency funds does not contravene the provisions of the Code. In addition, the regime under which TransGrid's Application is being assessed has features which act to mitigate risks that a TNSP might face because of unforseen costs. First, the regime includes an excluded project facility and a reopener facility to deal with large unforeseen occurrences. Second, the ACCC has decided on a regime with a symmetrical incentive structure in which a TNSP would only lose the return on any overspend over its ex ante cap rather than the amount itself.

For the above reasons, the ACCC has decided that the provision of a contingency fund is neither necessary nor efficient, and it will not include a contingency fund in TransGrid's ex ante capex program.

9.4 Non-network solutions

TransGrid's Application indicates that there is the potential for non-network or generation investments which may be a substitute for network investment over the regulatory period. To the extent that a non-network investment defers network investment, the ACCC would expect the TNSP to negotiate network support payments with the provider up to the value of this deferred investment.

TransGrid has indicated to the ACCC that notwithstanding its obligations to consider non-network investments under the regulatory test that they are not sufficiently incentivised to pursue these alternatives. In circumstances where no allowance has been provided in TransGrid's ex-ante revenue cap, TransGrid would not be compensated for any network support payments made to a provider.

The ACCC considers this to be an important issue, and that this is an area for future review. In this decision the ACCC proposes to assess network support payments (should they eventuate) in the context of a re-opener of the TransGrid Revenue Cap.

10. Total Revenue

This chapter explains the ACCC's calculation of TransGrid's allowable revenue (AR) in respect of its capex program for 1 July 2004 to 30 June 2009 only.

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

TNSPs are responsible for calculating the transmission charges payable by their customers in accordance with the principles contained in part C of chapter 6 of the Code. The annual revenue that a TNSP recovers through these charges must not exceed the MAR set by the ACCC.

The ACCC will detail its determination in respect of TransGrid's complete application (past capex, future capex, operating and maintenance expenditure, depreciation, tax, service standards and the weighted cost of capital to be applied) in its Final Decision which will be a compendium of this decision and a revised version of the Draft Decision on past capex and opex released by the ACCC in April 2004.

10.1 Application of the Accrual Building Block Approach

The SRP confirms that the ACCC will apply a 'building block' approach to determining a TNSP's revenue requirement for each regulatory period, based on expected efficient costs.

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

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

Where:

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

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

MAR_t = (allowed revenue) + (financial incentive)

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

Where:

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

The services standards regime applicable to TransGrid will be addressed in the Final Decision.

10.2 Return on and Return of Capital

The essential difference between the determination of the MAR under the ACCC's ex-post approach and the determination of TransGrid's MAR under an ex-ante approach is the calculation of TransGrid's depreciation allowance (return of capital) and return on capital (the WACC multiplied by the written down value of the asset base) allowances during the regulatory period.

Under the ex-ante model, both the depreciation and WACC allowances are set at the beginning of the regulatory period, and do not change during the period in response to the actual level of capex undertaken by the TNSP.

At the end of the period, the TNSP's closing RAB (and the opening RAB for the next period) is determined by using a TNSP's actual expenditure figures by asset class and depreciating these asset classes according to their respective lives, to arrive at a closing RAB figure. In this way, a TNSP loses both the return of and the return on capital expenditure in excess of its allowance, but stands gain via a return of and a return on the difference between the allowed level of capex and the actual level of capex if it underspends during the regulatory period.

10.3 ACCC's Assessment of the Building Blocks

For illustrative purposes, the figures in this section, other than adjustments mentioned below and those that relate to TransGrid's forward capital expenditure program are drawn from the Draft Decision on TransGrid released by the ACCC on 24 April 2004.[12]

Capital Expenditure

As shown in Figure 10.3.1 TransGrid applied for an overall expenditure allowance of $2.147 billion for this regulatory period, and the ACCC determined an expenditure allowance of $1.862 billion. This is an overall reduction of $285 million for the current regulatory period.

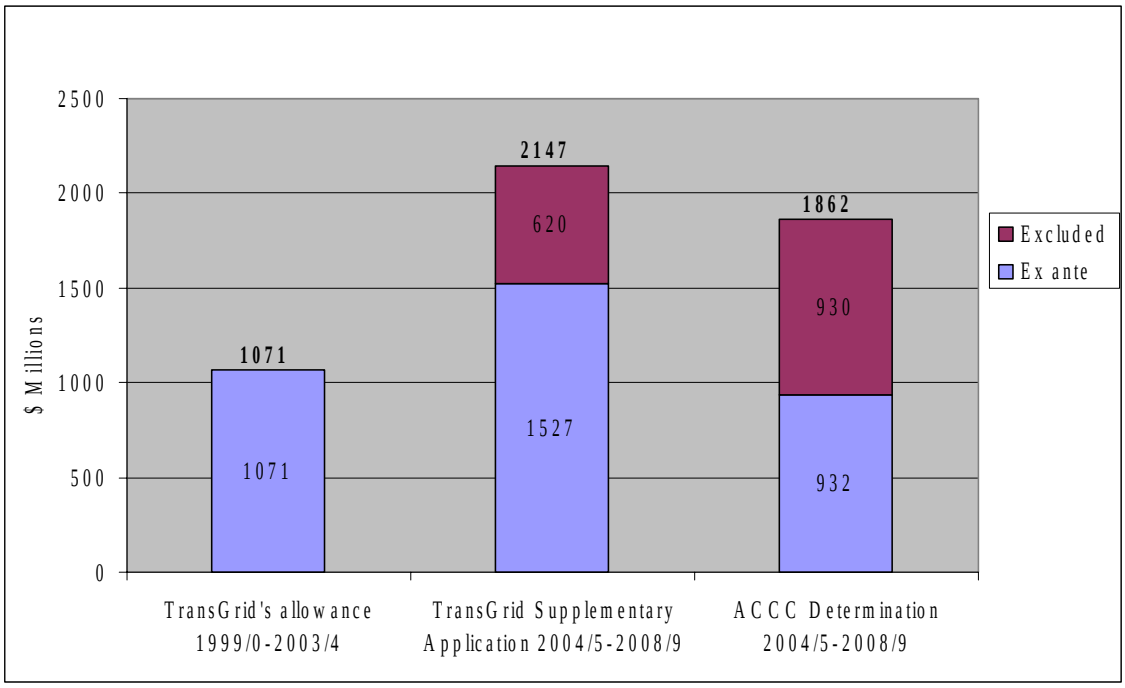
Of these totals, TransGrid applied for $1.52 billion of ex ante expenditure, and the ACCC has provided TransGrid with an ex ante capital allowance of $931.7 million. This compares with TransGrid's expenditure of $1,071.3 million ($2004) over the first regulatory period (after the ACCC's ex-post adjustments).

Most of the ACCC's reduction of TransGrid's ex ante application was the shifting of projects into the excluded category. The ACCC has classified $930 million of projects as falling within the excluded projects category compared to TransGrid's application of $620 million. The ACCC has estimated that approximately $300-400 million worth of excluded projects could eventuate in the current regulatory period if TransGrid can demonstrate that the need for the projects has arisen. If this were the case, the ex-ante allowance plus this excluded amount would be approximately $1.3 billion.

[12] In the Draft Decision the ACCC used a straight-line depreciation method (based on the remaining life per asset class of existing assets and the standard life for new assets) to model economic depreciation. The Draft Decision used a post-tax nominal return on equity of 11.87 per cent, which equates to a nominal vanilla WACC of 8.80 per cent. The ACCC's estimates of tax payable are also drawn from the Draft Decision.

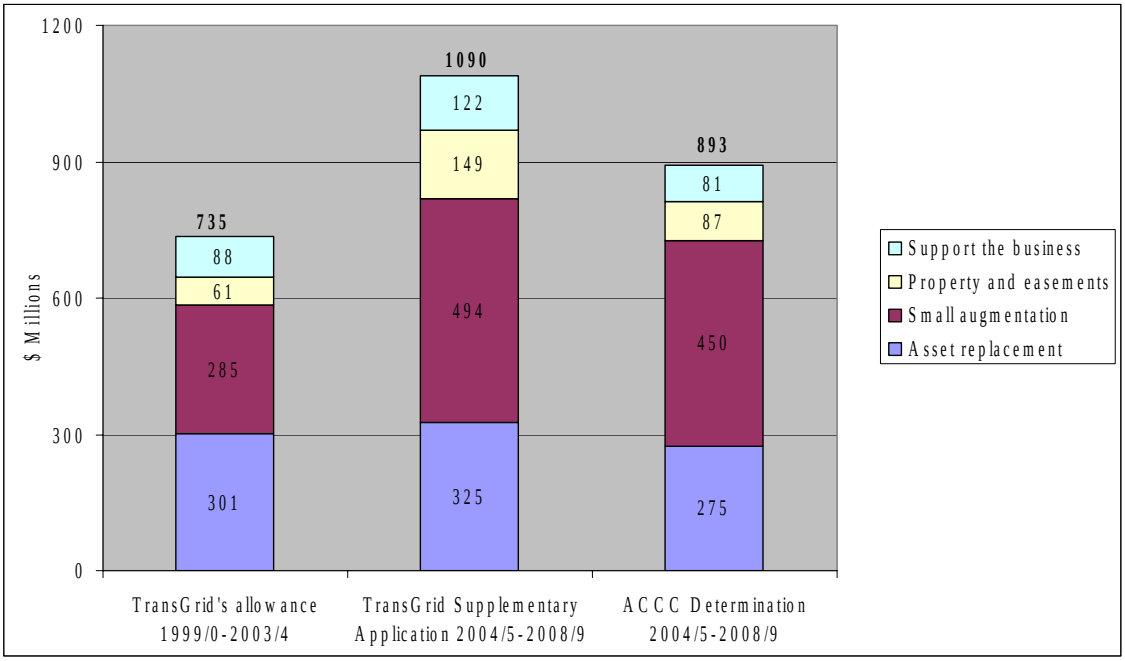
The chart below shows a comparison of: TransGrid's overall allowance for the last regulatory period; TransGrid's overall expenditure application broken down by excluded projects and ex ante components for this regulatory period; and the ACCC's Supplementary Draft Decision for this regulatory period.

Figure 10.3.1 Comparison of TransGrid's overall expenditure application and the ACCC's determination



The chart below shows a comparison of: TransGrid's allowance for the last regulatory period, TransGrid's expenditure application for this regulatory period, and the ACCC determination for this regulatory period, by category of expenditure. This chart does not show overall expenditure, because expenditure on large augmentation projects has not been included in order to provide comparable data.

Figure 10.3.2 Comparison of TransGrid Supp. Application by category of expenditure and the ACCC Supp. Draft Decision



The ACCC has adopted the value of TransGrid's asset base as at 30 June 2004 to be $2.923 billion consistent with the Draft Decision. TransGrid's asset base over the upcoming regulatory period is represented in the following table:

Table 10.3.1 TransGrid's return on capital, 1 July 2004 to 30 June 2009

($million, nominal)[13]	04/05	05/06	06/07	07/08	08/09
opening asset base	2,923.3	3,032.5	3,165.2	3,326.6	3,554.9
capital expenditure[14]	153.1	181.5	215.3	285.7	215.0
economic depreciation	43.8	48.8	53.9	57.3	63.6
closing asset base	3,032.5	3,165.2	3,326.6	3,554.9	3,706.4
return on capital	257.3	266.9	278.6	292.8	312.9

13 Opex figures used here are those from the Draft Decision.

14 Capital expenditure includes an allowance for interest during construction.

Total revenue and CPI-X smoothing in nominal terms

Based on the various elements of the building block approach, the ACCC proposes a smoothed revenue allowance that increases from $426.0 million for 1 July 2004 to 30 June 2005 to $445.3 million, $465.5 million, $486.7 million, and $508.8 million in the subsequent financial years. This is illustrated in the table below. These figures incorporate revenue smoothing based on the X smoothing factor of 2.1 per cent. That is, the MAR will increase by CPI plus 2.1 per cent in each year of the regulatory period.

Table 10.3.2 TransGrid's MAR from 01/07/04 to 30/06/09

($million, nominal)	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**
return on capital	257.33	266.94	278.62	292.83	312.93
return of capital	43.80	48.83	53.90	57.32	63.61
operating expenses	118.19	120.26	122.47	124.71	125.26
estimated taxes payable	13.32	15.31	17.57	19.94	26.33
less value of franking credits	6.66	7.66	8.79	9.97	13.16
raw revenue	425.97	443.69	463.78	484.83	514.97
smoothed revenue	425.97	445.32	465.54	486.68	508.78

Comparison of TransGrid's Revised Application & the ACCC's Supplementary Draft Decision

TransGrid applied for revenue in nominal terms of $425.97 million in the year 2004/05 to $446.52 million, $474.72 million, $505.03 million and $559.79 million in the subsequent full financial years of the regulatory period. Based on the various elements of the building block approach, the ACCC has decided on a smoothed revenue allowance in nominal terms of $425.97 million in the year 2004/05 to $445.32 million, $465.54 million, $486.68 million and $508.78 million in the subsequent full financial years of the regulatory period. The table below compares the ACCC's MAR and TransGrid's MAR over the regulatory period.

Table 10.3.3 Comparison of MAR 2004/05 – 2008/09

($million, nominal)	**03/04(f)**	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**
ACCC 2000 Decision	399.41					
TransGrid Supp Application		425.97	446.52	474.72	505.03	559.79
ACCC Supp. Draft Decision		425.97	445.32	465.54	486.68	508.78

The revenue set by the ACCC for this Supplementary Draft Decision is on average 3.31 per cent below that sought by TransGrid.

10.4 Impact on transmission charges in constant 2004 dollars

The table below illustrates how, based on forecast energy demand in New South Wales over the regulatory period, TransGrid's revised Application translates into real price changes. The overall effect is that the Draft Decision results in a 3.57 per cent increase in prices in the first year of the regulatory period and no average price change in the subsequent years of the regulatory period. This compares to TransGrid's proposed price increase in the first year of 3.57 per cent and an increase of around 1.5 per cent in subsequent years.[15]

Table 10.4.1 Impact on Transmission prices (2004 $dollars/MWh)

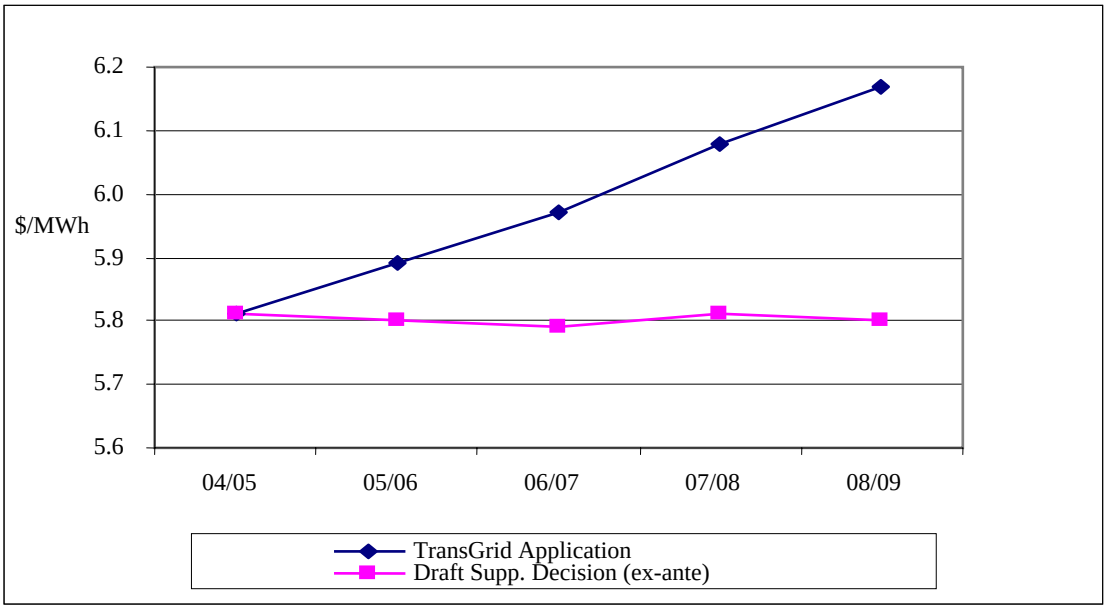
	04/05	05/06	06/07	07/08	08/09
TransGrid Application	3.57	1.30	1.43	1.88	1.45
ACCC Supp. Draft Decision	3.57	-0.25	-0.12	0.32	-0.11

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

[15] The transmission prices have been calculated by dividing the real smoothed revenue by the Energy demand (MWh) for that respective year. The ACCC has used the MWh forecast from the NEMMCo Statement of Opportunities 2004.

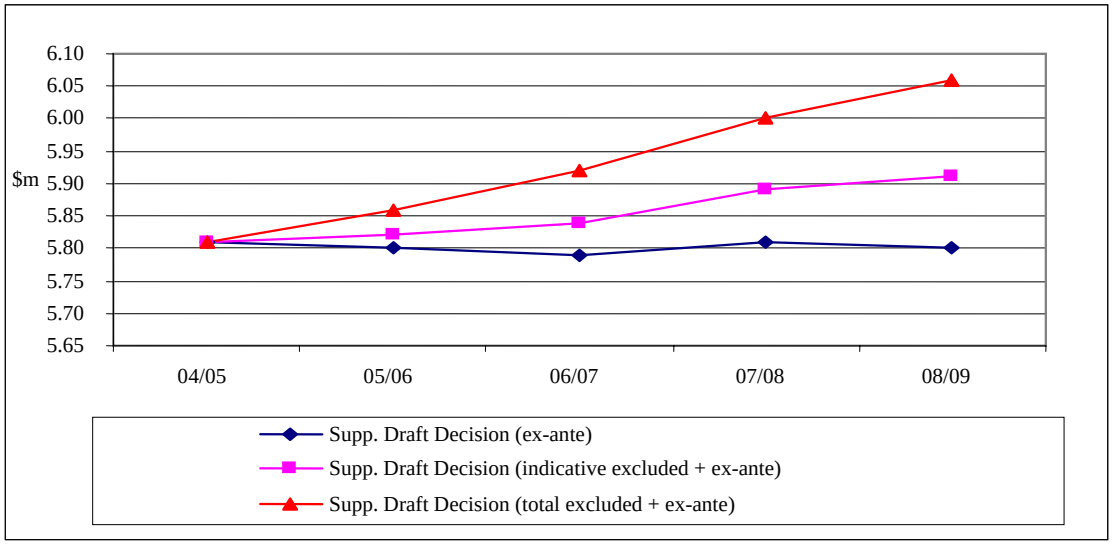
The Figure below compares real transmission prices resulting from TransGrid's revised application and the ACCC's Supplementary Draft Decision

Figure 10.4.1 Transmission prices (constant $2004/MWh)



The impact on transmission prices assuming $400 million of excluded projects are invoked and assuming all excluded projects are invoked during the regulatory period is provided for indicative purposes in the figure below.

Figure 10.4.2 Transmission prices (constant $2004/MWh)



10.5 Conclusion

On the basis of the ACCC's forecast inflation, the ACCC has determined a revenue cap in nominal terms for TransGrid that increases from approximately $425.97 million for 1 July 2004 to 30 June 2005, to $508.78 million from 1 July 2008 to 30 June 2009.

Appendix A: Small Augmentation Projects

1. New Transmission Lines

Glenn Innes – Inverell Supply

This project is driven by low voltages due to outages of either the 96N Armidale-Inverell line or 96M Moree-Narrabri line. The TransGrid Planning Report PLR 218 indicates that the project is required by 2008/09 and has been scheduled for commissioning by April 2004. TransGrid has estimated this project to cost $17.4 million.

Upgrade 966 Armidale-Koolkhan 132Kv Line

This project is driven by low voltages and the unacceptable thermal rating of the 966 line at the 89 Armidale-Koolkhan 330kV line. The work involves increasing the ground clearances on critical spans that currently limit the thermal rating. The Planning Report PLR 212 indicates this project is required by 2004/05 but will be deferred until 2006/07. TransGrid has estimated expenditure of $10.9 million on this project.

Mulwala 132kV Supply

This project is driven by main network limitations in the form of low voltages at Finley and Deniliquin substations. The project commenced following the outage of the Darlington Point -Coleambally 132kV line. In addition, load growth at Mulwala means that a firm 132kV is warranted. TransGrid has proposed the installation of a 10MVAr 132kV capacitor bank at Deniliquin and a second transformer at Finley to address these issues.

TransGrid has included expenditure of $1.4 million for the regulatory period associated with construction of the Finley-Mulwala 132kV line which is not scheduled for commissioning until 1 October 2011.

Parkes, Forbes and Cowra Supply

This project is driven by low voltages at Forbes and Parkes and the overloading of 999 Cowra-Yass on outage of 94K Wellington-Parkes. TransGrid has estimated $15.8 million for the line component of this project, to be commissioned on 1 December 2009. The costs associated with the installation of reactive plant and transformers have been included in the estimates for reactive plant and transformers.

Upgrade Lines 64, 65 and 66 – Snowy Asset Rehabilitation

This project is driven by the concerns about existing ground clearances under current operating conditions at lines 64, 65 and 66 in the Snowy region. The rating of these lines is placing constraints on the import capacity into NSW from Victoria and Snowy. TransGrid proposes upgrading these lines to address these issues at an estimated

expenditure of $17.7 million and has scheduled the project for commissioning by 1 December 2008.

Cable 41 Series Reactor Replacement

This project is driven by the need to replace the 330kV cable 41 series reactor due to its condition. TransGrid has estimated expenditure of $4.8 million. However, an amount has also been proposed in asset replacement of $4.8 million.

Reconstruction of 875 and 132kV

This project was not included in TransGrid's proposed capital works program as an augmentation but rather, was included as part of the asset replacement program. TransGrid has sought $4.8 m for maintenance of the existing 66kV line. TransGrid also proposed the installation of capacitors at Narrabri to provide voltage support until the construction of the 875 line at 132kV is required.

Thr reconstruction of the 875 line would rule out the need for maintenance works and delay the need to install the Narrabri capacitor bank for three years, saving nearly $5 m in the immediate future and further savings in the long term. The estimated cost of reconstructing the line is $18.3 million and easement cost are estimated to be $7.9 million.

2. New Substations

Boggabri 132kV Substations

This project is driven by the thermal capacity of both 88K Gunnedah TransGrid-Gunnedah Country Energy and 88L Gunnedah TransGrid-Gunnedah Country Energy and low voltage at Boggabri due to an outage of either line. The preferred option selected by a Joint Planning Committee of TransGrid and Country Energy is for Country Energy to request a new 132/66kV bulk supply point at Boggabri (Planning Report 205).

TransGrid has scheduled this project for commissioning by 1 March 2010 and has proposed expenditure to of $1.1 million for pre-construction design, construction approvals and site acquisition costs.

Buladelah 132kV Substation

This project is driven by constraints in the area identified by both TransGrid and Country Energy which affect voltage levels in the Buladelah area. The preferred option selected by the Joint Planning Committee is the establishment of a new bulk supply point at Buladelah by the construction of a 132kV substation (Planning Report 206).

The installation of capacitors in the Country Energy network has enabled TransGrid to defer this work.. The project has therefore been scheduled for commissioning by 1 August 2008 with estimated expenditure of $6.7 million.

Glenn Innes Supply

This project is driven by the need to provide communications and data services to the Glenn Innes substation and terminal equipment. TransGrid has estimated expenditure of $0.641 million.

Wagga North 132kV Substation

This project is driven by the load supplied by the 132/66kV substation exceeding the firm capacity of the transformers in 2005/06. The substation is also operating close to its equipment fault ratings and any further increase in capacity will require the fault limitation to be addressed. In addition, two 132kV circuits supplying the substation are near capacity and the additional capacity required from the substation as a result of new gold mine proposed to be commissioned in 2005 means that these feeders will need up-rating.

TransGrid has indicated that Country Energy has requested an additional bulk supply point and the least cost solution is to construct the new Wagga North substation (Planning Report 227). TransGrid has scheduled this project for commissioning by 1 August 2008 and estimated expenditure of $11.1 million.

Cooma North 132kV Switching Station

This project is driven by the need to avoid congestion at the Cooma substation as a result of the connection of an additional Country Energy line. TransGrid's preferred option is to construct a new 132kV switching station in the Cooma area to connect the new Country Energy line. The planning report indicates that the provision of additional capacitor banks in the area for voltage support is beneficial and TransGrid propose installing additional banks in the switching station as there is there is limited space at the substation (TransGrid Planning Report 208).

TransGrid has scheduled this project for 1 December 2007 and proposed expenditure of $8.0 million. Capacitor banks have been included in TransGrid's estimate of the proposed switching station as these were omitted from the TransGrid Application.

3. Reactive Plant

Canberra 132kV Capacitor Bank

This project is driven by the need to support the voltage at the Canberra substation when the 330kV lines into the substation are operated up to their full thermal ratings-importing power from Snowy/Victoria.

TransGrid has scheduled this project for commissioning by 1 December 2005 and has estimated expenditure of $2.1 million.

Cowra, Parkes and Forbes Capacitor Banks

This project is driven by the need to install capacitors at these locations to defer the commissioning of a second transformer Parkes substation (2006/07), construction of a Manildra-Parkes 132kV line (2007/08) and replacement of the Cowra transformers by lager units (2009/10).

TransGrid has scheduled this project for commissioning by 1 December 2006 and has estimated expenditure of $3.1 million.

Panorama 66kV Capacitor Bank

This project is driven by low volts at the Panorama substation on the outage of the 132kV Wallerawang-Panorama line. The installation of two 10MVAr 66kV capacitors at Panorama substation will remove this limitation.

TransGrid has scheduled this project for commissioning by 1 April 2008 and has estimated expenditure of $1.2 million.

Dapto Capacitor Banks

This project is driven by the need to augment the capacitor due to its condition. TransGrid has advised that additional reactive support is required to maintain voltage control under conditions of high import from Snowy/Victoria.

TransGrid has scheduled this project for commissioning by 1 December 2005 and has estimated expenditure of $3.4 million.

Darlington Point 132kV Capacitor Banks

This project is driven by a voltage collapse at Darlington Point under conditions of high load. TransGrid proposes to address this issue by the installation of 40MVAr capacitor banks and by Country Energy installing under voltage load shedding at a number of sites.

TransGrid has scheduled this project for commissioning by 1 December 2005 and has estimated expenditure of $4.6 million.

Koolkhan 66kV Capacitor Bank

This project is driven by the deferral of augmenting the Koolkhan transformers until 2009/10 by the installation of additional capacitors at the substation.

TransGrid has scheduled this project for commissioning by 1 December 2006 and has estimated expenditure of $1.2 million.

Nambucca 66kV Capacitor Bank

This project is driven by the need to alleviate low voltages on the outage of either the 965 Armidale-Kempsey or 96C Armidale-Coffs Harbour line prior to the commissioning of the Coffs Harbour 330/132kV substation.

TransGrid has scheduled the two 10MVAr capacitor banks to be commissioned by 1 December 2006 and has estimated expenditure of $1.2 million.

The new 330/132kV Coffs Harbour substation is also scheduled for construction in 2006 and this will provide additional voltage support to the area, which negates the need for the capacitor banks. TransGrid have provided additional planning studies that indicate the capacitor banks would provide voltage support on the combined outages of both 89 line Armidale-Coffs Harbour and the control scheme proposed for the area.

Main System Capacitor Banks

This project is driven by the need to provide capacitor banks at the following locations: Regentville 80MVAr; Sydney West 200MVAr; Vales Point 2x200MVAr; Bayswater/Liddell 150MVAr; Eraring 150MVAr; Mt Piper 150MVAr; and three other locations to be identified.

Tamworth Reactors Stage 2

This project is driven by the need to provide the capability to progressively restore supply to the Hunter Valley, western and central coast power stations from Queensland. This would facilitate more rapid restoration of supply to NSW, particularly the North of Sydney. TransGrid has also stated that this reactor would serve as an in service spare to cater for the failure of any of the six other 50MVAr 330kV shunt reactors in NSW.

132 Narrabri Capacitor Bank

This project is driven by the need to install two 66kV 10MVAr capacitor banks at the Narrabri substation to maintain acceptable voltage levels at Narrabri on the outage of the 968 Tamworth-Narrabri line.

TransGrid has scheduled the project for commissioning by 1 December 2006 (Planning Report 218) and estimated expenditure of $0.645 million.

TransGrid has allowed $4.8 million for urgent maintenance on the 66kV 875 Tamworth-Gunnedah line. A review of further planning studies indicate that the capacitor banks can be deferred until mid 2009 if this line is reconstructed at 132kV.

Cooma Capacitor Bank

This project is driven by the need to install a 132kV 10MVAr capacitor bank at Cooma substation to support voltage in the area. The construction of the proposed 132kV Cooma North Switching Station will allow additional capacitor banks to be installed (Planning Report 205).

TransGrid has estimated expenditure of $1.0 million to be scheduled for commissioning by 1 December 2005.

Deniliquin Capacitor Bank

This project is driven by the need to install a 132kV 10 MVA capacitor bank proposed for the Deniliquin substation to delay the need to complete of the 132kV ring from Mulwala to Finely for approximately two years (Planning Report 217).

TransGrid has estimated expenditure of $1.5 million to be scheduled for commissioning by 2006/07.

4. Substations

33kV Supply for EnergyAustralia – Vales Point

This project is driven by the need to replace the Vales Point transformer due to an Environment Protection Agency Prevention Notice (noisy transformer). TransGrid propose to relace the transformer with a standard 330/132kV spare transformer and then re-establish the 33kV supply for Energy Australia.

TransGrid has scheduled this project for commissioning by 1 June 2007 and has estimated expenditure of $4.6 million.

Buladelah 132kV Substation

This project is driven by the need to provide data, communications links and terminal equipment to the proposed 132Kv substation at Buladelah. This substation is required to provide a new bulk supply point for Country Energy to supply the Buladelah area.

TransGrid has scheduled the project for commissioning by 1 August 2008 to align with the commissioning date for the substation and estimated expenditure of $0.508 million.

Central Coast 330kV Line Re-arrangements

Turning in Line 24 Newcastle-Vales Point

This project will facilitate greater support for the Newcastle area voltage, using the reactive power generation capability of Eraring Power Station and overcome loading limitations on the Vales Point-Munmorah line. The project consists of turning in line 24 Newcastle-Vales Point into Eraring and some 330kV line re-arrangements on the central coast.

89 Line – Connection at Armidale

This project involves the installation of a second breaker on line 89, which will supply the new Coffs Harbour and the existing Lismore 330/132kV substations. The installation of a second breaker will provide a substantially higher level of reliability of supply to the far north coast of NSW and will facilitate programmed maintenance.

TransGrid has scheduled the project for commissioning by 1 October 2006 and has estimated expenditure of $2.5 million.

Dapto Substation

This project is driven by the need to provide additional feeder bays at the Dapto substation for Integral Energy to terminate a new feeder at their Mount Terry 132/33kV substation and to replace 330kV switchgear to accommodate the increasing fault level at the Dapto substation.

TransGrid has scheduled this project for commissioning by 1 December 2006 and has estimated expenditure of $8.7 million.

Finley 132Kv Transformer Capacity Limits

This project will up-rate the existing 30MVA transformer (due for replacement in 2008) to 60MVA at the Finley substation due to increasing loads in the area. In addition, with the construction of a new 132kV line to Mulwala utilising the existing route of the Country Energy 66Kv Finley-Mulwala line, the Finley substation will lose this back-up 66Kv supply.

TransGrid has scheduled this project for commissioning by 1 October 2007 and estimated expenditure of $4.4 million.

The transformer replacement is scheduled for 2008 and the construction of the new 132kV line to Mulwala for 2011, with construction commencing in 2010. Accordingly, installation of the first transformer should be scheduled for 2008 and the second for 2010. This results in $2.7 million being deferred until 2010 and the inclusion of only $1.7 million for this period.

Frequency Injection Points, Kempsey, Port Macquarie and Taree Substations

This project is driven by the need to establish 33kV frequency injection points at TransGrid substations for Country Energy to inject load control signals into their respective networks. Country Energy requires these injection points due to the efficiencies involved with single injection at higher voltage levels.

TransGrid has scheduled this project for commissioning by 1 June 2005 and has estimated expenditure of $1.2 million.

Glen Innes Substation Rebuild

It is expected load in the area will exceed 20MVA in 2006 at which time planning requirements indicate firm capacity will be required. This will require the construction of a second 132kV feeder into the Glen Innes substation and on-load changeover capability for the two transformers. In addition, Country Energy has also requested an additional feeder bay at the substation to be connected before summer 2005/06. As the existing substation was constructed as a temporary substation, TransGrid has proposed that the least cost option is to construct a new substation adjacent to the temporary substation.

TransGrid has scheduled this project for commissioning by 1 April 2007 and estimated expenditure of $7.9 million.

Line Terminal Upratings

This project is driven by the need to up-rate a number of line terminal bays on 330kV feeders to enable operation of the following lines at their full capacity: 33 and 34 Bayswater-Liddell; 37 Kemps Creek-Avon; 23 Munmorah to Vales Point; 01 UTSS to Canberra; 02 UTSS to Yass; and 24 Vales Point to Newcastle.

TransGrid has scheduled the project for completion by 1 December 2005 and has estimated expenditure of $3.4 million.

Orange Substation 132kV Augmentation

This project is driven by the need to replace three 30MVA transformers with two 120MVA transformers due to load growth requiring a firm capacity. The portion of these costs associated with condition-based replacement has been allocated to asset replacement.

Due to the limitation of the existing site, TransGrid propose to construct a 132kV bus bar and install the two new transformers on a new site approximately 500 metres from the existing substation. The existing site will be retained for the 66kV bus bar, which will be rebuilt, alleviating the need for Country Energy to rearrange their 66kV feeders.

TransGrid has scheduled this project for completion by 1 April 2008 and has estimated expenditure of $16.0 million (excluding the condition based component of expenditure).

Murray and Upper Tumut Switching Station Refurbishment

This project is driven by the need to replace the CT and isolation earth switches, and upgrade protection at the Murray switching station. The Upper Tumut switching station has fault level limitations and a complicated jack bus bar arrangement. This work will reduce the number of bus isolators by introducing the standard 'breaker and a half' and replace the isolators by earth switches and CTs.

TransGrid has scheduled this project for commissioning by 1 December 2007 and has estimated expenditure of $15.1 million.

Mount Annan 330Kv Substation

This project is driven by the need to establish a new bulk supply point for Integral Energy. Integral Energy propose to connect four 132kV circuits and four 66kV circuits into the Mt Annan substation. This project involves the construction of a new dual voltage 330/132/66kV substation in the Mount Annan area to provide a secure supply to the Campbelltown/Macarthur areas experiencing very high load and customer growth.

TransGrid has scheduled the project for completion by 1 December 2008 and has estimated expenditure of $24.1 million.

Sydney North 132kV Fault Level Upgrade

This project involves the replacement of 132kV isolators and earth switches in order to improve fault level at the 132kV bus bars at Sydney North substation.

TransGrid has scheduled the project for commissioning by 1 December 2006 and has estimated expenditure of $4.9 million.

Sydney East, Sydney North and Sydney West Duplicate Breakers

Duplicate line breakers are used to provide bus coupling capability between the duplicate bus bars at these substations. TransGrid has indicated that last summer's bushfires caused concurrent outages on the two feeders from Sydney West, which were fitted with duplicate breakers and the bus coupling was lost until the feeder was restored.

TransGrid has scheduled the project for commissioning by 1 December 2007 and estimated expenditure of $5.5 million.

Sydney West 132kV Switchbays

This project is driven by the need to establish two additional 132kV switchbays for Integral Energy as Integral Energy is commissioning two additional 132kV feeders to supply the increasing industrial load in the area.

TransGrid has scheduled the project for commissioning by 1 December 2006 and estimated expenditure of $1.8 million.

Sydney West Substation 132kV Fault Level Upgrade

This project is driven by the slowly decreasing impedances as additional transformers and additional lines and cables are installed. This project involves the replacement of the existing disconnectors in order to facilitate an increase in fault level at the 132kV bus bar to 15,000 MVA.

TransGrid has scheduled the project for commissioning by 1 December 2007 and has estimated expenditure of $2.3 million.

Tomago 330/132kv Supply Point

This project is driven by the need to establish a new 132kV supply point on the northern side of the Hunter River for EnergyAustralia. The load at the Energy Australia 132/33kV substation has reached the stage where additional 13kV capacity is required. The establishment of this additional 132kV capacity will delay the need to replace the banks of 330/132kV single phase transformers located in the Newcastle substation.

TransGrid has scheduled this project for commissioning by 1 March 2008 and has estimated expenditure of $10.3 million.

Tuggerah 132kV Augmentations

This project is driven by the need to maintain reliable supply to the increasing loads on the central coast. This project involves the establishment of an additional 132kV switch bay and a 132kV bus section switch bay at Tuggerah substation to allow EnergyAustralia to convert their Berkley Vale substation to a 132/33kV substation.

TransGrid has scheduled the project for commissioning by 1 October 2008 and this aligns with the commissioning date of the second transformer at Tuggerah substation. TransGrid has estimated expenditure of $2.8 million.

Vineyard 12kV Line Switch bays

This project is driven by the need to construct two additional 132kV switch bays for Integral Energy at the Vineyard substation. Integral Energy is currently constructing a new dual circuit 132kV line from Vineyard to their Rouse Hill substation.

TransGrid has scheduled this project for commissioning by 1 December 2006 and has estimated expenditure of $1.6 million.

5. Transformers

Armidale 132kV Transformer Augmentation

This project is driven by load growth projections which indicate that the firm capacity of the existing transformers will be exceeded by 2006 (Planning Report 201). In addition, the two 132/66kV transformers are approaching the end of their service life. TransGrid propose replacing the two 30MVA transformers with 60MVA transformers.

TransGrid has scheduled the project for commissioning by 1 March 2006 and has estimated expenditure of $2.0 million.

Armidale 330kV Transformer Augmentation

This project is driven by the need to replace and augment two 330/132kV 150MVA transformers at Armidale substation. There are currently three transformers at the substation, two 150MVA units and one 200MVA unit. TransGrid's preferred option is to replace the two 150MVA transformers with 375MVA units, scrap the two 150MVA units and transfer the 200MVA unit to Marulan as a spare transformer.

TransGrid has scheduled this project for commissioning by 1 June 2007 and has estimated expenditure of $7.2 million. The portion of the project related to the condition of the assets has been allocated to asset replacement expenditure.

Marulan 330kV Transformer

This project is driven by the need to install additional switch gear so that the spare 200MVA transformer relocated from Armidale can be placed in service quickly if required (refer to Armidale 330kV Transformer Augmentation).

TransGrid has scheduled the project for commissioning by 1 October 2007 and has estimated that the transformer relocation will cost $1.9 million.

Vineyard 330 Transformers

Firm capacity at the Vineyard substation is expected to be exceeded in 2005/06 (Planning Report 224). This project involves the replacement of the second 200MVA transformer at Vineyard substation with a new 375MVA unit to optimise the use of TransGrid's transformer population. The 200MVA unit released by this project will be relocated to Vales Point substation to replace the 160MVA unit which has an EPA Prevention Notice requiring action to reduce noise levels.

TransGrid has scheduled the project for commissioning by 1 November 2005 and has estimated expenditure of $6.1 million.

Wellington 330kV Transformer Augmentation

The Wellington substation has two transformers, a 200MVA unit and a 190MVA unit and on the outage of either transformer the other is overloaded. TransGrid plans to relocate the 200MVA transformer to Vales Point to replace the system spare which has a known fault. TransGrid has scheduled the replacement of the 190MVA transformer at Wellington in 2006 and the 190MVA transformer will be scrapped.

TransGrid has scheduled the project for commissioning by 1 May 2006 and has estimated expenditure of $5.9 million.

Cowra Transformer Replacement

This project is driven by forecast summer maximum demands which indicate that the firm capacity of the substation will be exceeded by 2009/10. This project involves the replacement of the existing two 30MVA 132/66kV transformers at the Cowra substation with 60MVA units scheduled for commissioning in the next regulatory period.

TransGrid has scheduled this project for commissioning by 1 October 2009 and has estimated expenditure of $1.1 million.

Dapto Substation, additional 375MVA Transformer

TransGrid has advised that the Dapto substation has a high load factor. TransGrid proposes to install an additional transformer to allow for maintenance of the existing transformers so that they may meet reliability standards.

Dapto substation currently has three 375MVA transformers and meets the statutory N-1 reliability standard.

TransGrid has scheduled this project for commissioning by 1 December 2008 and has estimated expenditure of $7.2 million.

Kempsey 132kV Transformer Limitation

This project is driven by the expected firm capacity of the transformers being exceeded by load growth and involves the replacement of two existing 30MVA 132/33kV transformers at the Kempsey substation. TransGrid proposes to replace the existing units with 60MVA units.

TransGrid has scheduled the project for commissioning by 1 April 2009 and has included an estimate of $4.0 million.

Koolkhan 132kV Transformer Augmentation

This project is driven by load growth and involves the installation of a third 60MVA 132/66kV transformer or the replacement of the existing two 60MVA transformers at an

estimated cost of $0.33 million. However, this project is not necessary until summer 2010/11 and therefore, this expenditure will be deferred until the next regulatory period.

Parkes Second Transformer

The Parkes substation has a single 60MVA transformer and backup is provided by the Country Energy 66kV 895 Forbes-Parkes line. This project is necessary due to steady load growth at Forbes which is expected to continue to grow at current rates. The load at Forbes has exceeded the ability of the Country Energy feeder to provide full backup and TransGrid have proposed to install a second 60MVA 132/66kV transformer to enable it to meet the statutory N-1 reliability standard.

TransGrid has scheduled the project for commissioning by 1 December 2007 and has estimated expenditure of $3.1 million.

Port Macquarie 132/33 Transformer Replacement

This project is driven by the condition of the three 30MVA 132/66kV transformers supplying Country Energy's network. In addition, the load at Port Macquarie continues to grow due to new redevelopment in the area and the firm capacity of the existing 30MVA transformers is expected to be exceeded by winter 2007. To address these issues TransGrid proposes to install three 60MVA 132/33kV transformers to replace existing units. Two of the transformers have been included under TransGrid's asset replacement program and the third transformer has been included in TransGrid's augmentation program.

TransGrid has scheduled the project for commissioning by 1 April 2006 and has estimated the augmentation component of the project to be $3.2 million.

Sydney South Transformers Nos 1 & 2 Replacement

This project is driven by the modified N-2 reliability standard adopted by TransGrid being exceeded on an outage of either cable 41 or cable 42 and one of the four 330kV transformers connected to the bus bars at Sydney South substation. On outage of cable 41 or 42 the rating of transformers 2, 5 and 6 are exceeded. TransGrid proposes to replace the 250MVA units No.1 and No. 2 with 375MVA units so that all transformers connected to the 132kV bus bars have the same capacity.

TransGrid has scheduled the project to be commissioned by 1 December 2007 and has estimated expenditure of $12.1 million.

Tuggerah second 330kV Transformer and Switchgear

This project is driven by load forecasts that indicate that by summer 2008/09 the load on the Central Coast is projected to exceed the capacity of the 132kV systems from Munmorah, Vales Point and Sydney East to supply the load on the outage of either the 330kV Sterland-Tuggerah line or the 330/132kV transformer at Tuggerah.. TransGrid proposes to complete the 330kV mesh bus bar at Tuggerah, operating the Sterland-

Tuggerah 30kV line as a dual circuit and installing a second 375MVA transformer at Tuggerah substation.

TransGrid has scheduled this project for commissioning by 1 October 2008 and has estimated expenditure of $12.7 million.

6. Committed Projects

Coffs Harbour 330/132kV Substation

This project was commenced during the last regulatory period due to low voltages on the outage of either the 965 Armidale-Kempsey or 96C Armidale-Coffs Harbour and involves the construction of a new 330/132kV substation adjacent to the existing 30kV Armidale to Lismore line.

TransGrid has estimated expenditure of $24.3 million and the project is scheduled for commissioning by winter 2006.

Coleambally 132kV Substation

This project involves outstanding works relating to the installation of the second transformer at Coleambally 132kV substation. TransGrid has estimated expenditure of $0.040 million.

Darlington Point Communications

This project was commenced during the last regulatory period and involves the construction of a new microwave link from Wagga to Darlington Point. This project was commenced to meet the NEMMCO Standard for Power Systems Data Communications and for SCADA.

TransGrid has estimated expenditure of $0.528 million.

Inner city Substation and Cable Works

This expenditure relates to the MetroGrid project which was commenced on 10 October 2004. TransGrid has sought $17.7 million for the settlement of contractor disputes but this expenditure is the subject of separate discussion between the ACCC and TransGrid.

Koolkahn 132kV Substation

This project was commenced during the last regulatory period and involves uprating the existing transformers to 60MVA transformers and the installation of two additional 66kV feeder bays for Country Energy.

TransGrid has estimated expenditure of $0.40 million.

Liverpool Third Transformer

This project was commenced during the last regulatory period and involves the installation of a third 375MVA 330/132kV transformer in the Liverpool substation.

TransGrid has estimated expenditure of $4.2 million.

Newcastle 330kV Substation

This project was commenced during the last regulatory period and involves work required at the Newcastle substation to facilitate operation of Lines 95 and 9W at 330kV to supply additional load at the Tomago smelter.

TransGrid has estimated expenditure of $0.901 million

Southern NSW Communications Upgrade

This project was commenced during the last regulatory period and involves upgrading of the PLCs and other obsolete communication equipment.

TransGrid has estimated expenditure of $1.8 million.

Sydney West New 132kV Switchbay

This project was commenced during the last regulatory period and involves the construction of a switchbay for Integral Energy.

TransGrid has estimated expenditure of $0.10 million.

Tomago 330kV Switching Station

This project was commenced during the last regulatory period and involves work associated with the operation of Lines 95 and 9W at 330kV to supply additional load to the Tomago smelter.

Tuggerah Sterland Upgrade

This project was commenced during the last regulatory period and involves the construction of a new double circuit 330kV line along the route of an existing single circuit 330kV line. The costs of this project relates to the removal of sections of the decommissioned single circuit line and restoration works associated with the easement.

TransGrid has estimated expenditure of $0.25 million.

Vales Point and Munmorah Switchyard Uprating

This project was commenced during the last regulatory period and involves uprating terminal equipment at both Vales Point and Munmorah as a result of the uprating of Line 23.

TransGrid has estimated expenditure of $0.10 million.

Vineyard No.1 Transformer Replacement

This project was commenced during the last regulatory period and involves the upgrading of No.1 transformer to 375MVA and the relocation of the existing 200MVA transformer to the Yass substation.

TransGrid has estimated expenditure of $4.4 million.

Vineyard No. 2 Transformer Replacement

This project was commenced during the last regulatory period and involves upgrading of the No.2 transformer to 375MVA and the relocation of the existing 200MVA transformer to the Vales Point substation.

TransGrid has estimated expenditure of $3.8 million.

Waratah West 330kV Substation

This project was commenced during the last regulatory period and involves the installation of a 375MVA 330/132kV transformer at Waratah West substation.

TransGrid has estimated expenditure of $3.8 million.

Wollar-Wellington 330kV Augmentation

This project was commenced during the last regulatory period and involves the construction of a new 330kV line from the Wollar switching station to the Wellington substation; including additional landing bays at Wollar Switching Station and Wellington substation and associated communication works. The project was commenced as a result of voltage collapse on the 132kV bus bar at Wellington substation.

TransGrid has estimated expenditure of $74.0 million

Committed Condition Based Projects

These projects (Yass substation and Sydney West SVC) have been reallocated to TransGrid's asset replacement program**.**

Appendix B: Establishing the Revenue Cap and CPI-X Adjustment

Establishment of revenue caps and CPI-X adjustment	
Step 1.	
Decision parameters at start of period: The regulatory asset base (A) Post-tax WACC	Collect forecast variables for each year of the regulatory periods: O&M (OM) Capital expenditure (K) Change in CPI (ΔCPI) *That is estimate:* *OM(i), K(i), ΔCPI(i), A(I) for i= 1,2,..5*
Step 2.	
Compute Target Revenues (TR) on the basis of forecasts	Sum forecast elements of cost for each year (taking into account any forecast efficiency improvements) to determine total revenue for each year: That is: *TR(i) = OM(I) + A(i)+K(i) - A(i+1)+ r* x *A(i) + Tax*
Step 3.	
Choose the revenue cap for Year 1 Usually select AR(1)=TR(1)	The chosen revenue cap that will be used as the basis for the revenue cap in the following years via the CPI-X adjustment mechanism That is: *AR(i) = AR(i-1)* x *(1+ΔCPI(I))*x*(1-X)*
Step 4.	
Calculate X	Determine the revenue caps to give same net present value as the target revenues (net of O&M) – using WACC as discount rate That is: *NPV(TR(1),..TR(5)) = NPV(R(1),…R(2))*
Step 5.	
Calculate Maximum Allowed Revenue (MAR)	Annual revenue is adjusted by a service standards performance incentive (PI) That is: *MAR (i) = AR(i) + (PI)*

Adjustments At End Year I

Establish Actual Revenue Cap for Year i+1 i.e. AR(i+1) Given: AR(1)=R(1)	Re-apply CPI-X adjustment using CPI outcome for year just past ΔACPI (i) That is: $AR(i+1) = AR(I) \times (1+\Delta ACPI(I)) \times (1- X)$

Adjust Regulatory asset base for next regulatory period

Adjust Regulatory Asset Base for changes in Actual Inflation and Actual Capex	Apply depreciation allowances for period as assessed to asset base based on actual capex

Appendix C: Assessment of excluded projects

This appendix outlines the process the ACCC intends to use to assess future TransGrid requests to invoke an excluded project.

Appendix E lists the excluded projects that might be invoked during the regulatory period. It also lists triggers that must be satisfied for excluded projects to be invoked.

The process outlined in this appendix should be considered indicative of the process that will be followed in the future. This process and times indicated are likely to vary to account for the needs of the projects and the timing of TransGrid's investment decision making process.

A.1 ACCC's Considerations

Stage 1: Invoke the excluded event

In the first instance TransGrid should identify the needs or drivers of the project. Typically this will be associated with the excluded project triggers defined in Appendix E. Hence the outputs provided to the ACCC should include supporting information and an explanation that shows how the excluded project has met the trigger events described in Appendix E.

The complexity of the needs and the trigger events will dictate whether the ACCC requires expert assistance in this first stage. It will also dictate what supporting information the ACCC will request to form an opinion.

Upon receiving any expert advice and supporting information from TransGrid, if required, the ACCC will write to TransGrid to inform it whether the ACCC considers an excluded event has been triggered.

For information only, the ACCC will also publish via its website its letter to TransGrid. It will also place on the website any other information about the identification of needs that is not to be treated as confidential under the code.

Stage 2: Investment appraisal

The ACCC considers that in the past TransGrid has selected the preferred option after considering a high level options analysis. To assess excluded projects the ACCC will be looking to a further level of detail. Its view is that further consideration of the options, their forecast costs, sensitivities and risks for each possible scenario will ensure the most efficient project is selected.

Therefore this stage of the process will include identifying a range of possible options to address the needs identified in Stage 1 above. It will also include a regulatory test or other investment appraisal required under the code to determine the most efficient option.

The ACCC will undertake consultation with interested parties throughout the assessment of the excluded project. However in this stage it is likely to be more significant than the other stages. It may also include more consultation than is required by the regulatory test.

In this stage the ACCC is likely to obtain an independent assessment of the excluded project by an appropriate expert.

The public consultation is likely to include a call for interested parties to make written submissions prior to TransGrid finalising its investment decision. Interested parties would be requested to make submissions on any expert advice received.
Also it might be appropriate for TransGrid to provide a draft justification of project selection for interested parties to comment on.

Stage 3: Setting the incentive

The ACCC will write to TransGrid informing it of the value the ACCC intends to include in the RAB for the period of the incentive. TransGrid would then be free to undertake the remainder of its governance framework, including a final justification of project selection.

In forming an opinion about the value to be included in the RAB the ACCC would consider:

- the issues raised by submissions
- the draft justification of project selection (and TransGrid's considerations up to that point)
- any expert advice the ACCC obtains
- any indicative allowance already provided in the revenue cap

For information only, the ACCC will also publish via its website its letter to TransGrid. It would also request that TransGrid's final justification of project selection report be placed on the ACCC website for information purposes only.

The incentive that the ACCC designs for each excluded project will include the following for the incentive period:

- the start date of the incentive period
- the end date of the incentive period
- the RAB at the starting date
- the annual profile of the target capex
- the AR, which will comprise of a return of capital and return on the capex
- the RAB at the end date.

Stage 4: Investment in the excluded project

This stage involves the delivery of the project where TransGrid invests in the excluded project according to the capex selected in the regulatory test or other investment appraisal.

Stage 5: Re-setting the revenue cap

Code changes are necessary to implement the excluded project mechanism outlined in the SRP. In the event that such code changes are not made before the final revenue cap determination for EnergyAustralia, the ACCC proposes to administer the excluded projects identified in this decision in the manner set out below.

Clause 6.2.4(d) of the code limits the circumstances in which a revenue cap can be re-opened. This revenue cap is due to expire on 30 June 2009. Following are considerations about how the ACCC will review the excluded projects when re-setting the revenue cap at that time. The ACCC anticipates the following possible scenario outcomes.

Outturn capex is different from the forecast

The ACCC considers that if the execution of the excluded project was **substantially** different to the forecast, adjustments may be required at the reset. This is intended to work symmetrically and only for **extreme** cases. This is a very unlikely scenario and is only mentioned for completeness.

However if this scenario arose the ACCC would have discretion to adjust the RAB at the next regulatory period. It should be noted that it is intended to protect customers and TransGrid from windfall losses, which would be caused by exogenous events.

The ACCC understands that regulatory discretion causes concerns, however it is the ACCC's strong preference not to exercise this discretion.

If the executed capex is not substantially different from the forecast the considerations at the time of the revenue reset are more procedural and the ACCC would:

- include in the revenue cap an allowance for the Allowed Revenue specified for each year of the incentive period (both before and after the revenue reset). This would ensure that the incentive remains fixed and that it is unaffected by changes in market conditions that may affect the cost of capital.
- roll in the forecast depreciated actual capex into the RAB in the year after the end of the incentive period.
- include any capex that is planned to occur after the end of the incentive period in the ex-ante capex allowance at its forecast efficient value.

Timing

The ACCC would like to be able to forecast the amount of time it requires to assess the excluded project, that is, the time required from stage 1 to the completion of stage 3. However this would to a large extent depend on the timing of TransGrid's decision making process.

In its typical decision making process the ACCC would suggest allowing about 4 weeks for each of the following:

- public submissions
- expert review
- ACCC consideration of all issues and formally providing advice to TransGrid.

The ACCC expects that it would require about four to six months to complete a review of an excluded project, when considering the above processes and information gathering.

The times stated above are intended to provide an indication of the times expected for each review. Some of these events could overlap and the length of time required may change. To complete the regulatory test process in accordance with the code as well as the complexity and scope of the project being reviewed could also affect the time required.

Appendix D: Submissions in response to the PB Associates' Report

Energy Users' Association of Australia

PowerLink Queensland

TransGrid

Transend

Mr Robert Needham

Appendix E: Excluded Projects and their Triggers

The following table sets out the ACCC's consideration of the range of excluded projects within TransGrid's application, and the triggers that will be required to be met to signal the need for investment in these projects.

Excluded project	Trigger
Royalla 330kV	In justifying the need for the excluded Royalla project, TransGrid should:: • Demonstrate the need for 2 separate points of supply and how deep that separation must be; • Define the N-1 or N-2 level that must be available continuously and after switching; and • Define the % Probability of Exceedence forecast that this security of supply should be within. The technical and economic evaluation of solutions related to this trigger would have to show how a medium/long term horizon impacts the prudent network development, particularly with respect to the needs of the Cooma region. Information provided by TransGrid has also indicated the possibility of generation in this region. An argument that Royalla investment has been triggered would need to explicitly and objectively demonstrate how existing or committed generation can be utilised to secure the Canberra load.
Increased capacity to NSW corridor	The triggers for this excluded expenditure include: • Limitation 1 - Thermal Limitation - Hunter valley to Central Coast 330 kV line (Liddell to Newcastle 330 kV DC): The line ratings associated with the Liddell to Newcastle and Tomago 330 kV lines are as follows: Continuous rating 1220 MVA; sustained emergency rating 1430 MVA; 15 min 1500 MVA (15 min rating applicable for post contingency generation re-dispatch or network switching). The worst case contingency for loading the remaining in service 330 kV circuit is an outage of the other Liddell to Tomago or Liddell to Newcastle 330 kV circuit. • Limitation 2: Reactive deficiency / voltage stability for transfers to Sydney: The reactive margin criteria discussed here is defined as: Reactive deficiency (Sydney West)[16] +

[16] The reactive deficiency at Sydney West has been calculated from a load flow study with a QV type generator at Sydney West. The voltage of the QV generator is adjusted to determine the knee point

	200 MVAr – 280 MVAr (Sydney West SVC). The worst case contingency for calculation of this limitation is an outage of either the Bayswater to Regentville or Wallerawang to Ingleburn 330 kV circuits. Any application by TransGrid for excluded project expenditure related to augmentation of capacity to the N-S-W corridor should be related to specific demonstration that one or both of the above limitations are binding. Much of the existing power system studies conducted by TransGrid assist in defining the network limitation and relationships with the generation dispatch pattern. For a future of review of whether investment has been triggered an analysis encompassing the following would be desirable: • Clear descriptions of both limitations indicating the multi dimensional nature with Sydney/Newcastle demand levels and generation dispatch patterns. This would probably be in the form of some type of equation such that a demand and dispatch pattern can be defined, and from this it can be seen whether the limitation is violated or not. This would need to address the overload, voltage knee point, and reactive deficiency. The definition of the limitations would need to be supported by power system studies results that can be reviewed to verify the limitations. • For a medium to long term assessment of the network development, further development of the network limitations following the assumed network developments would be required similar to those above. • NEM supply / demand / minimum reserve market analysis to better define the capability of the NEM system to supply NSW at the peak, and the ability to economically and reliably alleviate the limitations, particularly via dispatch of central coast generation and generation from south of Sydney. The technical and economic evaluation would have to show how an economic assessment across a medium/long term horizon impacts the prudent network development. This is particularly important to assess the optimal timing of a major network reinforcement such as the western 500

and the reactive deficiency is calculated as the Q value at this knee point. The knee point is the voltage that results in the minimum Q value.

	kV upgrade with a new line development, and which stage should be first and second. TransGrid has also advised that environmental and planning issues result in difficulties with obtaining new lines which results in a preference for no new line solutions. However, it is still important that all reasonable options are evaluated first from a technical and economic perspective. Following some form of PV or NPV type of analysis, the criticality of planning issues and potential lead times can be better understood. Based upon the information provided by TransGrid to date, there is a range of possible solutions to the limitations discussed above. The discussion of the limitations in the PB Associates report indicates the possible non-network options that would defer the need for major network reinforcement. However, if firm commitments on the non network options can not be obtained, or a reliable system and economic outcome can not be maintained, then some form of network option may be required during this regulatory period. The non-network options that should be evaluated could include: • generation dispatch patterns favouring dispatch in the Sydney / Newcastle region, and south of Sydney; or • pre contingent load curtailment, or automatic load curtailment system in the Sydney/Newcastle region; or • additional generation in favourable locations (Newcastle, Sydney and south of Sydney); or • a combination of the above. Network solutions could include: • Some form of network switching option (this would probably require a special protection scheme to automatically operate post contingent) • Shunt compensation – capacitor banks above those assumed in the TransGrid application (TransGrid indicate options for this are exhausted by 2008/09 – only impacts reactive limitation) • Line series compensation on existing 330 kV lines • Phase angle regulator(s) on existing 330 kV lines • Western 500 kV upgrade • New line development – Hunter Valley to Central Coast • New line development – Bannaby/Marulan to Sydney

	• Other line upgrade or development option • Combinations of above, particularly over medium/long term For an evaluation over the short, medium and long term planning horizon, it would be expected that a combination of the above would be obtained. The optimal outcomes across a range of generation development scenarios should also be obtained. These scenarios should assess the network developments required if generation is obtained in more favourable locations and times as well as the minimum reserve margin scenario (as in the existing TransGrid backgrounds) to better understand the relationship between future generation levels and locations, and the impact on the future network development. Note on major interconnector upgrades At times of peak NSW demand, interconnector flows must transfer power into NSW. However, the flows from Vic/Snowy are more favourable than those from Queensland in reducing the two limitations discussed above. As flows from Vic/Snowy are preferential over flows from Queensland with respect to reducing the limitations, it would appear reasonable to expect that the upgrading of the interconnections should be considered within the evaluation of any project related to the transfers to Sydney. This will relate to the prospective levels of generation in the all regions and the coincidence of peak demand in NSW with the other regions. Note on Kemp Creek to Sydney South development. The needs for this project are not related to the limitations described above. The Kemps Creek to Sydney South project is most likely required in the next regulatory period. The prudent solution to this requirement may well be impacted by the developments related to the transfers to Sydney and as such the possible options for developments related to the Kemps Creek to Sydney South development will be required to be included in the analysis related to the limitations discussed here.
Holroyd complex	The three relevant triggers (for different elements of the Holroyd complex and Mason Park substation expenditure) are as follows: • Limitation 1 (need for Holroyd 132 kV) - Integral

	Energy supplies to Parramatta limitation: This is a TransGrid/Integral Energy planning issue. Information provided by TransGrid indicates that Integral Energy could manage this limitation until well past this regulatory period if an adequate refurbishment strategy of the existing Integral Energy 132 kV cables is implemented. As such it appears that joint planning with Integral Energy is still required on this issue. • Limitation 2 (need for Holroyd 330 kV) - Sydney West 330/132 kV transformer limitation: Based upon information provided by TransGrid, limitation 2 (Sydney West transformers) will not occur until the next regulatory period. As such the ACCC does not consider that this limitation can be cast as a trigger for the development of 330 kV capacity at Holroyd during this regulatory period. • Limitation 3 (need for Masons Park 330/132 kV) – 330/132 kV supplies to Energy Australia inner Sydney. TransGrid study results indicated that Limitation 3 could occur in summer 2008/09. In an assessment that Holroyd complex and/or Mason Park investment in response to any of these three limitations has been triggered, the TransGrid technical and economic evaluation (taking account of joint planning with Energy Australia and Integral Energy) would need to demonstrate consideration of a range of solutions addressing both Energy Australia and Integral Energy's longer term plans, and that all opportunities to economically defer investment through short term network or non-network solutions, had been exhausted. Short term network solutions that could defer substantial investment in the Mason Park substation and associated Holroyd complex works would include pre or post contingency network switching (particularly on Energy Australia's 132 kV system) possibly linked with short term transformer ratings or a special protection scheme. Longer term network solutions would include: • phase shift compensation to control power flows; • increase in 330 /132 kV transformer capacity; • new Energy Australia 132 kV circuits; • new 330/132 kV supply (one option for location is Mason Park – other options would have to be considered) • combinations of the above (e.g. new 132 kV cable

	plus transformer capacity increase) The technical and economic evaluation of the 132 kV supplies to Parramatta limitation would have to be conducted through the joint planning process with Integral Energy. It should include the range of possible Integral Energy and TransGrid options, clearly discussing any issues relating to the Integral Energy 132 kV cable refurbishment option and the medium to long term needs of the 330 kV supply from Sydney West.
QNI upgrade and Yass Wagga transmission line	These projects need to be justified against a net benefit criterion as set out in the Regulatory Test.

Table 2: Related project included in ex-ante cap

Excluded project	**Related projects included in ex-ante cap.**
Royalla	The cost of the Royalla 132 kV switching station has been included in PB Associates' recommendation of the ex ante allowance. This expenditure will provide for the 132 kV side of the Royalla 330/132 kV substation if the Royalla 330 kV substation was commissioned. The costs associated with the 132 kV works already allowed for in the ex ante cap must not be included in the costs associated with a project in response to the suggested trigger.
Increased capacity to NSW corridor	The determination of incremental expenditure based on augmentations of capacity to the N-S-W corridor should take account of the allowance that has already been made in the calculation of the ex-ante cap in respect of the following projects: • Line uprates: Liddell – Tomago; Wallerawang – Ingleburn • Line rearrangements on central coast (turn Vales Pt Newcastle line into Eraring) • Line terminal uprates: UTSS-Canberra No 1; UTSS – Yass No 2; LTSS – Yass No 3; LTSS – Canberra No 7; Marulan – Avon; Marulan – Dapto; Marulan – Yass Bayswater – Liddell No 33 and No 34; Vales Pt – Newcastle No 24; Munmorah – Tuggerah • Capacitor Banks: Sydney West 330 kV 200 MVAr; Vales Pt 330 kV 2 x 200 MVAr; Canberra 132 kV 120 MVAr; Darlington Pt 132 kV 2 x 20 MVAr; Sydney region 330 kV 5 x 200 MVAr (2 x 2006/07, 2 x 2007/08, 1 x 2008/09); Regentville 80 MVAr

QNI upgrade and Yass - Wagga transmission line	• QNI - 132 kV Phase angle regulator at Armidale • Refurbishment of the 132 kV Yass-Wagga line (990) Regard should also be had of the augmentations listed in the "Augmentation of capacity to Newcastle-Sydney-Wollongong corridor" excluded project discussed above. Some of these projects also relate to maintaining the capability of the existing system, including allowing the transfer from the interconnectors. The projects which may be linked to maintaining the transfer capability from the VIC/Snowy interconnector would be: • Line terminal uprates: UTSS-Canberra No 1; UTSS – Yass No 2; LTSS – Yass No 3; LTSS – Canberra No 7; Marulan – Avon; Marulan – Dapto; Marulan – Yass. • Capacitor Banks: Canberra 132 kV 120 MVAr; and Darlington Pt 132 kV 2 x 20 MVAr.